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 **February 7, 2023**

AGENDA

I. APPROVAL OF MINUTES

A. Approval of minutes from the January 3, 2023 Site Plan Review Technical Advisory Committee Meeting.

II. OLD BUSINESS

A. **REQUEST TO POSTPONE** The application of **Banfield Realty, LLC, (Owner)**, for property located at **375 Banfield Road** requesting Site Plan review approval to demolish two existing commercial buildings and an existing shed and construct a 75,000 s.f. industrial warehouse building with 75 parking spaces as well as associated paving, stormwater management, lighting, utilities and landscaping. Said property is shown on Assessor Map 266 Lot 7 and lies within the Industrial (I) District. **REQUEST TO POSTPONE** (LU-20-259)

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

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

D. The request of **Pease Development Authority (Owner)**, for property located at **80 Rochester Avenue** Site Plan approval for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. Said property is shown on Assessor Map 308 Lot 1 and lies within the Pease Industrial District (PI). (LU-22-210)

E. The request of **Pease Development Authority (Owner)**, for property located at **80 Rochester Avenue** requesting lot line adjustment to add 22,251 square feet to the existing lot as part of a realignment of Rochester Avenue for a proposed lot size of 496,584 square feet (11.4 acres). Said property is shown on Assessor Map 308 Lot 1 and lies within the Pease Industrial District (PI). (LU-22-210)

III. NEW BUSINESS

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

B. The request of **Lucky Thirteen Properties LLC (Owner)**, for property located at **361 Islington Street** requesting Site Plan review approval for the redevelopment of the existing property including a 695 square foot addition and a 73 square foot addition with associated site improvements including lighting, utilities, landscaping, and stormwater treatment/management, and a Conditional Use Permit approval in accordance with section 10.1112.14 of the Zoning Ordinance to allow twelve (12) parking spaces where twenty-two (22) are required. Said property is shown on Assessor Map 144 Lot 23 and lies within the Character District 4-L2 (CD-4-L2) and Historic District. (LU-22-195)

C. The request of **Brandon Kunkel (Applicant)** and **The City of Portsmouth (Owner),** for property located at **305 Greenland Road** requesting Site Plan review approval for the construction of a 19,500 square foot skateboard park including walkways and a 25 space parking lot with associated site improvements. Said property is shown on Assessor Map 241 Lot 18 and lies within the Municipal District (M). (LU-23-7)

IV. OTHER BUSINESS

V. ADJOURNMENT

https://us06web.zoom.us/webinar/register/WN_ed1Kf23yQJG32-UTimM61g

SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

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

2:00 PM **January 3, 2023**

<u>MINUTES</u>

MEMBERS PRESENT:

Peter Stith, Chairperson, Principal Planner; David Desfosses, Construction Technician Supervisor; Patrick Howe, Deputy Fire Chief; Shanti Wolph, Chief Building Inspector; Peter Britz, Planning and Sustainability Director; Nicholas Cracknell, Principal Planner; Zachary Cronin, Assistant City Engineer, Eric Eby, Parking and Transportation Engineer, Mike Maloney; Deputy Police Chief

MEMBERS ABSENT:

ADDITIONAL STAFF PRESENT: Stefanie Casella, Planner 1; Kate Homet, Associate Environmental Planner

*[] Items in brackets denote timestamp of recording

[4:14] The meeting began at 2:00 pm.

I. APPROVAL OF MINUTES

A. Approval of minutes from the December 15, 2022 Site Plan Review Technical Advisory Committee Meeting.

[4:35] P. Britz made a motion to approve the minutes as presented. The motion was seconded by D. Desfosses. The motion passed unanimously.

II. OLD BUSINESS

A. REQUEST TO POSTPONE The application of **Banfield Realty, LLC, (Owner)**, for property located at **375 Banfield Road** requesting Site Plan review approval to demolish two existing commercial buildings and an existing shed and construct a 75,000 s.f. industrial warehouse building with 75 parking spaces as well as associated paving, stormwater management, lighting, utilities and landscaping. Said property is shown on Assessor Map 266 Lot 7 and lies within the Industrial (I) District. **REQUEST TO POSTPONE** (LU-20-259)

[4:47] Chairman Stith stated that the applicant had requested to postpone.

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

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

[5:10] Chairman Stith read in both items B and C together as one application to be heard.

SPEAKING TO THE APPLICATION

Joseph Coronati of Jones & Beach Engineers and Michael Garrepy, the developer, came to present this application. Mr. Coronati went over the updates from their last application, these included: drainage updates, existing trees listed on the plans, detention pond details and changes, infiltration changes, grade changes, etc. They have responded to many of the third party review comments from Altus Engineering and are awaiting responses from them.

[11:20] Mr. Coronati proceeded to go through each comment submitted by staff.

1. Landscaping plans should be stamped by a licensed landscape architect.

They are working with someone who is a landscape designer but not a licensed architect, but a stamp is not required. Mr. Cracknell would like the proposed wall of arborvitae to be interspersed with other species so that there is a better mix of plantings such as evergreens.

2. Green building statement to be provided in every submission.

It was submitted back in email but will be included in submissions going forward.

3. The 9" 'Sycamore' (London Plane) tree in front of 216 Woodbury will need to go before Trees and Greenery for permission to remove. The tree should be replaced with a suitable species.

They will go to the Trees & Greenery Committee for this.

[14:33] Mr. Coronati mentioned that the rest of the comments were straightforward and would be addressed. They would add notes about the landscaping and irrigation comments along with the sidewalk extension comments.

[17:32] Mr. Coronati mentioned that the only comment they were not in agreement with was the very last comment about a redesign.

PUBLIC HEARING

[17:58] Chairman Stith opened the public hearing for this application. No one spoke. The hearing was closed.

DISCUSSION AND DECISION OF THE BOARD

[18:31] Chairman Stith mentioned that they were still waiting for Altus Engineering to complete their review of the drainage.

[18:50] Mr. Britz mentioned that the sheet flow and the reduction of riprap helped considerably since the previous application. He also asked for clarification on the note about eco-pavers and standard asphalt.

Mr. Coronati responded that it notes the difference from where the eco-pavers end where the asphalt begins. The eco-pavers could not be done on every driveway because of the high groundwater table.

[20:33] Mr. Cracknell suggested using other pavers instead of asphalt so that they all look the same.

[21:38] Mr. Desfosses asked how they plan on water-metering each building.

Mr. Coronati responded that they would have water shut offs going to each unit. Mr. Desfosses would like the pipe details to show a sleeve and the shut offs generally should be located in grass areas if possible. The domestic valve caps have to be painted blue and the fire service caps should be painted red.

[26:37] Mr. Britz made a motion to postpone the application to the next meeting to address all the Altus Engineering comments and the comments given today. Mr. Desfosses seconded the motion. The motion passed unanimously.

D. The request of **One Market Square LLC (Owner),** for property located at **1 Congress Street** requesting Site Plan Review approval for the partial demolition and expansion of the existing structure to construct a 3-story building with 58,780 square feet of gross floor area, 12,080 square foot building footprint, 13 parking spaces, and associated onsite and offsite improvements. Said property is shown on Assessor Map 117 Lot 14 and lies within the Character District 4 (CD4), Character District 5 (CD5), Downtown Overlay (DOD), and Historic District. (LU-22-12)

[27:10] Chairman Stith introduced this application.

SPEAKING TO THE APPLICATION

[27:48] John Chagnon of Ambit Engineering, Mark McNabb (developer), Tracey Kozak (architect) and Terrence Parker (landscape architect) came to present this application.

They previously presented at the November meeting and had addressed a list of comments for plans that have not changed other than a separation from the offsite improvements application.

[28:45] Mr. Chagnon proceeded to address the most recent comments from staff.

1. Move 8” valve before connection to water on Ladd Street so it is not directly over sewer main.

Mr. Chagnon passed out a revised detail sheet showing this change.

2. Show details on connection to 4” main on Ladd.

Mr. Chagnon responded that these details were also added to the revised plans.

[31:05] Mr. Cracknell mentioned that there were a few staff concerns that were minor such as the zoning analysis, the open space, building height details and pervious pavement areas. These can be gone over in a short meeting with staff when the applicant is ready.

[32:15} Mr. Howe raised concerns about the fire department access to High Street and Haven Court and would like to see a truck turning template. There will be a condition on the off-site improvement plans that the curb cuts go away to meet the fire department’s needs and access requirements.

[36:50] Mr. Desfosses mentioned that he was hopeful that they could put in building-mounted lighting in lieu of street poles because he could not approve of pole lighting. The sconce lightning fixture may not be visually appropriate on the older buildings but something like those would be good.

Mr. McNabb responded that they are committed to doing catenary lighting and they could work on the sconce lighting fixture as well.

PUBLIC HEARING

[39:19] Chairman Stith opened up the public hearing. No one spoke. The public hearing was closed.

DISCUSSION AND DECISION OF THE BOARD

[40:00] Mr. Eby made a motion to recommend approval of this application to the Planning Board with the following stipulations:

Prior to Planning Board consideration:

1. Applicant and project team will meet with the Planning staff to discuss the zoning compliance table.
2. Pole lights will be removed and the replacement fixtures will be reviewed and approved by Public Works Department.
3. Any utility work that is necessary to construct a fully operational building will need to be reviewed and approved by the Public Works Department.

Subsequent to Planning Board approval by prior to the issuance of a Building Permit:

4. Prior to issuance of building permit the proposed off site improvement for High Street and Ladd Street and Haven Court will be reviewed and approved authorized by the City entity to ensure building, pedestrian, vehicular, and emergency vehicle safety.

Mr. Desfosses seconded the motion.

[42:18] The motion passed unanimously.

III. NEW BUSINESS

a. The request of **Pease Development Authority (Owner)**, for property located at **80 Rochester Avenue** Site Plan approval for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. Said property is shown on Assessor Map 308 Lot 1 and lies within the Pease Industrial District (PI). (LU-22-210)

b. The request of **Pease Development Authority (Owner)**, for property located at **80 Rochester Avenue** requesting lot line adjustment to add 22,251 square feet to the existing lot as part of a realignment of Rochester Avenue for a proposed lot size of 496,584 square feet (11.4 acres). Said property is shown on Assessor Map 308 Lot 1 and lies within the Pease Industrial District (PI). (LU-22-210)

[42:35] Chairman Stith introduced new business items A and B and read them together.

SPEAKING TO THE APPLICATION

[43:50] Patrick Crimmons and Neil Hansen of Tighe & Bond, along with Michael Mates of PDA and John Stephens of the development team came to present these applications.

Mr. Hansen proceeded to give a brief overview of the proposed plan which would include a 209,000+ sf advanced manufacturing facility on a currently vacant site. The proposed site plan would include two separate loading and parking areas, one in the north and one in the south. These areas also have options for future parking expansions if needed. This project has received a variance from the ZBA for a front yard setback. They will no longer be seeking an application for a lot line revision but will instead be seeking another variance for a rear yard setback which is related to a comment received about City drainage infrastructure concerns. They will also be seeking an alteration of terrain permit from NHDES for all proposed stormwater improvements.

[47:50] Mr. Hansen read through and responded to the comments received by staff.

1. Please confirm this project includes a lot line adjustment and not the creation of a new parcel.

They will no longer be pursuing a lot line revision, but they will still need to go through the subdivision process for the lease area.

2. Rochester Ave pavement is too far deteriorated for the mill and pave process. The road needs reclamation fortified and new pavement. Stratham and Newfields Streets need to be reconstructed as well.

They acknowledge this and will update the plans to reflect these changes.

3. The new lease line may extend over the street drainage system and sidewalk. A license may be required.

They have no issue providing the City or PDA with whatever the proper conveyance is for any drainage lines.

4. PCB 18 should tie into the street drainage, not the site drainage

[49:20] The PDA is requesting that this be connected to the onsite drainage system so that it receives treatment.

5. DMH 1925 is likely not large enough to accept such a large new core. Please confirm this design will work by investigating the structure with Stormwater division from DPW.

They have no issue investigating this. They will have to expand the opening a bit but plan to do it during the investigation.

6. Proposed sidewalk should be at least 5.5’ wide, preferably 6’ wide.

Assuming the PDA has no objection to this, they can make the revision to a 5.5’ width sidewalk.

7. Third party review of stormwater design. Is location of pretreatment outlet structure after detention basin appropriate? Is treatment prior to detention basin more appropriate?

They will be needing an alteration of terrain permit so this stormwater will be reviewed by the State which could serve this third party’s purpose.

8. State sizes of domestic water and fire services.

They will begin work with the project architect to get those sizes added to the plans.

9. Provide flow tests to show the existing water main can supply adequate water to proposed building.

Those can be completed.

10. Provide vehicle speed data for New Hampshire Avenue to confirm adequacy of sight lines at
driveways and to determine need for additional safety measures at proposed crosswalks.

The sidewalks were added at the request of the PDA and they do not anticipate any issues for site distances at the driveways for vehicles or pedestrians. Additionally, the traffic study is being peer reviewed at the request of the PDA.

11. Provide pedestrian counts and vehicle turning movement counts at intersections of New Hampshire Avenue with Newfields and Stratham, to document need for crosswalks across New Hampshire Ave.

Similar to the last comment, this is under a third party review.

12. A third party peer review of the traffic study should be done.

[55:15] Mr. Eby asked for clarification on how the building placement was decided.

Mr. Hansen responded that the building is designed based on the bay spacing of the columns and the parking configuration could only work like this with the spacing they have laid out.

[56:28] Mr. Howe asked where the front of the building was located. He mentioned that they do not need a fire truck turning template for the front of the parking lot because they would have access along the streets. He also asked if there were any hazardous materials proposed to be stored in the building.

Mr. Hansen responded that it will be along New Hampshire Avenue. They do not know what will be stored in the building because they do not yet know who the end user will be.

PUBLIC HEARING

[58:35] Chairman Stith opened the public hearing. No one spoke. The public hearing was closed.

DISCUSSION AND DECISION OF THE BOARD

[1:00:00] Mr. Desfosses asked for the re-evaluation of the catch basins and their locations in the middle of the driveways.

[1:03:14] Mr. Eby asked what type of facility this would be because the description states that it would reduce the number of employees needed yet they are keeping the option open to expand parking.

Mr. Stephens stated that they do not yet know who the user will be but with advanced manufacturing they expect for mechanized manufacturing with less employee needs but they want to leave their parking options open in case they need to include office uses as well.

[1:05:02] Mr. Stith requested that the next application include the subdivision application as well before the next submission.

[1:05:23] Mr. Cracknell made a motion to continue this application to the next meeting. The motion was seconded by Mr. Cronin. The motion passed unanimously.

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

[1:06:02] Chairman Stith introduced this application.

SPEAKING TO THE APPLICATION

[1:06:43] Eric Weinrub and Marissa Sewell of Altus Engineering, Jen Ramsey the project architect, and David Sinclair the property owner came to present this application. Mr. Weinrub described the application with the proposal of constructing a fourth dwelling unit on the property. There currently is a single-family home, a two-apartment carriage house and they are proposing a garage with an apartment above. They have previously received relief for density and setback requirements from the ZBA and Ms. Ramsey has been working with the HDC for the design process. In the past, the lot was previously two parcels. They would like to keep this as a single parcel and keep the current streetscape on Middle Street and the access off of Lincoln Avenue.

[1:10:20] Mr. Weinrub proceeded to go over and respond to staff comments.

1. Does the 1970 square foot calculation include the deck or is that total only for the building footprint?

The proposed garage and residences are proposing over 2,200 sf of surface area, adding in the deck brings this count up to 2,248.67 sf and the overall building coverage remains at 23%.

2. Green building statement states, “the proposed 3-bay garage reduces the site impervious and improves the storm water runoff.” Please explain how the impervious surfaces are reaching an overall reduction on the site.

This was a typo and in fact the impervious will slightly increase and this will be the effective impervious.

3. Install catch basin at low point of driveway (elevation 23.75) and connect to catch basin in road. Install overflow pipe in retention pond and connect it to catch basin on property.

They have no issue with that but they prefer to put in a leeching structure instead so they are not disrupting the mature plantings along Lincoln Avenue. They do not believe it is necessary to connect their closed drainage and infiltration drainage systems due to their calculations, the pond should not overtop even in a ten-year storm.

4. State size of proposed water service to new building.

They will have a 1” domestic water line to the main house and will continue that to service the new apartment above the garage. They would like to have the decision of the service line size be a condition prior to getting a building permit so they can have a third-party engineer look at it and determine it later.

Mr. Desfosses clarified that they were bringing both main lines into the principal structure so that in the future if they want fire protection the main line will already be there for the home.

5. Driveway apron must be asphalt from roadway to edge of right of way.

[1:16:25] Mr. Cracknell asked what they plan to do with the textured surface of the driveway entrance.

Mr. Desfosses mentioned that cobblestone pavers on the sidewalk right of way would not be ADA compliant. Textured surfaces on the apron are not allowed in the City because it would require City maintenance and it can only be asphalt.

[1:18:11] Mr. Wolph asked if there was a set of stairs from the second floor down to the garage or if it was all internal.

Ms. Ramsey responded that there was both an internal and external set of stairs. One bay will be for the accessory dwelling unit, two will be for the property owner, and a fourth bay will be a flexible space mainly used for yard tools.

[1:19:56] Mr. Howe asked what the model of the fire suppression system would be.

Ms. Ramsey responded that they have not gotten that far yet but it will be chosen after approvals by a general contractor or engineer.

PUBLIC HEARING

[1:20:30] Chairman Stith opened up the public hearing.

[1:20:44] Nicole Bodoh spoke on behalf of 729/733 Middle Street. She expressed concerns for exacerbating water runoff impacts on her abutting property and the applicant's need for a variance for an accessory dwelling unit.

[1:22:38] Mr. Cracknell responded that since there was no existing garage structure on this property it does not count as an accessory dwelling unit. The proposed garage is just being considered a third principal structure.

[1:32:00] Mr. Wolph mentioned that it would be nice to come up with a mechanism that guarantees that the drainage will not be worse for an abutter than before a project has begun.

Mr. Cracknell responded that by asking the applicant to document existing conditions and asking them to determine whether it exacerbates existing conditions is something that they already ask for and is a valid method.

[1:33:35] Mr. Weinrub responded that they had included a detailed drainage study that shows the drainage runs toward the abutter to the east, which would indicate that Ms. Bodoh's flooding issues do not stem from this particular property.

[1:35:38] Mr. Britz commented that the site plan review regulations in Section 7.6.1 say that there has to be at least an annual inspection of maintenance for bioretention systems and Mr. Britz wants them to specify who will be doing the inspections and when.

Mr. Weinrub responded that they will specify who will be the inspector, likely a stormwater design professional or a PE.

[1:37:18] Mr. Cracknell spoke on the issues relating to the HDC that he felt were relevant. The issues raised at the HDC were reiterated for everyone to consider. These included the screening in between properties, he would like them to refine or augment their design with a proposed screen such as a fence or fence with plantings along the property line. Additionally, they should consider reducing the carriage house deck size by recessing it. They should panelize the railing along the property line so that it is more opaque for the renters and the abutters. Also, they might consider a pergola to provide more privacy with landscaping and changing their proposed double hung windows to Bahama shutters for privacy.

[1:42:21] Ms. Bodoh expressed concerns for the proximity of the deck to her property line, which she mentioned would have direct views into her dining room.

[1:43:45] Chairman Stith closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

[1:46:58] Mr. Britz made a motion to approve the application to the Planning Board with the following stipulations:

Prior to Planning Board consideration:

1. Applicant will update application materials to identify who will perform the maintenance of the stormwater system and make information available to the City on an annual basis.
2. Applicant will update application materials to move the leeching catch basin to the low point in the driveway.
3. Applicant will show fire service and domestic water line on the utility plan.

Subsequent to Planning Board approval by prior to the issuance of a Building Permit:

4. A licensed utility engineer will determine the appropriate sizing for the fire service and domestic water lines.

The motion was seconded by Mr. Desfosses. The motion passed unanimously.

IV. OTHER BUSINESS

V. ADJOURNMENT

[1:50:45] Mr. Cronin made a motion to adjourn. Mr. Cracknell seconded the motion. The motion passed unanimously.

The meeting adjourned at 3:47 pm.

Respectfully submitted,

Kate E. Homet
Secretary for the Technical Advisory Committee

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

January 19, 2023

Portsmouth Technical Advisory Committee
Attn. Board Members
1 Junkins Avenue, 3rd Floor
Portsmouth, NH 03801

RE: Response Letter 4 –TAC Comments
212, 214, & 216 Woodbury Ave., Portsmouth, NH, 03801
Tax Map 175, Lots 1, 2, & 3
JBE Project No. 21254

Dear Board Members,

We are in receipt of comments from Stefanie Casella, Portsmouth Planning Department, dated December 30, 2022 as well as comments from Eric Weinrieb, Altus Engineering, dated January 11, 2023. Review comments are listed below with our responses in bold.

Portsmouth Planning Department Comments

1. *Landscaping plans should be stamped by a licensed landscape architect.*
   RESPONSE: The landscape plan was prepared by Lise McNaughton of LM Land Design, LLC, who is an experienced landscape designer. A landscape architect stamp is not a City requirement for site plans.

2. *Green building statement to be provided in every submission.*
   RESPONSE: The green building statement is included with this submission and was submitted in June and December. This is uploaded to the OpenGov Viewpoint Cloud.

3. *The 9" 'Sycamore' (London Plane) tree in front of 216 Woodbury will need to go before Trees and Greenery for permission to remove. The tree should be replaced with a suitable species.*
   RESPONSE: We are applying to Trees and Greenery for approval and the Trees and Greenery request letter is going directly to DPW. The Planning Department will be copied via email on this submission. As shown on Sheet L1, the sycamore is proposed to be replaced with a 3" caliper American Sentry Linden, which is narrow and will avoid the utility wires.

4. *The sidewalk should terminate at the driveway entrance to the hotel. Please clarify the proposed sidewalk notes to indicate that.*
   RESPONSE: The sidewalk has been revised to terminate at the driveway entrance to the hotel. Sheet C2 now shows this and calls it out.

5. *If Boyd Road is reconstructed (due to happen in this coming construction season) prior to the site work in Boyd Road being constructed, Boyd Road will require a mill and fill pavement resurfacing for all disturbed areas to the satisfaction of the DPW.*
   RESPONSE: See Note #30 on Sheet C2.

6. *Please smooth out the proposed curb alignment on Boyd Road near the intersection of Woodbury.*
   RESPONSE: The jog that was shown in the proposed curb has been removed.

7. *Altus to conclude review and comment on submission.*
   RESPONSE: Altus review comments are addressed with this response.

8. *No welded wire shall be used in any sidewalks in the City's ROW. Use 4000psi fiber-mesh instead.*
   RESPONSE: The details have been revised to call for a 4000 psi fiber mesh instead of welded wire reinforcement within the sidewalk.

9. *The sewer services will need to be tested. Extend the cleanout for each service to the surface within 5' of each structure.*
   RESPONSE: A cleanout is now shown on each gravity service 5' from the unit that it services. As shown on the sewer service detail on Sheet D2, the sewer cleanout shall be capped at finished grade.

10. *Additional information needed on Potential Irrigation Meter.*
    RESPONSE: If irrigation is required, water usage for irrigation for the entire development will be metered using a meter on Unit 2 as shown. The irrigation meter will be above ground and inside of a structure and will have a backflow enclosure as required per City requirements.

11. *Fire services to buildings 5-8 are shown as capped before entering the buildings.*
    RESPONSE: Fire services to buildings 5-8 are shown stubbed in lawn areas. The fire service lines will be installed before the units are built so they will be stubbed just before each building and then the line extended to the unit once the unit is constructed.

12. *Easement required to DPW for access to water shutoffs.*
    RESPONSE: See Note #25 on Sheet C2.

13. *State location of outlet to overflow risers in bioretention system #2.*
    RESPONSE: The overflow risers do not have an outlet. They are connected to each other with a perforated underdrain to infiltrate runoff beyond the water quality volume. This helps to allow infiltration during the winter when the ground is frozen.

14. *Third party review of responses to stormwater comments.*
    RESPONSE: Altus comments are addressed with this response.

15. *State outlet of bioretention system #1.*
RESPONSE: Bioretention system #1 has an outlet structure and a pipe coming out of the outlet structure. This pipe is designed to carry any overflow into the adjacent stone infiltration bed, through which the overflow will be infiltrated to groundwater.

16. *Proposed curbstop and blowoff at end of water main should be a 2" blowoff hydrant.*
RESPONSE: A 2" blowoff hydant is proposed at the end of the water main as shown on Sheet C4.

17. *Correct spelling of Thornton Street.*
RESPONSE: The spelling of Thornton Street has been corrected.

18. *Property owner should consider plant irrigation for the first two years of growth (Note 7 Sheet L1).*
RESPONSE: This verbiage has been added to Note 7 on Sheet L1.

19. *Please identify areas where protective groundcover measures could be applied in lieu of grass, mulch is also not considered a groundcover. Managed turf areas should be kept to a minimum to reduce mowing and fertilizer needs. (Note 8 Sheet L1).*
RESPONSE: Bearberry is now proposed in several areas of the site. This is a native spreading groundcover that would provide a shallow rooting mat over these areas.

20. *Staff recommends requiring the applicant plan for at least two years of monitoring and maintaining the new plantings. If after one year the plantings do not have at least an 80% success rate, replanting will be required. (Note 19 Sheet L1).*
RESPONSE: See Note #24 on Sheet L1.

21. *Please include more evergreen plantings along the northern edge of the property – see site plan review regulation 6.9.2.*
RESPONSE: Groups of black pine, autumn gold ginkgo, green giant arborvitae, and white fir have been added along the northern edge of the property to supplement the existing vegetation to remain.

22. *Include smart controllers for the planned irrigation of landscaped areas for more efficient use of water resources – see site plan review regulation 6.11.2. Please also consider using recycled water when possible for irrigation needs.*
RESPONSE: See Note #25 on Sheet L1.

23. *Although the project density may be in compliance with the dimensional regulations of the zoning ordinance, staff continues to maintain that the overall impact to the existing topography and vegetation on the site is excessive. As shown on the demolition plan, the revised plan now shows the limit-of-work in which the grading and vegetation will be substantially removed or regraded in order to support the proposed buildings, parking, driveways and other infrastructure. Importantly, the proposed limit-of-work comprises of over 90% of the natural areas located behind the existing single family structures on Woodbury Ave. Over 30 mature trees are proposed for removal, including many trees over 12 inches in diameter. Much of this vegetative material currently provides a strong visual screen to the high-density commercial properties along Route 1 and the Traffic Circle. Thus, the removal of this nature vegetation will significantly reduce this visual buffer. Further, the applicant's proposal to selectively target a thin screening of arborvitae will likely result in a significantly reduction in the quality of the buffer or visual screen. Understanding that subsequent zoning relief would be required to significantly reduce the limit-of-work and its associated tree removal, staff remain supportive of that approach should the applicant seek to revisit this issue. Otherwise, a careful assessment of the proposed landscape screen, including the use of fencing, should be undertaken to ensure this project design complies with the screening requirements of the Site Plan Regulations.*
RESPONSE: The trees in the vicinity of the houses and infrastructure will be removed as is typical of all developments. The landscape plan shows how the trees will be re-planted within the middle of the development as well as buffer plantings on the exterior. The trees around the existing homes to remain will be retained as well as the tall trees and brush along the property lines with the existing hotels.

Altus Engineering Comments

24. *The revised drainage study has some minor technical inconsistencies such as minor discrepancies in the longest flow path and a subcatchment that is no longer relevant to the computations. However, it is our opinion that they have no relevance on the accuracy of the computations. Revisions are not necessary.*
RESPONSE: No response necessary.

25. *The Stormwater Management Operation and Maintenance Manual should be expanded to include specific language on maintaining the swales, spillway and foundation drain outfalls.*
RESPONSE: A section for maintaining swales has been added to the Operation and Maintenance manual. Specific notes regarding the spillways, overflow risers, and outlet structures have been added to the bioretention system section of the O&M Manual. In order to facilitate inspections and maintenance of the sump pump drains, inspection ports have been added to each sump pump drain just before they tie into the perforated pipe that runs through the stone infiltration bed that is used to infiltrate the sump pump discharge. A section for inspections and maintenance of the sump pump drains has been added to the O&M Manual as well.

26. *The Stormwater Management Operation and Maintenance Manual should be recorded with the condominium documents and be referenced in the condominium documents.*
RESPONSE: The Stormwater Management and Operation and Maintenance Manual will be recorded with the condominium documents and referenced in those documents.

27. *The clay core should be depicted on the spillway detail and should be shown being keyed into the original grade to ensure that lateral movement of water does not occur.*
RESPONSE: The clay core has been added to the spillway detail and it is noted on the detail that it shall be keyed into original grade to ensure that lateral movement of water does not occur. The bioretention berm section detail on Sheet D4 states the same.

Included with this response letter are the following:

1. One (1) Full Size Plan Set Folded.
2. One (1) Revised Operation and Maintenance Manual
3. Green Building Statement.

Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Daniel Meditz

Daniel Meditz, E.I.T.
Project Engineer

cc: Eric Weinrieb, P.E., Altus Engineering (via email and hand delivered)
Michael Garrepy, Tuck Realty Corporation (via email)
Tim Phoenix, Hoefle, Phoenix, Gormley & Roberts, PLLC (via email)
Kevin Baum, Hoefle, Phoenix, Gormley & Roberts, PLLC (via email)
Lise McNaughton, LM Land Design (via email)

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

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

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

Prepared for:

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

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

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

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

B. General Inspection and Maintenance Requirements

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

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

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

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

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

   c. Bioretention Systems:

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

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

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

e. Permeable paver driveways:

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

Winter maintenance:

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

Routine maintenance:

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

f. Stone Drip Edge:

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

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

g. Subsurface Stone Infiltration Beds:

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

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

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

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

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

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

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

See attached sample forms as a guideline.

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

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

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

Commitment to maintenance requirements

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

Signature

Print Name

Title

Date

Annual Operations and Maintenance Report

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

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

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

Regular Inspection and Maintenance Guidance for Bioretention Systems / Tree Filters

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

ACTIVITIES

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

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

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

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:

Date: Time: Site Conditions:

Date Since Last Rain Event:

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

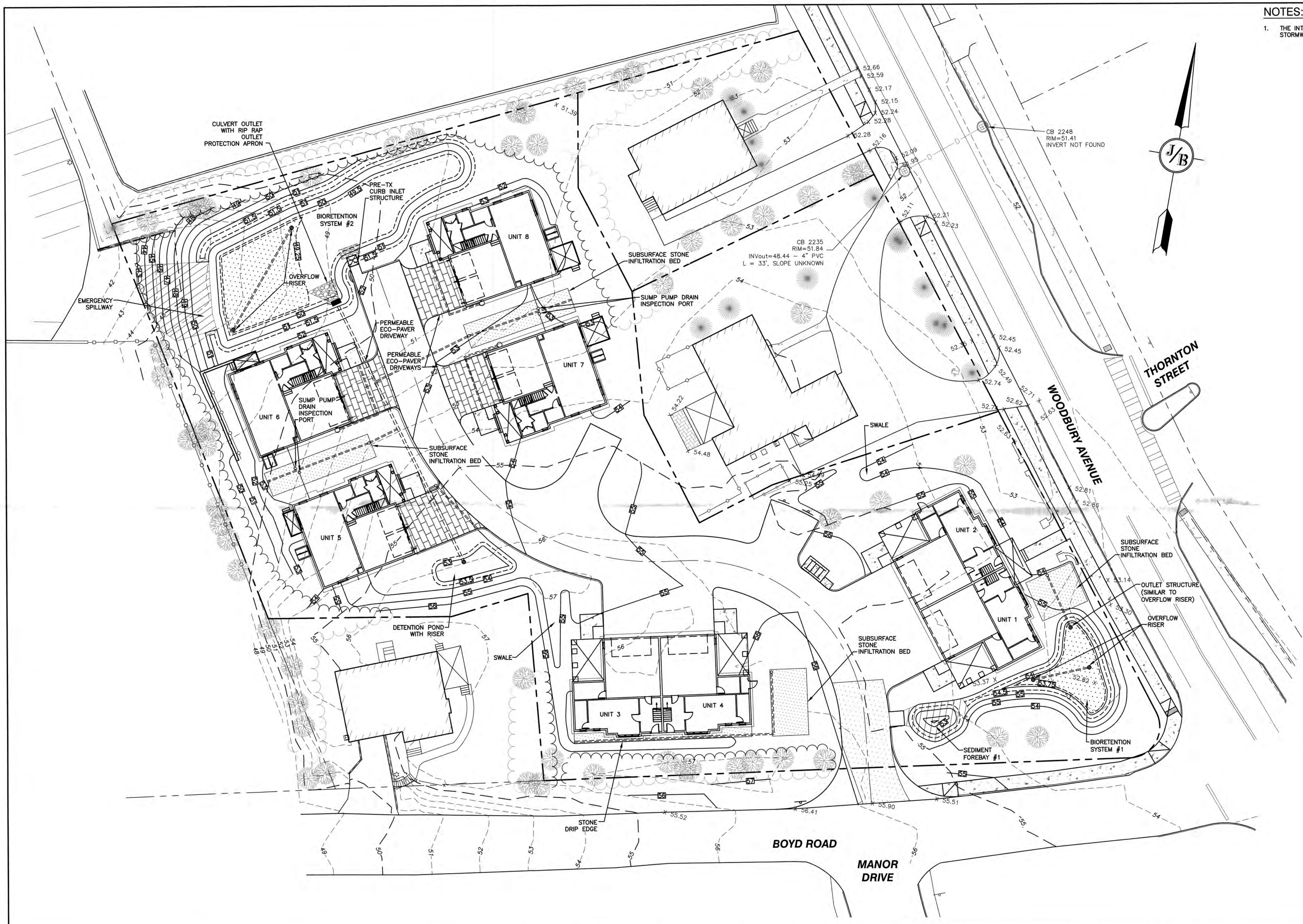
Corrective Action Needed	Due Date
1.	
2.	
3.	

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

JONES&BEACH ENGINEERS INC.

NOTES:

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



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

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

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

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

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

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

Plan Name: **OPERATIONS AND MAINTENANCE PLAN**

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

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

DRAWING No.

OM1

SHEET 1 OF 1
JBE PROJECT NO. 21254

Art Form Architecture, Inc.

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

June 10, 2022

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

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

Dear Mr. Stith

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

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

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

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

Sincerely,

Wendy Welton, RA
President

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Applicant: Tuck Realty Corp. Date Submitted: 6/21/22

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

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

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**		
☒	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**		N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**		N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**		N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**		N/A
☒	List of reference plans. **(2.5.3.1H)**		N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**		N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**		N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	N/A, none onsite	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**		N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**		N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**		N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architectural Drawings	
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plan	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan Notes	
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utility Plan	
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utility Plan	

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utility Plan	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	Site Plan Notes	
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Drainage report	
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Lighting Plan	
☒	11. Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**		
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.		
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.		
☐	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	N/A	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**		
☐	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☐	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	N/A	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading & Drainage Plan	
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Plans & Drainage Report	
☒	Inspection and Maintenance Plan **(7.6.5)**	Drainage Report	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Site Plan Notes	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Notes	N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Notes	N/A

Applicant's Signature: ______________________ **Date:** 6/21/22

City of Portsmouth, New Hampshire

Subdivision Application Checklist

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

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

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

Applicant: Tuck Realty Corp.

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

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

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

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

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

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

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

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

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

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

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

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

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

Letter of Authorization

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

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

Frederick Bailey

As Partners and, Individually — 1/5/22
Date

Joyce Nelson

Joyce S. Nelson

As Partners and, Individually — 1/05/22
Date

Letter of Authorization

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

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

Susan Porter
Witness

Turner Porter
Tuck Realty Corporation

1/5/22
Date

DEED

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

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

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

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

DEED

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

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

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

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

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

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

TRACT II.

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

DEED

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

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

TRACT IV.

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

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

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

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

DEED

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

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

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

TRACT VIII.

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

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

DEED

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

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

In the presence of:

Sheila Castellez-Cook | Seron E. Nelson

Sheila Castellez-Cook | Peter A. Nelson

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS.

December 27 ,2002

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

Before me,

Jane H. Dodge
Notary Public

JANE H. DODGE, Notary Public
My Commission Expires September

JANE H. DODGE NOTARY PUBLIC NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS.

December 27 , 2002

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

Before me,

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

JANE H. DODGE NOTARY PUBLIC NEW HAMPSHIRE

WARRANTY DEED

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

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

085503

with **Warranty Covenants**

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

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

2005 NOV 18 AM 8:08

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

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

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

Mitchell A. Hyder, Trustee

Edward A. Hyder, Trustee

A. Robert McGuire, Jr. Trustee

Henry K. Hyder, III, Trustee

Henry K. Hyder, Jr., Trustee

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

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

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

Rockingham
~~ESSEX~~, ss November 16 2005

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

Susan Covey
Notary Public
My Commission Expires:

Susan Covey
NOTARY PUBLIC
New Hampshire
My Commission Expires

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

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

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

Pamela J. Starkey
Notary Public
My Commission Expires:

PAMELA J. STARKEY, Commissioner of
My Commission Expires August

State of New Hampshire
County of Rockingham

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

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

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

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

State of New Hampshire
County of Rockingham

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

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

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

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

State of New Hampshire
County of Rockingham

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

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

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

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

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
7 THOUSAND 1 HUNDRED AND 25 DOLLARS
091506 791253 $7125.00
VOID IF ALTERED

WARRANTY DEED

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

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

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

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

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

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

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

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

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

Joseph M. Verna
JOSEPH M. VERNA

Gloria C. Collins
GLORIA C. COLLINS

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

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

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

VICTORIA ... KNIGHT NOTARY PUBLIC NEW HAMPSHIRE

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

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

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

2" gravel at surface.

NRCS : Woodbridge

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

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

NRCS : Woodbridge

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

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

NRCS : Woodbridge

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

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

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

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

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

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

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

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

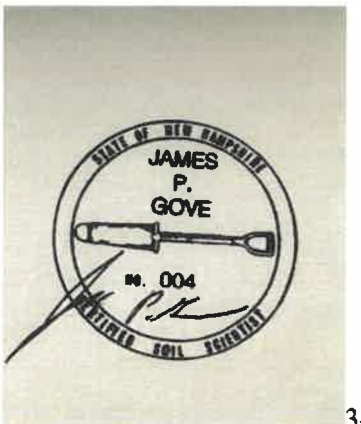
Test Pit No. 7
ESHWT: 26"
Termination @ 40"
Refusal: None
NRCS : Woodbridge
Obs. Water: None

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

Legend:

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

Soil Colors at Munsell.



3-22-2022

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

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

<u>Test Pit #8</u>

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

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

Test Pit #9

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

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

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

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

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

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

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

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

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Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

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

Prepared for:

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

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED
PROFESSIONAL ENGINEER

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746

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

EXECUTIVE SUMMARY

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

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

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

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

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

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

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

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

TABLE OF CONTENTS

1.0 RAINFALL CHARACTERISTICS

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

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

2.0 EXISTING CONDITIONS ANALYSIS

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

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

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

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

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

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

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

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

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

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

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

3.0 PROPOSED CONDITIONS ANALYSIS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5.0 CONCLUSION

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

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

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

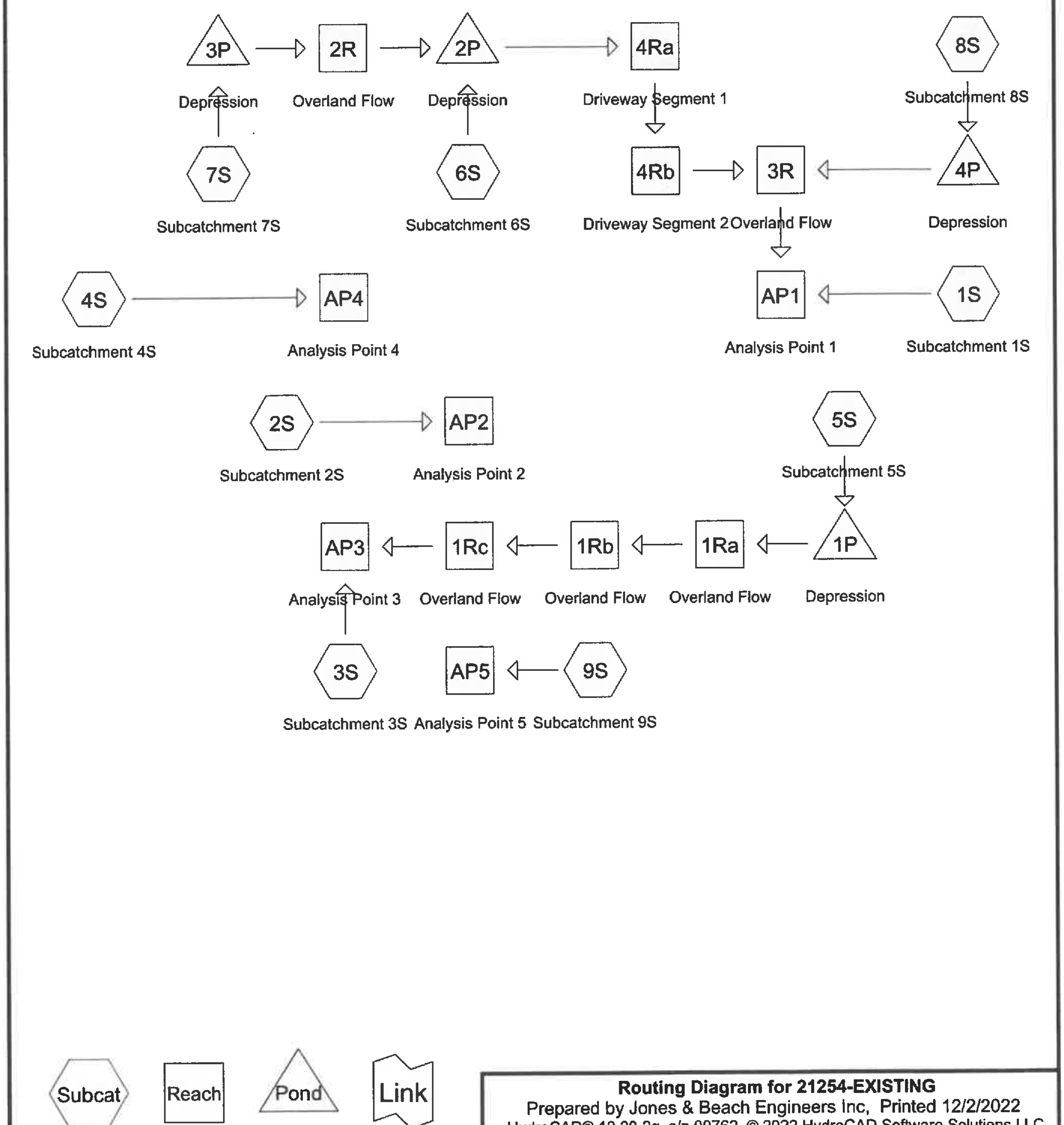
Daniel Meditz

Daniel Meditz, E.I.T
Project Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

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



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

Area Listing (all nodes)

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

Soil Listing (all nodes)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.85 cfs @ 12.26 hrs, Volume= 0.194 af, Depth> 3.34"
Routed to Reach AP1 : Analysis Point 1

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

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

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

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 2.78"
Routed to Reach AP2 : Analysis Point 2

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

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

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.17 cfs @ 12.42 hrs, Volume= 0.146 af, Depth> 2.16"
Routed to Reach AP3 : Analysis Point 3

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

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

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

Summary for Subcatchment 4S: Subcatchment 4S

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

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

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

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

Summary for Subcatchment 5S: Subcatchment 5S

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

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

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

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

Summary for Subcatchment 6S: Subcatchment 6S

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

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

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

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

Summary for Subcatchment 7S: Subcatchment 7S

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

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

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

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

Summary for Subcatchment 8S: Subcatchment 8S

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

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

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

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

Summary for Subcatchment 9S: Subcatchment 9S

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

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

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

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

Summary for Reach 1Ra: Overland Flow

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

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

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

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

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

Summary for Reach 1Rb: Overland Flow

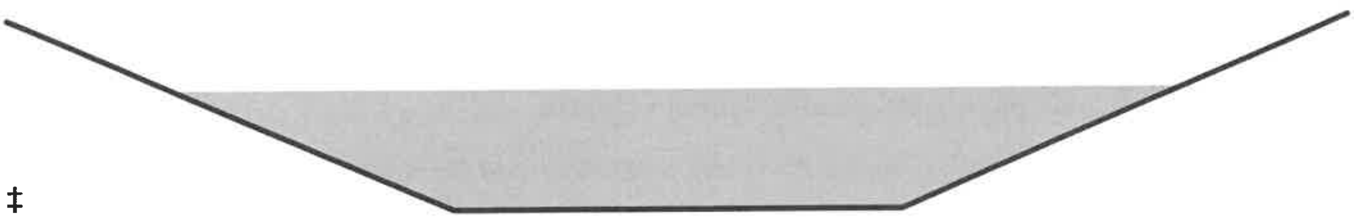
[62] Hint: Exceeded Reach 1Ra OUTLET depth by 0.02' @ 12.45 hrs

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

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

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

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



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Summary for Reach 1Rc: Overland Flow

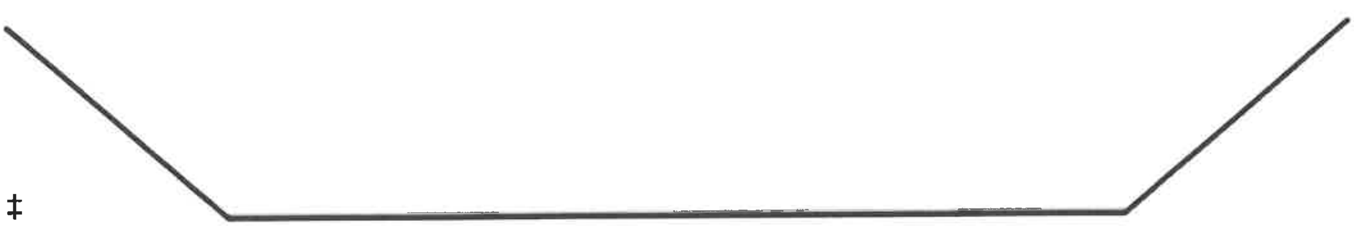
[61] Hint: Exceeded Reach 1Rb outlet invert by 0.03' @ 12.35 hrs

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

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

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

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



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Summary for Reach 2R: Overland Flow

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

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

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

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

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

‡

Summary for Reach 3R: Overland Flow

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

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

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

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

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

‡

Summary for Reach 4Ra: Driveway Segment 1

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

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

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

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

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

‡

Summary for Reach 4Rb: Driveway Segment 2

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

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

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

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

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

Summary for Reach AP1: Analysis Point 1

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

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

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

Summary for Reach AP2: Analysis Point 2

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

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

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

Summary for Reach AP3: Analysis Point 3

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

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

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

Summary for Reach AP4: Analysis Point 4

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

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

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

Summary for Reach AP5: Analysis Point 5

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

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

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

Summary for Pond 1P: Depression

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

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

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

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

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

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

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

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

Summary for Pond 2P: Depression

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

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

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

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

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

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

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

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

Summary for Pond 3P: Depression

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

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

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

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

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

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

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

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

Summary for Pond 4P: Depression

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Reach AP1: Analysis Point 1 Inflow=3.99 cfs 0.395 af
Outflow=3.99 cfs 0.395 af

Reach AP2: Analysis Point 2 Inflow=0.17 cfs 0.013 af
Outflow=0.17 cfs 0.013 af

Reach AP3: Analysis Point 3 Inflow=2.00 cfs 0.240 af
Outflow=2.00 cfs 0.240 af

Reach AP4: Analysis Point 4 Inflow=0.40 cfs 0.032 af
Outflow=0.40 cfs 0.032 af

Reach AP5: Analysis Point 5 Inflow=0.55 cfs 0.050 af
Outflow=0.55 cfs 0.050 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.31 cfs 0.027 af
Outflow=0.30 cfs 0.024 af

Pond 2P: Depression Peak Elev=55.31' Storage=33 cf Inflow=0.49 cfs 0.038 af
Outflow=0.48 cfs 0.037 af

Pond 3P: Depression Peak Elev=56.21' Storage=189 cf Inflow=0.34 cfs 0.028 af
Outflow=0.33 cfs 0.023 af

Pond 4P: Depression Peak Elev=53.11' Storage=236 cf Inflow=1.13 cfs 0.099 af
Outflow=1.11 cfs 0.094 af

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.10 cfs @ 12.26 hrs, Volume= 0.332 af, Depth> 5.72"
Routed to Reach AP1 : Analysis Point 1

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

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

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

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 5.05"
Routed to Reach AP2 : Analysis Point 2

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

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

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 2.32 cfs @ 12.41 hrs, Volume= 0.286 af, Depth> 4.25"
Routed to Reach AP3 : Analysis Point 3

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

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

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

Summary for Subcatchment 4S: Subcatchment 4S

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

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

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

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

Summary for Subcatchment 5S: Subcatchment 5S

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

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

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

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

Summary for Subcatchment 6S: Subcatchment 6S

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

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

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

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

Summary for Subcatchment 7S: Subcatchment 7S

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

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

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

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

Summary for Subcatchment 8S: Subcatchment 8S

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

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

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

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

Summary for Subcatchment 9S: Subcatchment 9S

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

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

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

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

Summary for Reach 1Ra: Overland Flow

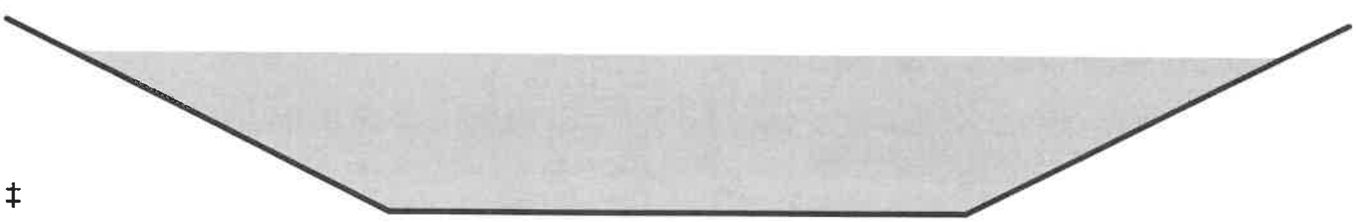
[80] Warning: Exceeded Pond 1P by 1.05' @ 0.00 hrs (2.56 cfs 5.636 af)

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

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

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

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



Summary for Reach 1Rb: Overland Flow

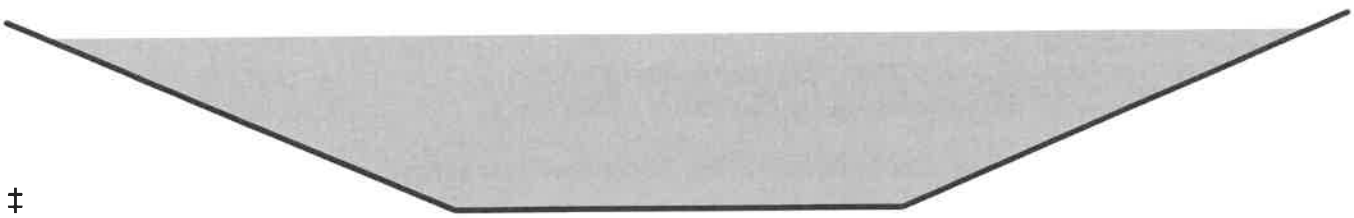
[62] Hint: Exceeded Reach 1Ra OUTLET depth by 0.03' @ 12.40 hrs

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

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

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

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



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Summary for Reach 1Rc: Overland Flow

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

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

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

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

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

‡

Summary for Reach 2R: Overland Flow

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

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

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

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

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

‡

Summary for Reach 3R: Overland Flow

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

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

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

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

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

‡

Summary for Reach 4Ra: Driveway Segment 1

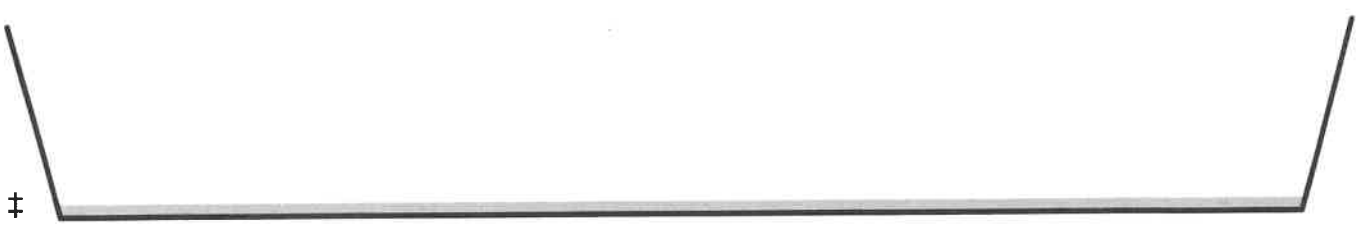
[80] Warning: Exceeded Pond 2P by 0.02' @ 12.20 hrs (0.15 cfs 0.006 af)

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

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

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

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



‡

Summary for Reach 4Rb: Driveway Segment 2

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

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

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

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

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

Summary for Reach AP1: Analysis Point 1

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

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

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

Summary for Reach AP2: Analysis Point 2

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

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

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

Summary for Reach AP3: Analysis Point 3

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

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

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

Summary for Reach AP4: Analysis Point 4

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

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

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

Summary for Reach AP5: Analysis Point 5

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

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

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

Summary for Pond 1P: Depression

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

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

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

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

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

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

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

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

Summary for Pond 2P: Depression

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

Inflow Area = 0.152 ac, 4.89% Impervious, Inflow Depth > 4.06" for 50 Yr 24 Hr event
Inflow = 0.64 cfs @ 12.17 hrs, Volume= 0.051 af
Outflow = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af, Atten= 2%, Lag= 1.7 min
Primary = 0.63 cfs @ 12.20 hrs, Volume= 0.051 af
Routed to Reach 4Ra : Driveway Segment 1

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

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

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

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

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

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

Summary for Pond 3P: Depression

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

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

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

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

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

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

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

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

Summary for Pond 4P: Depression

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

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

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

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

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

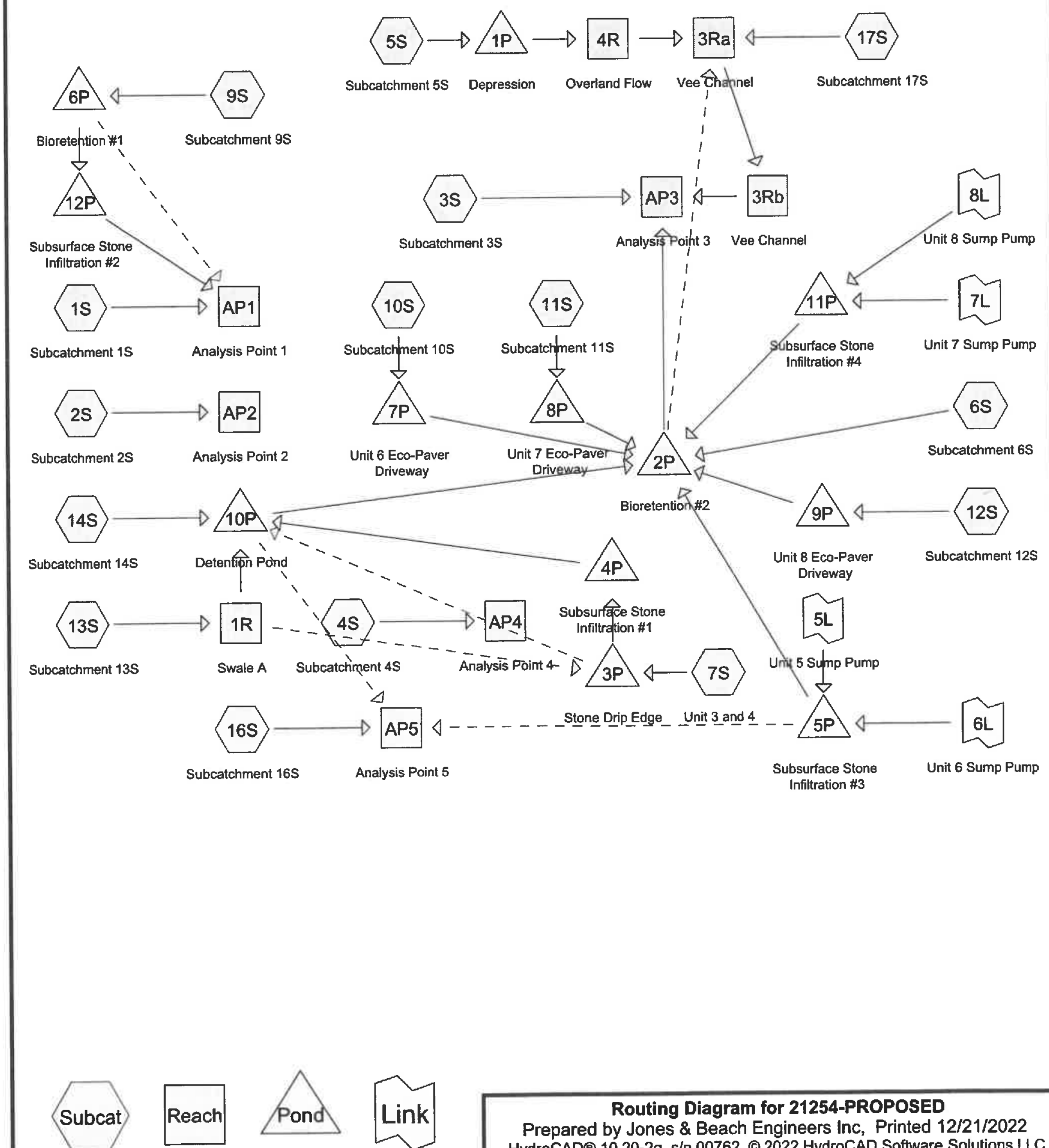
Device	Routing	Invert	Outlet Devices
#0	Primary	53.11'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	53.10'	**45.0 deg x 8.0' long x 0.20' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)

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

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

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



Routing Diagram for 21254-PROPOSED
Prepared by Jones & Beach Engineers Inc, Printed 12/21/2022
HydroCAD® 10.20-2g s/n 00762 © 2022 HydroCAD Software Solutions LLC

Area Listing (all nodes)

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

Soil Listing (all nodes)

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

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

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

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

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

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

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

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

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

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

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

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>2.98"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>2.18"
Tc=6.0 min CN=90 Runoff=0.11 cfs 0.008 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>1.04"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.04 cfs 0.003 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>1.34"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.22 cfs 0.016 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>1.16"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.13 cfs 0.010 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>1.21"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.14 cfs 0.014 af

Reach 1R: Swale A Avg. Flow Depth=0.22' Max Vel=0.22 fps Inflow=0.04 cfs 0.003 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.03 cfs 0.003 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.30' Max Vel=0.54 fps Inflow=0.14 cfs 0.020 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.14 cfs 0.020 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.27' Max Vel=0.67 fps Inflow=0.14 cfs 0.020 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.14 cfs 0.020 af

Reach 4R: Overland Flow Avg. Flow Depth=0.12' Max Vel=0.10 fps Inflow=0.05 cfs 0.005 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.02 cfs 0.005 af

Reach AP1: Analysis Point 1 Inflow=1.29 cfs 0.112 af
Outflow=1.29 cfs 0.112 af

Reach AP2: Analysis Point 2 Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Reach AP3: Analysis Point 3 Inflow=0.16 cfs 0.022 af
Outflow=0.16 cfs 0.022 af

Reach AP4: Analysis Point 4 Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Reach AP5: Analysis Point 5 Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.10 cfs 0.009 af
Outflow=0.05 cfs 0.005 af

Pond 2P: Bioretention #2 Peak Elev=49.85' Storage=2,206 cf Inflow=1.08 cfs 0.117 af
Discarded=0.18 cfs 0.112 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.112 af

Pond 3P: Stone Drip Edge Peak Elev=55.29' Storage=20 cf Inflow=0.09 cfs 0.007 af
Primary=0.08 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.007 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=54.97' Storage=0.001 af Inflow=0.08 cfs 0.007 af
Discarded=0.03 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.007 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=53.87' Storage=384 cf Inflow=0.56 cfs 0.040 af
Discarded=0.26 cfs 0.040 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.040 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=50.44' Storage=131 cf Inflow=0.09 cfs 0.007 af
Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=51.91' Storage=97 cf Inflow=0.09 cfs 0.007 af
Discarded=0.02 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.007 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=49.83' Storage=117 cf Inflow=0.11 cfs 0.008 af
Discarded=0.03 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.008 af

Pond 10P: Detention Pond Peak Elev=53.06' Storage=14 cf Inflow=0.24 cfs 0.019 af
Primary=0.24 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.019 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.30' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.351 af Average Runoff Depth = 1.77"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

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

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>3.54"
Flow Length=221' Tc=11.9 min CN=88 Runoff=2.24 cfs 0.198 af

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

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>2.18"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.07 cfs 0.005 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>2.96"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.24 cfs 0.020 af

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

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>3.24"
Flow Length=133' Tc=19.6 min CN=85 Runoff=1.71 cfs 0.179 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>3.54"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=0.96 cfs 0.072 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>3.75"
Tc=6.0 min CN=90 Runoff=0.19 cfs 0.014 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>2.26"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.09 cfs 0.007 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>2.69"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.45 cfs 0.033 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>2.43"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.28 cfs 0.021 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>2.51"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.30 cfs 0.030 af

Reach 1R: Swale A Avg. Flow Depth=0.31' Max Vel=0.27 fps Inflow=0.09 cfs 0.007 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.08 cfs 0.007 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.45' Max Vel=0.71 fps Inflow=0.42 cfs 0.045 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.42 cfs 0.045 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.40' Max Vel=0.88 fps Inflow=0.42 cfs 0.045 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.43 cfs 0.045 af

Reach 4R: Overland Flow Avg. Flow Depth=0.25' Max Vel=0.17 fps Inflow=0.21 cfs 0.015 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.15 cfs 0.015 af

Reach AP1: Analysis Point 1 Inflow=2.24 cfs 0.198 af
Outflow=2.24 cfs 0.198 af

Reach AP2: Analysis Point 2 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach AP3: Analysis Point 3 Inflow=0.46 cfs 0.050 af
Outflow=0.46 cfs 0.050 af

Reach AP4: Analysis Point 4 Inflow=0.24 cfs 0.020 af
Outflow=0.24 cfs 0.020 af

Reach AP5: Analysis Point 5 Inflow=0.28 cfs 0.021 af
Outflow=0.28 cfs 0.021 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.21 cfs 0.019 af
Outflow=0.21 cfs 0.015 af

Pond 2P: Bioretention #2 Peak Elev=50.65' Storage=4,756 cf Inflow=2.01 cfs 0.219 af
Discarded=0.23 cfs 0.205 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.205 af

Pond 3P: Stone Drip Edge Peak Elev=55.34' Storage=25 cf Inflow=0.13 cfs 0.011 af
Primary=0.12 cfs 0.011 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.011 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.21' Storage=0.002 af Inflow=0.12 cfs 0.011 af
Discarded=0.05 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.011 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.43' Storage=787 cf Inflow=0.96 cfs 0.072 af
Discarded=0.32 cfs 0.072 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.072 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=51.73' Storage=201 cf Inflow=0.14 cfs 0.012 af
Discarded=0.03 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.012 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=52.98' Storage=130 cf Inflow=0.14 cfs 0.011 af
Discarded=0.06 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.011 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=50.37' Storage=209 cf Inflow=0.19 cfs 0.014 af
Discarded=0.05 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.014 af

Pond 10P: Detention Pond Peak Elev=53.10' Storage=23 cf Inflow=0.51 cfs 0.040 af
Primary=0.51 cfs 0.039 af Secondary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.039 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.30' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.641 af Average Runoff Depth = 3.23"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af, Depth> 3.54"
Routed to Reach AP1 : Analysis Point 1

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

Area (sf)	CN	Description
14,174	98	Paved parking, HSG C
2,616	98	Roofs, HSG C
12,481	74	>75% Grass cover, Good, HSG C
29,271	88	Weighted Average
12,481		42.64% Pervious Area
16,790		57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0220	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.3	15	0.0167	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	84	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	221	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 2.78"
Routed to Reach AP2 : Analysis Point 2

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

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

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth> 2.18"
Routed to Reach AP3 : Analysis Point 3

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

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
286	70	Woods, Good, HSG C
1,237	73	Weighted Average
1,237		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	17	0.3300	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	11	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.0	6	0.1670	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
3.2	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af, Depth> 2.96"
Routed to Reach AP4 : Analysis Point 4

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

Area (sf)	CN	Description
1,717	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
586	70	Woods, Good, HSG C
3,492	82	Weighted Average
2,303		65.95% Pervious Area
1,189		34.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
6.9	27	0.0250	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.4	47	Total			

Summary for Subcatchment 5S: Subcatchment 5S

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

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

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

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

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.71 cfs @ 12.27 hrs, Volume= 0.179 af, Depth> 3.24"
Routed to Pond 2P : Bioretention #2

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

Area (sf)	CN	Description
8,011	98	Paved parking, HSG C
5,272	98	Roofs, HSG C
14,477	74	>75% Grass cover, Good, HSG C
1,205	70	Woods, Good, HSG C
28,965	85	Weighted Average
15,682		54.14% Pervious Area
13,283		45.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0450	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
16.6	78	0.0230	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.4	11	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	22	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.6	133	Total			

Summary for Subcatchment 7S: Unit 3 and 4

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.63"
Routed to Pond 3P : Stone Drip Edge

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

Area (sf)	CN	Description
984	98	Roofs, HSG C
248	98	Water Surface, HSG C
1,232	98	Weighted Average
1,232		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.072 af, Depth> 3.54"
Routed to Pond 6P : Bioretention #1

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

Area (sf)	CN	Description
4,178	98	Paved parking, HSG C
1,922	98	Roofs, HSG C
4,331	74	>75% Grass cover, Good, HSG C
129	70	Woods, Good, HSG C
10,560	88	Weighted Average
4,460		42.23% Pervious Area
6,100		57.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0100	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.8	45	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
0.3	13	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	72	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af, Depth> 4.63"
Routed to Pond 7P : Unit 6 Eco-Paver Driveway

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

Area (sf)	CN	Description
876	98	Roofs, HSG C
433	98	Paved parking, HSG C
1,309	98	Weighted Average
1,309		100.00% Impervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.63"
Routed to Pond 8P : Unit 7 Eco-Paver Driveway

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

Area (sf)	CN	Description
876	98	Roofs, HSG C
421	98	Paved parking, HSG C
1,297	98	Weighted Average
1,297		100.00% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.75"
Routed to Pond 9P : Unit 8 Eco-Paver Driveway

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

Area (sf)	CN	Description
876	98	Roofs, HSG C
425	98	Paved parking, HSG C
669	74	>75% Grass cover, Good, HSG C
1,970	90	Weighted Average
669		33.96% Pervious Area
1,301		66.04% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.09 cfs @ 12.11 hrs, Volume= 0.007 af, Depth> 2.26"
Routed to Reach 1R : Swale A

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

Area (sf)	CN	Description
1,013	74	>75% Grass cover, Good, HSG C
530	70	Woods, Good, HSG C
81	98	Roofs, HSG C
1,624	74	Weighted Average
1,543		95.01% Pervious Area
81		4.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	28	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
3.3	10	0.0210	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	5	0.3300	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
7.1	43	Total			

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.033 af, Depth> 2.69"
Routed to Pond 10P : Detention Pond

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

Area (sf)	CN	Description
5,067	74	>75% Grass cover, Good, HSG C
35	70	Woods, Good, HSG C
1,225	98	Roofs, HSG C
6,327	79	Weighted Average
5,102		80.64% Pervious Area
1,225		19.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0230	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
5.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af, Depth> 2.43"
Routed to Reach AP5 : Analysis Point 5

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

Area (sf)	CN	Description
3,173	74	>75% Grass cover, Good, HSG C
863	70	Woods, Good, HSG C
580	98	Roofs, HSG C
4,616	76	Weighted Average
4,036		87.44% Pervious Area
580		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	41	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	12	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.7	6	0.3300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.8	64	Total			

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.30 cfs @ 12.23 hrs, Volume= 0.030 af, Depth> 2.51"
Routed to Reach 3Ra : Vee Channel

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

Area (sf)	CN	Description
3,861	74	>75% Grass cover, Good, HSG C
1,428	70	Woods, Good, HSG C
301	98	Paved parking, HSG C
585	98	Roofs, HSG C
6,175	77	Weighted Average
5,289		85.65% Pervious Area
886		14.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	95	0.0050	0.10		**Sheet Flow, Longest path to enter the Vee Channel** Grass: Short n= 0.150 P2= 3.21"

Summary for Reach 1R: Swale A

Inflow Area = 0.037 ac, 4.99% Impervious, Inflow Depth > 2.26" for 10 Yr 24 Hr event
Inflow = 0.09 cfs @ 12.11 hrs, Volume= 0.007 af
Outflow = 0.08 cfs @ 12.17 hrs, Volume= 0.007 af, Atten= 18%, Lag= 4.0 min
Routed to Pond 10P : Detention Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Stone Drip Edge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.27 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 13.4 min

Peak Storage= 28 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 1.84'
Bank-Full Depth= 0.70' Flow Area= 1.5 sf, Capacity= 0.70 cfs
Any excess flow will be diverted to the secondary overflow

0.00' x 0.70' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 4.20'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 3Ra: Vee Channel

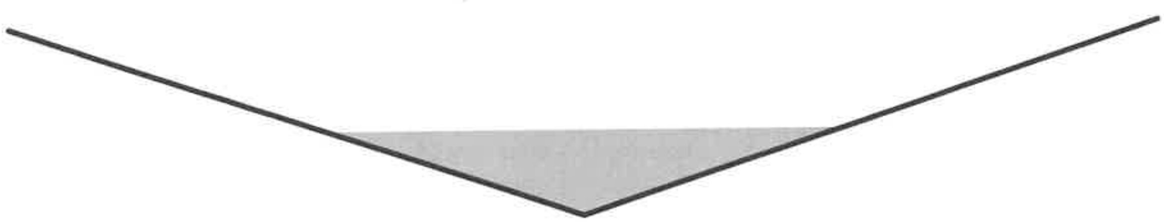
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.33' @ 12.10 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 2.30" for 10 Yr 24 Hr event
Inflow = 0.42 cfs @ 12.28 hrs, Volume= 0.045 af
Outflow = 0.42 cfs @ 12.30 hrs, Volume= 0.045 af, Atten= 0%, Lag= 1.1 min
Routed to Reach 3Rb : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.71 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 2.5 min

Peak Storage= 30 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 2.69'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 3.62 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 51.00', Outlet Invert= 49.00'



Summary for Reach 3Rb: Vee Channel

[61] Hint: Exceeded Reach 3Ra outlet invert by 0.40' @ 12.30 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 2.30" for 10 Yr 24 Hr event
Inflow = 0.42 cfs @ 12.30 hrs, Volume= 0.045 af
Outflow = 0.43 cfs @ 12.31 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.5 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.88 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 1.4 min

Peak Storage= 17 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.41'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 4.83 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 35.0' Slope= 0.0714 '/'
Inlet Invert= 49.00', Outlet Invert= 46.50'

Summary for Reach 4R: Overland Flow

[80] Warning: Exceeded Pond 1P by 0.89' @ 0.00 hrs (0.55 cfs 2.092 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.00" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Outflow = 0.15 cfs @ 12.36 hrs, Volume= 0.015 af, Atten= 26%, Lag= 8.9 min
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.17 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 16.4 min

Peak Storage= 76 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 7.40'
Bank-Full Depth= 0.50' Flow Area= 3.8 sf, Capacity= 1.01 cfs

0.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 15.0 '/' Top Width= 15.00'
Length= 83.0' Slope= 0.0047 '/'
Inlet Invert= 51.39', Outlet Invert= 51.00'

‡

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 0.914 ac, 57.47% Impervious, Inflow Depth > 2.60" for 10 Yr 24 Hr event
Inflow = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af
Outflow = 2.24 cfs @ 12.16 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach AP2: Analysis Point 2

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

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

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

Summary for Reach AP3: Analysis Point 3

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

Inflow Area = 1.242 ac, 39.21% Impervious, Inflow Depth > 0.48" for 10 Yr 24 Hr event
Inflow = 0.46 cfs @ 12.30 hrs, Volume= 0.050 af
Outflow = 0.46 cfs @ 12.30 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.080 ac, 34.05% Impervious, Inflow Depth > 2.96" for 10 Yr 24 Hr event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.106 ac, 12.56% Impervious, Inflow Depth > 2.43" for 10 Yr 24 Hr event
Inflow = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af
Outflow = 0.28 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 2.51" for 10 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.19 hrs, Volume= 0.019 af
Outflow = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af, Atten= 1%, Lag= 1.7 min
Primary = 0.21 cfs @ 12.21 hrs, Volume= 0.015 af
Routed to Reach 4R : Overland Flow

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

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

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

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

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=51.31' TW=51.58' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

Inflow Area = 0.981 ac, 46.18% Impervious, Inflow Depth > 2.68" for 10 Yr 24 Hr event
Inflow = 2.01 cfs @ 12.25 hrs, Volume= 0.219 af
Outflow = 0.23 cfs @ 13.67 hrs, Volume= 0.205 af, Atten= 89%, Lag= 85.4 min
Discarded = 0.23 cfs @ 13.67 hrs, Volume= 0.205 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP3 : Analysis Point 3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 3Ra : Vee Channel

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

Peak Elev= 50.65' @ 13.67 hrs Surf.Area= 3,523 sf Storage= 4,756 cf

Plug-Flow detention time= 238.3 min calculated for 0.204 af (93% of inflow)
Center-of-Mass det. time= 204.2 min (1,025.2 - 821.0)

Volume	Invert	Avail.Storage	Storage Description
#1	46.41'	8,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.41	1,080	138.0	0.0	0	0	1,080
46.42	1,080	138.0	40.0	4	4	1,081
47.74	1,080	138.0	40.0	570	575	1,264
47.75	1,080	138.0	15.0	2	576	1,265
49.24	1,080	138.0	15.0	241	818	1,471
49.25	1,080	138.0	100.0	11	828	1,472
49.50	2,550	271.0	100.0	441	1,269	5,801
50.00	2,971	283.0	100.0	1,379	2,648	6,348
51.00	3,839	301.0	100.0	3,396	6,044	7,234
51.50	4,298	310.0	100.0	2,033	8,077	7,697
51.51	4,331	315.0	100.0	43	8,120	7,946

Device	Routing	Invert	Outlet Devices
#1	Secondary	51.50'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Primary	51.00'	**2.0' long + 3.0 '/' SideZ x 28.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Discarded	46.41'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 46.25' Phase-In= 0.01'

Discarded OutFlow Max=0.23 cfs @ 13.67 hrs HW=50.65' (Free Discharge)
↑—**3=Exfiltration** (Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=51.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Stone Drip Edge

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 5%, Lag= 1.7 min
Primary = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Routed to Pond 4P : Subsurface Stone Infiltration #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.34' @ 12.12 hrs Surf.Area= 248 sf Storage= 25 cf

Plug-Flow detention time= 14.0 min calculated for 0.011 af (99% of inflow)
Center-of-Mass det. time= 9.5 min (757.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.09'	93 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.09	248	0.0	0	0
55.10	248	40.0	1	1
56.00	248	40.0	89	90
56.01	248	100.0	2	93

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**6.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.10' / 54.98' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	55.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	56.00'	**72.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.12 cfs @ 12.12 hrs HW=55.34' TW=55.01' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.12 cfs @ 1.31 fps)
  └─**2=Orifice/Grate** (Passes 0.12 cfs of 0.15 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.09' TW=53.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Subsurface Stone Infiltration #1

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 4.60" for 10 Yr 24 Hr event
Inflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Outflow = 0.05 cfs @ 12.37 hrs, Volume= 0.011 af, Atten= 62%, Lag= 15.3 min
Discarded = 0.05 cfs @ 12.37 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.21' @ 12.37 hrs Surf.Area= 0.009 ac Storage= 0.002 af

Plug-Flow detention time= 17.6 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 17.3 min (774.8 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.60'	0.004 af	**15.00'W x 27.00'L x 1.01'H Prismatoid** 0.009 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.60'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.47' Phase-In= 0.01'
#2	Primary	55.60'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.05 cfs @ 12.37 hrs HW=55.21' (Free Discharge)
└─**1=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.60' TW=53.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 5P: Subsurface Stone Infiltration #3

Inflow =	0.05 cfs @	2.01 hrs,	Volume=	0.051 af	
Outflow =	0.04 cfs @	15.05 hrs,	Volume=	0.050 af,	Atten= 21%, Lag= 782.5 min
Discarded =	0.04 cfs @	15.05 hrs,	Volume=	0.050 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	
Routed to Pond 2P : Bioretention #2					
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	
Routed to Reach AP5 : Analysis Point 5					

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.38' @ 15.05 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 41.9 min calculated for 0.050 af (99% of inflow)
Center-of-Mass det. time= 34.1 min (753.2 - 719.2)

Volume	Invert	Avail.Storage	Storage Description
#1	50.80'	0.006 af	**10.00'W x 45.00'L x 1.41'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.75' Phase-In= 0.01'
#2	Secondary	52.20'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

			2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	51.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	51.40'	**6.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.40' / 50.23' S= 0.0975 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 15.05 hrs HW=51.38' (Free Discharge)
└─**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=46.41' (Dynamic Tailwater)
└─**4=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Bioretention #1

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth > 3.54" for 10 Yr 24 Hr event
Inflow = 0.96 cfs @ 12.09 hrs, Volume= 0.072 af
Outflow = 0.32 cfs @ 12.39 hrs, Volume= 0.072 af, Atten= 67%, Lag= 17.9 min
Discarded = 0.32 cfs @ 12.39 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
  Routed to Pond 12P : Subsurface Stone Infiltration #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
  Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 54.43' @ 12.39 hrs Surf.Area= 965 sf Storage= 787 cf

Plug-Flow detention time= 27.4 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 27.1 min (825.4 - 798.4)

Volume	Invert	Avail.Storage	Storage Description
#1	51.24'	1,473 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.24	502	118.0	0.0	0	0	502
51.25	502	118.0	40.0	2	2	503
52.24	502	118.0	40.0	199	201	620
52.25	502	118.0	15.0	1	202	621
53.74	502	118.0	15.0	112	314	797
53.75	502	118.0	100.0	5	319	798
54.00	595	130.0	100.0	137	456	1,037
54.50	1,035	224.0	100.0	402	858	3,687
55.00	1,376	234.0	100.0	601	1,459	4,069
55.01	1,376	234.0	100.0	14	1,473	4,071

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**6.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.00' / 51.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	55.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 1	54.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	51.24'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.13' Phase-In= 0.01'

Discarded OutFlow Max=0.32 cfs @ 12.39 hrs HW=54.43' (Free Discharge)
↑—**4=Exfiltration** (Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=51.30' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)
  ↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 7P: Unit 6 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.03 cfs @ 12.53 hrs, Volume= 0.012 af, Atten= 81%, Lag= 26.5 min
Discarded = 0.03 cfs @ 12.53 hrs, Volume= 0.012 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.73' @ 12.53 hrs Surf.Area= 421 sf Storage= 201 cf

Plug-Flow detention time= 120.3 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 118.6 min (866.7 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.66'	338 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.66	421	0.0	0	0
49.67	421	40.0	2	2
50.49	421	40.0	138	140
50.50	421	5.0	0	140
51.49	421	5.0	21	161
51.50	421	40.0	2	163
52.49	421	40.0	167	329
52.50	421	100.0	4	333
52.51	421	100.0	4	338

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.66'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.40' Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 12.53 hrs HW=51.73' (Free Discharge)
2=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.66' TW=46.41' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 8P: Unit 7 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 4.63" for 10 Yr 24 Hr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af, Atten= 54%, Lag= 10.6 min
Discarded = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 52.98' @ 12.26 hrs Surf.Area= 421 sf Storage= 130 cf

Plug-Flow detention time= 41.2 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 40.2 min (788.2 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	51.33'	225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.33	421	0.0	0	0
51.34	421	40.0	2	2
51.91	421	40.0	96	98
51.92	421	5.0	0	98
52.91	421	5.0	21	119
52.92	421	40.0	2	120
53.49	421	40.0	96	216
53.50	421	100.0	4	221
53.51	421	100.0	4	225

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	51.33'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.25' Phase-In= 0.01'

Discarded OutFlow Max=0.06 cfs @ 12.26 hrs HW=52.97' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.33' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 9P: Unit 8 Eco-Paver Driveway

Inflow Area = 0.045 ac, 66.04% Impervious, Inflow Depth > 3.75" for 10 Yr 24 Hr event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.05 cfs @ 12.46 hrs, Volume= 0.014 af, Atten= 74%, Lag= 22.5 min
Discarded = 0.05 cfs @ 12.46 hrs, Volume= 0.014 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.37' @ 12.46 hrs Surf.Area= 421 sf Storage= 209 cf

Plug-Flow detention time= 56.1 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 55.0 min (846.2 - 791.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.13'	393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.13	421	0.0	0	0
49.14	421	40.0	2	2
50.71	421	40.0	264	266
50.72	421	5.0	0	266
51.71	421	5.0	21	287
51.72	421	40.0	2	289
52.29	421	40.0	96	385
52.30	421	100.0	4	389
52.31	421	100.0	4	393

Device	Routing	Invert	Outlet Devices
#1	Primary	52.30'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.13'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.05' Phase-In= 0.01'

Discarded OutFlow Max=0.05 cfs @ 12.46 hrs HW=50.37' (Free Discharge)
↑**2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.13' TW=46.41' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 10P: Detention Pond

Inflow Area = 0.211 ac, 27.64% Impervious, Inflow Depth > 2.25" for 10 Yr 24 Hr event
Inflow = 0.51 cfs @ 12.10 hrs, Volume= 0.040 af
Outflow = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.5 min
Primary = 0.51 cfs @ 12.11 hrs, Volume= 0.039 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.10' @ 12.11 hrs Surf.Area= 238 sf Storage= 23 cf

Plug-Flow detention time= 1.5 min calculated for 0.039 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (830.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	337 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	213	0	0
54.00	451	332	332
54.01	451	5	337

Device	Routing	Invert	Outlet Devices
#1	Primary	50.50'	**8.0" Round Culvert** L= 117.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.50' / 49.80' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	53.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	54.00'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.50 cfs @ 12.11 hrs HW=53.10' TW=49.63' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.50 cfs of 1.59 cfs potential flow)
  ↑—**2=Orifice/Grate** (Weir Controls 0.50 cfs @ 1.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' TW=0.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 11P: Subsurface Stone Infiltration #4

Inflow =	0.06 cfs @	6.13 hrs,	Volume=	0.056 af
Outflow =	0.06 cfs @	8.24 hrs,	Volume=	0.056 af, Atten= 4%, Lag= 127.0 min
Discarded =	0.06 cfs @	8.24 hrs,	Volume=	0.056 af
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.59' @ 8.24 hrs Surf.Area= 0.010 ac Storage= 0.006 af

Plug-Flow detention time= 69.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (623.2 - 554.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.20'	0.009 af	**10.00'W x 45.00'L x 2.21'H Prismatoid** 0.023 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.12' Phase-In= 0.01'
#2	Primary	51.40'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	50.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	50.60'	**6.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.60' / 50.08' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.06 cfs @ 8.24 hrs HW=50.59' (Free Discharge)
└1=**Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.20' TW=46.41' (Dynamic Tailwater)
├2=**Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└4=**Culvert** (Controls 0.00 cfs)
  └3=**Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Subsurface Stone Infiltration #2

Inflow Area =	0.242 ac,	57.77% Impervious,	Inflow Depth = 0.00"	for 10 Yr 24 Hr event	
Inflow =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	
Outflow =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.30' @ 0.00 hrs Surf.Area= 0.008 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	0.007 af	**17.00'W x 20.00'L x 2.21'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.30'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.20' Phase-In= 0.01'
#2	Primary	53.50'	**14.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' (Free Discharge)
└1=**Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=0.00' (Dynamic Tailwater)
└2=**Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link 5L: Unit 5 Sump Pump

Factor of safety of 2 provided

Inflow =	0.04 cfs @	13.00 hrs,	Volume=	0.044 af	
Primary =	0.04 cfs @	13.00 hrs,	Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min

Routed to Pond 5P : Subsurface Stone Infiltration #3

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

29 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	

Summary for Link 6L: Unit 6 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

5 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.02	0.04	0.02	0.00

Summary for Link 7L: Unit 7 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af
Primary = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

23 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
0.01	0.00	0.00							

Summary for Link 8L: Unit 8 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af
Primary = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

16 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.03	0.03	0.02
0.01	0.01	0.00	0.00	0.00	0.00				

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

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>4.78"
Flow Length=221' Tc=11.9 min CN=88 Runoff=2.99 cfs 0.268 af

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

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>3.23"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.11 cfs 0.008 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>4.14"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.34 cfs 0.028 af

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

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>4.45"
Flow Length=133' Tc=19.6 min CN=85 Runoff=2.32 cfs 0.247 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>4.79"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=1.28 cfs 0.097 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>5.93"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=90 Runoff=0.25 cfs 0.019 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>3.32"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.14 cfs 0.010 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>3.83"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.64 cfs 0.046 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>3.52"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.41 cfs 0.031 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>3.62"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.44 cfs 0.043 af

Reach 1R: Swale A Avg. Flow Depth=0.36' Max Vel=0.30 fps Inflow=0.14 cfs 0.010 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.12 cfs 0.010 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.53' Max Vel=0.79 fps Inflow=0.68 cfs 0.066 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.68 cfs 0.066 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.48' Max Vel=0.98 fps Inflow=0.68 cfs 0.066 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.68 cfs 0.066 af

Reach 4R: Overland Flow Avg. Flow Depth=0.30' Max Vel=0.19 fps Inflow=0.30 cfs 0.024 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.26 cfs 0.023 af

Reach AP1: Analysis Point 1 Inflow=2.99 cfs 0.268 af
Outflow=2.99 cfs 0.268 af

Reach AP2: Analysis Point 2 Inflow=0.17 cfs 0.013 af
Outflow=0.17 cfs 0.013 af

Reach AP3: Analysis Point 3 Inflow=0.73 cfs 0.093 af
Outflow=0.73 cfs 0.093 af

Reach AP4: Analysis Point 4 Inflow=0.34 cfs 0.028 af
Outflow=0.34 cfs 0.028 af

Reach AP5: Analysis Point 5 Inflow=0.41 cfs 0.031 af
Outflow=0.41 cfs 0.031 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.31 cfs 0.027 af
Outflow=0.30 cfs 0.024 af

Pond 2P: Bioretention #2 Peak Elev=51.11' Storage=6,485 cf Inflow=2.75 cfs 0.303 af
Discarded=0.26 cfs 0.243 af Primary=0.23 cfs 0.019 af Secondary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.262 af

Pond 3P: Stone Drip Edge Peak Elev=55.39' Storage=29 cf Inflow=0.17 cfs 0.014 af
Primary=0.16 cfs 0.014 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.014 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.36' Storage=0.003 af Inflow=0.16 cfs 0.014 af
Discarded=0.06 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.014 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.73' Storage=1,119 cf Inflow=1.28 cfs 0.097 af
Discarded=0.36 cfs 0.095 af Primary=0.10 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.097 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=52.11' Storage=265 cf Inflow=0.18 cfs 0.015 af
Discarded=0.03 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.015 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=53.19' Storage=167 cf Inflow=0.18 cfs 0.015 af
Discarded=0.07 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.015 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=51.15' Storage=275 cf Inflow=0.25 cfs 0.019 af
Discarded=0.08 cfs 0.019 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.019 af

Pond 10P: Detention Pond Peak Elev=53.13' Storage=30 cf Inflow=0.73 cfs 0.057 af
Primary=0.73 cfs 0.057 af Secondary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.057 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=51.60' Storage=0.001 af Inflow=0.10 cfs 0.001 af
Discarded=0.03 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.001 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 0.879 af Average Runoff Depth = 4.43"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

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

Subcatchment1S: Subcatchment1S Runoff Area=29,271 sf 57.36% Impervious Runoff Depth>5.96"
Flow Length=221' Tc=11.9 min CN=88 Runoff=3.69 cfs 0.334 af

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

Subcatchment3S: Subcatchment3S Runoff Area=1,237 sf 0.00% Impervious Runoff Depth>4.27"
Flow Length=34' Tc=6.0 min CN=73 Runoff=0.14 cfs 0.010 af

Subcatchment4S: Subcatchment4S Runoff Area=3,492 sf 34.05% Impervious Runoff Depth>5.28"
Flow Length=47' Slope=0.0250 '/' Tc=9.4 min CN=82 Runoff=0.43 cfs 0.035 af

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

Subcatchment6S: Subcatchment6S Runoff Area=28,965 sf 45.86% Impervious Runoff Depth>5.61"
Flow Length=133' Tc=19.6 min CN=85 Runoff=2.90 cfs 0.311 af

Subcatchment7S: Unit 3 and 4 Runoff Area=1,232 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af

Subcatchment9S: Subcatchment9S Runoff Area=10,560 sf 57.77% Impervious Runoff Depth>5.97"
Flow Length=72' Slope=0.0100 '/' Tc=6.0 min CN=88 Runoff=1.58 cfs 0.121 af

Subcatchment10S: Subcatchment10S Runoff Area=1,309 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment11S: Subcatchment11S Runoff Area=1,297 sf 100.00% Impervious Runoff Depth>7.15"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment12S: Subcatchment12S Runoff Area=1,970 sf 66.04% Impervious Runoff Depth>6.20"
Tc=6.0 min CN=90 Runoff=0.30 cfs 0.023 af

Subcatchment13S: Subcatchment13S Runoff Area=1,624 sf 4.99% Impervious Runoff Depth>4.38"
Flow Length=43' Tc=7.1 min CN=74 Runoff=0.18 cfs 0.014 af

Subcatchment14S: Subcatchment14S Runoff Area=6,327 sf 19.36% Impervious Runoff Depth>4.94"
Flow Length=50' Slope=0.0230 '/' Tc=6.0 min CN=79 Runoff=0.82 cfs 0.060 af

Subcatchment16S: Subcatchment16S Runoff Area=4,616 sf 12.56% Impervious Runoff Depth>4.60"
Flow Length=64' Tc=7.8 min CN=76 Runoff=0.53 cfs 0.041 af

Subcatchment17S: Subcatchment17S Runoff Area=6,175 sf 14.35% Impervious Runoff Depth>4.70"
Flow Length=95' Slope=0.0050 '/' Tc=16.3 min CN=77 Runoff=0.57 cfs 0.056 af

Reach 1R: Swale A Avg. Flow Depth=0.40' Max Vel=0.33 fps Inflow=0.18 cfs 0.014 af
n=0.150 L=100.0' S=0.0100 '/' Capacity=0.70 cfs Outflow=0.16 cfs 0.014 af Overflow=0.00 cfs 0.000 af

Reach 3Ra: Vee Channel Avg. Flow Depth=0.59' Max Vel=0.85 fps Inflow=0.90 cfs 0.087 af
n=0.150 L=50.0' S=0.0400 '/' Capacity=3.62 cfs Outflow=0.90 cfs 0.087 af

Reach 3Rb: Vee Channel Avg. Flow Depth=0.53' Max Vel=1.06 fps Inflow=0.90 cfs 0.087 af
n=0.150 L=35.0' S=0.0714 '/' Capacity=4.83 cfs Outflow=0.90 cfs 0.087 af

Reach 4R: Overland Flow Avg. Flow Depth=0.33' Max Vel=0.21 fps Inflow=0.39 cfs 0.032 af
n=0.150 L=83.0' S=0.0047 '/' Capacity=1.01 cfs Outflow=0.34 cfs 0.032 af

Reach AP1: Analysis Point 1 Inflow=3.69 cfs 0.334 af
Outflow=3.69 cfs 0.334 af

Reach AP2: Analysis Point 2 Inflow=0.21 cfs 0.016 af
Outflow=0.21 cfs 0.016 af

Reach AP3: Analysis Point 3 Inflow=1.57 cfs 0.172 af
Outflow=1.57 cfs 0.172 af

Reach AP4: Analysis Point 4 Inflow=0.43 cfs 0.035 af
Outflow=0.43 cfs 0.035 af

Reach AP5: Analysis Point 5 Inflow=0.53 cfs 0.041 af
Outflow=0.53 cfs 0.041 af

Pond 1P: Depression Peak Elev=51.31' Storage=167 cf Inflow=0.40 cfs 0.036 af
Outflow=0.39 cfs 0.032 af

Pond 2P: Bioretention #2 Peak Elev=51.29' Storage=7,196 cf Inflow=3.44 cfs 0.384 af
Discarded=0.27 cfs 0.258 af Primary=1.13 cfs 0.074 af Secondary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.333 af

Pond 3P: Stone Drip Edge Peak Elev=55.51' Storage=42 cf Inflow=0.20 cfs 0.017 af
Primary=0.18 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.017 af

Pond 4P: Subsurface Stone Infiltration #1 Peak Elev=55.50' Storage=0.003 af Inflow=0.18 cfs 0.017 af
Discarded=0.07 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.017 af

Pond 5P: Subsurface Stone Infiltration #3 Peak Elev=51.38' Storage=0.002 af Inflow=0.05 cfs 0.051 af
Discarded=0.04 cfs 0.050 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.050 af

Pond 6P: Bioretention #1 Peak Elev=54.81' Storage=1,214 cf Inflow=1.58 cfs 0.121 af
Discarded=0.36 cfs 0.110 af Primary=0.58 cfs 0.010 af Secondary=0.00 cfs 0.000 af Outflow=0.95 cfs 0.120 af

Pond 7P: Unit 6 Eco-Paver Driveway Peak Elev=52.47' Storage=326 cf Inflow=0.21 cfs 0.018 af
Discarded=0.03 cfs 0.017 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.017 af

Pond 8P: Unit 7 Eco-Paver Driveway Peak Elev=53.41' Storage=203 cf Inflow=0.21 cfs 0.018 af
Discarded=0.08 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.018 af

Pond 9P: Unit 8 Eco-Paver Driveway Peak Elev=51.91' Storage=320 cf Inflow=0.30 cfs 0.023 af
Discarded=0.10 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.023 af

Pond 10P: Detention Pond Peak Elev=53.16' Storage=36 cf Inflow=0.95 cfs 0.073 af
Primary=0.95 cfs 0.073 af Secondary=0.00 cfs 0.000 af Outflow=0.95 cfs 0.073 af

Pond 11P: Subsurface Stone Infiltration #4 Peak Elev=50.59' Storage=0.006 af Inflow=0.06 cfs 0.056 af
Discarded=0.06 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.056 af

Pond 12P: Subsurface Stone Infiltration #2 Peak Elev=53.46' Storage=0.007 af Inflow=0.58 cfs 0.010 af
Discarded=0.16 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.010 af

Link 5L: Unit 5 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.044 af
Primary=0.04 cfs 0.044 af

Link 6L: Unit 6 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.007 af
Primary=0.04 cfs 0.007 af

Link 7L: Unit 7 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.036 af
Primary=0.04 cfs 0.036 af

Link 8L: Unit 8 Sump Pump Manual Hydrograph Inflow=0.04 cfs 0.020 af
Primary=0.04 cfs 0.020 af

Total Runoff Area = 2.382 ac Runoff Volume = 1.108 af Average Runoff Depth = 5.58"
55.32% Pervious = 1.318 ac 44.68% Impervious = 1.064 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af, Depth> 5.96"
Routed to Reach AP1 : Analysis Point 1

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

Area (sf)	CN	Description
14,174	98	Paved parking, HSG C
2,616	98	Roofs, HSG C
12,481	74	>75% Grass cover, Good, HSG C
29,271	88	Weighted Average
12,481		42.64% Pervious Area
16,790		57.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0220	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.3	15	0.0167	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	84	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	221	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 0.21 cfs @ 12.11 hrs, Volume= 0.016 af, Depth> 5.05"
Routed to Reach AP2 : Analysis Point 2

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

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

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

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 4.27"
Routed to Reach AP3 : Analysis Point 3

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

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
286	70	Woods, Good, HSG C
1,237	73	Weighted Average
1,237		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	17	0.3300	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.5	11	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
1.0	6	0.1670	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
3.2	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af, Depth> 5.28"
Routed to Reach AP4 : Analysis Point 4

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

Area (sf)	CN	Description
1,717	74	>75% Grass cover, Good, HSG C
453	98	Paved parking, HSG C
736	98	Roofs, HSG C
586	70	Woods, Good, HSG C
3,492	82	Weighted Average
2,303		65.95% Pervious Area
1,189		34.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
6.9	27	0.0250	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
9.4	47	Total			

Summary for Subcatchment 5S: Subcatchment 5S

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

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

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

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

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 2.90 cfs @ 12.26 hrs, Volume= 0.311 af, Depth> 5.61"
Routed to Pond 2P : Bioretention #2

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

Area (sf)	CN	Description
8,011	98	Paved parking, HSG C
5,272	98	Roofs, HSG C
14,477	74	>75% Grass cover, Good, HSG C
1,205	70	Woods, Good, HSG C
28,965	85	Weighted Average
15,682		54.14% Pervious Area
13,283		45.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0450	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
16.6	78	0.0230	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.4	11	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	22	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.6	133	Total			

Summary for Subcatchment 7S: Unit 3 and 4

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 7.15"
Routed to Pond 3P : Stone Drip Edge

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

Area (sf)	CN	Description
984	98	Roofs, HSG C
248	98	Water Surface, HSG C
1,232	98	Weighted Average
1,232		100.00% Impervious Area

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

Summary for Subcatchment 9S: Subcatchment 9S

Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.121 af, Depth> 5.97"
Routed to Pond 6P : Bioretention #1

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

Area (sf)	CN	Description
4,178	98	Paved parking, HSG C
1,922	98	Roofs, HSG C
4,331	74	>75% Grass cover, Good, HSG C
129	70	Woods, Good, HSG C
10,560	88	Weighted Average
4,460		42.23% Pervious Area
6,100		57.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0100	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.8	45	0.0100	0.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
0.3	13	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	72	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 7.15"
Routed to Pond 7P : Unit 6 Eco-Paver Driveway

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

Area (sf)	CN	Description
876	98	Roofs, HSG C
433	98	Paved parking, HSG C
1,309	98	Weighted Average
1,309		100.00% Impervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth> 7.15"
Routed to Pond 8P : Unit 7 Eco-Paver Driveway

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

Area (sf)	CN	Description
876	98	Roofs, HSG C
421	98	Paved parking, HSG C
1,297	98	Weighted Average
1,297		100.00% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 6.20"
Routed to Pond 9P : Unit 8 Eco-Paver Driveway

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

Area (sf)	CN	Description
876	98	Roofs, HSG C
425	98	Paved parking, HSG C
669	74	>75% Grass cover, Good, HSG C
1,970	90	Weighted Average
669		33.96% Pervious Area
1,301		66.04% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 4.38"
Routed to Reach 1R : Swale A

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

Area (sf)	CN	Description
1,013	74	>75% Grass cover, Good, HSG C
530	70	Woods, Good, HSG C
81	98	Roofs, HSG C
1,624	74	Weighted Average
1,543		95.01% Pervious Area
81		4.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	28	0.0210	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
3.3	10	0.0210	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
0.3	5	0.3300	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
7.1	43	Total			

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.060 af, Depth> 4.94"
Routed to Pond 10P : Detention Pond

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

Area (sf)	CN	Description
5,067	74	>75% Grass cover, Good, HSG C
35	70	Woods, Good, HSG C
1,225	98	Roofs, HSG C
6,327	79	Weighted Average
5,102		80.64% Pervious Area
1,225		19.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0230	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
5.3	50	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Depth> 4.60"
Routed to Reach AP5 : Analysis Point 5

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

Area (sf)	CN	Description
3,173	74	>75% Grass cover, Good, HSG C
863	70	Woods, Good, HSG C
580	98	Roofs, HSG C
4,616	76	Weighted Average
4,036		87.44% Pervious Area
580		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	41	0.0120	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	12	0.3300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.6	5	0.0500	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.7	6	0.3300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.21"
7.8	64	Total			

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.57 cfs @ 12.22 hrs, Volume= 0.056 af, Depth> 4.70"
Routed to Reach 3Ra : Vee Channel

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

Area (sf)	CN	Description
3,861	74	>75% Grass cover, Good, HSG C
1,428	70	Woods, Good, HSG C
301	98	Paved parking, HSG C
585	98	Roofs, HSG C
6,175	77	Weighted Average
5,289		85.65% Pervious Area
886		14.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	95	0.0050	0.10		**Sheet Flow, Longest path to enter the Vee Channel** Grass: Short n= 0.150 P2= 3.21"

Summary for Reach 1R: Swale A

Inflow Area = 0.037 ac, 4.99% Impervious, Inflow Depth > 4.38" for 50 Yr 24 Hr event
Inflow = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af
Outflow = 0.16 cfs @ 12.16 hrs, Volume= 0.014 af, Atten= 14%, Lag= 3.4 min
Routed to Pond 10P : Detention Pond
Overflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Stone Drip Edge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.33 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 11.9 min

Peak Storage= 48 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.39'
Bank-Full Depth= 0.70' Flow Area= 1.5 sf, Capacity= 0.70 cfs
Any excess flow will be diverted to the secondary overflow

0.00' x 0.70' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 4.20'
Length= 100.0' Slope= 0.0100 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 3Ra: Vee Channel

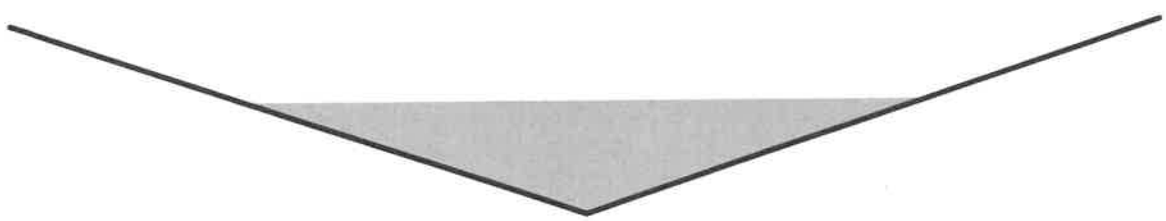
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.26' @ 12.25 hrs
[80] Warning: Exceeded Pond 2P by 1.21' @ 12.15 hrs (2.13 cfs 0.120 af)

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 4.50" for 50 Yr 24 Hr event
Inflow = 0.90 cfs @ 12.25 hrs, Volume= 0.087 af
Outflow = 0.90 cfs @ 12.26 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.8 min
Routed to Reach 3Rb : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.85 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 2.3 min

Peak Storage= 53 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 3.56'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 3.62 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 51.00', Outlet Invert= 49.00'



Summary for Reach 3Rb: Vee Channel

[61] Hint: Exceeded Reach 3Ra outlet invert by 0.53' @ 12.25 hrs

Inflow Area = 0.233 ac, 14.62% Impervious, Inflow Depth > 4.50" for 50 Yr 24 Hr event
Inflow = 0.90 cfs @ 12.26 hrs, Volume= 0.087 af
Outflow = 0.90 cfs @ 12.27 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.4 min
Routed to Reach AP3 : Analysis Point 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.06 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.45 fps, Avg. Travel Time= 1.3 min

Peak Storage= 30 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 3.19'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 4.83 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 3.0 '/' Top Width= 6.00'
Length= 35.0' Slope= 0.0714 '/'
Inlet Invert= 49.00', Outlet Invert= 46.50'

Summary for Reach 4R: Overland Flow

[80] Warning: Exceeded Pond 1P by 0.89' @ 0.00 hrs (0.55 cfs 2.484 af)

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.20" for 50 Yr 24 Hr event
Inflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Outflow = 0.34 cfs @ 12.29 hrs, Volume= 0.032 af, Atten= 12%, Lag= 4.8 min
Routed to Reach 3Ra : Vee Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.21 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 14.1 min

Peak Storage= 138 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 10.00'
Bank-Full Depth= 0.50' Flow Area= 3.8 sf, Capacity= 1.01 cfs

0.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 15.0 '/' Top Width= 15.00'
Length= 83.0' Slope= 0.0047 '/'
Inlet Invert= 51.39', Outlet Invert= 51.00'

‡

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 0.914 ac, 57.47% Impervious, Inflow Depth > 4.38" for 50 Yr 24 Hr event
Inflow = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af
Outflow = 3.69 cfs @ 12.16 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach AP2: Analysis Point 2

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

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

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

Summary for Reach AP3: Analysis Point 3

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

Inflow Area = 1.242 ac, 39.21% Impervious, Inflow Depth > 1.66" for 50 Yr 24 Hr event
Inflow = 1.57 cfs @ 12.60 hrs, Volume= 0.172 af
Outflow = 1.57 cfs @ 12.60 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.080 ac, 34.05% Impervious, Inflow Depth > 5.28" for 50 Yr 24 Hr event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.106 ac, 12.56% Impervious, Inflow Depth > 4.60" for 50 Yr 24 Hr event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af
Outflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Depression

Inflow Area = 0.091 ac, 15.05% Impervious, Inflow Depth > 4.71" for 50 Yr 24 Hr event
Inflow = 0.40 cfs @ 12.18 hrs, Volume= 0.036 af
Outflow = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af, Atten= 1%, Lag= 1.6 min
Primary = 0.39 cfs @ 12.21 hrs, Volume= 0.032 af
Routed to Reach 4R : Overland Flow

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

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

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

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

Device	Routing	Invert	Outlet Devices
#0	Primary	51.31'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	51.30'	**8.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

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

Summary for Pond 2P: Bioretention #2

[80] Warning: Exceeded Pond 11P by 1.18' @ 18.30 hrs (0.00 cfs 0.120 af)

Inflow Area = 0.981 ac, 46.18% Impervious, Inflow Depth > 4.70" for 50 Yr 24 Hr event
Inflow = 3.44 cfs @ 12.24 hrs, Volume= 0.384 af
Outflow = 1.40 cfs @ 12.65 hrs, Volume= 0.333 af, Atten= 59%, Lag= 24.4 min
Discarded = 0.27 cfs @ 12.65 hrs, Volume= 0.258 af
Primary = 1.13 cfs @ 12.65 hrs, Volume= 0.074 af
Routed to Reach AP3 : Analysis Point 3
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 3Ra : Vee Channel

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

Peak Elev= 51.29' @ 12.65 hrs Surf.Area= 4,102 sf Storage= 7,196 cf

Plug-Flow detention time= 212.3 min calculated for 0.332 af (86% of inflow)
Center-of-Mass det. time= 154.3 min (959.7 - 805.4)

Volume	Invert	Avail.Storage	Storage Description
#1	46.41'	8,120 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.41	1,080	138.0	0.0	0	0	1,080
46.42	1,080	138.0	40.0	4	4	1,081
47.74	1,080	138.0	40.0	570	575	1,264
47.75	1,080	138.0	15.0	2	576	1,265
49.24	1,080	138.0	15.0	241	818	1,471
49.25	1,080	138.0	100.0	11	828	1,472
49.50	2,550	271.0	100.0	441	1,269	5,801
50.00	2,971	283.0	100.0	1,379	2,648	6,348
51.00	3,839	301.0	100.0	3,396	6,044	7,234
51.50	4,298	310.0	100.0	2,033	8,077	7,697
51.51	4,331	315.0	100.0	43	8,120	7,946

Device	Routing	Invert	Outlet Devices
#1	Secondary	51.50'	**100.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Primary	51.00'	**2.0' long + 3.0 '/' SideZ x 28.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Discarded	46.41'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 46.25' Phase-In= 0.01'

Discarded OutFlow Max=0.27 cfs @ 12.65 hrs HW=51.29' (Free Discharge)
↑—**3=Exfiltration** (Controls 0.27 cfs)

Primary OutFlow Max=1.13 cfs @ 12.65 hrs HW=51.29' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 1.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=46.41' TW=51.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Stone Drip Edge

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 9%, Lag= 0.5 min
Primary = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af
Routed to Pond 4P : Subsurface Stone Infiltration #1
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.51' @ 12.37 hrs Surf.Area= 248 sf Storage= 42 cf

Plug-Flow detention time= 12.3 min calculated for 0.017 af (99% of inflow)
Center-of-Mass det. time= 8.9 min (750.7 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	55.09'	93 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.09	248	0.0	0	0
55.10	248	40.0	1	1
56.00	248	40.0	89	90
56.01	248	100.0	2	93

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**6.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 55.10' / 54.98' S= 0.0150 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	55.10'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	56.00'	**72.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.18 cfs @ 12.09 hrs HW=55.41' TW=55.25' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.18 cfs @ 2.03 fps)
└─**2=Orifice/Grate** (Passes 0.18 cfs of 0.25 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.09' TW=53.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Subsurface Stone Infiltration #1

Inflow Area = 0.028 ac,100.00% Impervious, Inflow Depth > 7.11" for 50 Yr 24 Hr event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.07 cfs @ 12.37 hrs, Volume= 0.017 af, Atten= 64%, Lag= 16.6 min
Discarded = 0.07 cfs @ 12.37 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 10P : Detention Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 55.50' @ 12.37 hrs Surf.Area= 0.009 ac Storage= 0.003 af

Plug-Flow detention time= 21.1 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 20.8 min (771.5 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	54.60'	0.004 af	**15.00'W x 27.00'L x 1.01'H Prismatoid** 0.009 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.60'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 54.47' Phase-In= 0.01'
#2	Primary	55.60'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.07 cfs @ 12.37 hrs HW=55.50' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.60' TW=53.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 5P: Subsurface Stone Infiltration #3

Inflow = 0.05 cfs @ 2.01 hrs, Volume= 0.051 af
Outflow = 0.04 cfs @ 15.05 hrs, Volume= 0.050 af, Atten= 21%, Lag= 782.5 min
Discarded = 0.04 cfs @ 15.05 hrs, Volume= 0.050 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.38' @ 15.05 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 41.9 min calculated for 0.050 af (99% of inflow)
Center-of-Mass det. time= 34.1 min (753.2 - 719.2)

Volume	Invert	Avail.Storage	Storage Description
#1	50.80'	0.006 af	**10.00'W x 45.00'L x 1.41'H Prismatoid** 0.015 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 50.75' Phase-In= 0.01'
#2	Secondary	52.20'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

			2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	51.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	51.40'	**6.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 51.40' / 50.23' S= 0.0975 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 15.05 hrs HW=51.38' (Free Discharge)
└─**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=46.41' (Dynamic Tailwater)
└─**4=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.80' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 6P: Bioretention #1

Inflow Area = 0.242 ac, 57.77% Impervious, Inflow Depth > 5.97" for 50 Yr 24 Hr event
Inflow = 1.58 cfs @ 12.09 hrs, Volume= 0.121 af
Outflow = 0.95 cfs @ 12.22 hrs, Volume= 0.120 af, Atten= 40%, Lag= 7.7 min
Discarded = 0.36 cfs @ 12.22 hrs, Volume= 0.110 af
Primary = 0.58 cfs @ 12.22 hrs, Volume= 0.010 af
  Routed to Pond 12P : Subsurface Stone Infiltration #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
  Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 54.81' @ 12.22 hrs Surf.Area= 1,243 sf Storage= 1,214 cf

Plug-Flow detention time= 30.3 min calculated for 0.120 af (100% of inflow)
Center-of-Mass det. time= 28.7 min (812.8 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	51.24'	1,473 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
51.24	502	118.0	0.0	0	0	502
51.25	502	118.0	40.0	2	2	503
52.24	502	118.0	40.0	199	201	620
52.25	502	118.0	15.0	1	202	621
53.74	502	118.0	15.0	112	314	797
53.75	502	118.0	100.0	5	319	798
54.00	595	130.0	100.0	137	456	1,037
54.50	1,035	224.0	100.0	402	858	3,687
55.00	1,376	234.0	100.0	601	1,459	4,069
55.01	1,376	234.0	100.0	14	1,473	4,071

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**6.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.00' / 51.90' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	55.00'	**30.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 1	54.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	51.24'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.13' Phase-In= 0.01'

Discarded OutFlow Max=0.36 cfs @ 12.22 hrs HW=54.81' (Free Discharge)
↑—**4=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.54 cfs @ 12.22 hrs HW=54.81' TW=52.14' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.54 cfs of 1.19 cfs potential flow)
  ↑—**3=Orifice/Grate** (Weir Controls 0.54 cfs @ 1.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.24' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 7P: Unit 6 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.03 cfs @ 12.56 hrs, Volume= 0.017 af, Atten= 84%, Lag= 28.5 min
Discarded = 0.03 cfs @ 12.56 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 52.47' @ 12.56 hrs Surf.Area= 421 sf Storage= 326 cf

Plug-Flow detention time= 131.5 min calculated for 0.017 af (97% of inflow)
Center-of-Mass det. time= 116.6 min (858.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.66'	338 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.66	421	0.0	0	0
49.67	421	40.0	2	2
50.49	421	40.0	138	140
50.50	421	5.0	0	140
51.49	421	5.0	21	161
51.50	421	40.0	2	163
52.49	421	40.0	167	329
52.50	421	100.0	4	333
52.51	421	100.0	4	338

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.66'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.40' Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 12.56 hrs HW=52.47' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.66' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 8P: Unit 7 Eco-Paver Driveway

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 7.15" for 50 Yr 24 Hr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.08 cfs @ 12.33 hrs, Volume= 0.018 af, Atten= 63%, Lag= 14.5 min
Discarded = 0.08 cfs @ 12.33 hrs, Volume= 0.018 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.41' @ 12.33 hrs Surf.Area= 421 sf Storage= 203 cf

Plug-Flow detention time= 43.0 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 42.0 min (783.8 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	51.33'	225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.33	421	0.0	0	0
51.34	421	40.0	2	2
51.91	421	40.0	96	98
51.92	421	5.0	0	98
52.91	421	5.0	21	119
52.92	421	40.0	2	120
53.49	421	40.0	96	216
53.50	421	100.0	4	221
53.51	421	100.0	4	225

Device	Routing	Invert	Outlet Devices
#1	Primary	53.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	51.33'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.25' Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 12.33 hrs HW=53.41' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.33' TW=46.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 9P: Unit 8 Eco-Paver Driveway

Inflow Area = 0.045 ac, 66.04% Impervious, Inflow Depth > 6.20" for 50 Yr 24 Hr event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.10 cfs @ 12.36 hrs, Volume= 0.023 af, Atten= 65%, Lag= 16.6 min
Discarded = 0.10 cfs @ 12.36 hrs, Volume= 0.023 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 51.91' @ 12.36 hrs Surf.Area= 421 sf Storage= 320 cf

Plug-Flow detention time= 57.2 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 55.9 min (833.7 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	49.13'	393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.13	421	0.0	0	0
49.14	421	40.0	2	2
50.71	421	40.0	264	266
50.72	421	5.0	0	266
51.71	421	5.0	21	287
51.72	421	40.0	2	289
52.29	421	40.0	96	385
52.30	421	100.0	4	389
52.31	421	100.0	4	393

Device	Routing	Invert	Outlet Devices
#1	Primary	52.30'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	49.13'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.05' Phase-In= 0.01'

Discarded OutFlow Max=0.10 cfs @ 12.36 hrs HW=51.91' (Free Discharge)
2=Exfiltration (Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.13' TW=46.41' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond 10P: Detention Pond

Inflow Area = 0.211 ac, 27.64% Impervious, Inflow Depth > 4.17" for 50 Yr 24 Hr event
Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Outflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.5 min
Primary = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Routed to Pond 2P : Bioretention #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach AP5 : Analysis Point 5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.16' @ 12.10 hrs Surf.Area= 250 sf Storage= 36 cf

Plug-Flow detention time= 1.3 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (812.2 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	337 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.00	213	0	0
54.00	451	332	332
54.01	451	5	337

Device	Routing	Invert	Outlet Devices
#1	Primary	50.50'	**8.0" Round Culvert** L= 117.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.50' / 49.80' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	53.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	54.00'	**6.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.94 cfs @ 12.10 hrs HW=53.15' TW=50.18' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.94 cfs of 1.60 cfs potential flow)
  ↑—**2=Orifice/Grate** (Weir Controls 0.94 cfs @ 1.29 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.00' TW=0.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 11P: Subsurface Stone Infiltration #4

Inflow	=	0.06 cfs @	6.13 hrs, Volume=	0.056 af
Outflow	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af, Atten= 4%, Lag= 127.0 min
Discarded	=	0.06 cfs @	8.24 hrs, Volume=	0.056 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af

Routed to Pond 2P : Bioretention #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 50.59' @ 8.24 hrs Surf.Area= 0.010 ac Storage= 0.006 af

Plug-Flow detention time= 69.2 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 69.1 min (623.2 - 554.1)

Volume	Invert	Avail.Storage	Storage Description
#1	49.20'	0.009 af	**10.00'W x 45.00'L x 2.21'H Prismatoid** 0.023 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.20'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 49.12' Phase-In= 0.01'
#2	Primary	51.40'	**45.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Device 4	50.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	50.60'	**6.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 50.60' / 50.08' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.06 cfs @ 8.24 hrs HW=50.59' (Free Discharge)
└─**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.20' TW=46.41' (Dynamic Tailwater)
├─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
└─**4=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 12P: Subsurface Stone Infiltration #2

Inflow Area =	0.242 ac, 57.77% Impervious, Inflow Depth = 0.51"	for 50 Yr 24 Hr event	
Inflow =	0.58 cfs @ 12.22 hrs, Volume=	0.010 af	
Outflow =	0.16 cfs @ 12.45 hrs, Volume=	0.010 af, Atten= 73%, Lag= 13.9 min	
Discarded =	0.16 cfs @ 12.45 hrs, Volume=	0.010 af	
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af	

Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 53.46' @ 12.45 hrs Surf.Area= 0.008 ac Storage= 0.007 af

Plug-Flow detention time= 28.7 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (765.8 - 737.2)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	0.007 af	**17.00'W x 20.00'L x 2.21'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.30'	**0.890 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 51.20' Phase-In= 0.01'
#2	Primary	53.50'	**14.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.16 cfs @ 12.45 hrs HW=53.46' (Free Discharge)
└─**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link 5L: Unit 5 Sump Pump

Factor of safety of 2 provided

Inflow =	0.04 cfs @ 13.00 hrs, Volume=	0.044 af	
Primary =	0.04 cfs @ 13.00 hrs, Volume=	0.044 af, Atten= 0%, Lag= 0.0 min	

Routed to Pond 5P : Subsurface Stone Infiltration #3

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

29 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03
0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	

Summary for Link 6L: Unit 6 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 2.00 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 5P : Subsurface Stone Infiltration #3

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

5 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.02	0.04	0.02	0.00

Summary for Link 7L: Unit 7 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af
Primary = 0.04 cfs @ 10.00 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

23 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.01	0.01
0.01	0.00	0.00							

Summary for Link 8L: Unit 8 Sump Pump

Factor of safety of 2 provided

Inflow = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af
Primary = 0.04 cfs @ 6.00 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 11P : Subsurface Stone Infiltration #4

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

16 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.03	0.03	0.02
0.01	0.01	0.00	0.00	0.00	0.00				

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

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

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

2” gravel at surface.

NRCS : Woodbridge

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

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

NRCS : Woodbridge

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

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

NRCS : Woodbridge

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

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

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

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

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

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

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

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

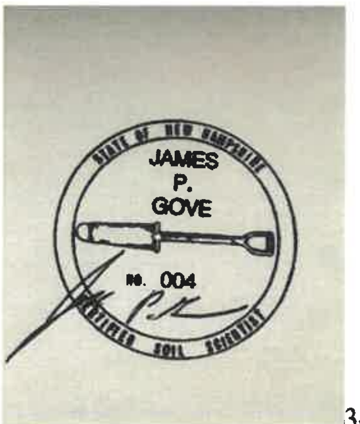
Test Pit No. 7
ESHWT: 26"
Termination @ 40"
Refusal: None
NRCS : Woodbridge
Obs. Water: None

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

Legend:

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

Soil Colors at Munsell.



3-22-2022

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

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

<u>Test Pit #8</u>

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

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

Test Pit #9

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

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

Gove Environmental Services, Inc.

TEST PIT DATA

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

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

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

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

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

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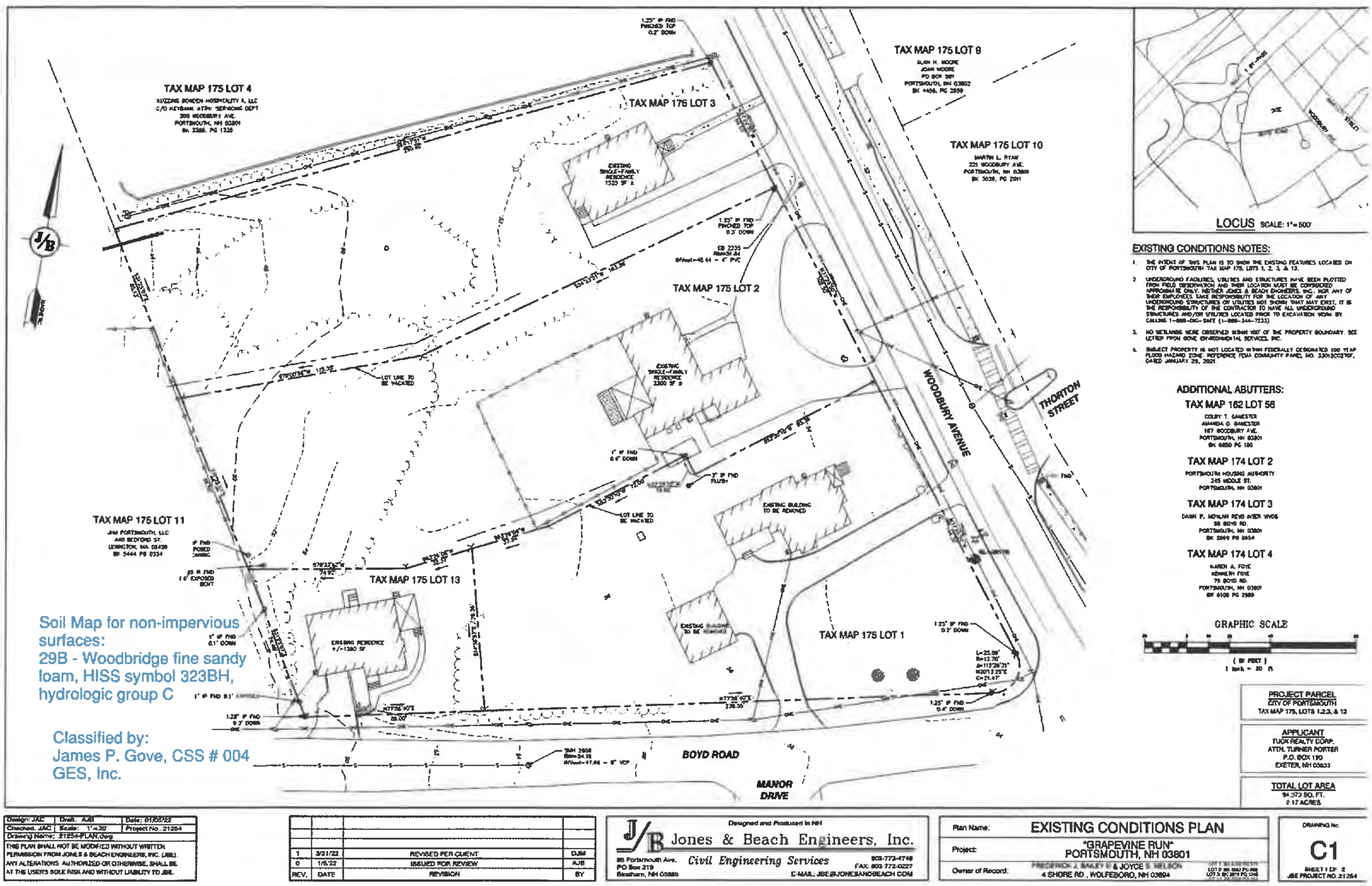
APPENDIX IV

Professional Soil Classification Exhibit


TAX MAP 175 LOT 4
TAX MAP 175 LOT 3
TAX MAP 175 LOT 9
TAX MAP 175 LOT 10
TAX MAP 175 LOT 2
TAX MAP 175 LOT 11
TAX MAP 175 LOT 13
TAX MAP 175 LOT 1
WOODBURY AVENUE
THORTON STREET
BOYD ROAD
MANOR DRIVE
LOCUS SCALE: 1"=500'
EXISTING CONDITIONS NOTES:
ADDITIONAL ABUTTERS:
TAX MAP 162 LOT 56
TAX MAP 174 LOT 2
TAX MAP 174 LOT 3
TAX MAP 174 LOT 4
GRAPHIC SCALE
PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1,2,3, & 13
APPLICANT
TUCK REALTY CORP.
ATTN. TURNER PORTER
P.O. BOX 190
EXETER, NH 03833
TOTAL LOT AREA
94,373 SQ. FT.
2.17 ACRES
Soil Map for non-impervious surfaces:
29B - Woodbridge fine sandy loam, HISS symbol 323BH, hydrologic group C
Classified by:
James P. Gove, CSS # 004
GES, Inc.
Design: JAC Draft: AJB Date: 01/05/22
Checked: JAC Scale: 1"=20' Project No.: 21254
Drawing Name: 21254-PLAN.dwg
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1 3/21/22 REVISED PER CLIENT DJM
0 1/5/22 ISSUED FOR REVIEW AJB
REV. DATE REVISION BY
Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
E-MAIL: JBE@JONESANDBEACH.COM
Plan Name: EXISTING CONDITIONS PLAN
Project: "GRAPEVINE RUN" PORTSMOUTH, NH 03801
Owner of Record:
4 SHORE RD., WOLFEBORO, NH 03894
Drawing No.
C1
JBE PROJECT NO. 21254

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(Grapevine Run)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 19, 2021—Nov 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

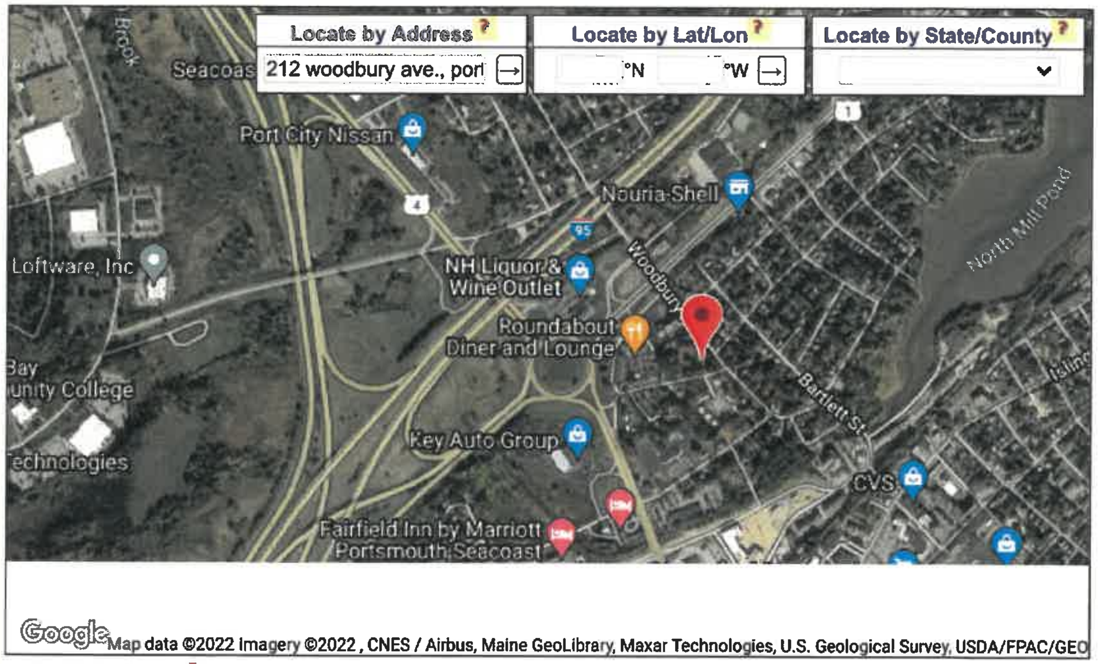
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
799	Urban land-Canton complex, 3 to 15 percent slopes	2.4	100.0%
Totals for Area of Interest		**2.4**	**100.0%**

APPENDIX VI

Extreme Precipitation Estimates

Select Product
Extreme Precipitation Tables - HTML
Extreme Precipitation Tables - Text/CSV
Partial Duration Series - by Point
Partial Duration Series - by Station
Distribution Curves - Graphical
Distribution Curves - Text/TBL
Intensity Frequency Duration Graphs
Precipitation Frequency Duration Graphs
GIS Data Files
Regional/State Maps

Select Location ? *Double-click the map to place a marker, or enter address or latitude/longitude.*



Select Options ?

Smoothing	Delivery
Yes	Popup

Submit

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.777 degrees West
Latitude	43.073 degrees North
Elevation	0 feet
Date/Time	Wed, 04 May 2022 15:24:32 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.92	**1yr**	2.35	2.81	3.22	3.94	4.55	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.21	3.57	**2yr**	2.84	3.43	3.94	4.68	5.33	**2yr**
5yr	0.37	0.58	0.73	0.97	1.25	1.60	**5yr**	1.08	1.46	1.88	2.43	3.14	4.07	4.58	**5yr**	3.60	4.40	5.04	5.93	6.70	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.72	2.23	2.89	3.75	4.87	5.53	**10yr**	4.31	5.32	6.08	7.11	7.98	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.33	**25yr**	1.53	2.14	2.77	3.62	4.74	6.17	7.10	**25yr**	5.46	6.83	7.80	9.02	10.05	**25yr**
50yr	0.53	0.86	1.10	1.53	2.06	2.75	**50yr**	1.78	2.52	3.28	4.32	5.66	7.39	8.58	**50yr**	6.54	8.25	9.42	10.81	11.98	**50yr**
100yr	0.59	0.96	1.24	1.76	2.41	3.24	**100yr**	2.08	2.97	3.89	5.15	6.76	8.86	10.38	**100yr**	7.84	9.98	11.37	12.96	14.28	**100yr**
200yr	0.67	1.10	1.42	2.04	2.81	3.82	**200yr**	2.43	3.50	4.60	6.11	8.07	10.61	12.55	**200yr**	9.39	12.07	13.74	15.55	17.04	**200yr**
500yr	0.79	1.31	1.70	2.47	3.46	4.74	**500yr**	2.98	4.36	5.74	7.68	10.21	13.49	16.15	**500yr**	11.94	15.53	17.65	19.78	21.52	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.67	2.22	2.51	**1yr**	1.97	2.41	2.86	3.16	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.06	3.45	**2yr**	2.70	3.32	3.82	4.55	5.08	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.79	4.20	**5yr**	3.36	4.04	4.72	5.54	6.25	**5yr**
10yr	0.39	0.59	0.73	1.03	1.33	1.60	**10yr**	1.14	1.56	1.81	2.39	3.06	4.38	4.87	**10yr**	3.87	4.69	5.45	6.42	7.21	**10yr**

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.70	5.91	**25yr**	4.16	5.69	6.67	7.81	8.70	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.52	2.12	2.35	3.08	3.94	5.31	6.83	**50yr**	4.70	6.57	7.76	9.07	10.04	**50yr**
100yr	0.54	0.81	1.02	1.47	2.01	2.47	**100yr**	1.74	2.42	2.63	3.43	4.37	5.96	7.89	**100yr**	5.27	7.59	9.02	10.54	11.59	**100yr**
200yr	0.59	0.89	1.13	1.64	2.28	2.82	**200yr**	1.97	2.75	2.94	3.80	4.82	6.67	9.12	**200yr**	5.90	8.77	10.49	12.27	13.41	**200yr**
500yr	0.69	1.02	1.32	1.91	2.72	3.37	**500yr**	2.35	3.29	3.41	4.34	5.49	7.75	11.03	**500yr**	6.86	10.61	12.81	15.02	16.23	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.99	3.15	**1yr**	2.65	3.03	3.58	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.70	**2yr**	3.03	3.56	4.08	4.83	5.64	**2yr**
5yr	0.40	0.62	0.76	1.05	1.33	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.34	4.95	**5yr**	3.84	4.76	5.37	6.36	7.14	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.10	3.94	5.34	6.19	**10yr**	4.72	5.95	6.79	7.82	8.74	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.56	**25yr**	1.76	2.50	2.95	4.06	5.13	7.81	8.31	**25yr**	6.91	7.99	9.10	10.31	11.39	**25yr**
50yr	0.67	1.02	1.27	1.82	2.45	3.12	**50yr**	2.11	3.05	3.59	4.99	6.29	9.78	10.41	**50yr**	8.66	10.01	11.37	12.69	13.93	**50yr**
100yr	0.78	1.19	1.49	2.15	2.94	3.79	**100yr**	2.54	3.71	4.36	6.14	7.72	12.25	13.04	**100yr**	10.84	12.54	14.20	15.65	17.05	**100yr**
200yr	0.92	1.38	1.75	2.53	3.53	4.63	**200yr**	3.05	4.52	5.32	7.55	9.47	15.38	16.35	**200yr**	13.61	15.72	17.75	19.28	20.87	**200yr**
500yr	1.14	1.69	2.18	3.16	4.50	6.00	**500yr**	3.88	5.87	6.90	9.98	12.44	20.79	22.06	**500yr**	18.40	21.21	23.87	25.41	27.28	**500yr**

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Northeast Regional Climate Center

APPENDIX VII

Amoozemeter Test Results

Pit #1 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
6.8	20	0.5	0.008333	16320.0	17.2339	6.7850
10.5	20	1	0.016667	12600.0	13.3056	5.2384
13	20	1.5	0.025	10400.0	10.9824	4.3238
15.1	20	2	0.033333	9060.0	9.5674	3.7667
19.5	20	3	0.05	7800.0	8.2368	3.2428
23.6	20	4	0.066667	7080.0	7.4765	2.9435
28.1	20	5	0.083333	6744.0	7.1217	2.8038
32.3	20	6	0.1	6460.0	6.8218	2.6857
36.5	20	7	0.116667	6257.1	6.6075	2.6014
40.2	20	8	0.133333	6030.0	6.3677	2.5070
					Mean	**3.6898**
					σ (Std. Dev.)	**1.3236**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #1 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
10.5	20	0.5	0.008333	25200.0	26.6112	10.4769
22.1	20	1.25	0.020833	21216.0	22.4041	8.8205
27.1	20	2	0.033333	16260.0	17.1706	6.7601
30.8	20	2.5	0.041667	14784.0	15.6119	6.1464
33.9	20	3	0.05	13560.0	14.3194	5.6375
36	20	3.5	0.058333	12342.9	13.0341	5.1315
38.9	20	4	0.066667	11670.0	12.3235	4.8518
	105		0	#DIV/0!	#DIV/0!	
	105		0	#DIV/0!	#DIV/0!	
	105		0	#DIV/0!	#DIV/0!	
					Mean	6.8321
					σ (Std. Dev.)	1.9255

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #1 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
2.2	20	0.5	0.008333	5280.0	5.5757	2.1951
3	20	1	0.016667	3600.0	3.8016	1.4967
5.7	20	1.5	0.025	4560.0	4.8154	1.8958
7.5	20	2	0.033333	4500.0	4.7520	1.8709
10.8	20	3	0.05	4320.0	4.5619	1.7960
14.1	20	4	0.066667	4230.0	4.4669	1.7586
17.3	20	5	0.083333	4152.0	4.3845	1.7262
20.7	20	6	0.1	4140.0	4.3718	1.7212
23.8	20	7	0.116667	4080.0	4.3085	1.6963
27	20	8	0.133333	4050.0	4.2768	1.6838
30.4	20	9	0.15	4053.3	4.2803	1.6852
33.6	20	10	0.166667	4032.0	4.2578	1.6763

Mean	**1.7668**
σ (Std. Dev.)	**0.1621**

Constant	20	cm^2
Glover Coefficient:	0.001056	1/cm^2

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5	20	2	0.033333	3000.0	3.1680	1.2472
7.6	20	5	0.083333	1824.0	1.9261	0.7583
12	20	10	0.166667	1440.0	1.5206	0.5987
15.9	20	15	0.25	1272.0	1.3432	0.5288
20	20	20	0.333333	1200.0	1.2672	0.4989
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
					Mean	0.7264
					σ (Std. Dev.)	0.2755

Constant	20	cm^2
Glover Coefficient:	0.001056	1/cm^2

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
9.1	20	5	0.083333	2184.0	2.3063	0.9080
15.2	20	10	0.166667	1824.0	1.9261	0.7583
17.5	20	15	0.25	1400.0	1.4784	0.5820
21.5	20	20	0.333333	1290.0	1.3622	0.5363
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	0.6962
σ (Std. Dev.)	0.1477

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Pit #2 - Test #3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5.6	20	5	0.083333	1344.0	1.4193	0.5588
9.4	20	10	0.166667	1128.0	1.1912	0.4690
13.4	20	15	0.25	1072.0	1.1320	0.4457
17.6	20	20	0.333333	1056.0	1.1151	0.4390
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	
	20		0	#DIV/0!	#DIV/0!	

Mean	**0.4781**
σ (Std. Dev.)	**0.0479**

Constant	20	cm^2
Glover Coefficient:	0.001056	1/cm^2

Calculations:

Constant = 20 cm^2 for one tube, 153 cm^2 for two tubes (one tube used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

APPENDIX VIII

BMP Worksheets

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Bioretention #1 (6P)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.24	ac	A = Area draining to the practice	
0.14	ac	A_I = Impervious area draining to the practice	
0.58	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.57	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.14	ac-in	WQV= 1" x Rv x A	
501	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
125	cf	25% x WQV (check calc for sediment forebay volume)	
375	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
165	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
502	sf	A_{SA} = Surface area of the practice	
0.89	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
13.4	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
52.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
51.13	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
49.95	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
52.25	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
2.30	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.12	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
54.81	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
55.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
531	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	L1	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond 6P: Bioretention #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
51.24	502	0
51.29	502	10
51.34	502	20
51.39	502	30
51.44	502	40
51.49	502	50
51.54	502	60
51.59	502	70
51.64	502	80
51.69	502	90
51.74	502	100
51.79	502	110
51.84	502	120
51.89	502	131
51.94	502	141
51.99	502	151
52.04	502	161
52.09	502	171
52.14	502	181
52.19	502	191
52.24	502	201
52.29	502	205
52.34	502	208
52.39	502	212
52.44	502	216
52.49	502	220
52.54	502	223
52.59	502	227
52.64	502	231
52.69	502	235
52.74	502	238
52.79	502	242
52.84	502	246
52.89	502	250
52.94	502	254
52.99	502	257
53.04	502	261
53.09	502	265
53.14	502	269
53.19	502	272
53.24	502	276
53.29	502	280
53.34	502	284
53.39	502	287
53.44	502	291
53.49	502	295
53.54	502	299
53.59	502	302
53.64	502	306
53.69	502	310
53.74	502	314
53.79	516	339
53.84	535	365
53.89	553	393
53.94	572	421
53.99	591	450
54.04	626	480
54.09	665	512
54.14	706	547
54.19	748	583
54.24	791	622
54.29	835	662
54.34	881	705
54.39	928	750
54.44	976	798
54.49	1,025	848
54.54	1,060	900
54.59	1,093	954
54.64	1,126	1,009
54.69	1,159	1,066
54.74	1,193	1,125
54.79	1,227	1,186
54.84	1,262	1,248
54.89	1,297	1,312
54.94	1,333	1,378
54.99	**1,369**	**1,445**

Bottom of filter course
El. = 52.25
Vol. below = 201 cf
Excluded from WQV Calculation

Elevation of overflow risers = 54.15
Vol. below = 547 cf
Vol. Sediment forebay (included in WQV calculation) = 165 cf
Vol. below filter course (excluded from WQV calculation) = 201 cf

WQV Required = 501 cf

WQV Provided
547+165-201 = 511 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention #2 (2P) SEE DESIGNER NOTES BELOW**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.88	ac	A = Area draining to the practice	
0.36	ac	A_I = Impervious area draining to the practice	
0.41	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.42	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.37	ac-in	WQV= 1" x Rv x A	
1,346	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
336	cf	25% x WQV (check calc for sediment forebay volume)	
1,009	cf	75% x WQV (check calc for surface sand filter volume)	
Pre-Tx		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
1,080	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
49.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
47.75	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
46.25	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
44.42	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
47.75	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
3.33	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
51.29	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
51.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
1,361	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	L1	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

"Area draining to practice" excludes Eco-Paver driveways and subsurface stone basins, which are hydraulically routed to the bioretention in HydroCAD. Therefore there is a slight discrepancy, but these practices do not actually overflow to the bioretention system.

Stage-Area-Storage for Pond 2P: Bioretention #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
46.41	1,080	0	49.01	1,080	780
46.46	1,080	22	49.06	1,080	788
46.51	1,080	43	49.11	1,080	797
46.56	1,080	65	49.16	1,080	805
46.61	1,080	86	49.21	1,080	813
46.66	1,080	108	49.26	1,127	839
46.71	1,080	130	49.31	1,376	902
46.76	1,080	151	49.36	1,650	977
46.81	1,080	173	49.41	1,949	1,067
46.86	1,080	194	49.46	2,273	1,173
46.91	1,080	216	49.51	2,558	1,295
46.96	1,080	238	49.56	2,599	1,424
47.01	1,080	259	49.61	2,640	1,555
47.06	1,080	281	49.66	2,681	1,688
47.11	1,080	302	49.71	2,723	1,823
47.16	1,080	324	49.76	2,765	1,960
47.21	1,080	346	49.81	2,807	2,099
47.26	1,080	367	49.86	2,850	2,241
47.31	1,080	389	49.91	2,893	2,384
47.36	1,080	410	49.96	2,936	2,530
47.41	1,080	432	50.01	2,979	2,678
47.46	1,080	454	50.06	3,020	2,828
47.51	1,080	475	50.11	3,061	2,980
47.56	1,080	497	50.16	3,102	3,134
47.61	1,080	518	50.21	3,144	3,290
47.66	1,080	540	50.26	3,186	3,448
47.71	1,080	562	50.31	3,228	3,609
47.76	1,080	578	50.36	3,271	3,771
47.81	1,080	586	50.41	3,313	3,936
47.86	1,080	594	50.46	3,356	4,102
47.91	1,080	602	50.51	3,400	4,271
47.96	1,080	610	50.56	3,443	4,442
48.01	1,080	618	50.61	3,487	4,616
48.06	1,080	626	50.66	3,531	4,791
48.11	1,080	635	50.71	3,576	4,969
48.16	1,080	643	50.76	3,621	5,149
48.21	1,080	651	50.81	3,666	5,331
48.26	1,080	659	50.86	3,711	5,515
48.31	1,080	667	50.91	3,756	5,702
48.36	1,080	675	50.96	3,802	5,891
48.41	1,080	683	51.01	3,848	6,082
48.46	1,080	691	51.06	3,893	6,276
48.51	1,080	699	51.11	3,938	6,472
48.56	1,080	707	51.16	3,983	6,670
48.61	1,080	716	51.21	4,029	6,870
48.66	1,080	724	51.26	4,074	7,072
48.71	1,080	732	51.31	4,121	7,277
48.76	1,080	740	51.36	4,167	7,484
48.81	1,080	748	51.41	4,213	7,694
48.86	1,080	756	51.46	4,260	7,906
48.91	1,080	764	51.51	**4,331**	**8,120**
48.96	1,080	772			

Bottom of filter course el. = 47.75
Vol. below = 576 cf
Excluded from WQV calculation

Overflow riser el. = 49.75
Vol. below riser = 1,937 cf
WQV Required = 1,346 cf

WQV Provided
1937-576 = 1,361 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Unit 6 Permeable Paver Driveway (7P)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
103	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
26	cf	25% x WQV (check calc for sediment forebay volume)	
78	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
421	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
9.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
-	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
-	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
-	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
	ft	Elevation of the top of the practice	
-		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← **yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
3.0	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Unit 7 Permeable Paver Driveway (8P)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
103	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
26	cf	25% x WQV (check calc for sediment forebay volume)	
78	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
421	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
9.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
-	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
-	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
-	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
	ft	Elevation of the top of the practice	
-		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	≥ 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
3.0	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
12.0	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Unit 8 Permeable Paver Driveway (9P)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.05	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
0.67	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.65	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
106	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
27	cf	25% x WQV (check calc for sediment forebay volume)	
80	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
421	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
10.1	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
-	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
-	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
-	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
	ft	Elevation of the top of the practice	
-		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← yes
	cf	V = Volume of storage[3] (attach a stage-storage table)	≥ WQV
	inches	D_{FC} = Filter course thickness	18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	≥ 3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

Pavers		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
4.5	:1	Ratio of the contributing area to the pervious surface area	≤ 5:1
12.0	inches	D_{FC} = Filter course thickness	12", or 18" if within GPA
Sheet	D4	Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

APPENDIX IX

Pollutant Removal Efficiency Data & Worksheet

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	BMP	Notes	Lit. Ref.	TSS	TN	TP
Stormwater Ponds	Wet Pond		B, F	70%	35%	45%
	Wet Extended Detention Pond		A, B	80%	55%	68%
	Micropool Extended Detention Pond	TBA				
	Multiple Pond System	TBA				
	Pocket Pond	TBA				
Stormwater Wetlands	Shallow Wetland		A, B, F, I	80%	55%	45%
	Extended Detention Wetland		A, B, F, I	80%	55%	45%
	Pond/Wetland System	TBA				
	Gravel Wetland		H	95%	85%	64%
Infiltration Practices	Infiltration Trench (≥75 ft from surface water)		B, D, I	90%	55%	60%
	Infiltration Trench (<75 ft from surface water)		B, D, I	90%	10%	60%
	Infiltration Basin (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Infiltration Basin (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Dry Wells			90%	55%	60%
	Drip Edges			90%	55%	60%
Filtering Practices	Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Aboveground or Underground Sand Filter with underdrain		A, I, F, G, H	85%	10%	45%
	Tree Box Filter	TBA				
	Bioretention System		I, G, H	90%	65%	65%
	Permeable Pavement that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Permeable Pavement that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Permeable Pavement with underdrain		Use TN and TP values for sand filter w/ underdrain and outlet pipe	90%	10%	45%

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Treatment Swales	Flow Through Treatment Swale	TBA				
Vegetated Buffers	Vegetated Buffers		A, B, I	73%	40%	45%
Pre-Treatment Practices	Sediment Forebay	TBA				
	Vegetated Filter Strip		A, B, I	73%	40%	45%
	Vegetated Swale		A, B, C, F, H, I	65%	20%	25%
	Flow-Through Device - Hydrodynamic Separator		A, B, G, H	35%	10%	5%
	Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU)		G, H	72%	10%	9%
	Other Flow-Through Devices	TBA				
	Off-line Deep Sump Catch Basin		J, K, L, M	15%	5%	5%

TSS Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention	0.390	90%	0.351	
Porous Pavers	0.029	90%	0.026	
Infiltration	0.022	90%	0.020	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.398	84%

Phosphorous Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention Pond #1	0.390	65%	0.254	
Porous Pavers	0.029	60%	0.018	
Infiltration	0.022	60%	0.013	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.285	60%

Nitrogen Removal	A Non-Roof Impervious Area (acres)	B Removal Efficiency	C (A*B) Amount Removed	D (C/A) Total Removal Efficiency
Bioretention Pond #1	0.390	65%	0.254	
Porous Pavers	0.029	65%	0.019	
Infiltration	0.022	65%	0.015	
Untreated	0.030	0%	0.000	
Total Impervious	0.472		0.287	61%

APPENDIX X

Sump Pump Discharge Calculation Worksheet

Sump Pump Discharge Calculation Worksheet

Y	Surface Area	953	SF		
Permeability		1.78	iph		
		3.56	iph	Factor of Safety = 2	
		0.296667	fph		
	Z	8.24E-05	fps	Void ratio	0.5

	Unit 5				
A	FF	55.5	feet		
B	Excavation Depth	47.5	feet	B=A-8	
C	Average Ex Grade	52.85	feet		
D	SHWT Depth	1.25	feet		
E	SHWT El.	51.6	feet	E=C-D	
F	Depth in SHWT	4.1	feet	F=E-B	
G	Volume	1953.65	cf	G=Y*F*0.5	
H	Lag	49752.81	seconds	H=F/Z	13.82022 hours
Q	Flow	0.039267	cfs	Q=G/H	
	Unit 6				
A	FF	55.5	feet		
B	Excavation Depth	47.5	feet	B=A-8	
C	Average Ex Grade	49.4	feet		
D	SHWT Depth	2.5	feet		
E	SHWT El.	46.9	feet	E=C-D	
F	Depth in SHWT	0.6	feet	F=E-B	
G	Volume	285.9	cf	G=Y*F*0.5	
H	Lag	7280.899	seconds	H=F/Z	2.022472 hours
Q	Flow	0.039267	cfs	Q=G/H	
	Unit 7				
A	FF	55.5	feet		
B	Excavation Depth	47.5	feet	B=A-8	
C	Average Ex Grade	53	feet		
D	SHWT Depth	2.25	feet		
E	SHWT El.	50.75	feet	E=C-D	
F	Depth in SHWT	3.25	feet	F=E-B	
G	Volume	1548.625	cf	G=Y*F*0.5	
H	Lag	39438.2	seconds	H=F/Z	10.95506 hours
Q	Flow	0.039267	cfs	Q=G/H	
	Unit 8				
A	FF	55	feet		
B	Excavation Depth	47	feet	B=A-8	
C	Average Ex Grade	50.5	feet		
D	SHWT Depth	1.75	feet		
E	SHWT El.	48.75	feet	E=C-D	
F	Depth in SHWT	1.75	feet	F=E-B	
G	Volume	833.875	cf	G=Y*F*0.5	
H	Lag	21235.96	seconds	H=F/Z	5.898876 hours
Q	Flow	0.039267	cfs	Q=G/H	

Unit 5 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.003
2	0.006
3	0.009
4	0.011
5	0.014
6	0.017
7	0.020
8	0.023
9	0.026
10	0.028
11	0.031
12	0.034
13	0.037
14	0.040
15	0.037
16	0.034
17	0.031
18	0.028
19	0.026
20	0.023
21	0.020
22	0.017
23	0.014
24	0.011
25	0.009
26	0.006
27	0.003
28	0.000

Unit 6 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.019
2	0.039
3	0.019
4	0.000

Unit 7 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.004
2	0.007
3	0.011
4	0.014
5	0.018
6	0.022
7	0.025
8	0.029
9	0.032
10	0.036
11	0.039
12	0.036
13	0.032
14	0.029
15	0.025
16	0.022
17	0.018
18	0.014
19	0.011
20	0.007
21	0.004
22	0.000

Unit 8 Hydrograph

Hour	Discharge rate (cfs)
0	0.000
1	0.007
2	0.013
3	0.020
4	0.027
5	0.033
6	0.040
7	0.033
8	0.027
9	0.020
10	0.013
11	0.007
12	0.000

APPENDIX XI

Rip Rap Sizing Calculations

RIP RAP CALCULATIONS
Grapevine Run
212, 214, & 216 Woodbury Ave
Portsmouth, NH 03801

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
28-Nov-22

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.*
Aprons are sized for the 25-Year storm event.

TAILWATER < HALF THE D_o

$L_a = (1.8 \times Q) / D_0^{3/2} + (7 \times D_o)$

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

$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
				#DIV/0!	#DIV/0!	#DIV/0!

TAILWATER > HALF THE D_o

$L_a = (3.0 \times Q) / D_0^{3/2} + (7 \times D_o)$

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

$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
8" HDPE (Pond 10P)	0.44	0.73	0.67	8.7	5	0.04

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.25	Feet	3	Inches
% of Weight Smaller			Size of Stone (Inches)	
Than the Given d_{50} Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.5	Feet	6	Inches
% of Weight Smaller			Size of Stone (Inches)	
Than the Given d_{50} Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

APPENDIX XII

Pre- and Post-Construction Watershed Plans

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

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.15670
LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
5	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
4	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
3	9/16/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM
2	8/1/22	REVISED PER TAC COMMENTS	DJM
1	6/21/22	ISSUED FOR REVIEW	DJM

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

Plan Name: EXISTING WATERSHED PLAN

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

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

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 21254

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

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

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

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

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16070
LICENSED
PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
5	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
4	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
3	9/16/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM
2	8/1/22	REVISED PER TAC COMMENTS	DJM
1	6/21/22	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
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: **PROPOSED WATERSHED PLAN**
Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 21254

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.artform.us to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

Art Form Architecture ("Art Form") requires that our Drawings be built substantially as designed. Art Form will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Art Form. It is recommended that you have your Drawing updated by Art Form prior to attaching any Drawing to any builder agreement. Art Form shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

Facade Changes:
- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Art Form.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:
- Structural changes always require the express written consent of Art Form
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Tarquin

1108.124 GR (5/16/2022)

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Tarquin

1108.124 GR (5/16/2022)

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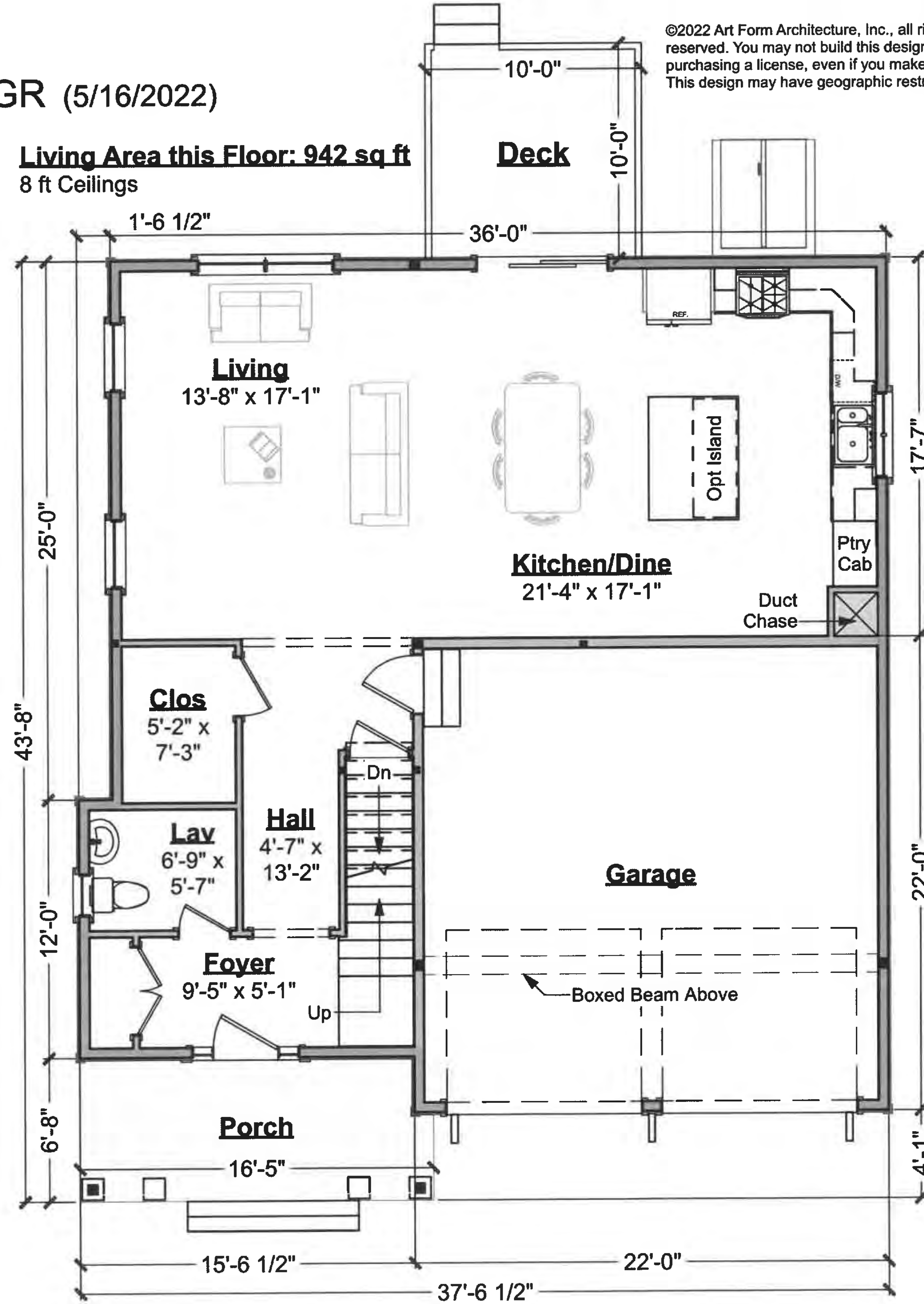
603-431-9559

Living Area this Floor: 942 sq ft

8 ft Ceilings



First Floor Plan

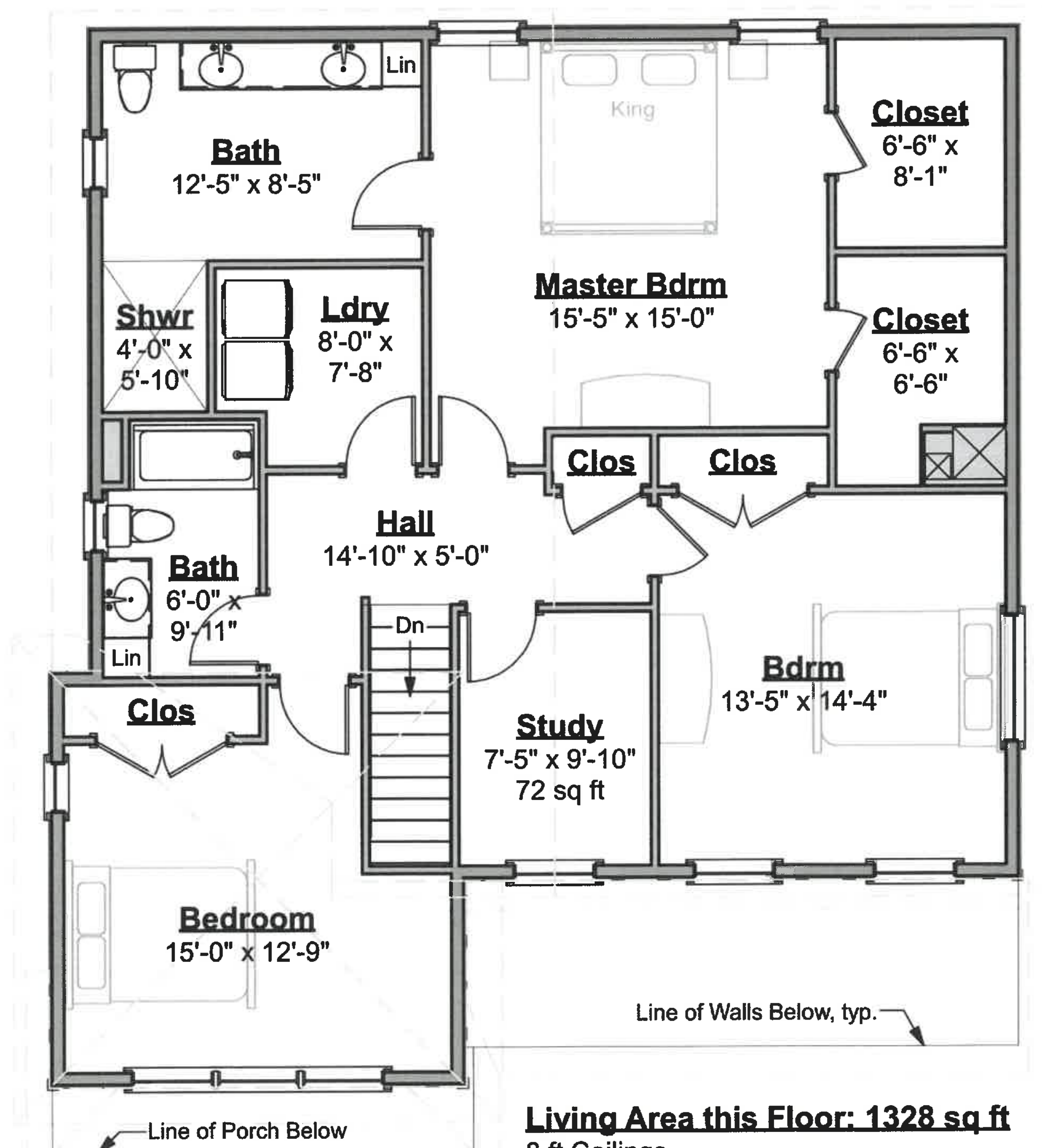
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559



Living Area this Floor: 1328 sq ft

8 ft Ceilings

Second Floor Plan

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

Tarquin

1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

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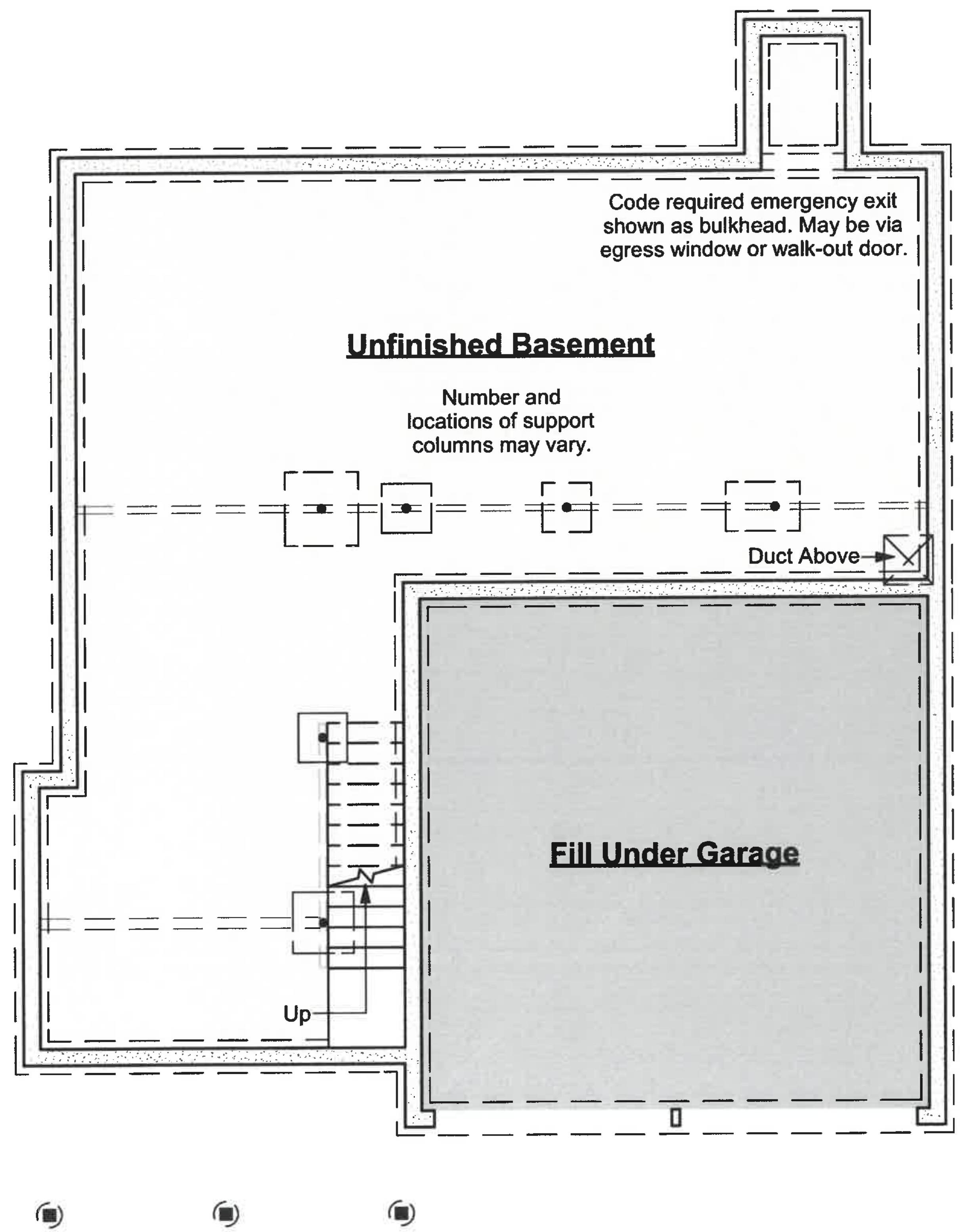

Foundation Plan

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

Tarquin
1108.124 GR (5/16/2022)

Art Form Architecture, Inc.

603-431-9559

Front Elevation
Scale: 1/8" = 1'-0"

Tarquin

1108.124 GR (5/16/2022)

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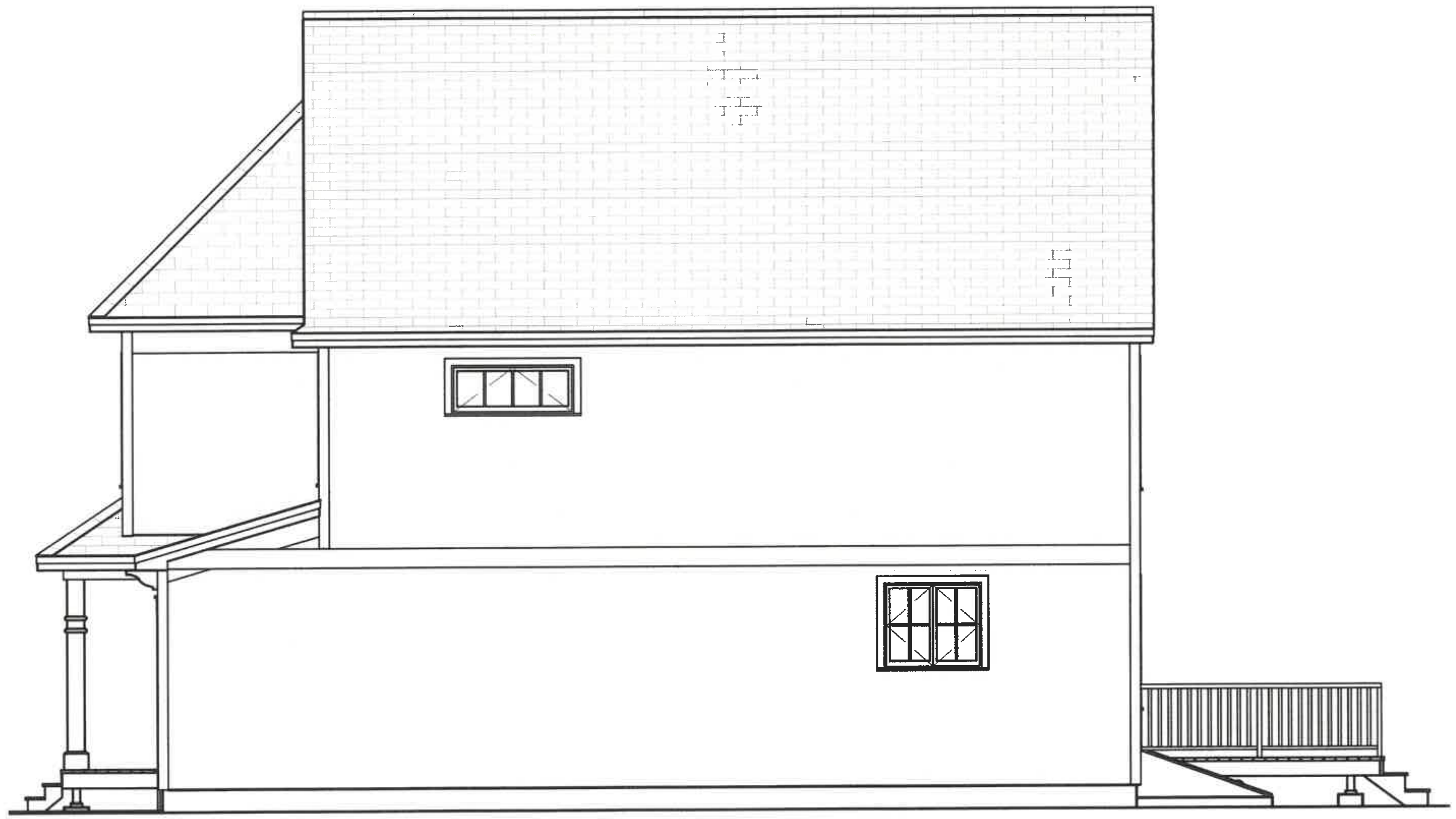

Right Elevation

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

Tarquin

1108.124 GR (5/16/2022)

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Rear Elevation

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

Tarquin
1108.124 GR (5/16/2022)

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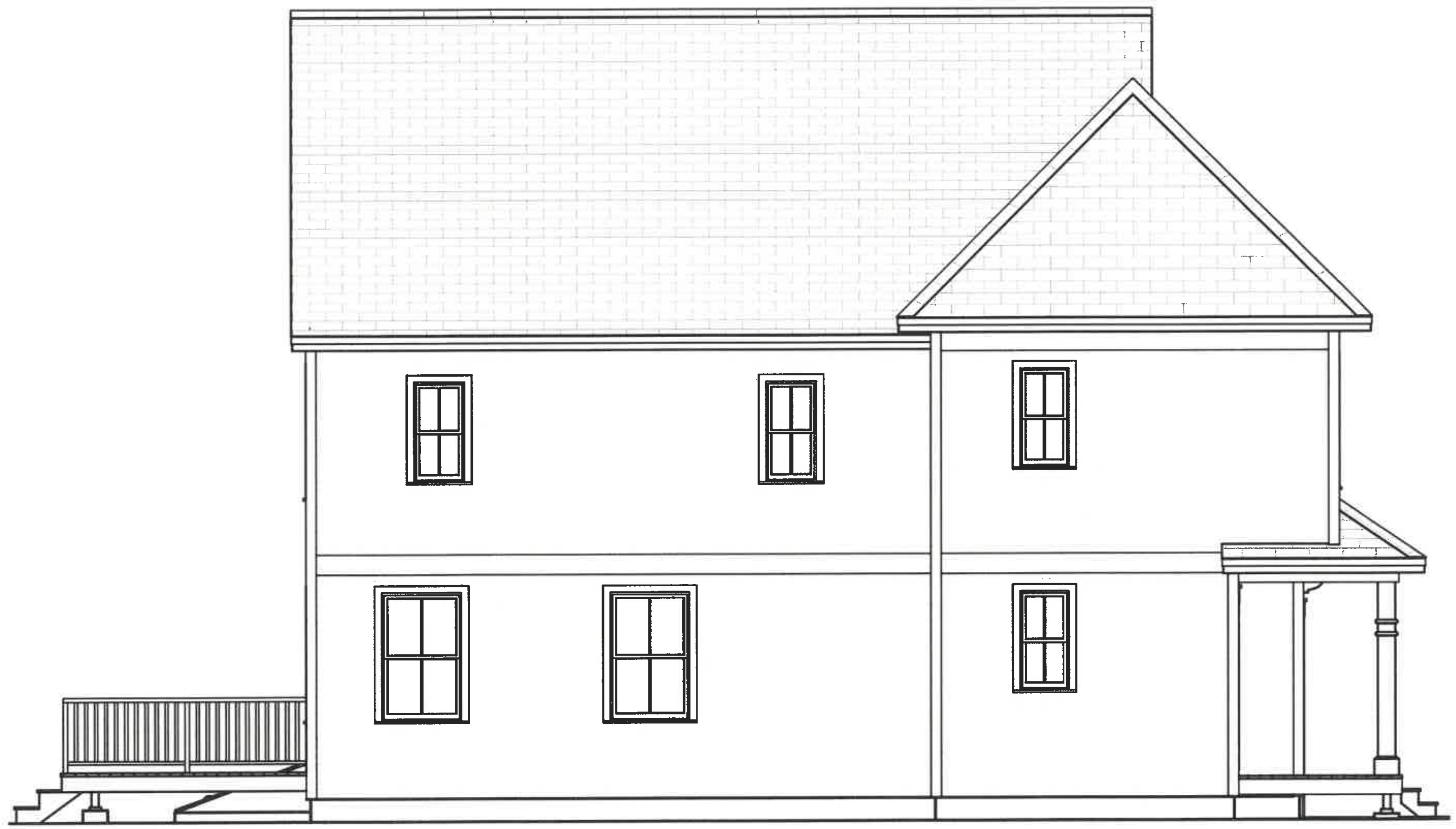

Left Elevation
Scale: 1/8" = 1'-0"

Matthias Duplex
1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

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Matthias Duplex
1107.224 (5/13/2022)

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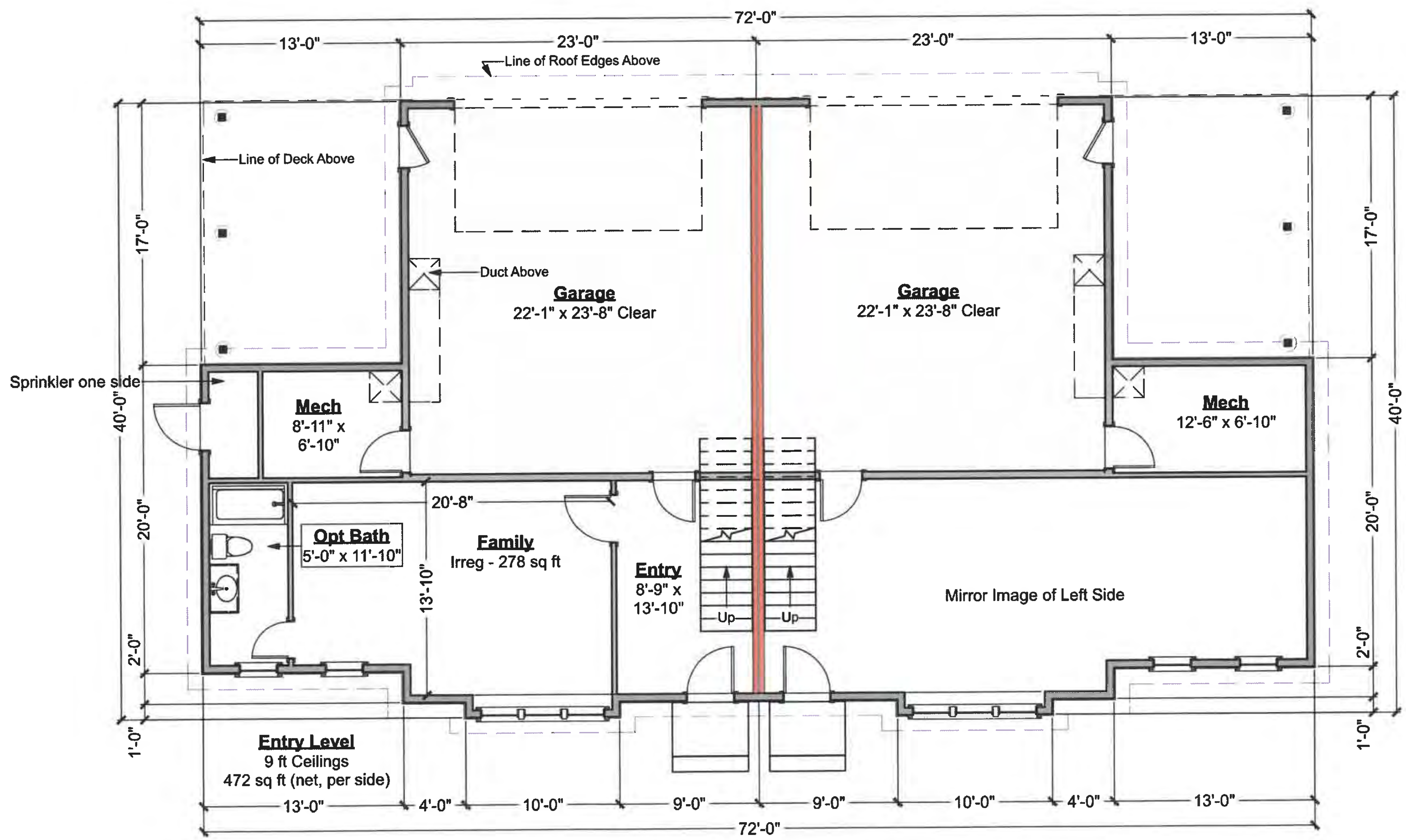

First Floor Plan
Scale: 1/8" = 1'-0"

Matthias Duplex

1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

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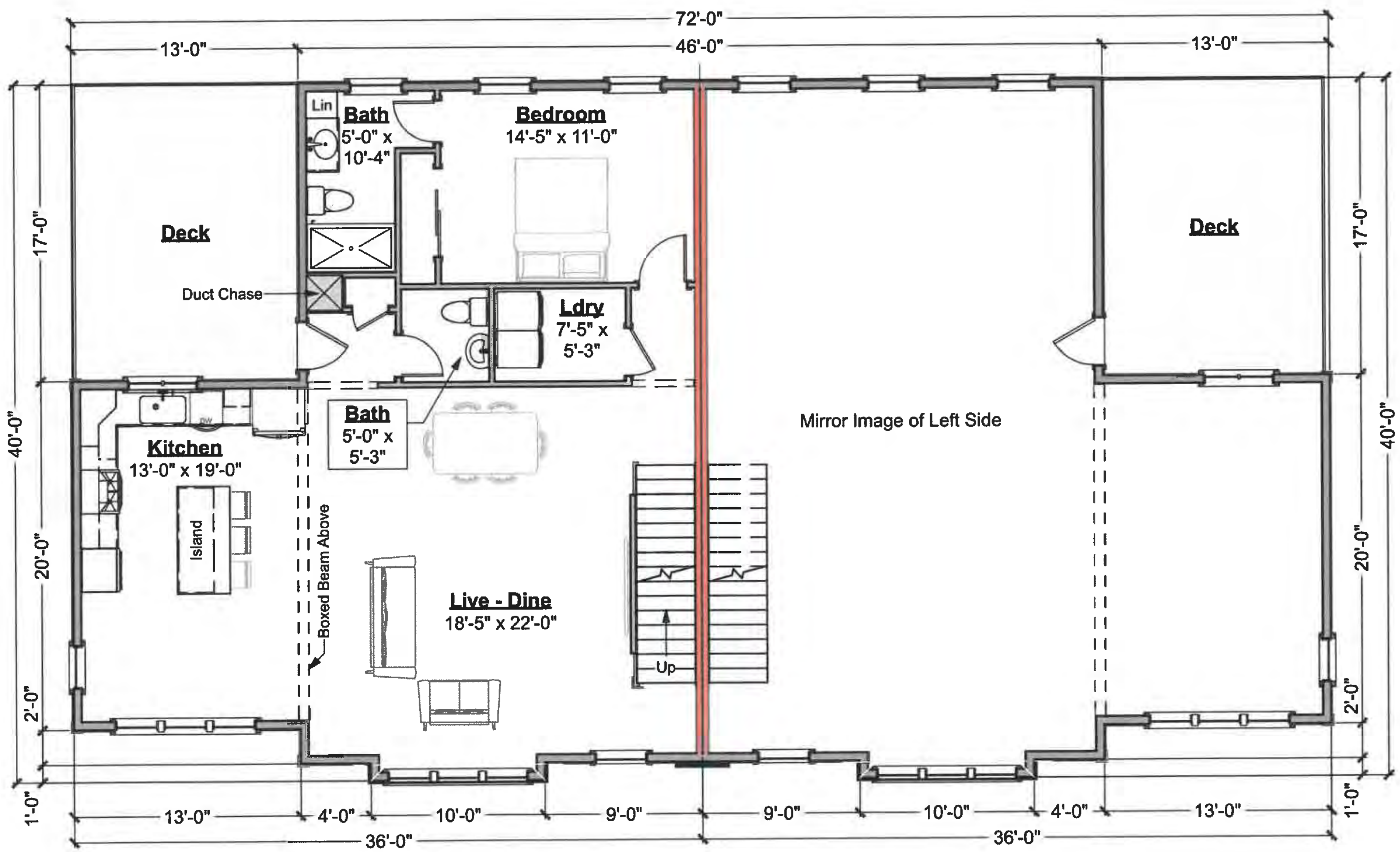

Main Floor
9 ft Ceilings
1103 sq ft (net, per side)

Second Floor Plan

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

Matthias Duplex
1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

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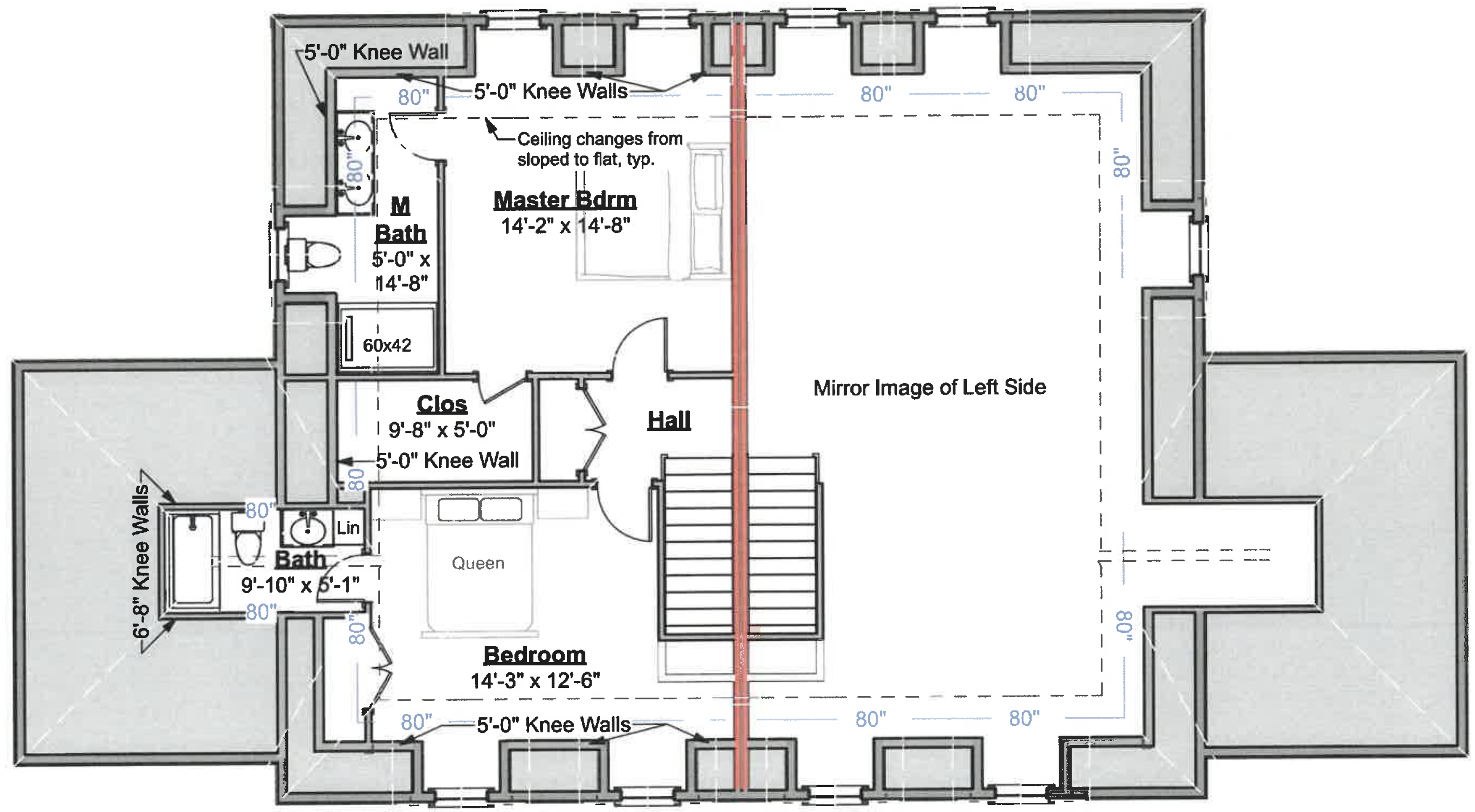
603-431-9559



Top Floor
9 ft Ceilings
742 sq ft (net, per side)

Third Floor Plan
Scale: 1/8" = 1'-0"

Matthias Duplex
1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.
603-431-9559

Front

Right

Elevations
Scale: 1/8" = 1'-0"

Matthias Duplex
1107.224 (5/13/2022)

NOTE: To scale as noted only if printed on 11x17 paper with "no scaling" (do not "Fit").

Art Form Architecture, Inc.
603-431-9559

Rear

Left

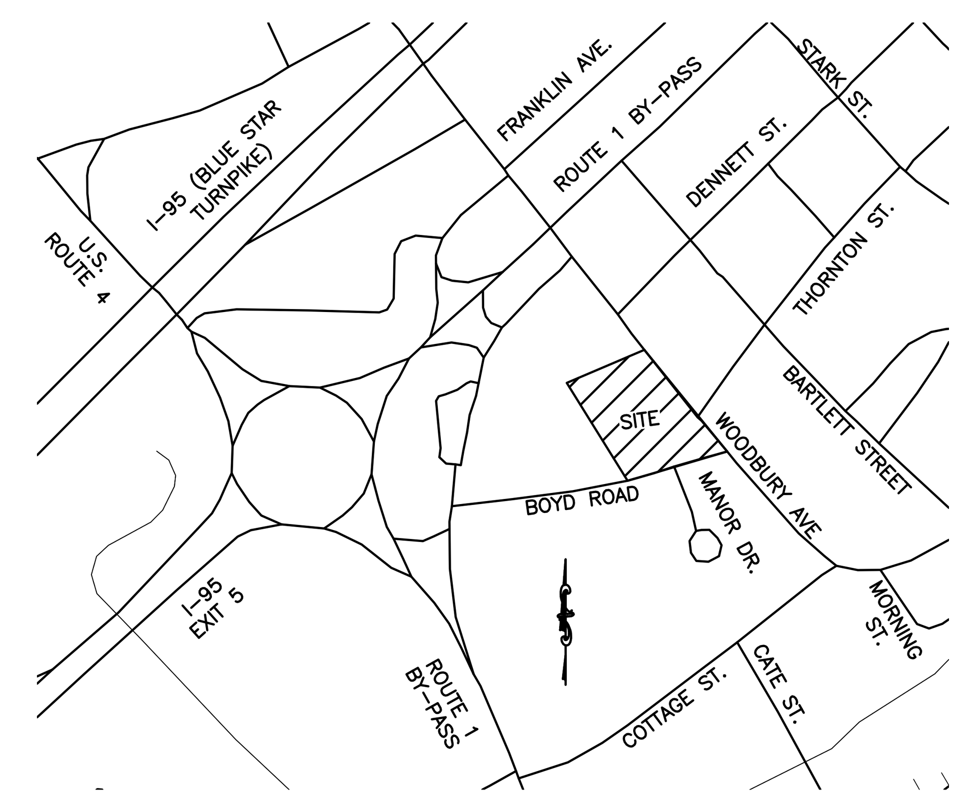
Elevations
Scale: 1/8" = 1'-0"

MULTI-FAMILY RESIDENTIAL SITE PLAN
"GRAPEVINE RUN"
TAX MAP 175, LOTS 1, 2, & 3
212, 214, & 216 WOODBURY AVE.,PORTSMOUTH, NH

GENERAL LEGEND

EXISTING | PROPOSED | DESCRIPTION

- PROPERTY LINES
- SETBACK LINES
- CENTERLINE
- TREE LINE
- STONEWALL
- FENCE
- SOIL BOUNDARY
- ZONELINE
- EASEMENT
- MAJOR CONTOUR (100)
- MINOR CONTOUR (98)
- EDGE OF PAVEMENT
- VERTICAL GRANITE CURB (VGC)
- SLOPE GRANITE CURB (SGC)
- SILT FENCE
- DRAINAGE LINE (D)
- SEWER LINE (S)
- SEWER FORCE MAIN (FM)
- GAS LINE (G)
- WATER LINE (W)
- WATER SERVICE (WS)
- OVERHEAD ELECTRIC (OHE)
- UNDERGROUND ELECTRIC (UGE)
- FIRE PROTECTION LINE (F)
- THRUST BLOCK
- IRON PIPE/IRON ROD
- DRILL HOLE
- IRON ROD/DRILL HOLE
- STONE/GRANITE BOUND
- SPOT GRADE (100x0)
- PAVEMENT SPOT GRADE (100.00)
- CURB SPOT GRADE (100.00 / 99.50)
- BENCHMARK (TBM)
- DOUBLE POST SIGN
- SINGLE POST SIGN
- TEST PIT (TP1)
- FAILED TEST PIT (TP1)
- TREES AND BUSHES
- UTILITY POLE
- LIGHT POLES
- SEWER MANHOLE
- HYDRANT
- WATER GATE
- WATER SHUT OFF
- REDUCER
- SINGLE GRATE CATCH BASIN
- DOUBLE GRATE CATCH BASIN
- TRANSFORMER
- CULVERT W/WINGWALLS
- CULVERT W/FLARED END SECTION
- CULVERT W/STRAIGHT HEADWALL
- DRAINAGE FLOW DIRECTION
- RIPRAP
- STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE
- SNOW STORAGE
- RETAINING WALL



LOCUS MAP
SCALE 1" = 500'

SHEET INDEX

CIVIL ENGINEER / SURVEYOR
JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: JOSEPH CORONATI
EMAIL: JCORONATI@JONESANDBEACH.COM

LIGHTING CONSULTANT
CHARRON, INC.
P.O BOX 4550
MANCHESTER, NH 03108
(603) 945-3500
CONTACT: DANIEL HEBERT
EMAIL: DHEBERT@CHARRONINC.COM

SOILS CONSULTANT
GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DR., BLDG 2, UNIT H
EXETER, NH 03833-7507
(603) 418-7260
CONTACT: JAMES GOVE
EMAIL: JGOVE@GESINC.BIZ

LANDSCAPE DESIGNER
LM LAND DESIGN, LLC
11 SOUTH ROAD
BRENTWOOD, NH 03833
(603) 770-7728
CONTACT: LISE MCNAUGHTON

WATER
CITY OF PORTMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: BRIAN GOETZ, P.E.
(603) 427-1530

SEWER
CITY OF PORTMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: ZACHARY CRONIN
(603) 766-1421

ELECTRIC
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
(603) 634-3029
CONTACT: CASEY MACDONALD

TELEPHONE
FAIRPOINT COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(800) 427-5525
CONTACT: JOE CONSIDINE

CABLE TV
COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

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

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

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

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

Design: JAC	Draft: DJM	Date: 01/05/22	
Checked: JAC	Scale: AS NOTED	Project No.: 21254	
Drawing Name: 21254-PLAN.dwg			

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

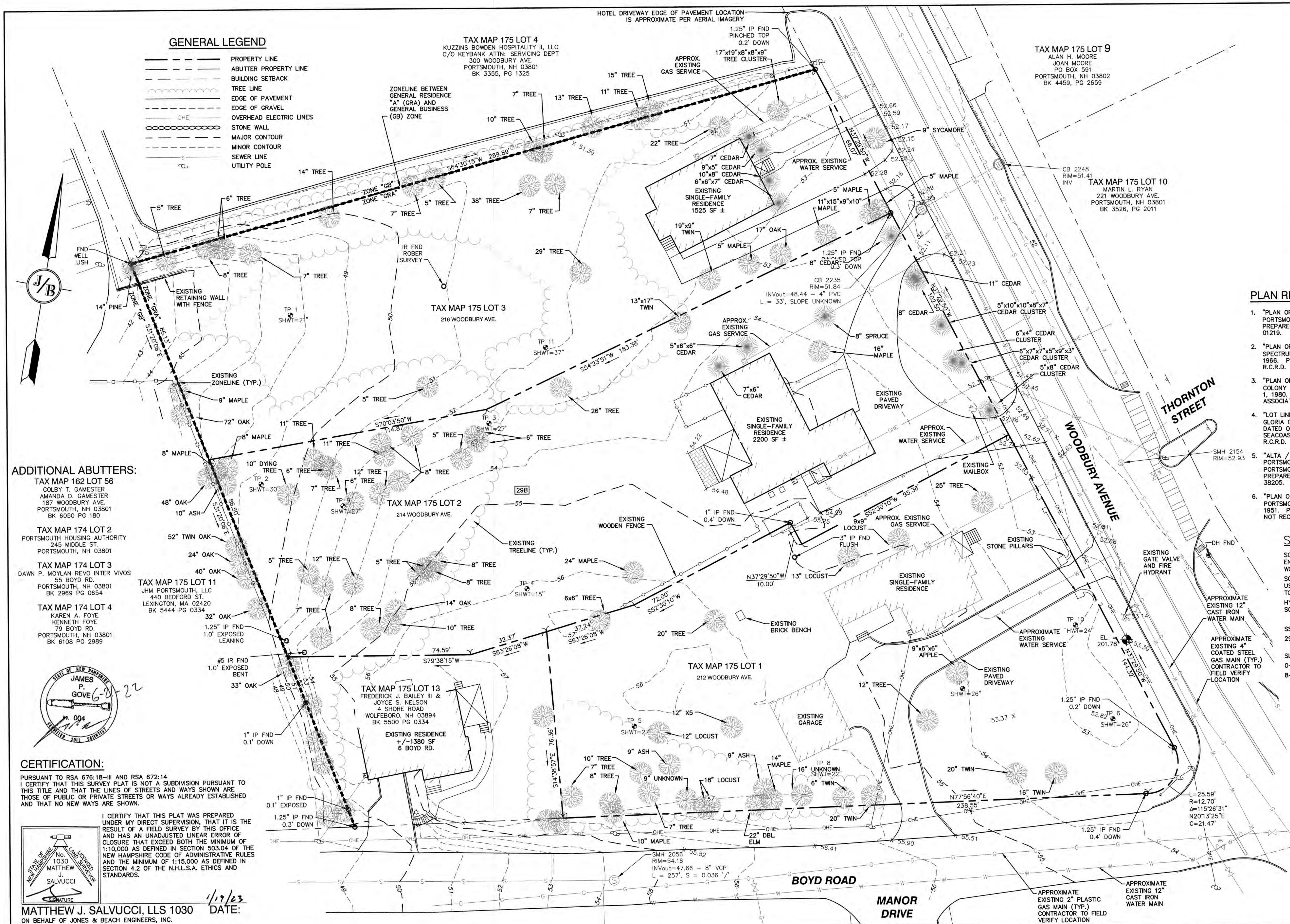
REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

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

Plan Name:	COVER SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
CS
SHEET 1 OF 23
JBE PROJECT NO. 21254

GRAPEVINE RUN, PORTSMOUTH, NH
JBE # 21254 REVISION 8, 1/19/23



GENERAL LEGEND

PROPERTY LINE
ABUTTER PROPERTY LINE
BUILDING SETBACK
TREE LINE
EDGE OF PAVEMENT
EDGE OF GRAVEL
OVERHEAD ELECTRIC LINES
STONE WALL
MAJOR CONTOUR
MINOR CONTOUR
SEWER LINE
UTILITY POLE

ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

STATE OF NEW HAMPSHIRE JAMES P. GOVE No. 004 CERTIFIED SOIL SCIENTIST 6-2-22

CERTIFICATION:

PURSUANT TO RSA 676:18-III AND RSA 672:14
I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE No. 1030 MATTHEW J. SALVUCCI LICENSED LAND SURVEYOR
SIGNATURE

1/19/23

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

LOCUS SCALE: 1"=500'

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY AND EXISTING CONDITIONS OF PORTSMOUTH TAX MAP 175, LOTS 1, 2, 3, AND 13.
2. THE UTILITY LOCATIONS SHOWN HEREON WERE DETERMINED BY OBSERVED ABOVE GROUND EVIDENCE AND SHOULD BE CONSIDERED APPROXIMATE IN LOCATION ONLY. LOCATION, DEPTH, SIZE, TYPE, EXISTENCE OR NONEXISTENCE OF UNDERGROUND UTILITIES AND/OR UNDERGROUND STORAGE TANKS WAS NOT VERIFIED BY THIS SURVEY. ALL CONTRACTORS SHOULD NOTIFY IN WRITING ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO ANY EXCAVATION WORK OR CALL DIG-SAFE AT 1-888-DIG-SAFE.
3. 4. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
4. BASIS OF BEARING:
   HORIZONTAL - NAD83 NH STATE PLANE.
   VERTICAL - NAVD88.
5. NO WETLANDS WERE OBSERVED WITHIN 100' OF THE PROPERTY BOUNDARY. SEE LETTER FROM GOVE ENVIRONMENTAL SERVICES, INC.
6. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.

PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH. NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.

SOIL NOTES:

SOILS SHOWN HEREON WERE CLASSIFIED IN SPRING 2022 BY JAMES GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC. THE SURVEY AREA IS LOCATED ON 212, 214, AND 216 WOODBURY AVE, PORTSMOUTH, NH.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOIL COMPONENTS OF THE COMPLEX.

HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009

SSSM SYM.	SSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
29	WOODBRIDGE FINE SANDY LOAM	229BH	C

SLOPE PHASE:

0-8%	B	15-25%	D
8-15%	C	25%+	E

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

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

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

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

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 01/19/2023

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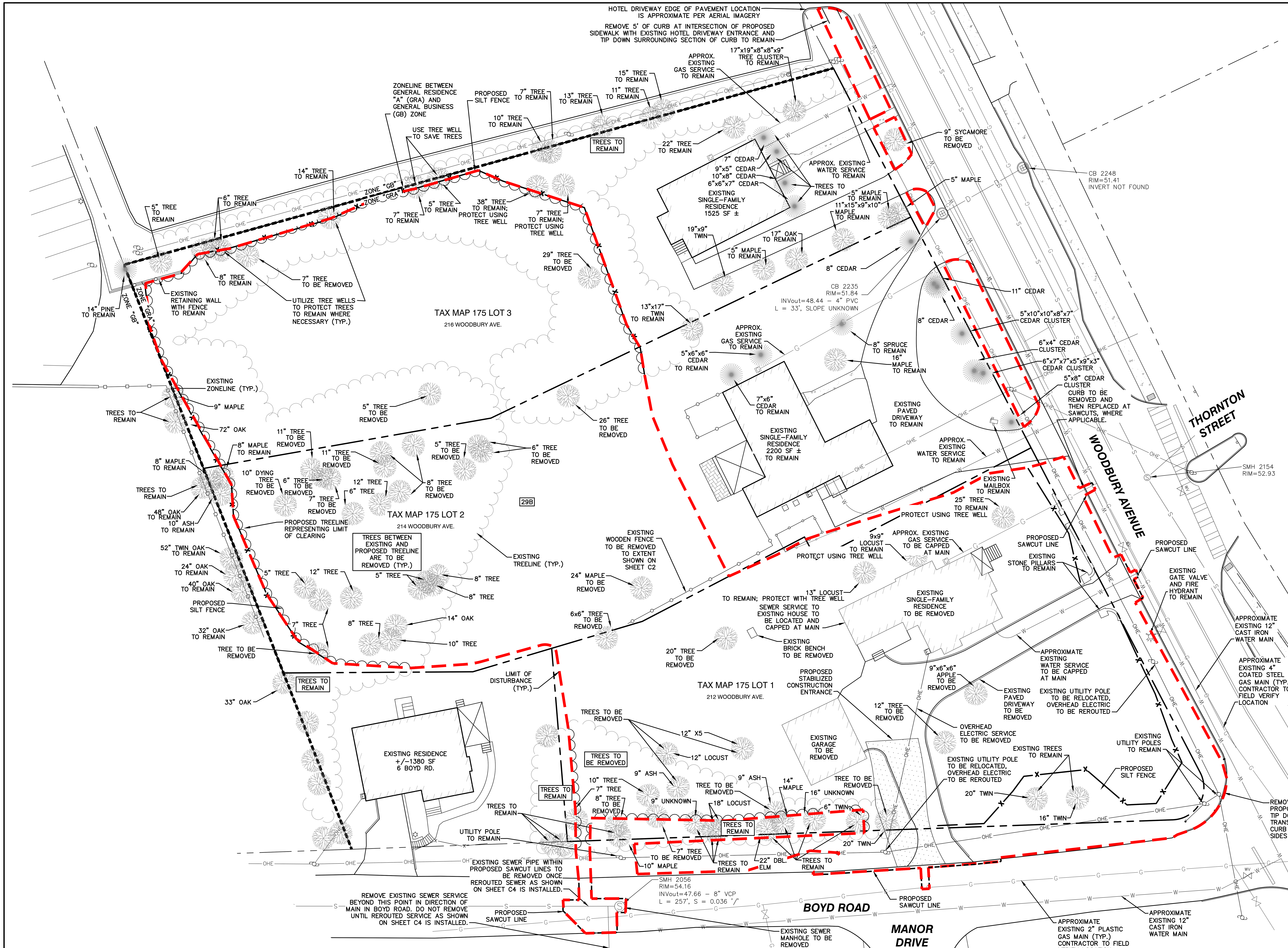
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

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

Plan Name:	EXISTING CONDITIONS PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
C1
SHEET 2 OF 23
JBE PROJECT NO. 21254



DEMOLITION NOTES:

1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR SITE DEMOLITION. IT SHOULD BE NOTED THAT ALL MANMADE FEATURES, PAVEMENT, SIGNS, POLES, CURBING, CONCRETE WALKS, UTILITIES, ETC., SHALL BE REMOVED AS NECESSARY TO CONSTRUCT WORK, UNLESS OTHERWISE NOTED TO REMAIN. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCIES FROM DATA AS SHOWN ON DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED. CLEARING LIMITS ARE THE EDGE OF THE PROPERTY AND THE LIMITS OF WORK.
3. ALL EXISTING STRUCTURES WITHIN THE CONSTRUCTION AREA, UNLESS OTHERWISE NOTED TO REMAIN, SHALL BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES. ANY BURNING ON-SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.
4. ALL EXISTING PAVED SURFACES WITHIN THE LIMITS OF WORK THAT ARE TO REMAIN SHALL BE RECLAIMED TO MINIMUM DEPTH OF 12" AND REGRADED AS SHOWN ON THE GRADING AND DRAINAGE PLAN. RECLAIMED ASPHALT SHALL CONFORM TO STATE SPECIFICATIONS. PRIOR TO REMOVAL, PAVEMENT SHALL BE SAWCUT AT ALL ENTRANCES AND LIMITS OF REMOVAL.
5. ALL EXISTING GRANITE CURBING TO BE REMOVED SHALL BE STOCKPILED IN AN AREA TO BE DESIGNATED BY THE OWNER OR OWNER'S REPRESENTATIVE. THE OWNER SHALL INSPECT GRANITE CURBING TO BE RESET AND APPROVE LOCATION OF RESET CURBING. THE CONTRACTOR SHALL NOT INSTALL USED CURBING AT ANY ENTRANCE LOCATIONS.
6. ALL EXISTING UTILITIES SHALL BE TERMINATED AT THE PROPERTY LINE, UNLESS OTHERWISE NOTED ON THE PLANS, IN CONFORMANCE WITH LOCAL, STATE AND UTILITY COMPANY STANDARDS, SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES PRIOR TO THE START OF WORK.
7. EXISTING WATERLINES AND HYDRANTS TO BE REMOVED SHALL BE CAPPED AT EXISTING WATERMAIN.
8. EXISTING GAS SERVICE LINES ARE TO BE REMOVED ON-SITE UP TO EXISTING GASMAIN LINES OR VALVES.
9. ALL CURBING, CONCRETE, PAVEMENT, BUILDINGS AND SUBBASE MATERIALS LOCATED WITHIN PROPOSED LANDSCAPED AREAS SHALL BE REMOVED AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPING IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS. (SEE ALSO LANDSCAPE PLAN).
10. SEE LANDSCAPE PLAN FOR "TREES TO BE SAVED" AND DETAILS ASSOCIATED WITH LANDSCAPED AREAS.
11. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
12. SEWER LINES SHALL BE DISCONNECTED IN ACCORDANCE WITH LOCAL STANDARDS AND REGULATIONS.
13. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ANY EARTH MOVING OPERATIONS. SILT FENCE SHALL BE INSTALLED AT THE LIMITS OF IMPACT AREAS ACCORDING TO THE DETAILS SHOWN ON SHEET E1.
14. EXCAVATED MATERIALS WILL BE PLACED WITHIN UPLAND AREAS AS FILL MATERIAL OR HAULED OFF-SITE FOR DISPOSAL IN AN APPROPRIATE UPLAND LOCATION.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

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

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

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

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
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Civil Engineering Services
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PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: DEMOLITION PLAN

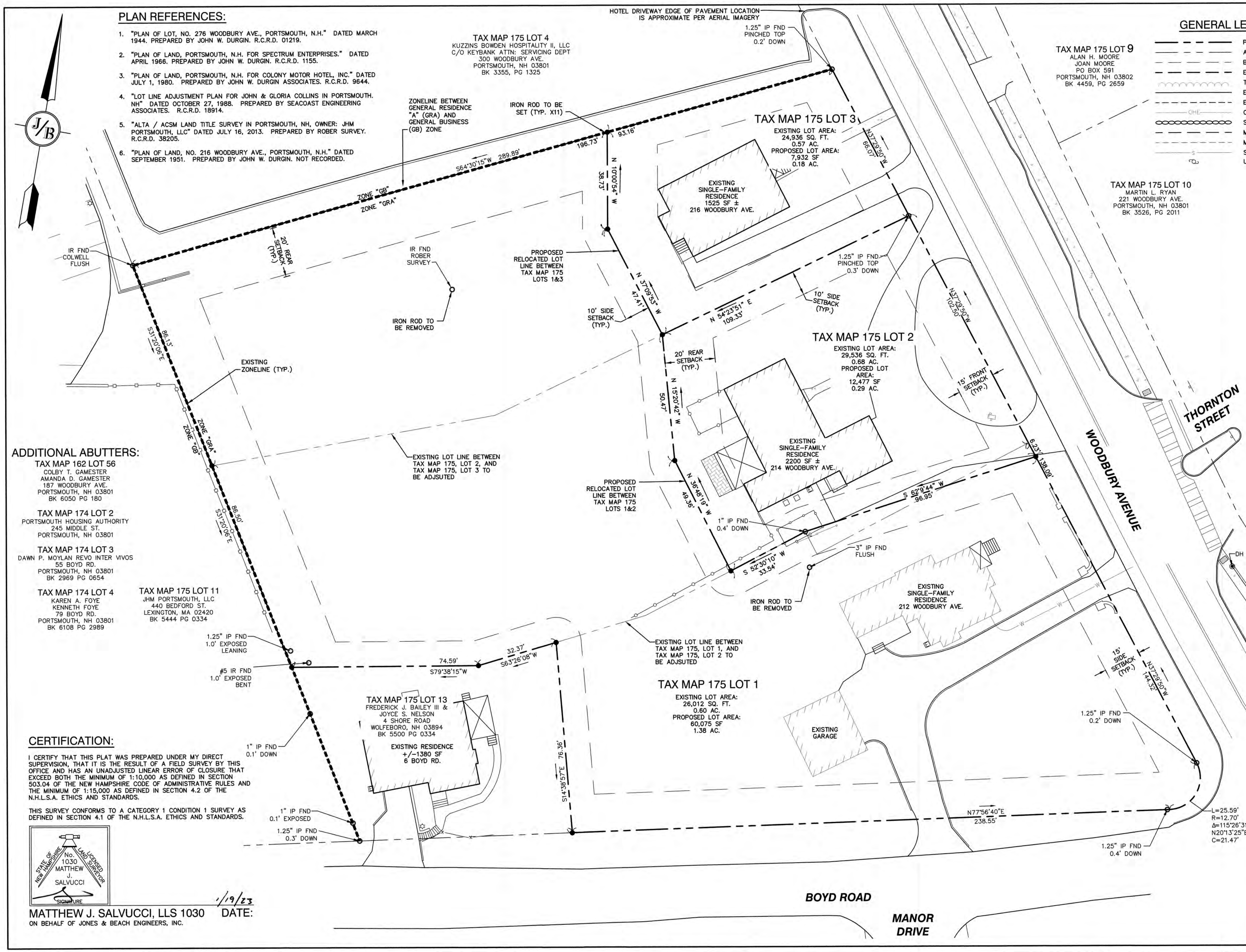
Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

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

DRAWING No.
DM-1
SHEET 3 OF 23
JBE PROJECT NO. 21254

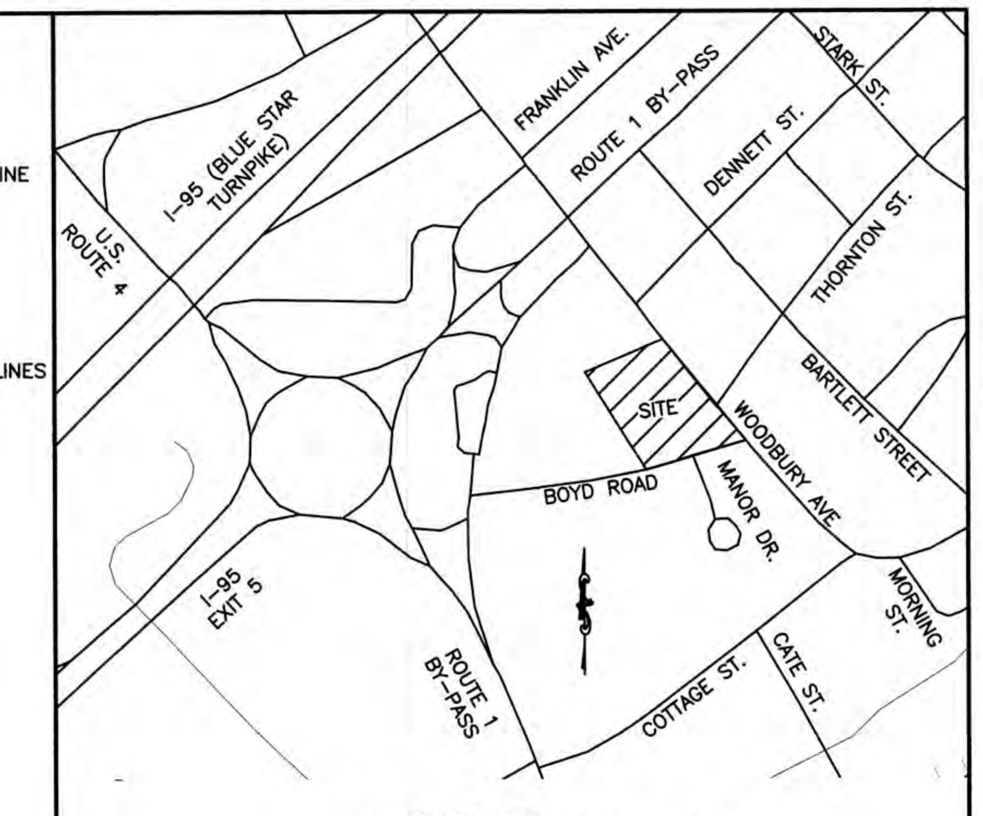
PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH, NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.



GENERAL LEGEND

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- BUILDING SETBACK
- EASEMENT
- TREE LINE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- OVERHEAD ELECTRIC LINES
- STONE WALL
- MAJOR CONTOUR
- MINOR CONTOUR
- SEWER LINE
- UTILITY POLE



LOCUS SCALE: 1"=500'

ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

SUBDIVISION NOTES:

1. THE INTENT OF THIS PLAN IS TO ADJUST THE LOT LINE BETWEEN TAX MAP 175, LOTS 1, 2, AND 3.
2. ZONING DISTRICT: GENERAL RESIDENTIAL A (GRA)
LOT AREA MINIMUM = 7,500 S.F.
MAX DENSITY = 1 DWELLING UNIT PER 7,500 S.F. LOT AREA
LOT FRONTAGE MINIMUM = 100'
LOT DEPTH MINIMUM = 70'
BUILDING SETBACKS (MINIMUM):
FRONT SETBACK = 15'
SIDE SETBACK = 10'
REAR SETBACK = 20'
MAX. BUILDING HEIGHT = 35' WITH SLOPED ROOF, 30' WITH FLAT ROOF
MAX. BUILDING COVERAGE = 25%
MIN. OPEN SPACE = 30%
3. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
4. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
5. IRON RODS WITH SURVEY CAPS TO BE SET AT ALL PROPERTY CORNERS AND ANGLE POINTS, UNLESS OTHERWISE INDICATED. ALL MONUMENTS SET ARE 5/8" IRON RODS WITH ALUMINUM CAPS MARKED "JONES & BEACH ENGINEERS BOUNDARY, DO NOT DISTURB, STRATHAM, N.H." AS SHOWN.
6. NO WETLANDS WERE OBSERVED ON THE SUBJECT PREMISES.
7. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
8. THE TAX MAP AND LOT NUMBERS AND ABUTTING OWNERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
9. RESEARCH WAS PERFORMED AT THE CITY OF PORTSMOUTH ASSESSORS OFFICE AND THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
10. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
11. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

CERTIFICATION:

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE LAND SURVEYOR No. 1030 MATTHEW J. SALVUCCI LICENSED
SIGNATURE

1/19/23

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

APPROVED - PORTSMOUTH, NH PLANNING BOARD

DATE:

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

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

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

Design: JAC	Draft: DJM	Date: 01/05/22	
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Drawing Name: 21254-PLAN.dwg			

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STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 01/19/2023

REV.	DATE	REVISION	BY
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4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

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

Plan Name: **LOT LINE ADJUSTMENT PLAN** TAX MAP 175, LOTS 1, 2, & 3

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

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

DRAWING No.
A1
SHEET 4 OF 23
JBE PROJECT NO. 21254

CERTIFICATION:

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

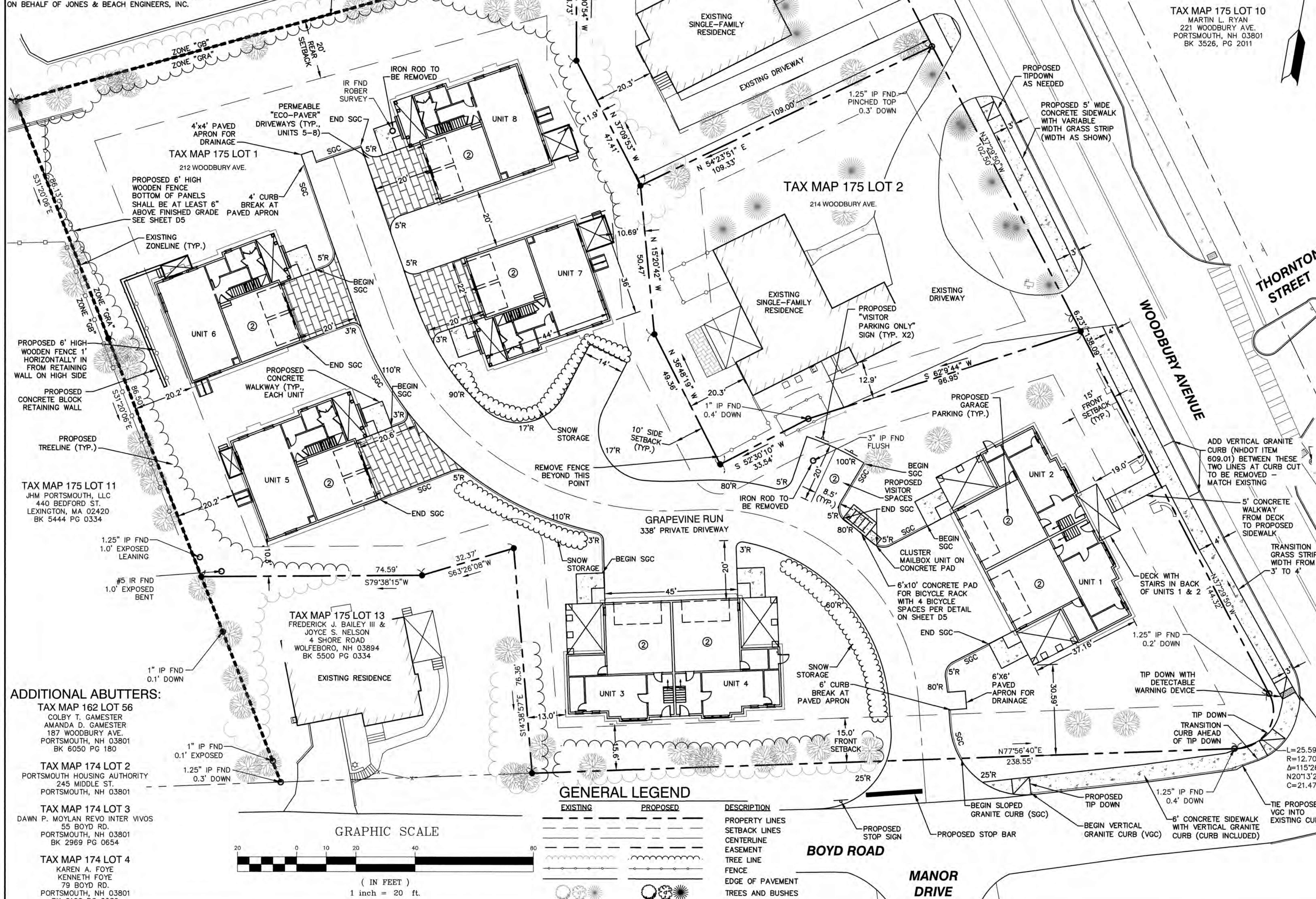
STATE OF NEW HAMPSHIRE No. 1030 MATTHEW J. SALVUCCI LICENSED LAND SURVEYOR

SIGNATURE

1/19/23

MATTHEW J. SALVUCCI, LLS 1030 DATE:

ON BEHALF OF JONES & BEACH ENGINEERS, INC.



ADDITIONAL ABUTTERS:

TAX MAP 162 LOT 56
COLBY T. GAMESTER
AMANDA D. GAMESTER
187 WOODBURY AVE.
PORTSMOUTH, NH 03801
BK 6050 PG 180

TAX MAP 174 LOT 2
PORTSMOUTH HOUSING AUTHORITY
245 MIDDLE ST.
PORTSMOUTH, NH 03801

TAX MAP 174 LOT 3
DAWN P. MOYLAN REVO INTER VIVOS
55 BOYD RD.
PORTSMOUTH, NH 03801
BK 2969 PG 0654

TAX MAP 174 LOT 4
KAREN A. FOYE
KENNETH FOYE
79 BOYD RD.
PORTSMOUTH, NH 03801
BK 6108 PG 2989

GRAPHIC SCALE

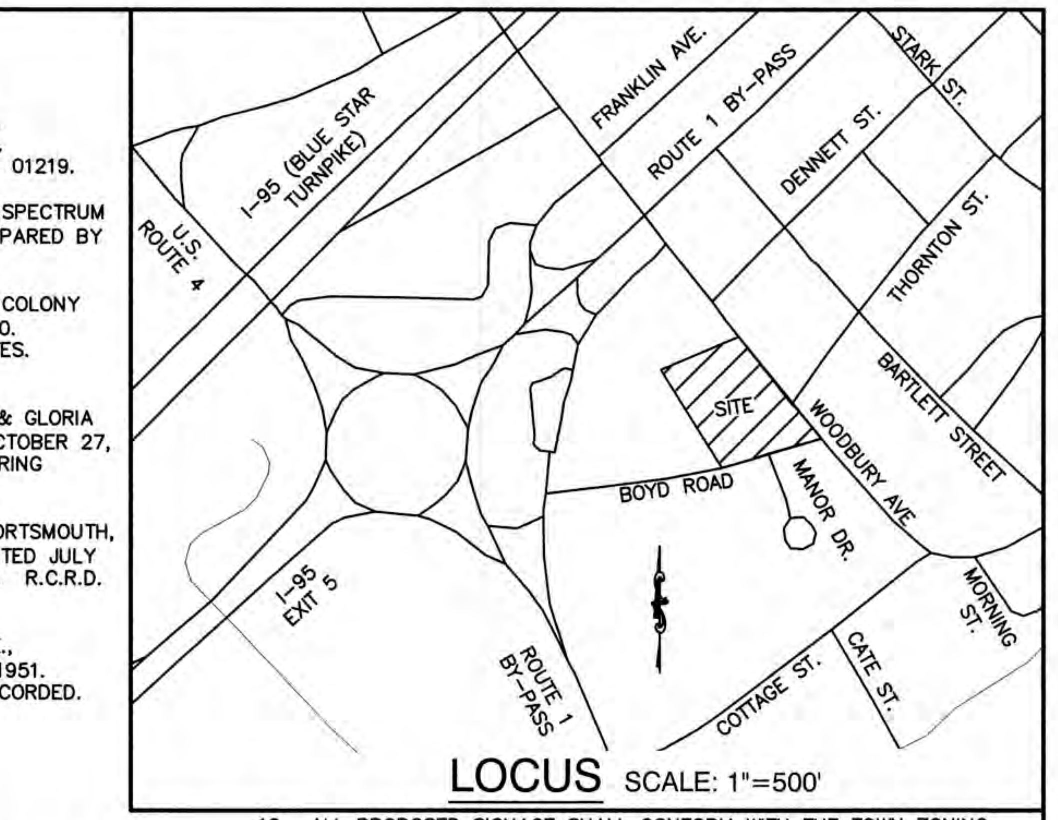
(IN FEET)
1 inch = 20 ft.

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		EASEMENT
		TREE LINE
		FENCE
		EDGE OF PAVEMENT
		TREES AND BUSHES
		UTILITY POLE

PLAN REFERENCES:

1. "PLAN OF LOT, NO. 276 WOODBURY AVE., PORTSMOUTH, N.H." DATED MARCH 1944. PREPARED BY JOHN W. DURGIN. R.C.R.D. 01219.
2. "PLAN OF LAND, PORTSMOUTH, N.H. FOR SPECTRUM ENTERPRISES." DATED APRIL 1966. PREPARED BY JOHN W. DURGIN. R.C.R.D. 1155.
3. "PLAN OF LAND, PORTSMOUTH, N.H. FOR COLONY MOTOR HOTEL, INC." DATED JULY 1, 1980. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 9644.
4. "LOT LINE ADJUSTMENT PLAN FOR JOHN & GLORIA COLLINS IN PORTSMOUTH. NH" DATED OCTOBER 27, 1988. PREPARED BY SEACOAST ENGINEERING ASSOCIATES. R.C.R.D. 18914.
5. "ALTA / ACSM LAND TITLE SURVEY IN PORTSMOUTH, NH, OWNER: JHM PORTSMOUTH, LLC" DATED JULY 16, 2013. PREPARED BY ROBER SURVEY. R.C.R.D. 38205.
6. "PLAN OF LAND, NO. 216 WOODBURY AVE., PORTSMOUTH, N.H." DATED SEPTEMBER 1951. PREPARED BY JOHN W. DURGIN. NOT RECORDED.



LOCUS SCALE: 1"=500'

SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE THE HOUSE AND GARAGE ON LOT 1, ADJUST THE LOT LINE BETWEEN LOT 1 WITH LOTS 2 & 3, AND PROPOSE AN 8-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT ON LOT 1 WITH ACCESS FROM BOYD ROAD.
2. ZONING DISTRICT: GENERAL RESIDENTIAL A (GRA)
   LOT AREA MINIMUM = 7,500 S.F.
   MAX DENSITY = 1 DWELLING UNIT PER 7,500 S.F. LOT AREA
   PROPOSED ON LOT 1 = 60,075 S.F. / 8 = 1 UNIT PER 7,509 S.F PROVIDED
   LOT FRONTAGE MINIMUM = 100'
   LOT DEPTH MINMUM = 70'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 15'
   SIDE SETBACK = 10'
   REAR SETBACK = 20'
   MAX. BUILDING HEIGHT = 35' WITH SLOPED ROOF, 30' WITH FLAT ROOF
   MAX. BUILDING COVERAGE = 25%
   PROPOSED, LOT 1 = 21.1%
   PROPOSED, LOT 2 = 17.6%
   PROPOSED, LOT 3 = 19.3%
   MAX. OPEN SPACE = 30%
   PROPOSED, LOT 1 = 58.7%
   PROPOSED, LOT 2 = 58.1%
   PROPOSED, LOT 3 = 68.2%
3. PARKING CALCULATIONS
   UNITS OVER 750 S.F. - 1.3 SPACES REQUIRED PER UNIT PLUS 1 VISITOR SPACE PER EVERY 5 DWELLING UNITS OR PORTION THEREOF
   8 UNITS * 1.3 SPACES REQUIRED = 11 SPACES REQUIRED, 16 SPACES PROVIDED IN GARAGES
   8 UNITS: 2 VISITOR SPACES REQUIRED, 2 VISITOR SPACES PROVIDED
   TOTAL: 13 SPACES REQUIRED, 18 SPACES PROVIDED.
4. LOT 1 CALCULATIONS
   TOTAL BUILDING FOOTPRINT = 12,700 SF
   TOTAL IMPERVIOUS PAVED AREA = 10,900 SF
   TOTAL IMPERVIOUS ON LOT 1 = 23,600 S.F. = 39.2% OF LOT 1
   PERVIOUS PAVERS = 1,350 S.F. = 2.2% OF LOT 1
   TOTAL OPEN SPACE ON LOT 1 = 100% - 39.2% - 2.2% = 58.6%
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
6. AT ITS MEETING ON APRIL 19, 2022, THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO GRANT A VARIANCE FROM THE FOLLOWING REQUIREMENT:
   - SECTION 10.513 - TO ALLOW MORE THAN ONE FREE-STANDING DWELLING ON A SINGLE LOT WITHIN THE GRA ZONE
7. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED. CONTRACTOR TO ALWAYS CONTACT DIG SAFE PRIOR TO DIGGING ONSITE OR OFFSITE TO ENSURE SAFETY AND OBEY THE LAW.
8. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
9. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0270F, DATED JANUARY 29, 2021.
10. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.P.). THIS DOCUMENT IS TO BE KEPT ONSITE AT ALL TIMES AND UPDATED AS REQUIRED.
11. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
12. ALL PROPOSED SIGNAGE SHALL CONFORM WITH THE TOWN ZONING REGULATIONS, UNLESS A VARIANCE IS OTHERWISE REQUESTED.
13. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND NHDOT STANDARDS AND SPECIFICATIONS (NON-REFLECTORIZED PAVEMENT MARKINGS), UNLESS OTHERWISE NOTED.
14. ALL STOP BARS SHALL BE 18" IN WIDTH IN A COLOR OF WHITE; ALL TRAFFIC ARROWS SHALL BE PAINTED IN A COLOR OF WHITE.
15. ALL BUILDING DIMENSIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PROVIDED BY THE OWNER. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER PRIOR TO THE START OF CONSTRUCTION. BUILDING DIMENSIONS AND AREAS TO BE TO OUTSIDE OF MASONRY, UNLESS OTHERWISE NOTED.
16. SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
17. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
18. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
19. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
20. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THE SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
21. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
22. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
23. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
24. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.
25. AN ACCESS EASEMENT SHALL BE GRANTED TO THE CITY OF PORTSMOUTH FOR ACCESS AND LEAK DETECTION OF THE WATER MAIN, SHUTOFFS, AND METERS ON THE PROPERTY. EASEMENT DESCRIPTION MUST BE APPROVED BY THE CITY'S LEGAL DEPARTMENT AND ACCEPTED BY THE CITY COUNCIL.
26. THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000.
27. ON-SITE SALT STORAGE IS PROHIBITIED WITHIN 250' OF AN INLAND WETLAND UNLESS COMPLETELY COVERED AND CONTAINED IN A STRUCTURE.
28. BUILDINGS SHALL BE CONSTRUCTED IN THE FOOTPRINTS SHOWN HEREON. NOTIFY THE PROJECT ENGINEER IF THE PROPOSED ROOF LAYOUT, GUTTERS, AND/OR ROOF LINES ARE MODIFIED AFTER FINAL PLANS ARE SUBMITTED. UNITS 1-4 WILL NOT HAVE BASEMENTS, SUMP PUMPS, OR FOUNDATION DRAINS.
29. AREA OF DISTURBANCE = 58,000 S.F. (ON AND OFF SITE)
30. IF BOYD ROAD IS RECONSTRUCTED PRIOR TO THE SITE WORK IN BOYD ROAD BEING CONSTRUCTED, BOYD ROAD WILL REQUIRE A MILL AND FILL PAVEMENT RESURFACING FOR ALL DISTURBED AREAS TO THE SATISFACTION OF THE DEPARTMENT OF PUBLIC WORKS.

APPROVED - PORTSMOUTH, NH
PLANNING BOARD

DATE:

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

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

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

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

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER 01/19/2023

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

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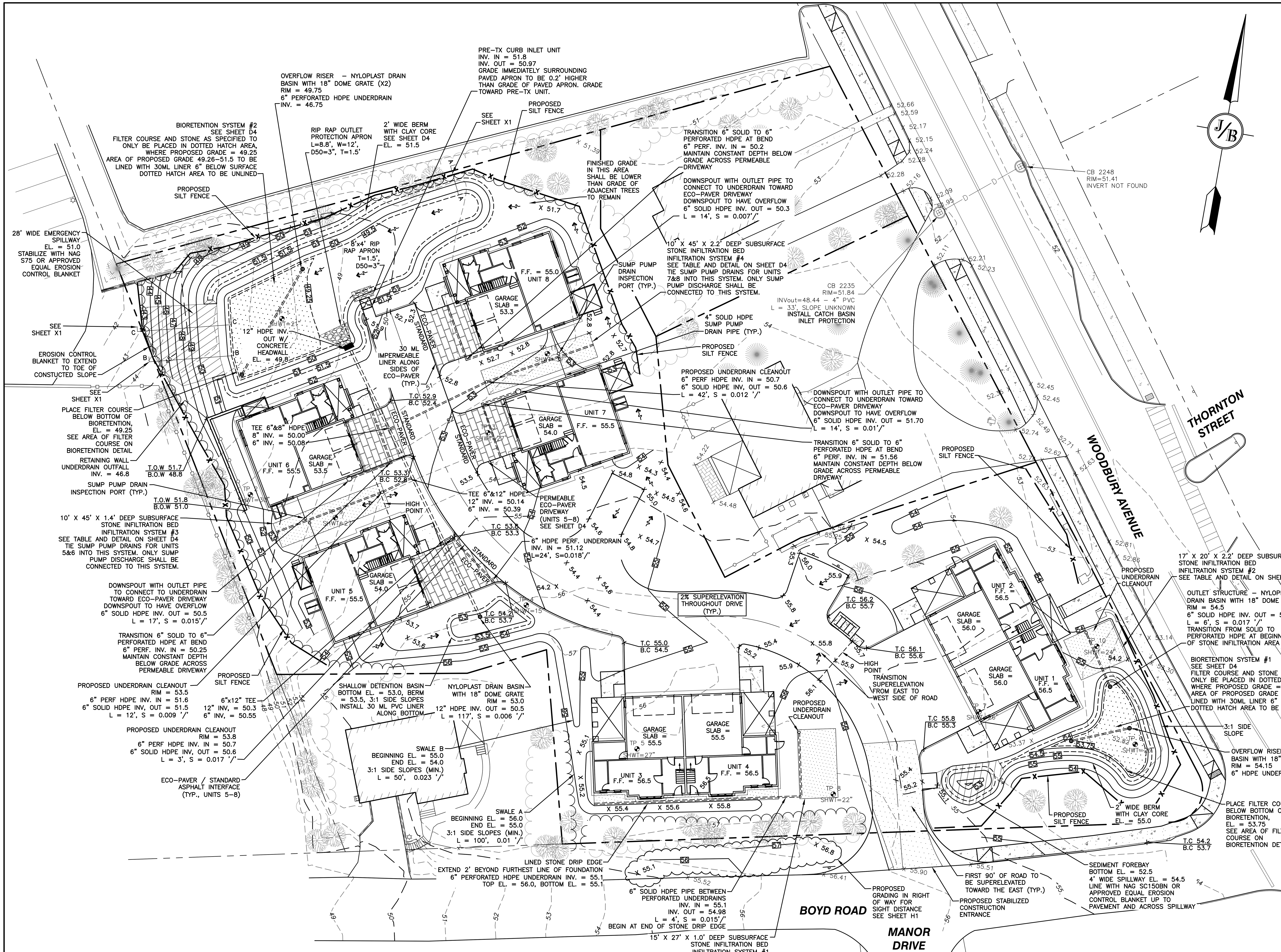
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: SITE PLAN

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

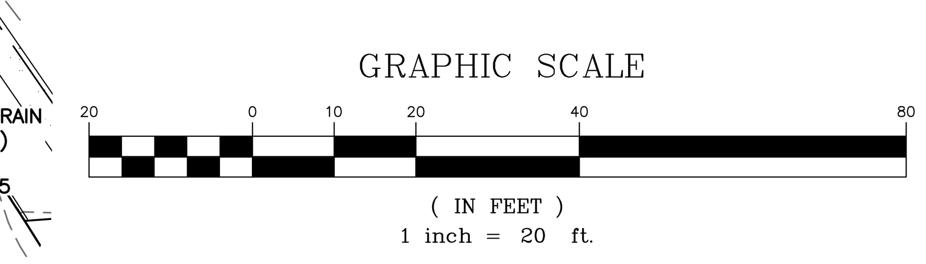
Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
C2
SHEET 5 OF 23
JBE PROJECT NO. 21254



GRADING AND DRAINAGE NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
2. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
3. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
4. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
5. ALL ROOF DRAINS FROM BUILDING SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT THE END. ALL EXTERIOR ROOF DOWNSPOUTS ARE TO BE INSTALLED WITH OVERFLOW DEVICES.
6. ALL SWALES AND BIORETENTION SYSTEMS ARE TO BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
7. ALL SLOPES SHALL BE 3:1 OR FLATTER AS DIRECTED.
8. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS. CATCH BASINS SHALL HAVE 3' DEEP SUMPS WITH GREASE HOODS, UNLESS OTHERWISE NOTED.
9. ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DETAIL SHEETS FOR DRAINAGE DETAILS.
10. ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
11. IMMEDIATELY APPLY AND COMPACT STONE BASE FOR BUILDING PAD TO +/-½" PRIOR TO EXCAVATING INTERIOR AND PERIMETER FOOTINGS.
12. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
13. ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
14. STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
15. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
16. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
17. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
18. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
19. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
20. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
21. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
22. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
23. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
24. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
25. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
26. POST-CONSTRUCTION EFFECTIVE IMPERVIOUS AREA ON TAX MAP 175, LOT 1, 2, & 3 = 7,600 S.F. (9.4% OF PARCELS).
27. UNITS 5-8 SHALL HAVE BASEMENTS WITH SUMP PUMPS. UNITS 1-4 SHALL NOT HAVE BASEMENTS, SUMP PUMPS, OR FOUNDATION DRAINS.



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

APPLICANT
TUCK REALTY CORP.
ATTN: TURNER PORTER
149 EPPING RD., SUITE 2A
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TOTAL LOT AREA
80,484 SQ. FT.
1.85 ACRES

Design: JAC	Draft: DJM	Date: 01/05/22	
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Drawing Name: 21254-PLAN.dwg			

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
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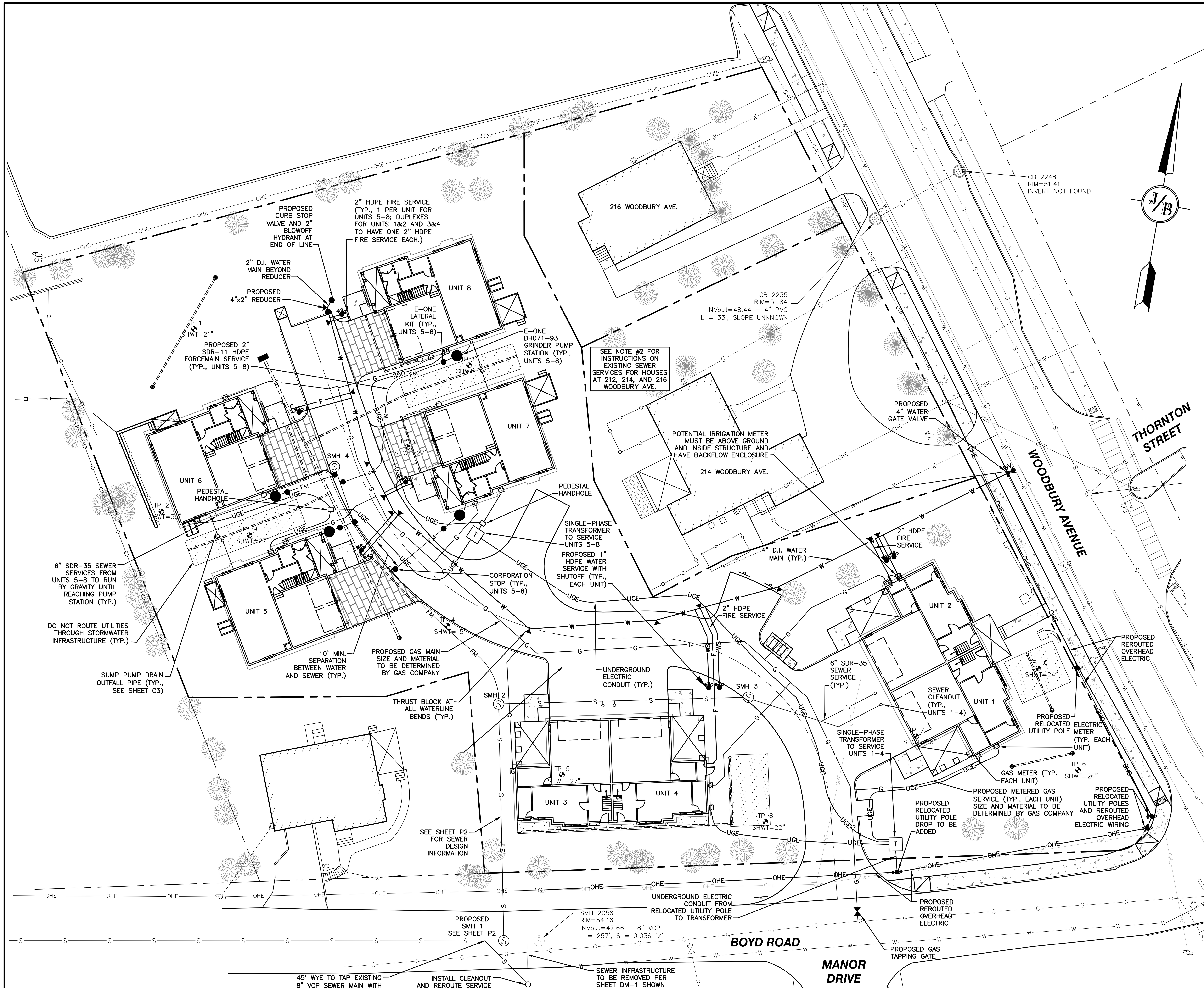
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: GRADING AND DRAINAGE PLAN

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

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

DRAWING No.
C3
SHEET 6 OF 23
JBE PROJECT NO. 21254



UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
2. CUT & CAP SEWER SERVICE FOR 212 WOODBURY AVENUE TO PROPERTY LINE. SEWER SERVICES FOR 214 AND 216 WOODBURY AVENUE ARE TO REMAIN. NOTIFY PROJECT ENGINEER IF EITHER OF THE TWO SEWER SERVICES TO REMAIN CONFLICT WITH THE PROPOSED DEVELOPMENT.
3. THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
4. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, FIRE ALARM, GAS, WATER, AND SEWER).
5. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT-RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
6. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS A WAIVER IS OTHERWISE OBTAINED.
7. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS
8. BUILDING TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR IS TO VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITY STUBS PRIOR TO CONSTRUCTION AND DISCONNECT ALL EXISTING SERVICE CONNECTIONS AT THEIR RESPECTIVE MAINS IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANY'S STANDARDS AND SPECIFICATIONS. ENGINEER TO BE NOTIFIED.
10. AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
11. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE THROUGH CHANNEL UNDERLAYMENT OF INVERT, AND SHELF SHALL CONSIST OF BRICK MASONRY.
12. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA, CLEAR OPENING. THE WORD "SEWER" OR "DRAIN" SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
13. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H20 LOADS.
14. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
15. SANITARY SEWER FLOW CALCULATIONS:
    8 – THREE BEDROOM UNITS @ 150 GPD/BEDROOM = 3,600 GPD
    IRRIGATION USE = 1,000 GPD ±
16. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
17. PROPOSED RIM ELEVATIONS OF DRAINAGE AND SANITARY MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
18. ALL WATER MAINS AND SERVICE PIPES SHALL HAVE A MINIMUM 12" VERTICAL AND 24" HORIZONTAL SEPARATION TO MANHOLES, OR CONTRACTOR SHALL INSTALL BOARD INSULATION FOR FREEZING PROTECTION.
19. WATER MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR LEAKAGE PRIOR TO ACCEPTANCE. WATERMAINS SHALL BE TESTED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICH EVER IS GREATER. TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600. WATERMAINS SHALL BE DISINFECTED AFTER THE ACCEPTANCE OF THE PRESSURE AND LEAKAGE TESTS ACCORDING TO AWWA STANDARD C 651.
20. ALL WATER AND SANITARY LEADS TO BUILDING(S) SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLANS AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT END.
21. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
22. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
23. THE CONTRACTOR SHALL HAVE THE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER FIRE PROTECTION SYSTEM PRIOR TO INSTALLATION.
24. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHALL BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
25. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
26. ALL WATER LINES SHOULD HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
27. ALL GRAVITY SEWER PIPE, MANHOLES, AND FORCE MAINS SHALL BE TESTED ACCORDING TO NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER TREATMENT FACILITIES, CHAPTER ENV-WQ 700. ADOPTED ON 10-15-14.
28. <u>ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING:</u> GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY USE OF LOW-PRESSURE AIR TESTS CONFORMING WITH ASTM F1417-92(2005) OR UNI-BELL PVC PIPE ASSOCIATION UNI-B-6. LINES SHALL BE CLEANED AND VISUALLY INSPECTED AND TRUE TO LINE AND GRADE. DEFLECTION TESTS SHALL TAKE PLACE AFTER 30 DAYS FOLLOWING INSTALLATION AND THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
29. <u>ENV-WQ 704.17 SEWER MANHOLE TESTING:</u> SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST PRIOR TO BACKFILLING AND PLACEMENT OF SHELVES AND INVERTS.
30. SANITARY SEWER LINES SHALL BE LOCATED AT LEAST TEN (10) FEET HORIZONTALLY FROM AN EXISTING OR PROPOSED WATER LINE. WHEN A SEWER LINE CROSSES UNDER A WATER LINE, THE SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATERMAIN. THE SEWER LINE SHALL ALSO MAINTAIN A VERTICAL SEPARATION OF NOT LESS THAN 18 INCHES.
31. SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6 FEET BELOW GRADE IN ALL ROADWAY LOCATIONS, AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS-COUNTRY LOCATIONS. PROVIDE TWO-INCHES OF R-10 FOAM BOARD INSULATION 2-FOOT WIDE TO BE INSTALLED 6-INCHES OVER SEWER PIPE IN AREAS WHERE DEPTH IS NOT ACHIEVED. A WAIVER FROM THE DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER ENGINEERING BUREAU IS REQUIRED PRIOR TO INSTALLING SEWER AT LESS THAN MINIMUM COVER.
32. THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY THE DEPARTMENT OF PUBLIC WORKS.
33. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
38. AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH WATER DEPARTMENT.
39. WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
40. SHOP DRAWINGS TO BE SUBMITTED TO CITY OF PORTSMOUTH FOR REVIEW AND APPROVAL.
41. NEW DUCTILE IRON WATER LINE SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THE FULL LENGTH. ALL WATER LINE JOINTS SHALL HAVE THREE (3) BRASS WEDGES PER JOINT. CONTRACTOR SHALL CONTACT CITY OF PORTSMOUTH WATER DEPARTMENT (JIM TOW AT 603-766-1439) PRIOR TO WATER LINE INSTALLATION.
42. IF IRRIGATION IS TO BE USED, THE PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY THE PORTSMOUTH CITY PLANNER, CITY ENGINEER, AND THE WATER DEPARTMENT PRIOR TO INSTALLATION.
43. DISINFECTION OF WATER MAINS SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH AWWA STANDARD C651, LATEST EDITION. THE BASIC PROCEDURE TO BE FOLLOWED FOR DISINFECTING WATER MAINS IS AS FOLLOWS:
    a. PREVENT CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR.
    b. REMOVE, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAINS.
    c. CHLORINATE ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSH THE CHLORINATED WATER FROM THE MAIN.
    d. PROTECT THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW DUE TO HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
    e. DETERMINE THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
    f. MAKE FINAL CONNECTION OF THE APPROVED NEW WATER MAIN TO THE ACTIVE DISTRIBUTION SYSTEM
44. DOMESTIC SHUTOFFS & VALVES SHALL BE PAINTED BLUE. FIRE SERVICE SHUTOFFS & VALVES SHALL BE PAINTED RED. COORDINATE WITH CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS FOR EXACT COLORS.
45. SEWER TRENCH DAMS SHALL BE UTILIZED EVERY 75' ALONG GRAVITY SEWER PIPE. REFER TO DETAIL ON SHEET D3.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

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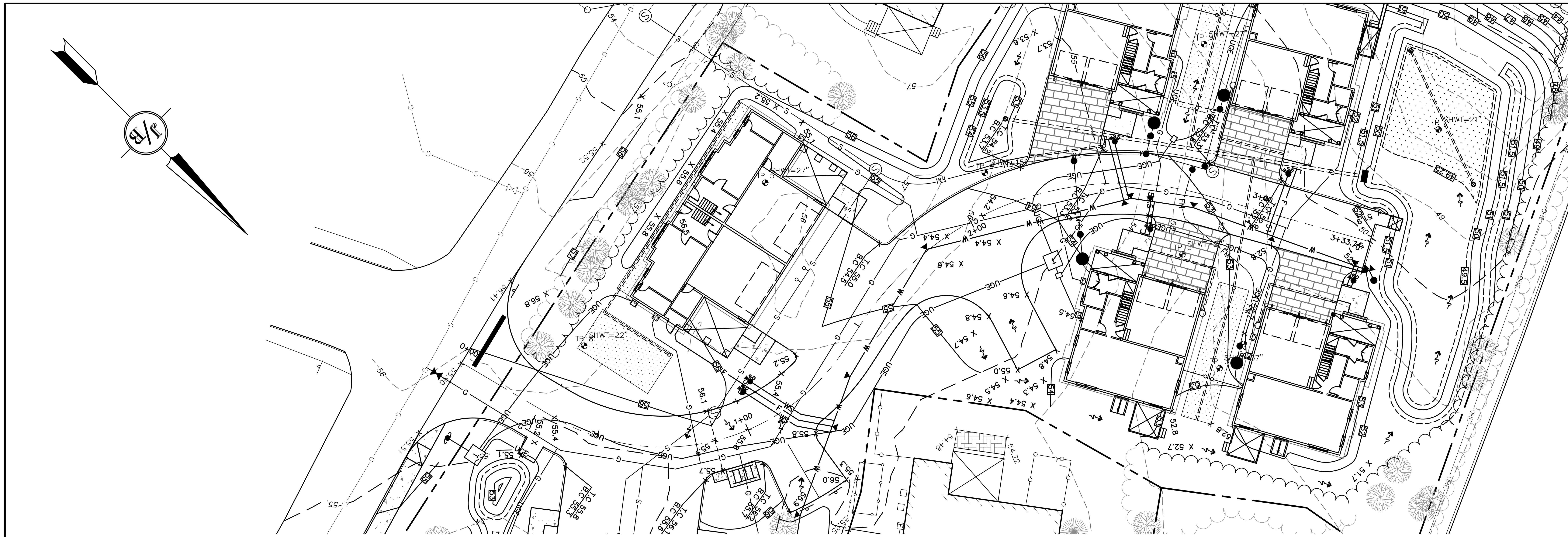
Plan Name: UTILITY PLAN

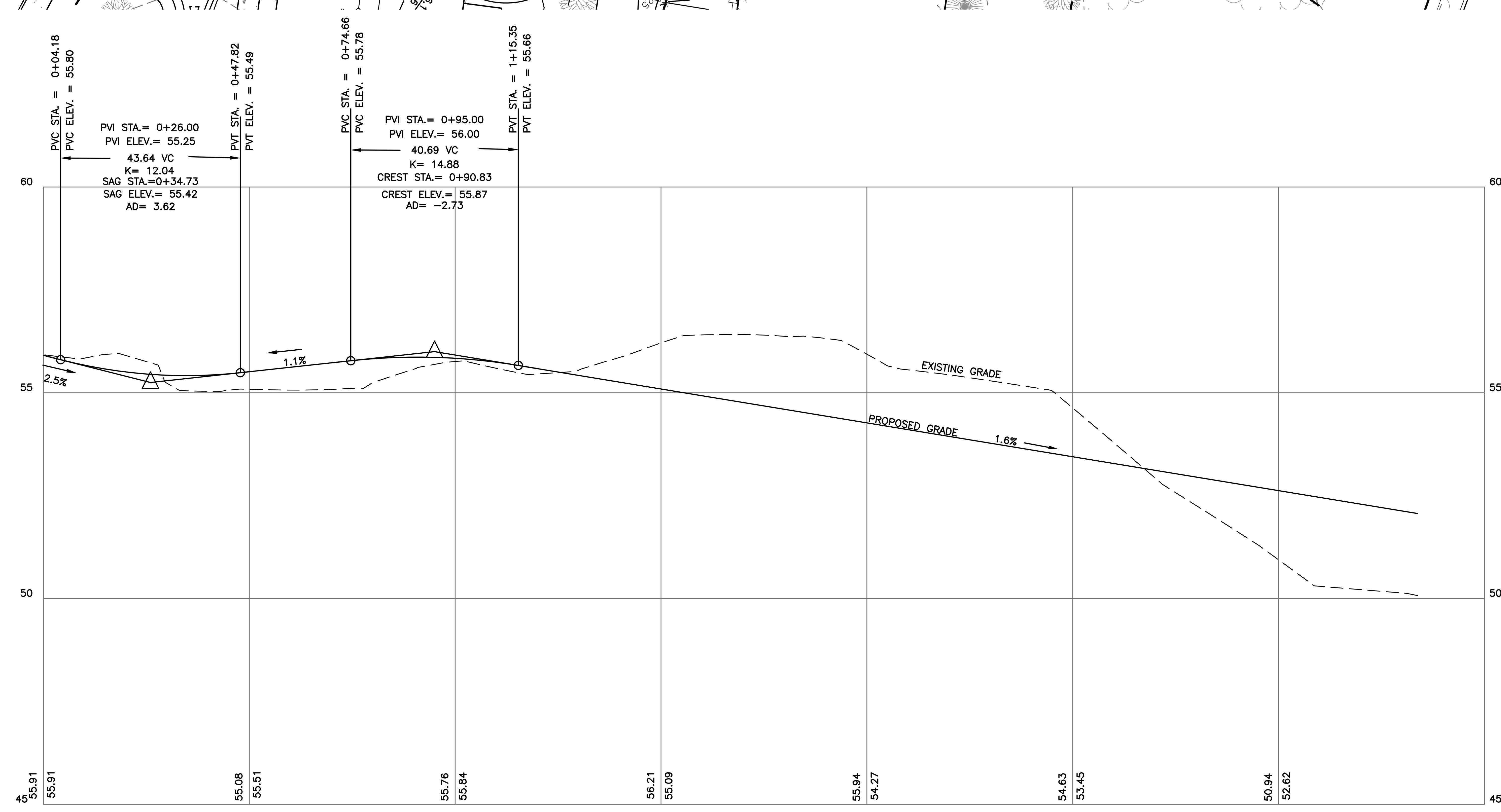
Project: "GRAPEVINE RUN"
212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

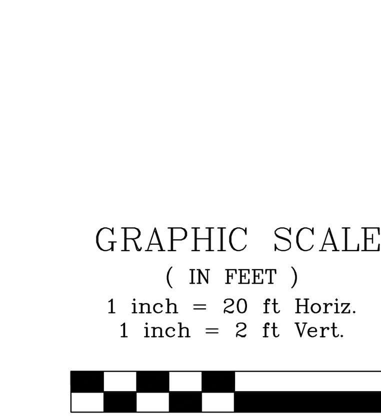
DRAWING No.
C4
SHEET 7 OF 23
JBE PROJECT NO. 21254





NOTES:

1. THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
   B. ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
2. ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE CITY, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
3. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, AND FIRE ALARM PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
4. THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
5. SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
6. ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET AS SPECIFIED ON SHEET E1.
7. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
8. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
9. ROADWAY INTERSECTIONS WITH SLOPE GRANITE CURB SHALL EXTEND AROUND RADIUS WITH 6' STRAIGHT PIECE ALONG TANGENT.
10. RETAINING WALLS SHALL BE DESIGNED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER PRIOR TO INSTALLATION.
11. DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
12. CONTRACTOR MUST HAVE A VALID PIPE INSTALLER'S LICENSE BEFORE WORKING ON ANY DRAINAGE AND/OR UTILITY CONSTRUCTION.
13. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
14. COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION, AND ON THE FOUNDATION OF THE BERM OF THE PROPOSED STORMWATER FEATURE AND ON EVERY LIFT OF NEWLY PLACED MATERIAL



Design: JAC	Draft: DJM	Date: 01/05/22
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Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE
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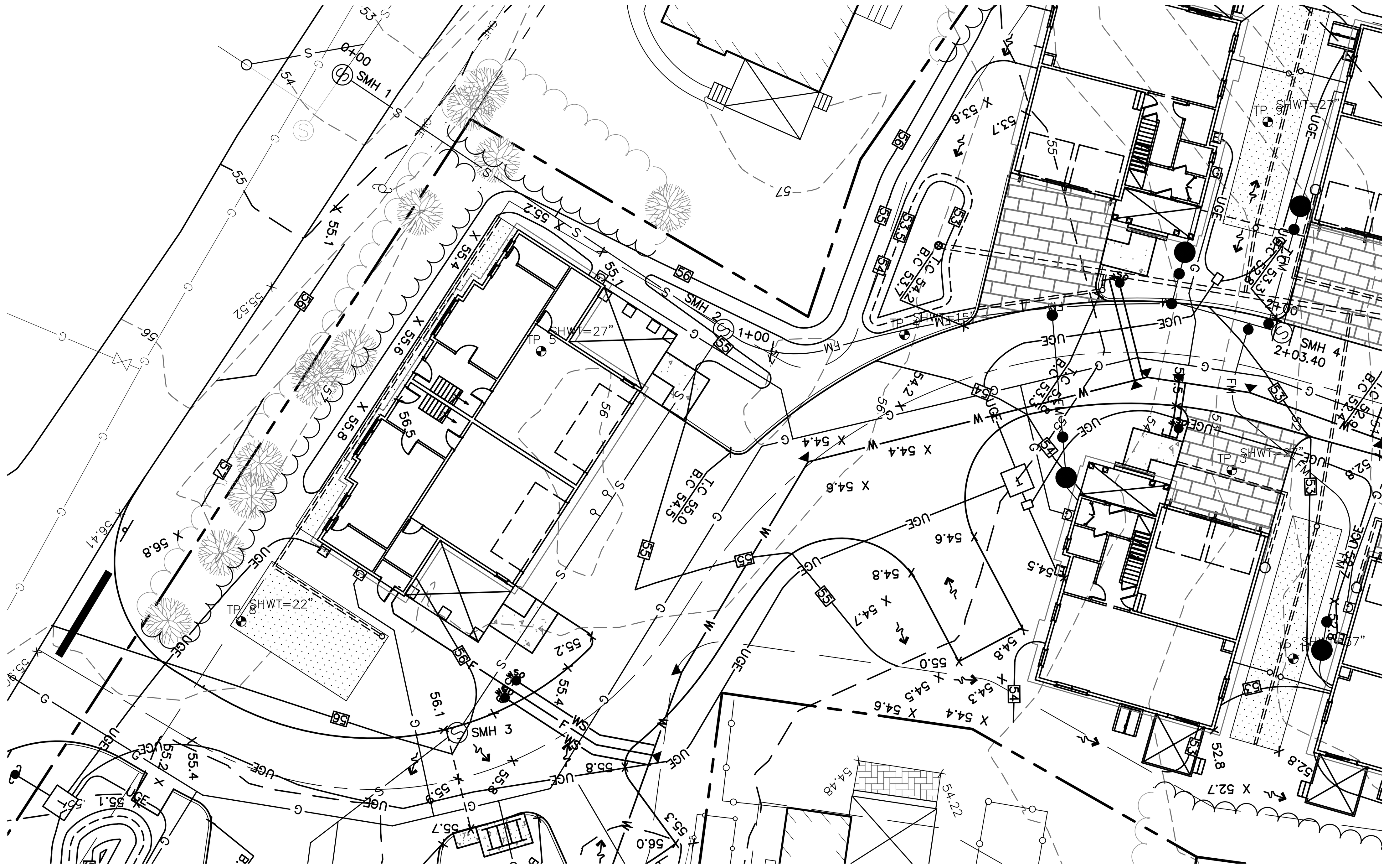
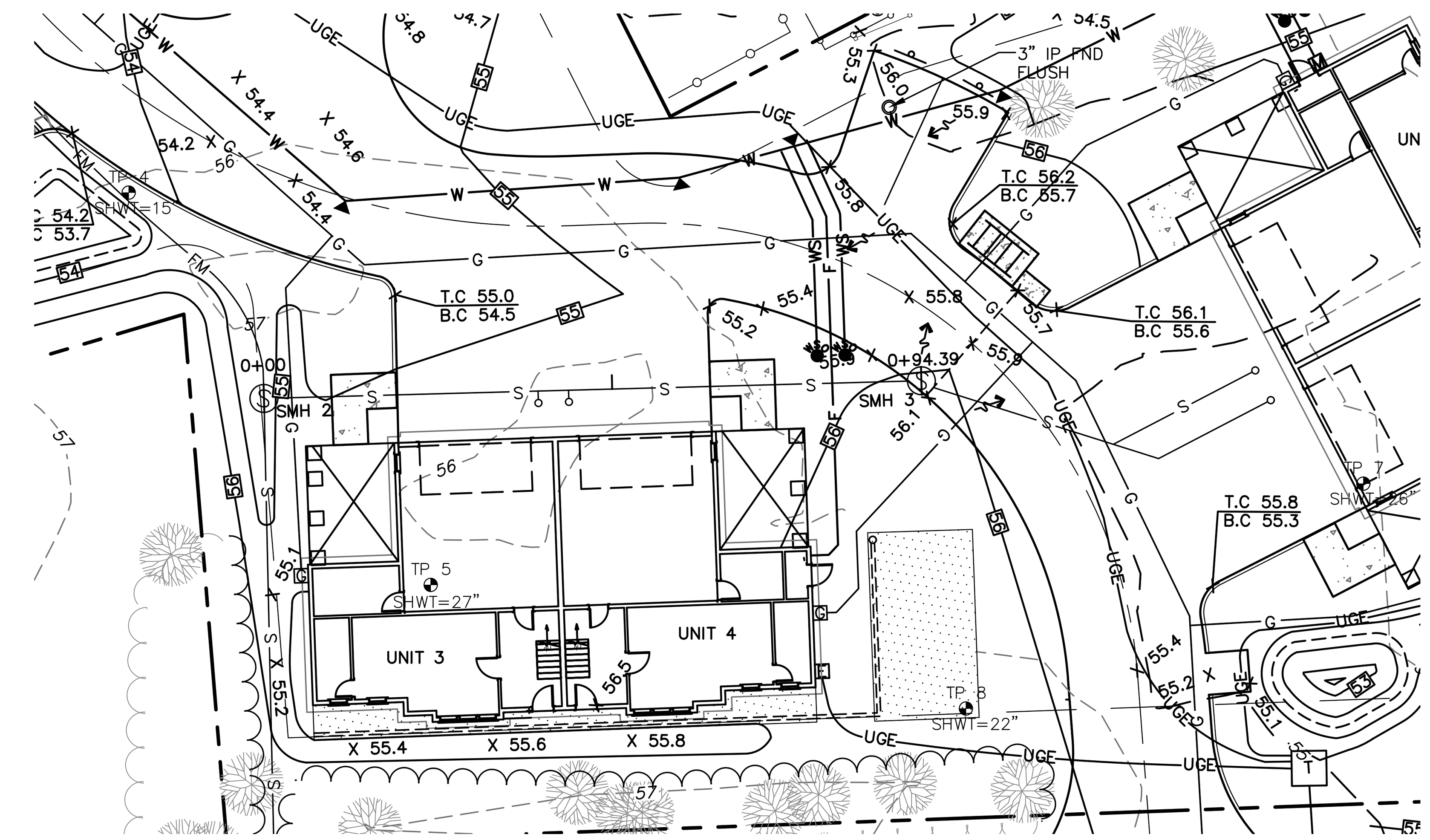
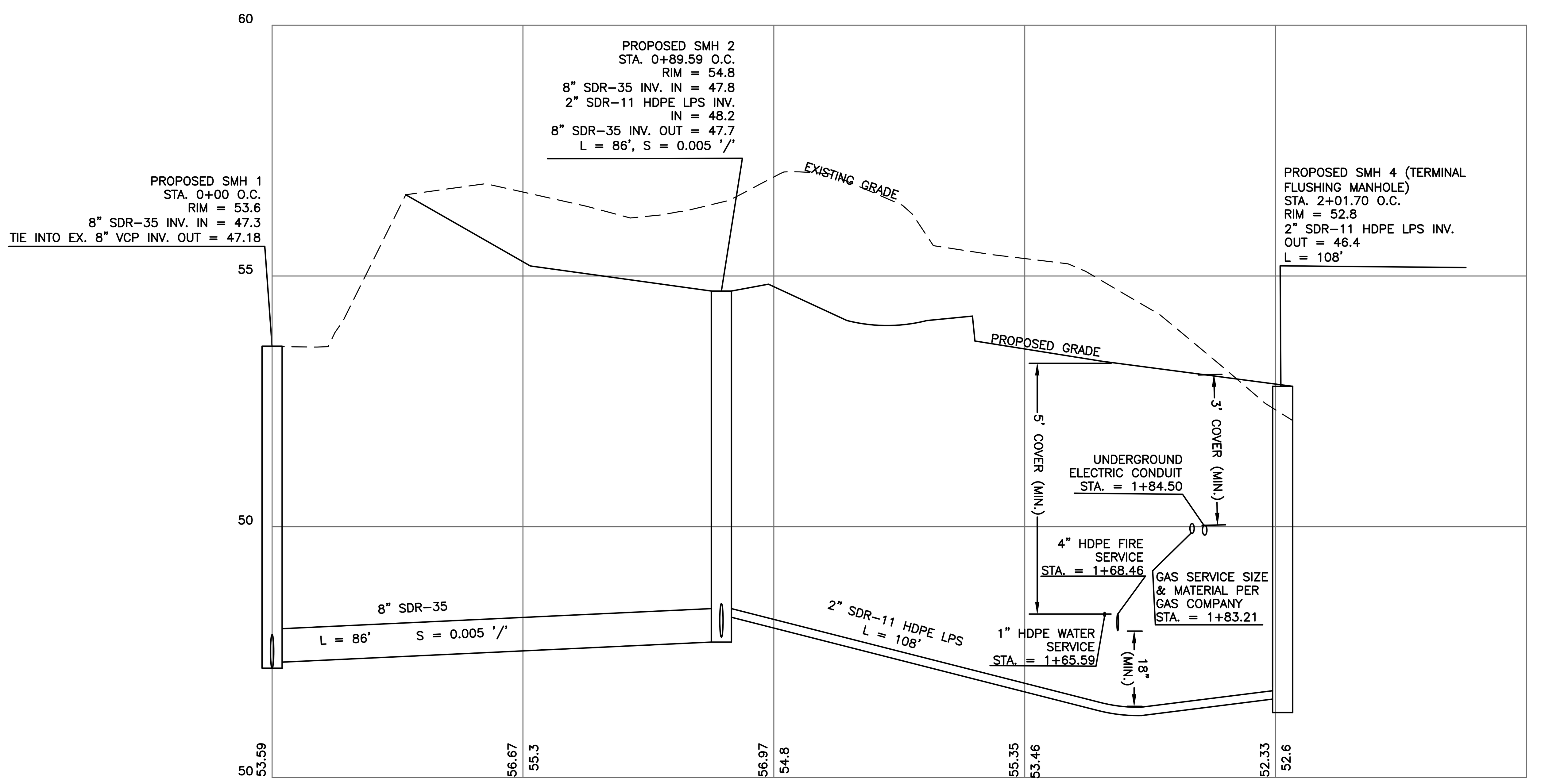
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	PLAN AND ROAD PROFILE
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

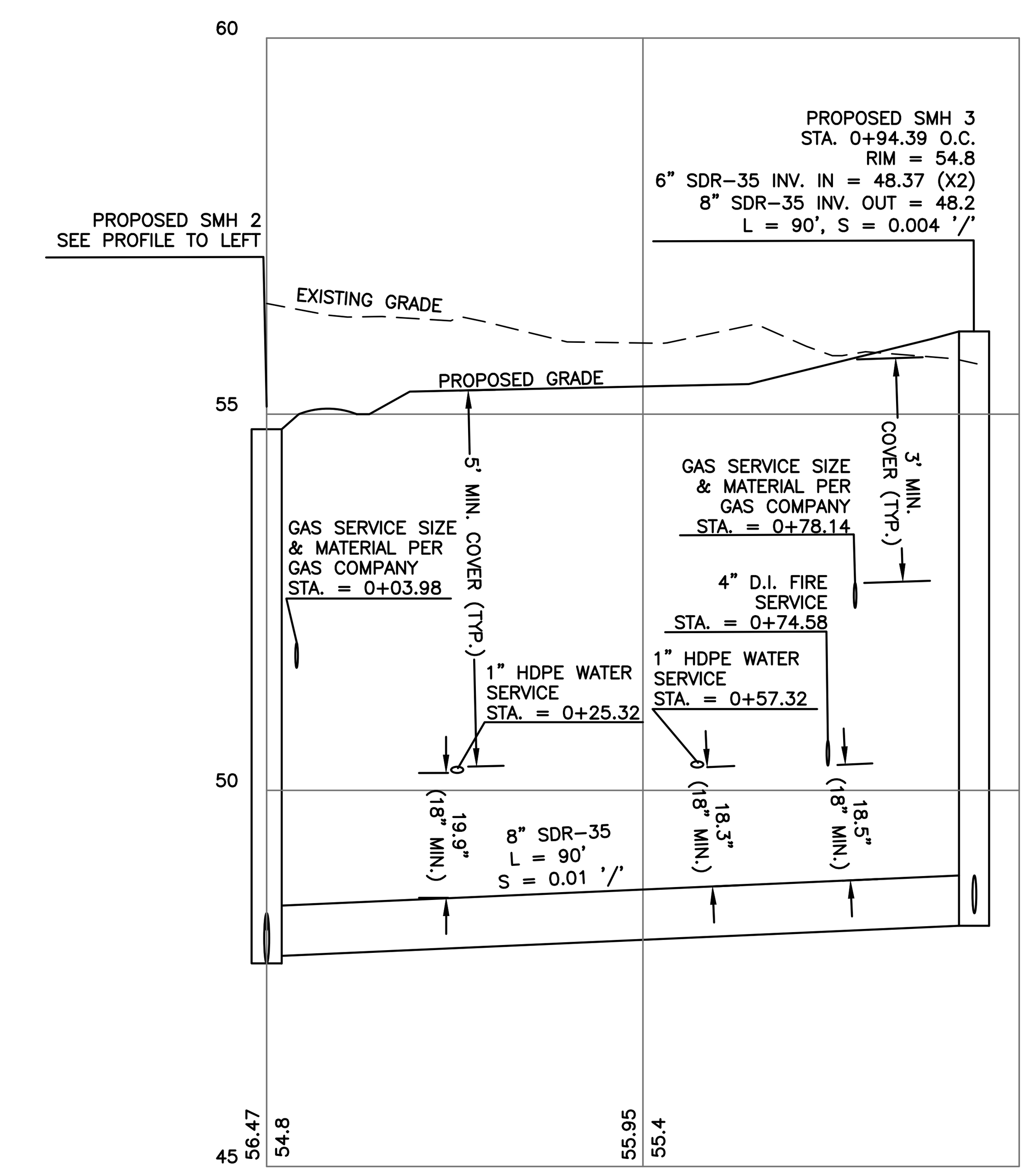
DRAWING No.
P1
SHEET 8 OF 23
JBE PROJECT NO. 21254







MAIN SEWER THROUGH SITE



SEWER MAIN SERVICING UNITS 1-2

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.

Design: JAC	Draft: DJM	Date: 01/05/22	
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Drawing Name: 21254-PLAN.dwg			

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED
PROFESSIONAL ENGINEER

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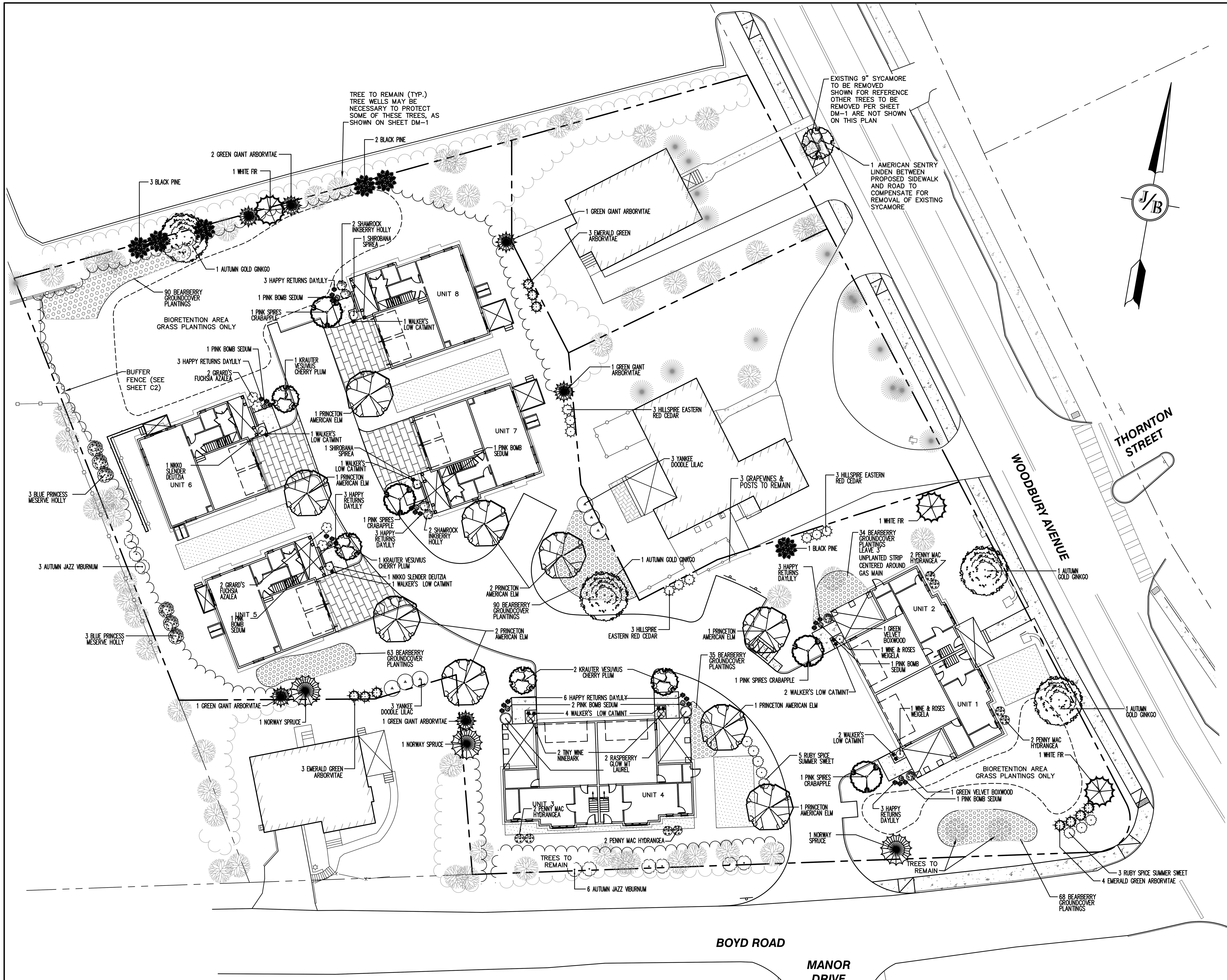
Plan Name: PLAN AND SEWER PROFILE

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

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

DRAWING No.
P2
SHEET 9 OF 23
JBE PROJECT NO. 21254



LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING FOR CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
5. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
6. ALL WORK AND PLANTS SHALL BE DONE, INSTALLED AND DETAILED IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
7. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON. IRRIGATION SHALL BE UTILIZED FOR AT LEAST THE FIRST TWO YEARS OF PLANT GROWTH.
8. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION, EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS SPECIFIED.
9. ALL TREES AND SHRUBS SHALL BE PLANTED IN MULCH BEDS WITH EDGE STRIPS TO SEPARATE TURF GRASS AREAS.
10. THE CONTRACTOR SHALL REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC. FROM ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE. GRASS SEED OR PINE BARK MULCH SHALL BE APPLIED AS DEPICTED ON PLANS.
11. FINISHED GRADES IN LANDSCAPED ISLANDS SHALL BE INSTALLED SO THAT THEY ARE 1" HIGHER THAN THE TOP OF THE SURROUNDING CURB.
12. ALL LANDSCAPING SHALL MEET THE CITY OF PORTSMOUTH STANDARDS AND REGULATIONS.
13. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE DRIPLINE OF THE TREE. THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
14. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH OVER A 10 MIL WEED MAT EQUAL TO 'WEEDBLOCK' BY EASY GARDENER OR DEWITT WEED BARRIER.
15. ALL LANDSCAPED AREAS SHALL HAVE SELECT MATERIALS REMOVED TO A DEPTH OF AT LEAST 12" BELOW FINISH GRADE. THE RESULTING VOID IS TO BE FILLED WITH A MINIMUM OF 9" HIGH-QUALITY SCREENED LOAM AMENDED WITH 3" OF AGED ORGANIC COMPOST.
16. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL/SITE DRAWINGS FOR OTHER SITE CONSTRUCTION INFORMATION.
17. IRRIGATION PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.
18. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR, AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
19. ALL REQUIRED PLANT MATERIALS SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY, AND KEPT FREE OF REFUSE AND DEBRIS. ALL REQUIRED FENCES AND WALLS SHALL BE MAINTAINED IN GOOD REPAIR.
20. THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE, AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED, AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.
21. SEE TYPICAL PLANTING DETAILS ON SHEET D5.
22. IF TREES SCHEDULED TO REMAIN NEED TO BE REMOVED OR BECOME UNHEALTHY, ADDITIONAL TREES WILL NEED TO BE PLANTED TO THE SATISFACTION OF THE PLANNING DEPARTMENT.
23. NO LOAM OR OTHER TOPSOIL SHALL BE REMOVED FROM THE SITE AS PART OF SITE DEVELOPMENT. TOPSOIL SHALL BE APPROPRIATELY STOCKPILED AND STABILIZED FOR REDISTRIBUTION WITHIN NEW PLANTING AREAS.
24. NEW PLANTINGS SHALL BE MONITORED AND MAINTAINED FOR AT LEAST TWO YEARS. IF AFTER ONE YEAR THE PLANTINGS DO NOT HAVE AT LEAST AN 80% SUCCESS RATE, REPLANTING WILL BE REQUIRED.
25. "SMART CONTROLLERS" SHALL BE UTILIZED FOR THE PLANNED IRRIGATION OF LANDSCAPED AREAS FOR MORE EFFICIENT USE OF WATER RESOURCES. USE RECYCLED WATER WHENEVER POSSIBLE FOR IRRIGATION NEEDS.

Quantity	Botanical Name	Common Name	Size
	TREES		
3	Abies concolor	WHITE FIR	7-8 FT. HT.
4	Ginkgo biloba 'Autumn Gold'	AUTUMN GOLD GINKGO	3" CALIPER
9	Juniperus virginiana 'Hillspire'	HILLSPIRE EASTERN RED CEDAR	7-8 FT. HT.
4	Malus x 'Pink Spires'	PINK SPIRES CRABAPPLE	2" CALIPER
3	Picea abies	NORWAY SPRUCE	8-9 FT. HT.
6	Pinus nigra	BLACK PINE	7-8 FT. HT.
4	Prunus cerasifera 'Krauter Vesuvius'	KRAUTER VESUVIUS CHERRY PLUM	2" CALIPER
10	Thuja occidentalis 'Smaragd Emerald'	EMERALD GREEN ARBORVITAE	5-6 FT. HT.
6	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE	7-8 FT. HT.
1	Tilia americana	AMERICAN SENTRY LINDEN	3" CALIPER
9	Ulmus americana 'Princeton'	PRINCETON AMERICAN ELM	3" CALIPER
	SHRUBS		
4	Azalea 'Girard's Fuchsia'	GIRARD'S FUCHSIA AZALEA	5 GALLON
2	Buxus 'Green Velvet'	GREEN VELVET BOXWOOD	5 GALLON
8	Clethra alnifolia 'Ruby Spice'	RUBY SPICE SUMMER SWEET	3 GALLON
2	Deutzia gracilis 'Nikko'	NIKKO SLENDER DEUTZIA	3 GALLON
8	Hydrangea macrophylla 'Penny Mac'	PENNY MAC HYDRANGEA	5 GALLON
4	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY	3 GALLON
6	Ilex x meserveae 'Blue Princess®'	BLUE PRINCESS MESERVE HOLLY	7 GALLON
2	Kalmia latifolia 'Raspberry Glow'	RASPBERRY GLOW MT LAUREL	3 GALLON
2	Physocarpus opulifolius 'SMNPOTW'	TINY WINE NINEBARK	3 GALLON
2	Spiraea japonica 'Shirobana'	SHIROBANA SPIREA	3 GALLON
6	Syringa vulgaris 'Yankee Doodle'	YANKEE DOODLE LILAC	5 GALLON
9	Viburnum dentatum 'Autumn Jazz'	AUTUMN JAZZ VIBURNUM	5 GALLON
2	Weigela florida 'Alexandra'	WINE & ROSES WEIGELA	3 GALLON
	PERENNIALS		
374	Arctostaphylos uva-ursi	BEARBERRY	4" POTS
24	Hemerocallis 'Happy Returns'	HAPPY RETURNS DAYLILY	1 GALLON
12	Nepeta x faassenii 'Walker's Low'	WALKER'S LOW CATMINT	1 GALLON
8	Sedum 'Pink Bomb'	PINK BOMB SEDUM	1 GALLON

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

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

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

Plan Name: LANDSCAPE PLAN

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

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

DRAWING No.
L1
SHEET 10 OF 23
JBE PROJECT NO. 21254

Calvin Wall

TMSLIGHTING
ESTABLISHED 1923

Features

- Provides excellent coverage and uniformity with cut-off
- Practical and aesthetic options for application and design flexibility
- Weatherproof construction to withstand the elements
- Quality components combined with the most current technology for high efficiency and reduced lighting costs

Applications

The Calvin wall-mount luminaire is ideal for illuminating areas where localized distribution is necessary, such as doorways and entrances, laneways, patios and could provide adequate night time security lighting. It lends itself to commercial, and industrial applications that could benefit from materials and maintenance cost reductions. Calvin could either augment the existing lighting, or illuminate a small to medium-sized area.

Calvin is also available as a pendant-style model.

Construction

High grade spun aluminum, brushed solid copper, or brushed 316L stainless steel reflector, with stainless steel mounting hardware, for indoor and outdoor applications.

Lamp

Operates with Cree™ LED (19W max.), compact fluorescent (42W max.), metal halide (100W max.), or incandescent (150W max.). Specify 3000K, 3500K or 4000K CCT for LED systems. A dimmable, screw-type, 17W LED lamp is also available (PAR 38, E26 base, 120V, 4000K CCT).

Note: LED systems are available with 120-277V supply voltage only.

LED modules do not require a socket, and are wired directly to the integral driver.

Incandescent and metal halide systems, and those using the 17W LED PAR 38 lamp, use a medium base socket (E26).

Diffuser

Globe: clear and prismatic, elongated, glass globes are available.

Lens: the clear, flat lens provides slight diffusion, and protects any components located in the reflector.

Note: G3 is used with 100IN, 32CF, and 15LED max.

Only prismatic globes are compatible with LED systems.

Globes are not available with the 17W LED PAR 38 lamps.

Option

Wire Guard: a steel, chrome-plated wire guard is available for lamp protection against light projectiles, wildlife, and serves as a vandal deterrent.

Ballast/LED Driver

Ballasts are efficient with a high power factor greater than 90%, and quiet with an "A" sound rating.

The LED source is controlled by an advanced electronic driver that delivers consistent power.

Ballast and LED drivers are electronic, and available for integral and remote mounting, indoor or outdoor.

IP23

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description
	8	W	Single	2W-O-15LED-30K-120-WM-CXX / WALL MTD 9' AFG

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LIGHTING AND ELECTRICAL NOTES:

1. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON–OPERATIONAL VALUES PER CITY REGULATIONS.
2. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
3. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT–CANDLES.
4. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY.
5. ALL LIGHTING FIXTURES SHALL BE FULL CUT–OFF DARK–SKY COMPLIANT, UNLESS OTHERWISE NOTED.
6. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY CHARRON, INC., P.O. BOX 4550, MANCHESTER, NH 03108. ALL LIGHTS SHOULD BE PURCHASED FROM THIS COMPANY, OR AN EQUAL LIGHTING DESIGN SHOULD BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.

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

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

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

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

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER
01/19/2023

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

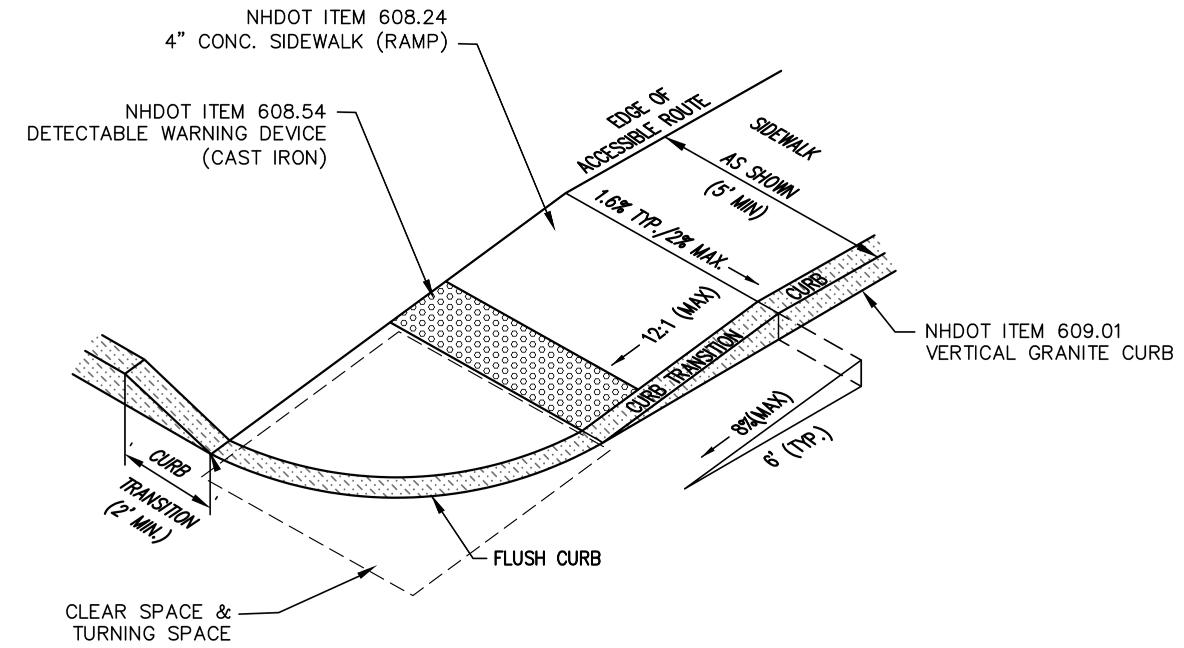
Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LIGHTING PLAN

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

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

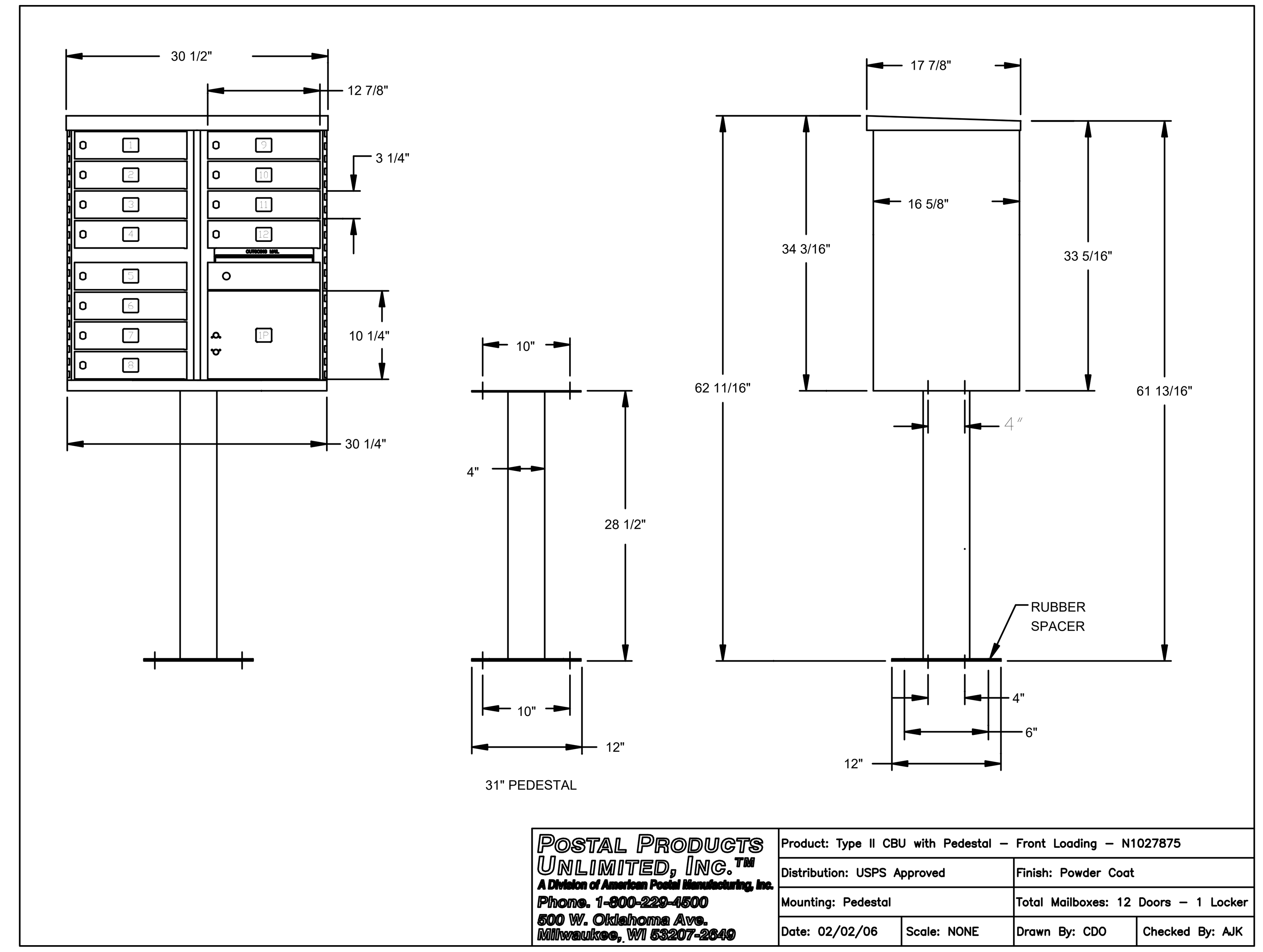
DRAWING No.
L2
SHEET 11 OF 23
JBE PROJECT NO. 21254



NOTES:
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) CURB RAMPS SHALL BE 8.3%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (i.e., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SECTION FOR RAMP CONSTRUCTION.
8. WHERE A CHANGE IN DIRECTION IS REQUIRED TO UTILIZE A CURB RAMP, A TURNING SPACE SHALL BE PROVIDED AT THE BASE AND/OR THE TOP OF THE CURB RAMP. TURNING SPACES SHALL BE PERMITTED TO OVERLAP CLEAR SPACES.
9. TURNING SPACE MAXIMUM CROSS SLOPE IS 2% IN ANY DIRECTION.
10. BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE OF 4'X4' MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN CROSSWALK, AND OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE. THE CLEAR SPACE MAY OVERLAP TURNING SPACES, DETECTABLE WARNING SURFACES AND DROP CURBS.

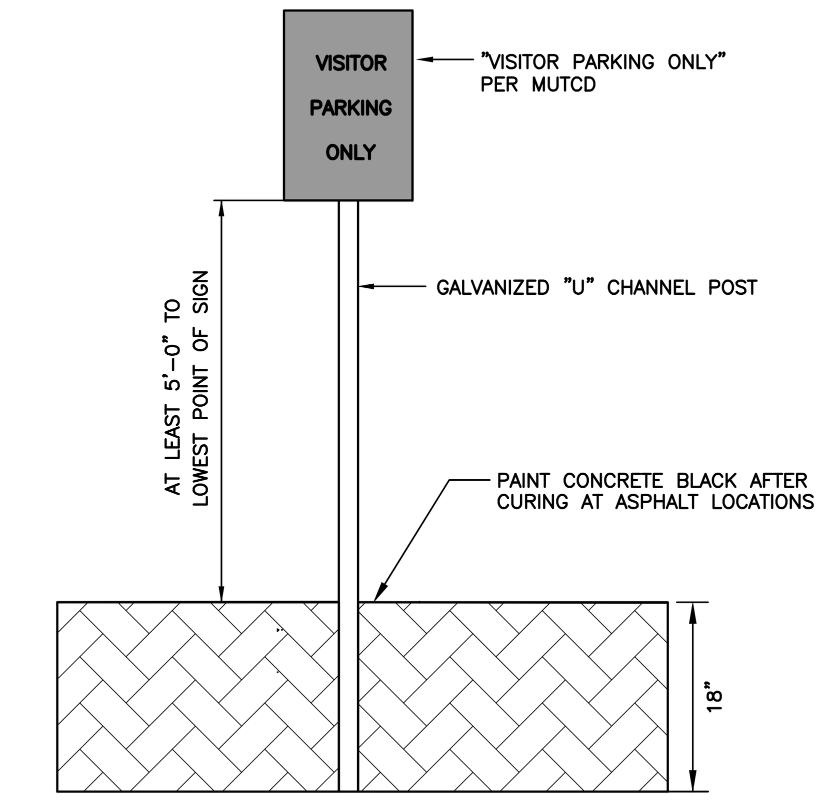
ACCESSIBLE CURB RAMP (NHDOT TYPE 1)

NOT TO SCALE



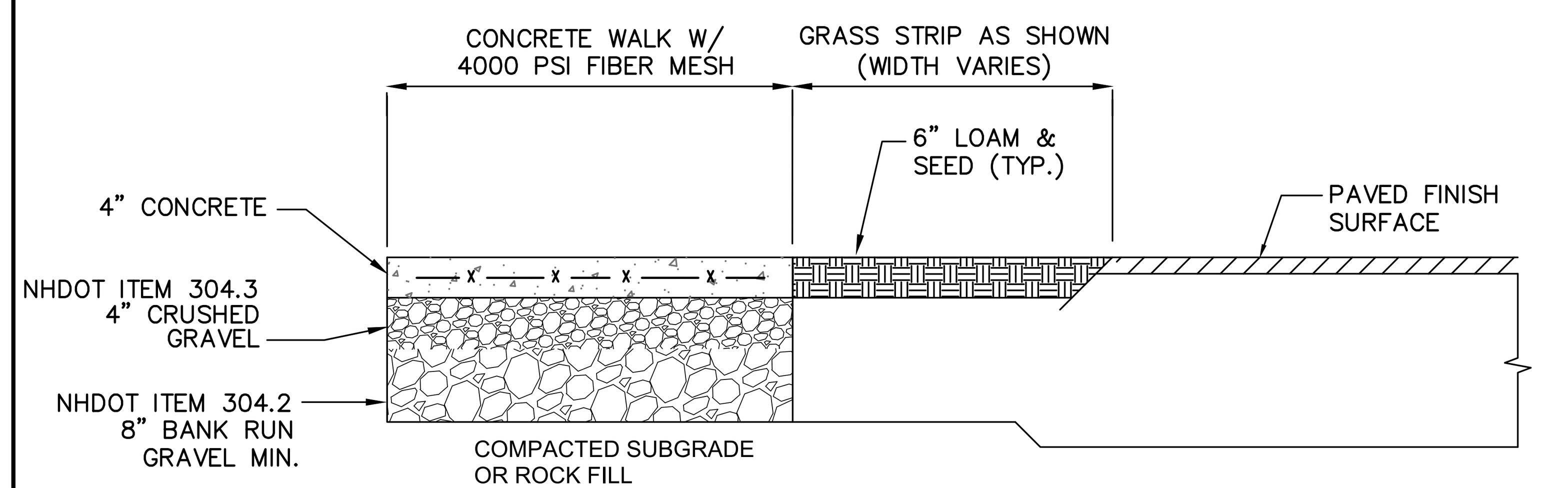
CLUSTER MAILBOX UNIT DETAIL

NOT TO SCALE



VISITOR PARKING SIGN

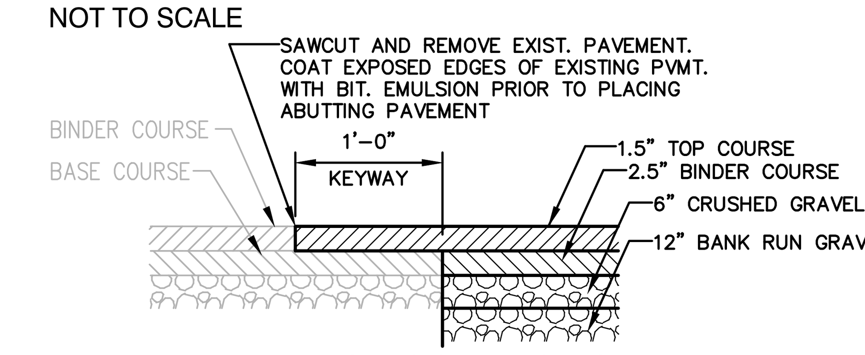
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT EVERY 16' ALONG SIDEWALK.

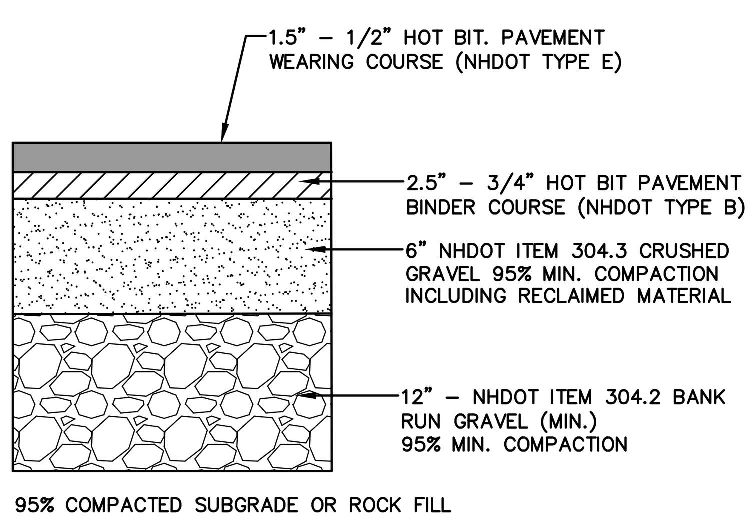
CONCRETE SIDEWALK WITH GRASS STRIP

NOT TO SCALE



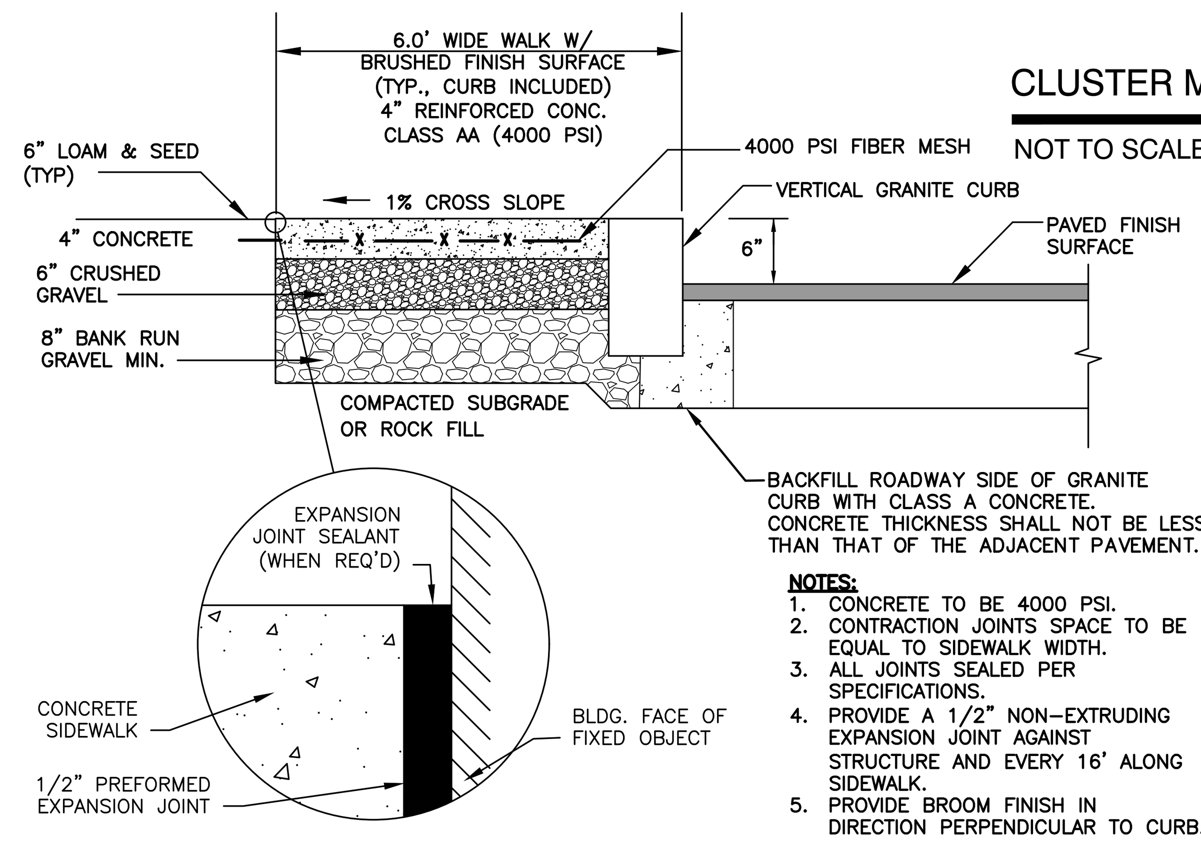
KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

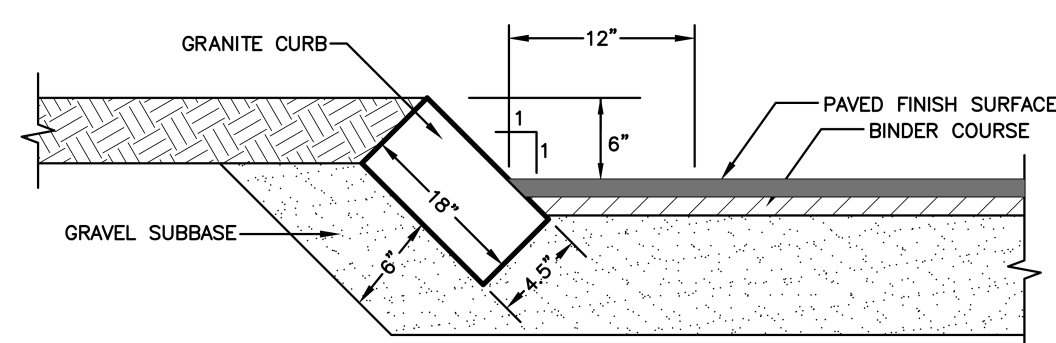
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.
5. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

CONCRETE SIDEWALK W/ VERTICAL GRANITE CURB

NOT TO SCALE



NOTES:
1. CURB TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.

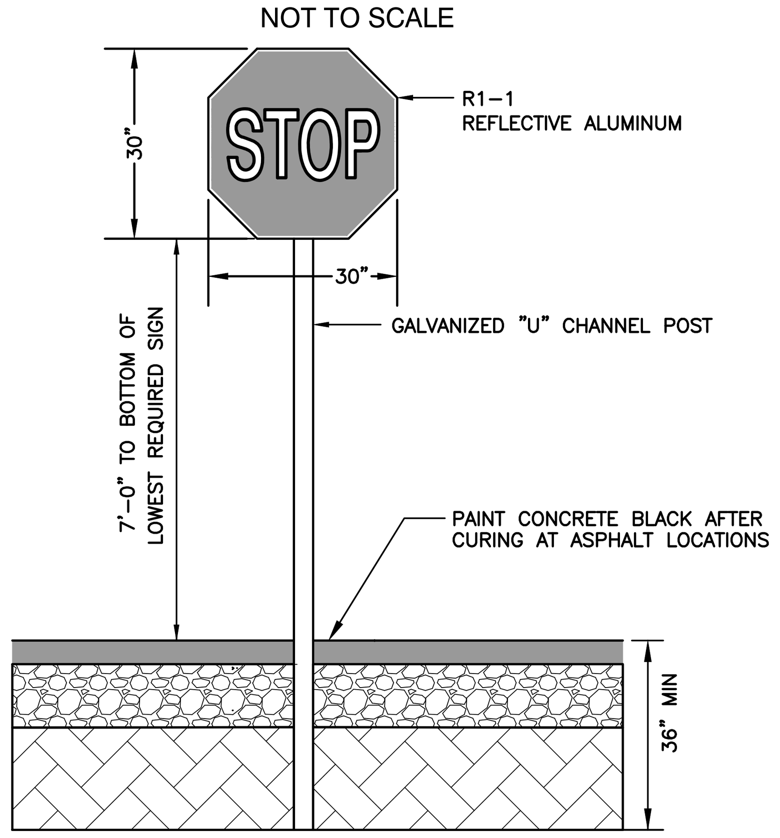
SLOPED GRANITE CURB

NOT TO SCALE

NOTES:
1. ALL STOP BARS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.

STOP BAR

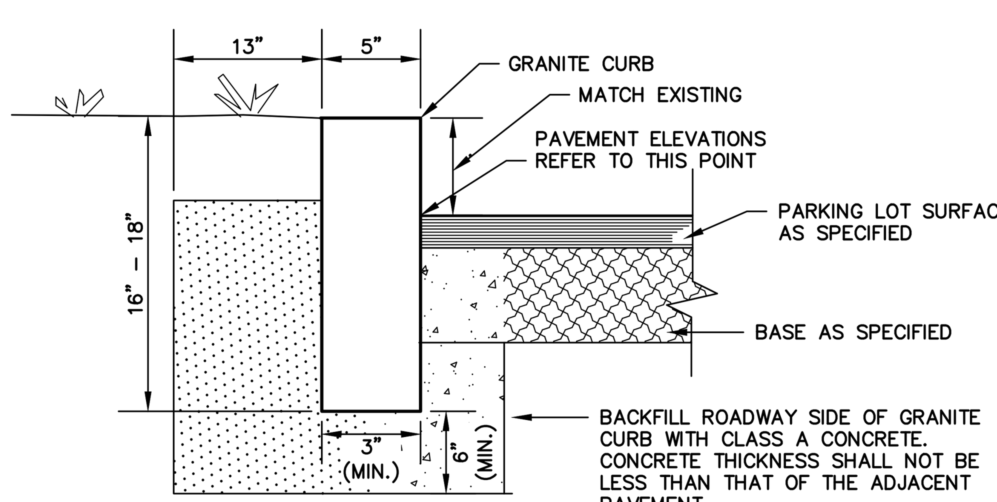
NOT TO SCALE



NOTES:
1. ALL SIGNAGE SHALL BE TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS AND NHDOT STANDARDS.
2. SIGN, HARDWARE, AND INSTALLATION TO CONFORM TO 2016 NHDOT STANDARD SPECIFICATION, SECTION 615 – TRAFFIC SIGNS.
3. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS/CATALOG CUTS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ERECTING SIGNS.
4. THE LOCATION OF THE SIGNS SHALL BE AS INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

STOP SIGN (R1-1)

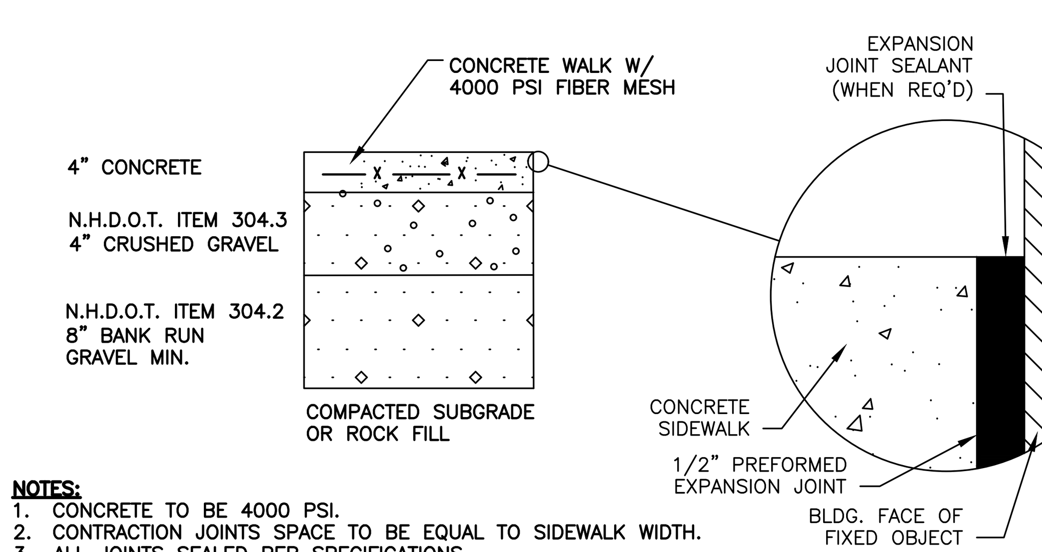
NOT TO SCALE



NOTES
1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. PROPOSED VERTICAL GRANITE CURB ALONG WOODBURY AVE. AT CURB CUT TO BE REMOVED SHALL MEET THE REQUIREMENTS OF NHDOT STANDARD SPECIFICATIONS SECTION 609.

VERTICAL GRANITE CURB

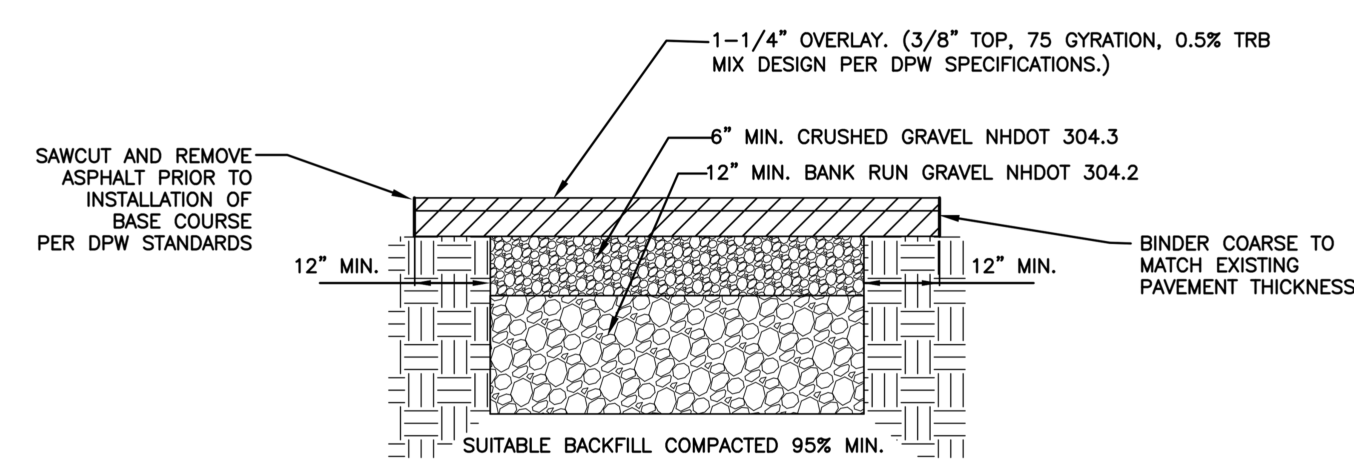
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.

CONCRETE SIDEWALK

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

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
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Designed and Produced in NH
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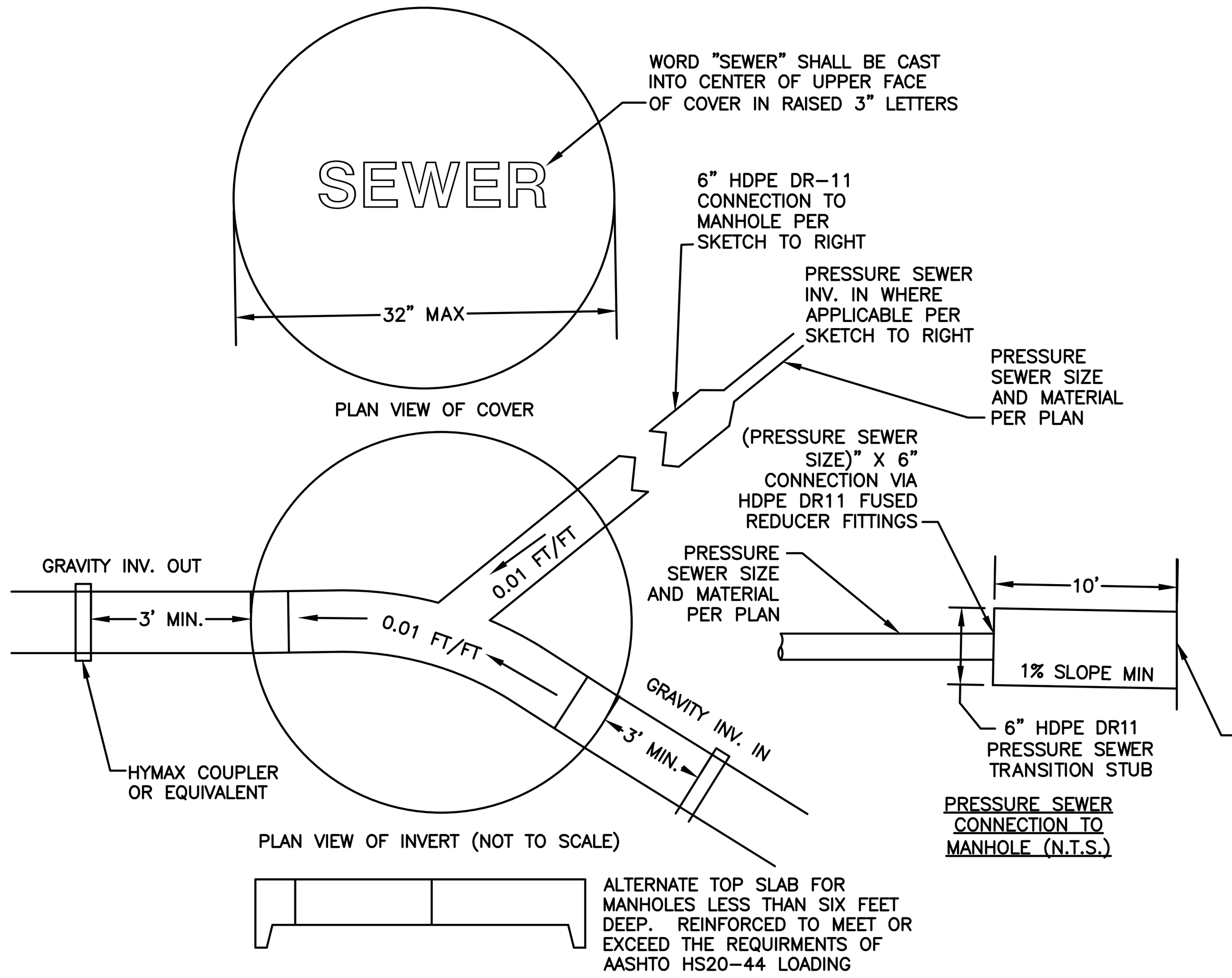
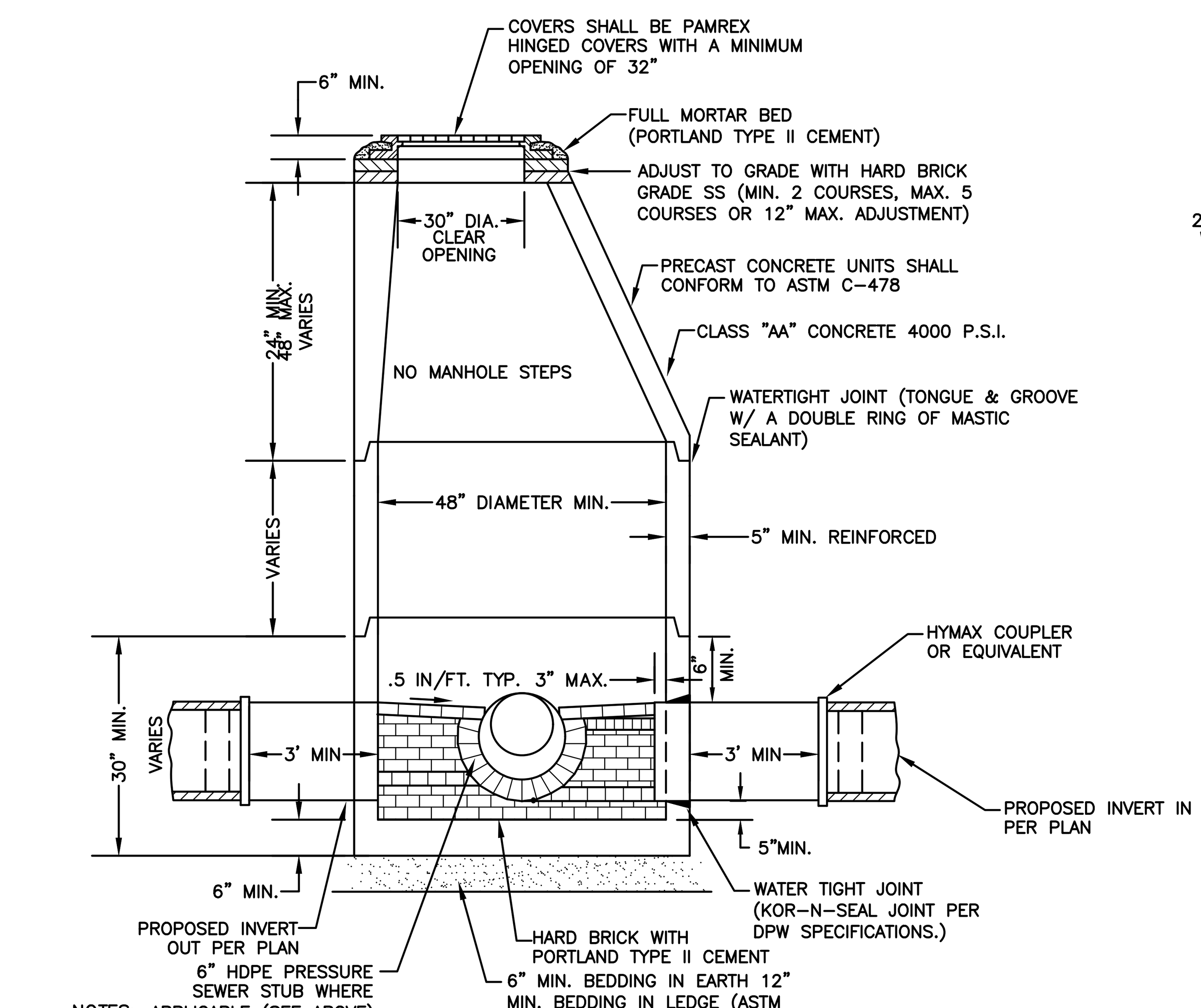
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
D1
SHEET 12 OF 23
JBE PROJECT NO. 21254



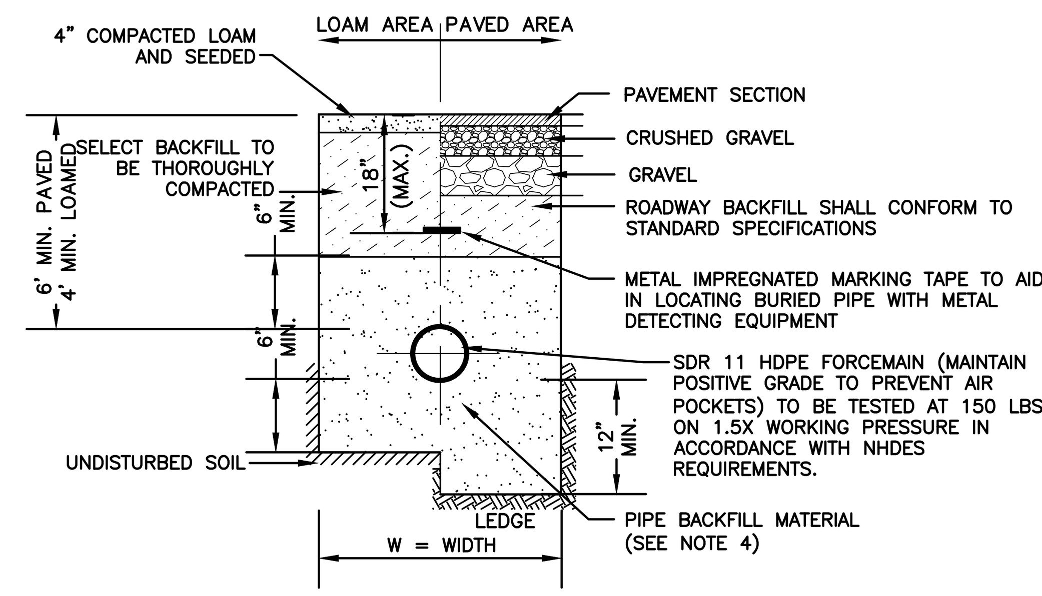


NOTES:

1. PER NHDES ENV-WQ 704.13(C), THE MORTAR SPECIFICATION SHALL BE AS FOLLOWS:
   1. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
   2. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
      A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      B. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
   3. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
   4. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 'STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES';
   5. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 'STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES';
2. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
3. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
4. SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48 WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (a).
5. ALL ASBESTOS CONTAINING WASTE MATERIALS MUST BE PROPERLY IDENTIFIED, PACKAGED AND DELIVERED TO A LANDFILL LICENCED BY THE NHDES SOLID WASTE MANAGEMENT PROGRAM FOR DISPOSAL. CALL (603) 271-2925 FOR MORE INFORMATION.
6. PORTSMOUTH STANDARD SEWER MANHOLE SHALL BE USED.
7. CONTRACTOR TO PURCHASE SEWER MANHOLE COVERS FROM THE CITY OF PORTSMOUTH DIRECTLY.
8. MANHOLE BASE SECTIONS SHALL BE MONOLITHIC TO A POINT AT LEAST 6" ABOVE THE HIGHEST INCOMING SEWER PIPE PER ENV-WQ 704.12 (e).
9. MANHOLE CASTINGS SHALL CONFORM TO ASTM A48 PER ENV-WQ 704.13 (a) (8).
10. ON-SITE SEWER MANHOLE COVERS WILL NEED TO BE PURCHASED BY THE APPLICANT. THE CITY OF PORTSMOUTH WILL NOT BE PROVIDING THESE.

PORTSMOUTH SEWER MANHOLE

NOT TO SCALE

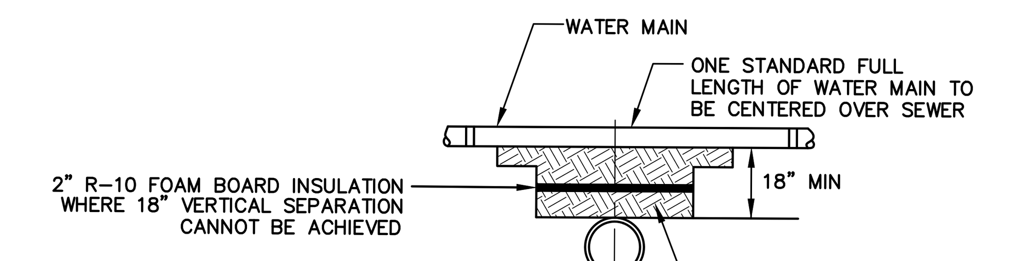


NOTES:

1. ALL JOINTS TO BE MECHANICALLY RESTRAINED.
2. W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. W SHALL BE NO MORE THAN 36"
3. SAND BEDDING AND BLANKET SHALL BE CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90-100% PASSES A 1/2 INCH SIEVE AND NO MORE THAN 15% WILL PASS A #200 SIEVE.

FORCE MAIN SEWER TRENCH

NOT TO SCALE

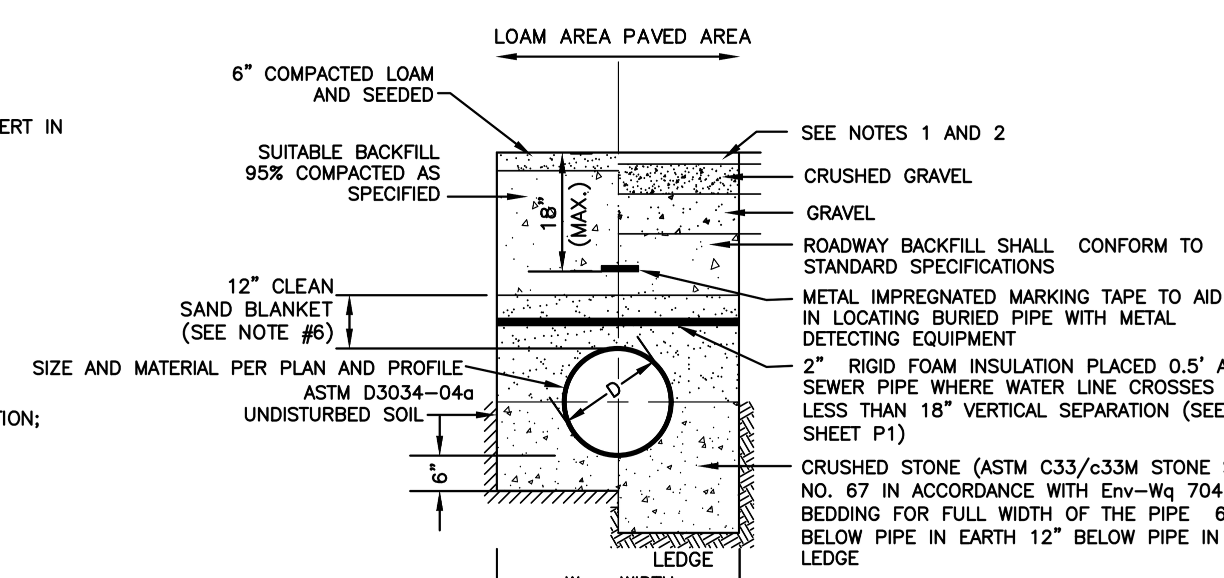


SEPARATION NOTES:

1. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN PIPES. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

TYPICAL WATER / SEWER SEPARATION

NOT TO SCALE

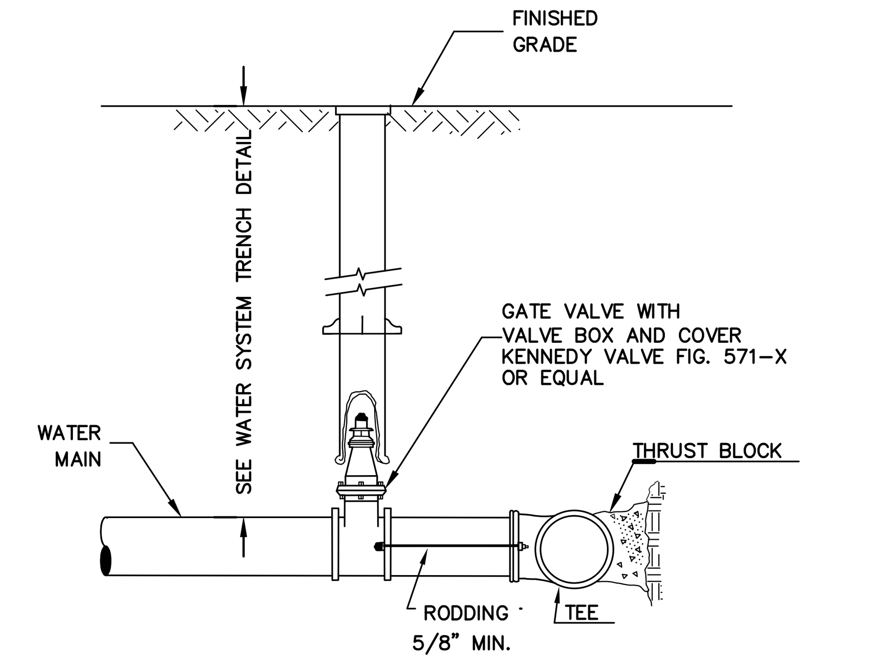


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO PAVEMENT DETAILS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. TRENCH BACKFILL SHALL CONFORM WITH ENV. Wq 704.11(h) AND BE FREE OF DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE OR ROCKS OVER SIX INCHES.
4. W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, WIDTH SHALL BE NO MORE THAN 36"; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, WIDTH SHALL BE 24 INCHES PLUS PIPE O.D. WIDTH SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
5. RIGID FOAM INSULATION TO BE PROVIDED WHERE COVER IN THE ROADWAY IS LESS THAN 6' AND CROSS COUNTRY IS LESS THAN 4', PURSUANT TO DES WAIVER BEING ISSUED.
6. PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES A 1/2 " SIEVE AND A MAXIMUM OF 15% PASSES A #200 SIEVE IN ACCORDANCE WITH Env-Wq 704.11(b).
7. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL AND CERTIFIED BY THE MANUFACTURER AS CONFORMING TO THE ASTM D3212 STANDARD IN EFFECT WHEN THE JOINT SEALS WERE MANUFACTURED, AND SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE PER Env-Wq 704.05 (e).

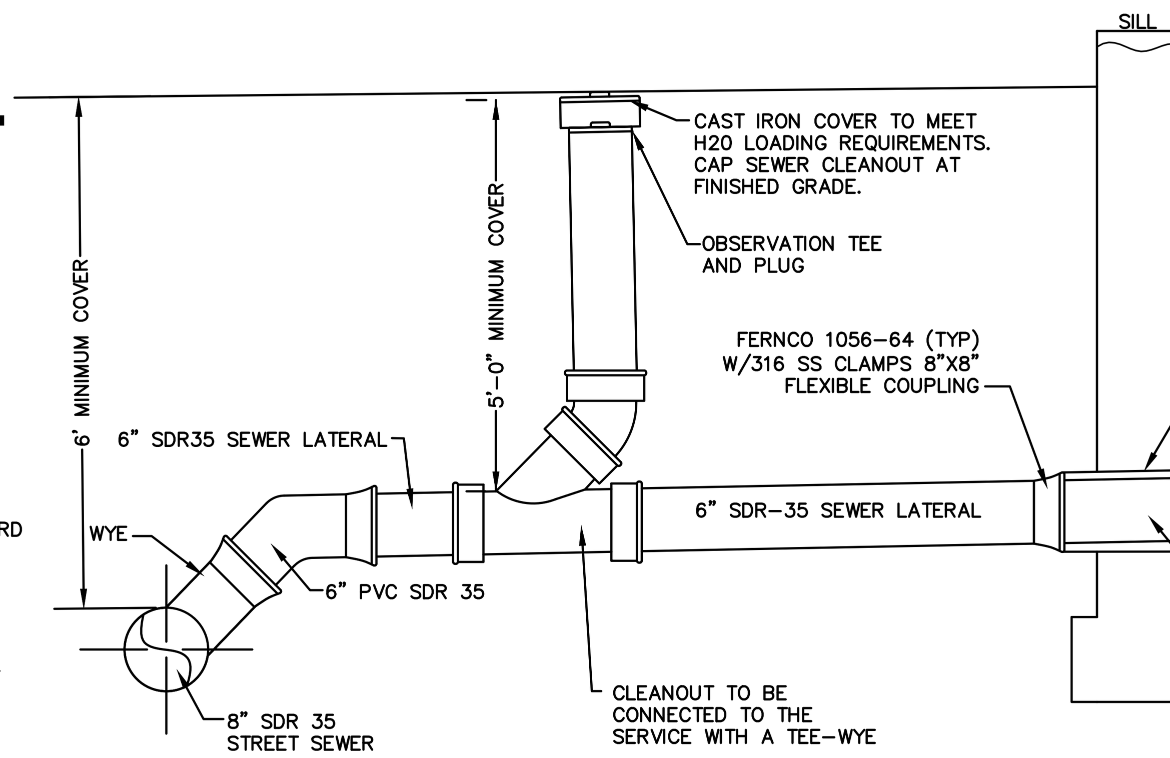
SEWER TRENCH

NOT TO SCALE



BURIED GATE VALVE DETAIL

NOT TO SCALE

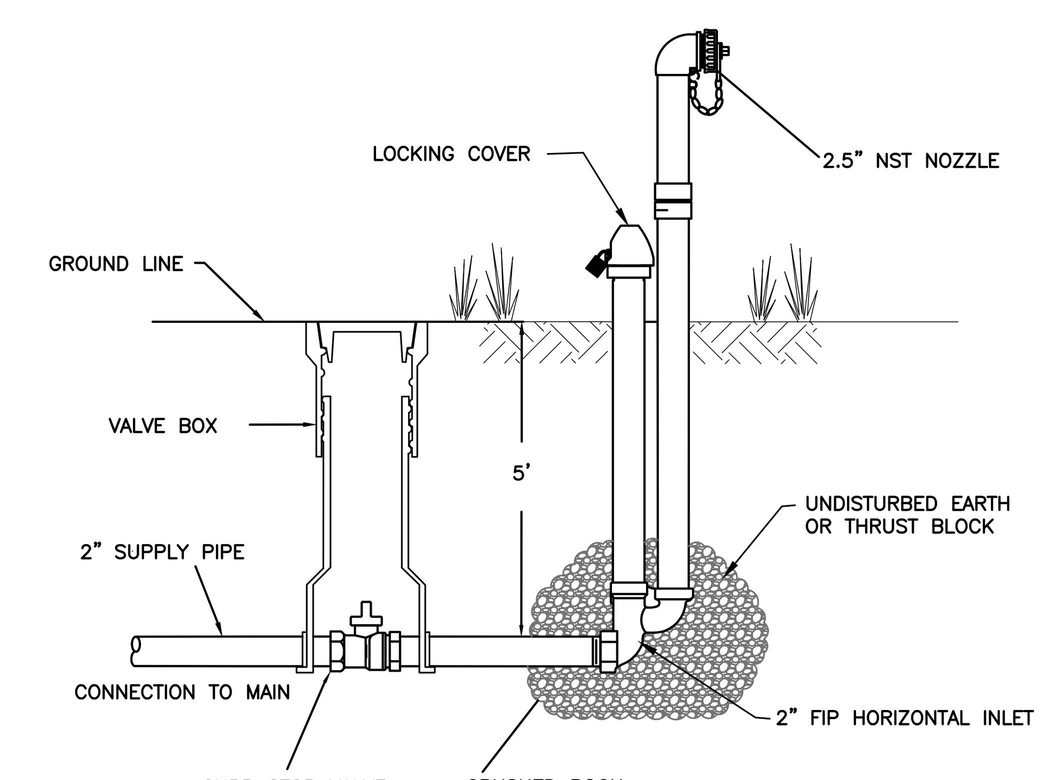


NOTES:

1. CLEANOUT COVER SHALL BE RAISED TO GRADE WITHIN 5' OF EACH UNIT THAT IS SERVICED BY GRAVITY.
2. THIS DETAIL ONLY APPLIES TO UNITS SERVICED BY GRAVITY SEWER. SERVICE FOR UNITS SERVICED BY LOW PRESSURE SEWER SHALL FOLLOW E-ONE DETAILS ON SHEET D3.

HOUSE SEWER SERVICE

NOT TO SCALE

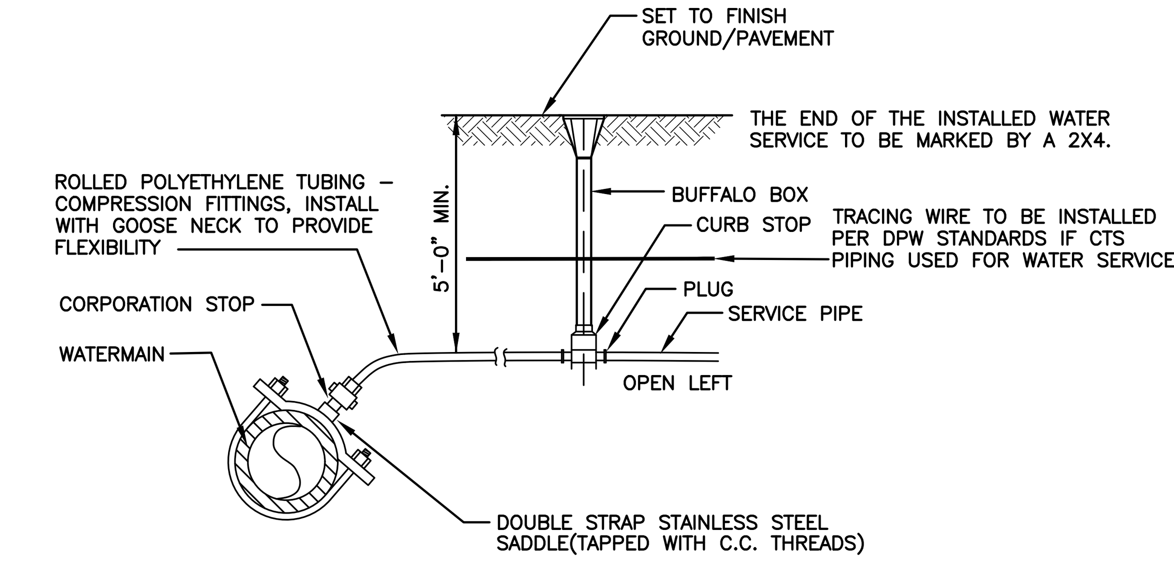


POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 5' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP HORIZONTAL INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN LEFT. BRONZE OPERATING MECHANISM AND ALUMINUM PLUNGER. DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO, OR APPROVED EQUAL.

INLET PRESSURE (PSI)	FLOW RATE (GPM)
75	675
100	742
125	800
150	856

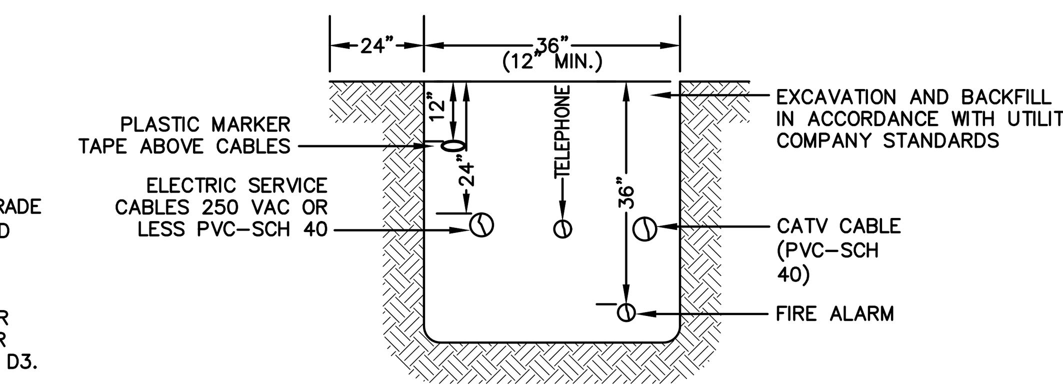
BLOW-OFF HYDRANT DETAIL

NOT TO SCALE



WATER SERVICE CONNECTION-POLYETHYLENE

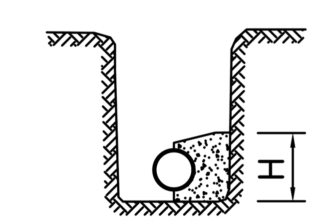
NOT TO SCALE



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

UTILITY TRENCH

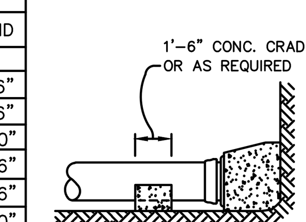
NOT TO SCALE



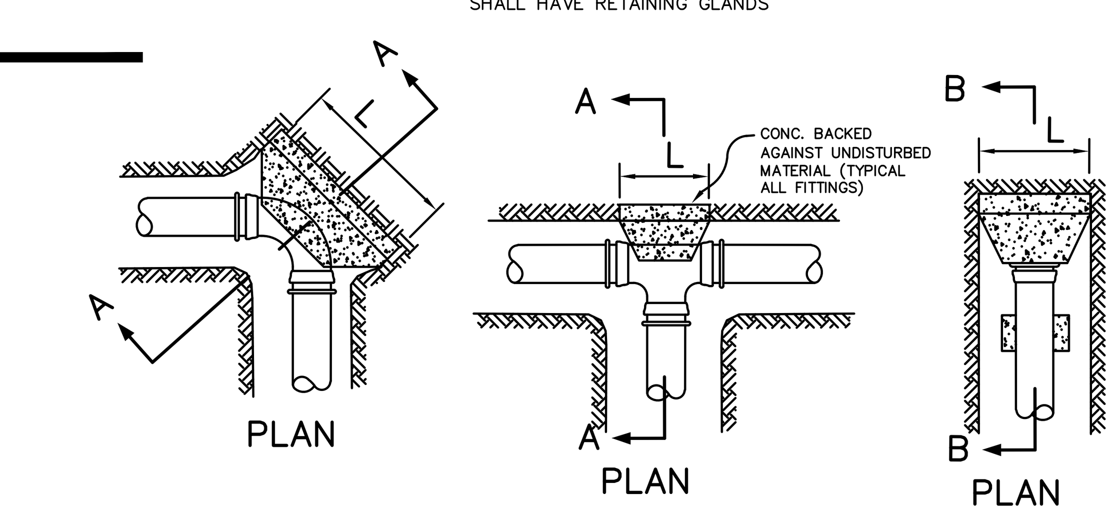
SECTION A-A

CONCRETE THRUST BLOCK DIMENSIONS								
PIPE DIA. (IN.)	TEE		90° BEND OR STUB		45° BEND		22.5° BEND	
	H	L	H	L	H	L	H	L
4"/6"	1'-6"	1'-6"	1'-6"	2'-0"	1'-6"	1'-6"	1'-6"	1'-6"
8"	2'-0"	2'-0"	2'-0"	3'-0"	1'-6"	2'-0"	1'-6"	1'-6"
10"	2'-0"	3'-0"	2'-6"	3'-6"	2'-0"	2'-6"	1'-6"	2'-0"
12"	2'-6"	3'-6"	3'-0"	4'-0"	2'-0"	3'-6"	1'-6"	2'-6"
15"	3'-0"	4'-6"	3'-6"	5'-6"	3'-0"	3'-6"	2'-0"	2'-6"
18"	4'-0"	5'-0"	4'-6"	6'-0"	3'-6"	4'-0"	2'-6"	3'-0"
24"	5'-0"	7'-0"	6'-0"	8'-0"	4'-0"	6'-0"	3'-0"	4'-6"

PIPING W/ MECHANICAL JOINT FITTINGS SHALL HAVE RETAINING GLANDS



SECTION B-B



THRUST BLOCK DETAILS

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE - PAIGE S. LIBBEY No.16670 - LICENSED PROFESSIONAL ENGINEER - 01/19/2023

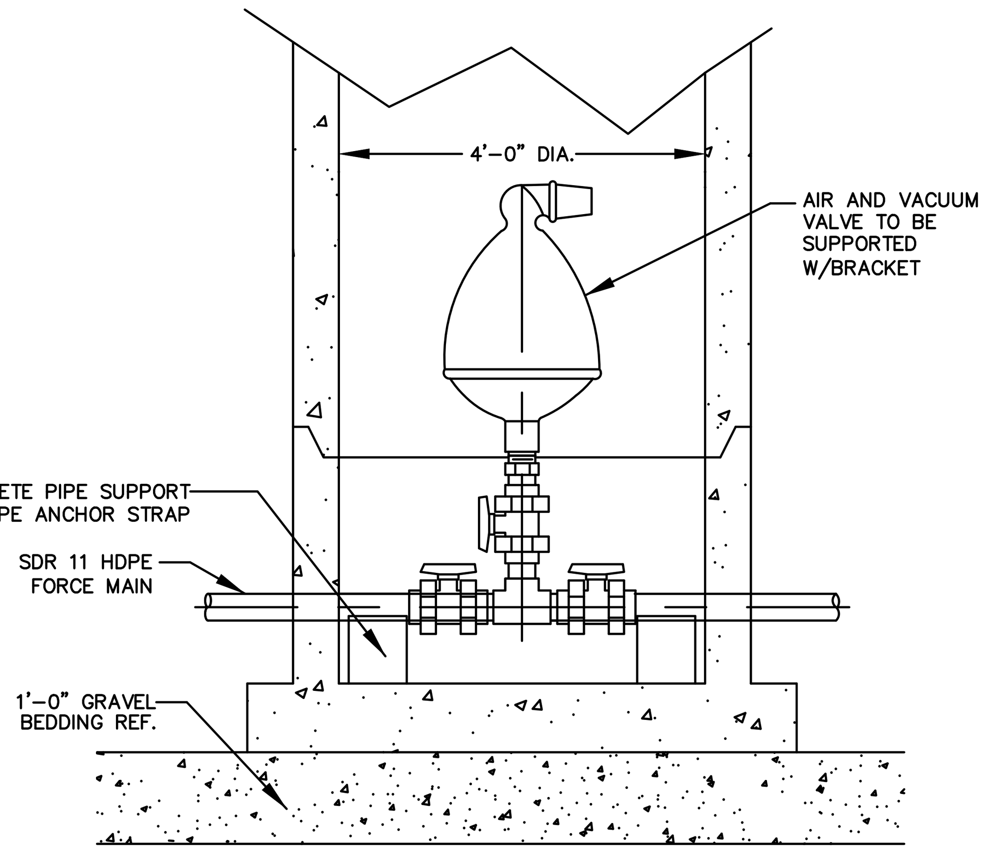
REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

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

Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

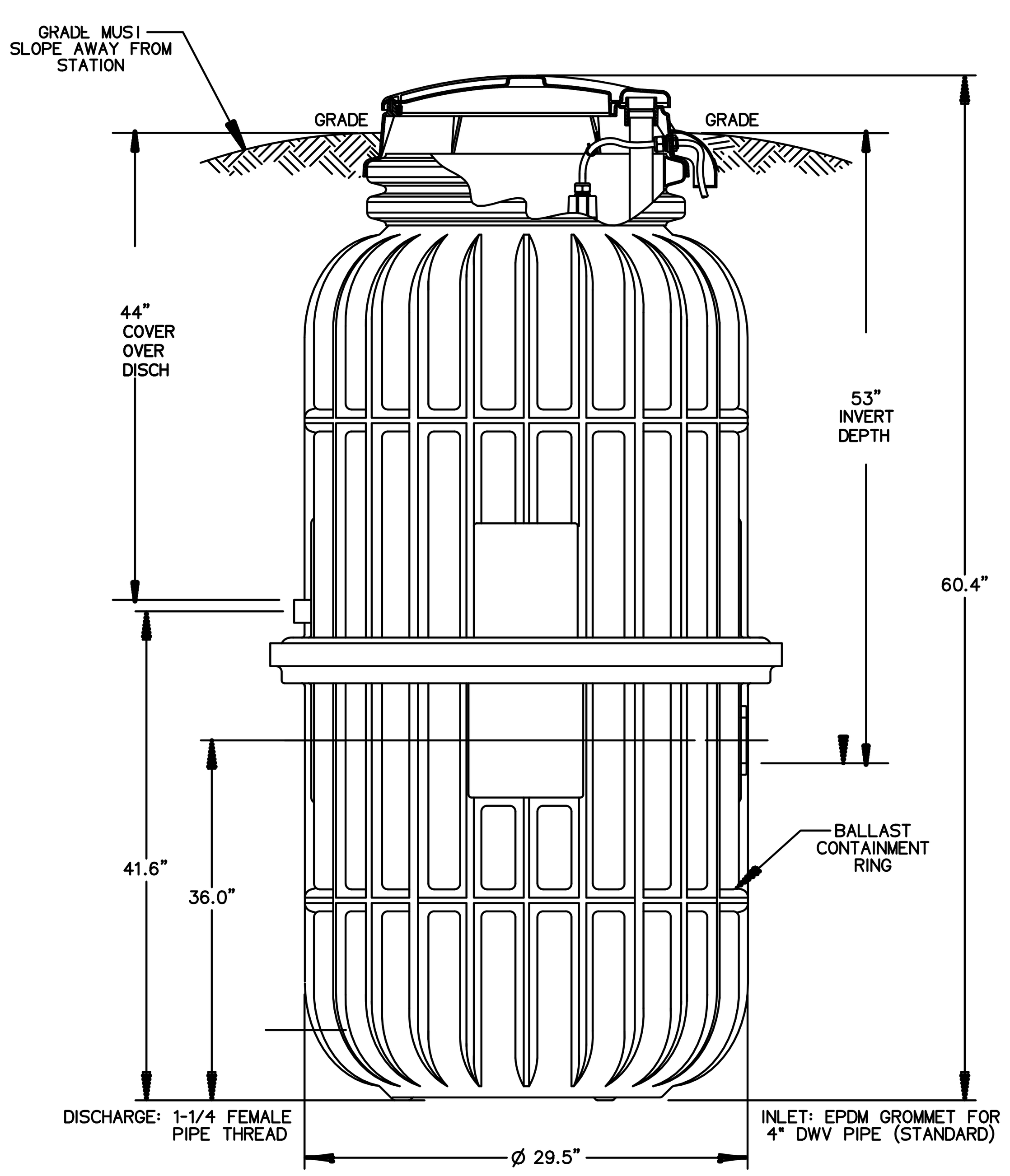
DRAWING No.

D2



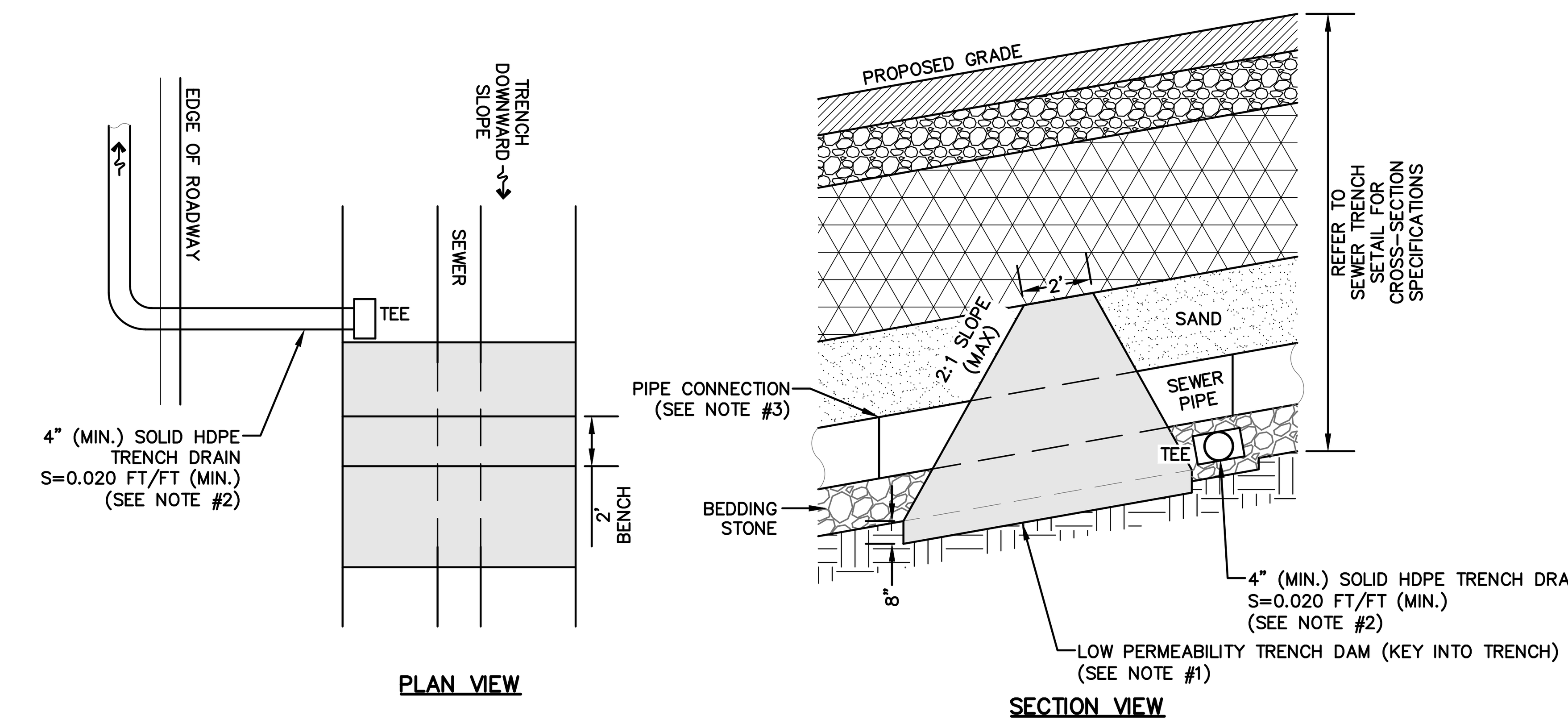
TERMINAL FLUSHING MANHOLE - OPTIONAL ELEV. VIEW

NOT TO SCALE



DH071-93 GRINDER PUMP STATION

NOT TO SCALE

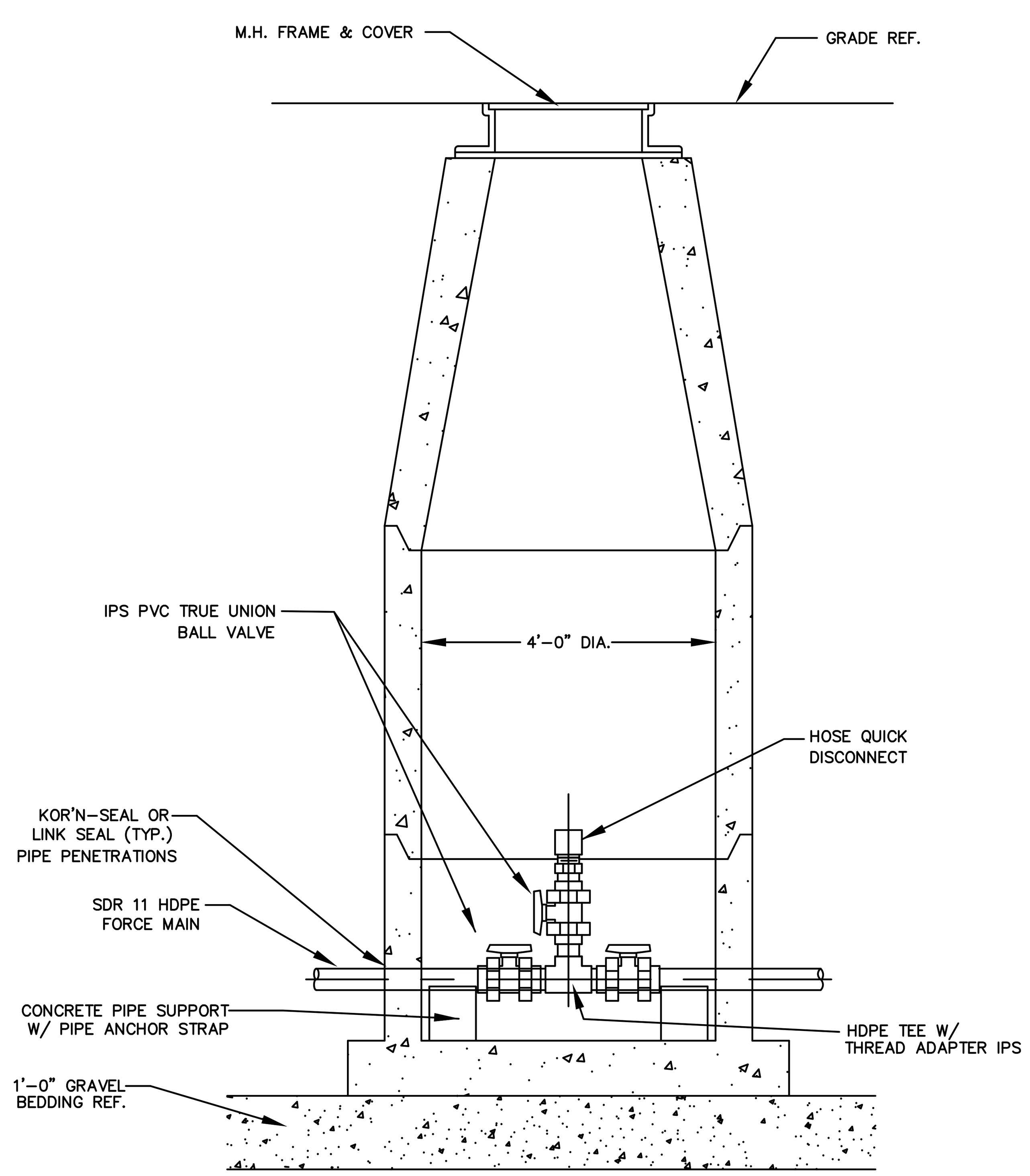


NOTES:

1. LOW PERMEABILITY SOIL USED FOR TRENCH DAM SHALL MEET THE FOLLOWING SPECIFICATION: CLAYEY SOIL – MIN. 15% PASSING THE #200 SIEVE AND A MIN. PERMEABILITY OF $1x10^{-5}$ CM/SEC
2. REFER TO PROJECT SITE PLANS FOR LOCATION OF TRENCH DRAINS AND OUTLET ROUTING. DRAINS SHALL DAYLIGHT TO NEAREST AT-GRADE POINT, TIE-INTO A DRAINAGE STRUCTURE, OR INTO A NETWORK OR TRENCH DRAINS.
3. CONTRACTOR SHALL NOT LOCATE A PIPE CONNECTION WITHIN THE LIMITS OF THE TRENCH DAM. A 2' SEPARATION BETWEEN LIMIT OF TRENCH DAM AND CONNECTION IS RECOMMENDED.
4. IF TRENCH DAMS & DRAINS ARE SPECIFIED ON THE PROJECT, THE CONTRACTOR SHALL INSTALL DAMS & DRAINS AT A MAXIMUM. 75' SPACING. REFER TO PROJECT PLANS FOR DESIGN SPACING.

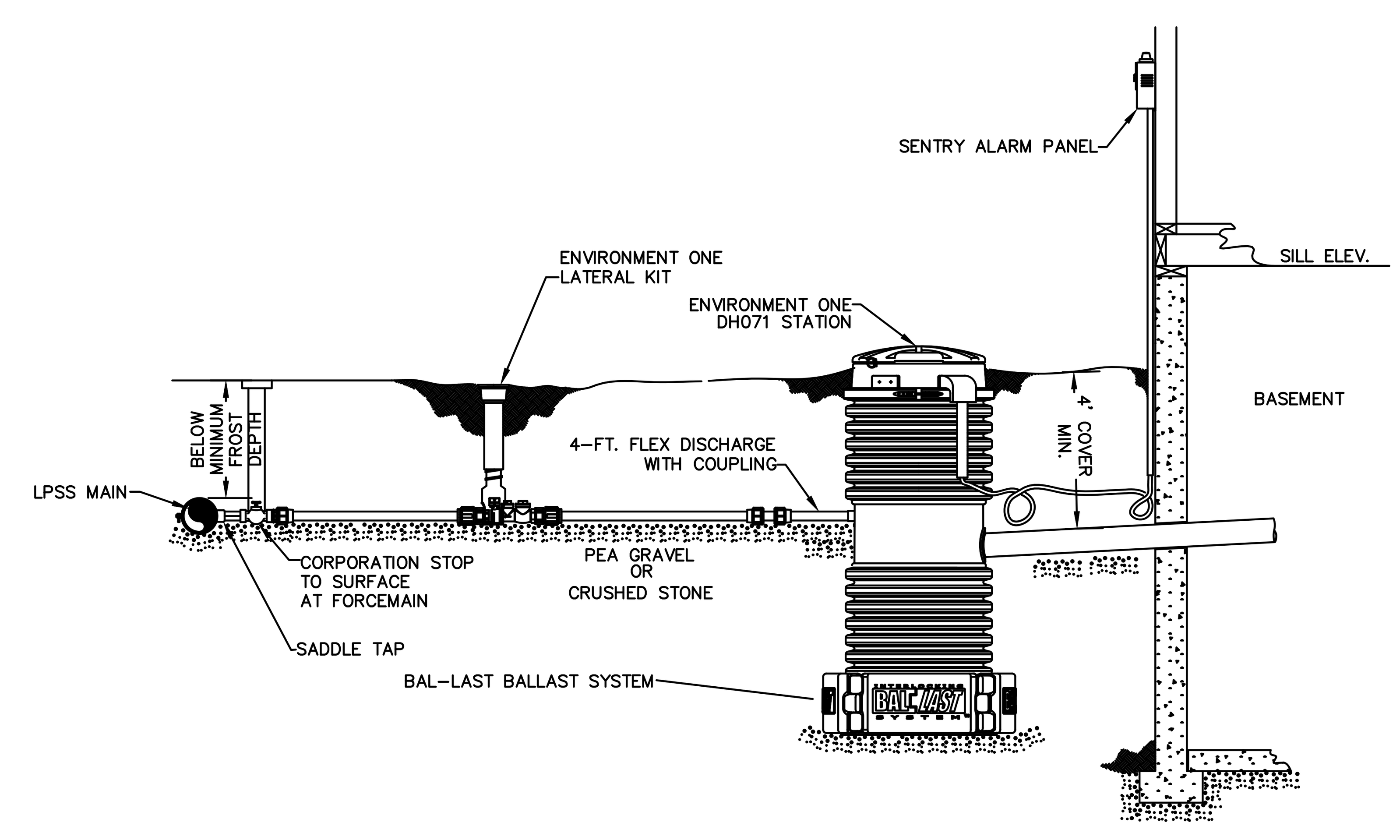
SEWER TRENCH DAM & DRAIN

NOT TO SCALE



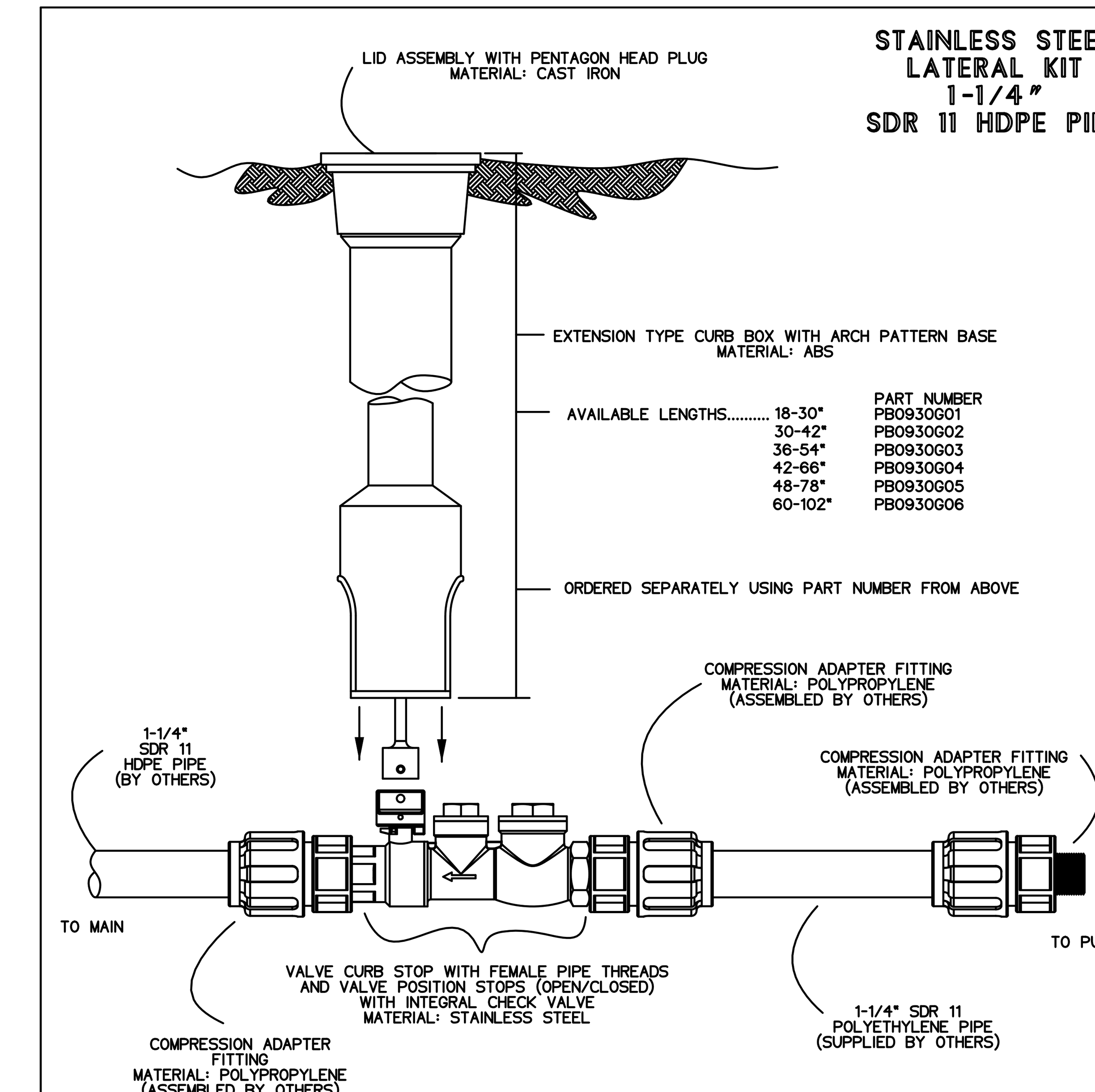
TERMINAL FLUSHING MANHOLE

NOT TO SCALE



TYPICAL PUMP AND BALLAST INSTALLATION

NOT TO SCALE



NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
*FOR SS FITTING INTO SS THREAD, USE PIPE DOPE OR TEFLON TAPE, NOT BOTH
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

SGS	DN	11/02/11	B	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE

eone SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE

NA0330P02

STAINLESS STEEL LATERAL KIT

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22	
Checked: JAC	Scale: AS NOTED	Project No.: 21254	
Drawing Name: 21254-PLAN.dwg			

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
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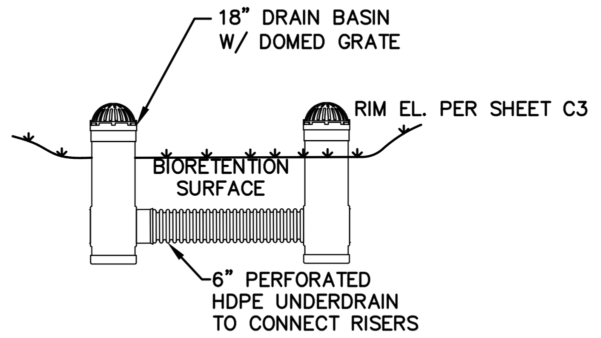
DRAWING No.

D3

SHEET 14 OF 23

JBE PROJECT NO. 21254

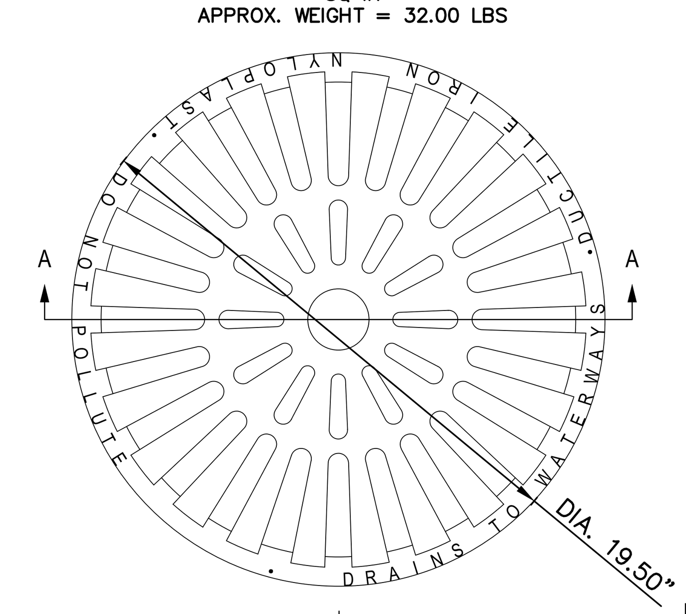
NYOPLAST DRAIN BASIN AND INLINE DRAIN

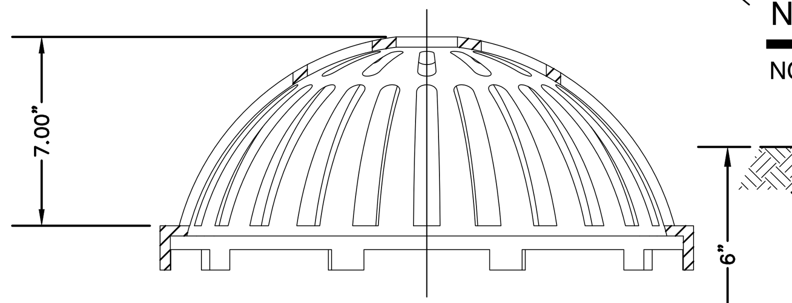


NOT TO SCALE

1899CGD

APPROX. DRAIN AREA = 175.59 SQ IN
APPROX. WEIGHT = 32.00 LBS





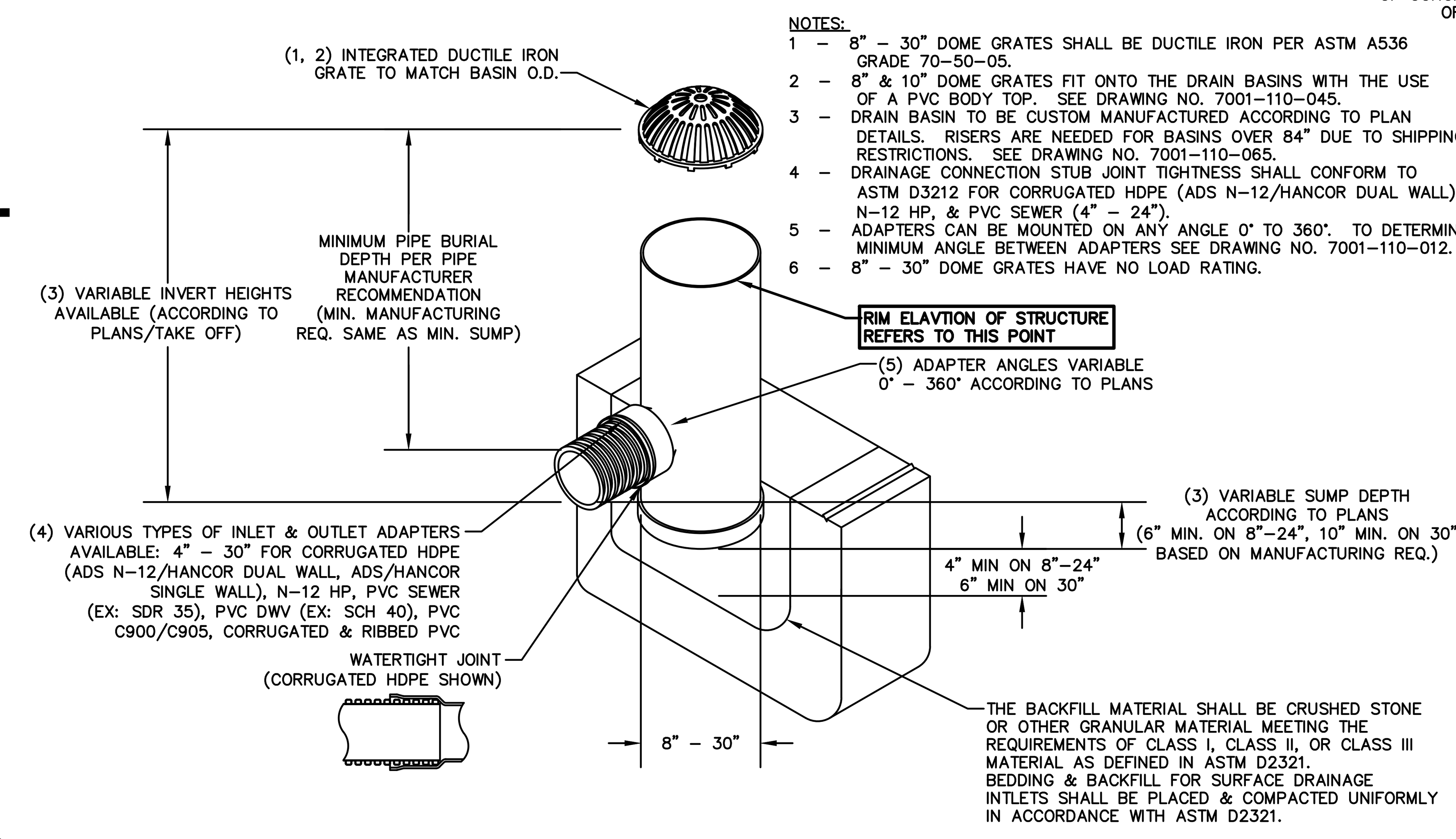
SECTION A-A

NOTES:
1. DIMENSIONS ARE FOR REFERENCE ONLY
2. ACTUAL DIMENSIONS MAY VARY
3. DIMENSIONS ARE IN INCHES
4. QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
5. PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
6. LOCKING DEVICE AVAILABLE UPON REQUEST

18" NYLOPLAST DOME GRATE

Nyloplast

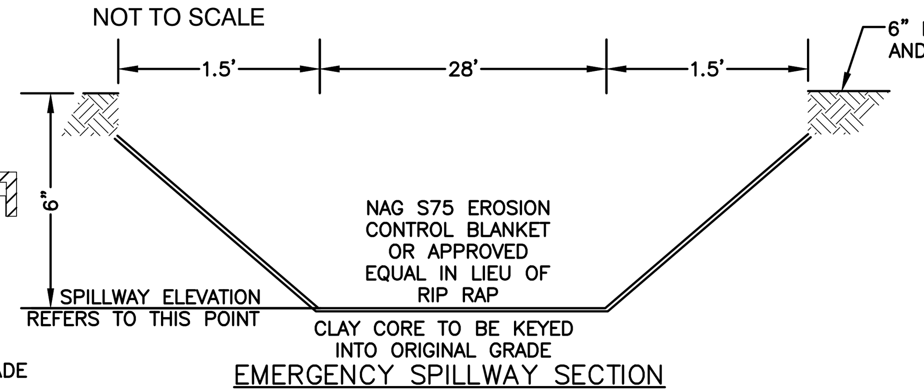
NOT TO SCALE



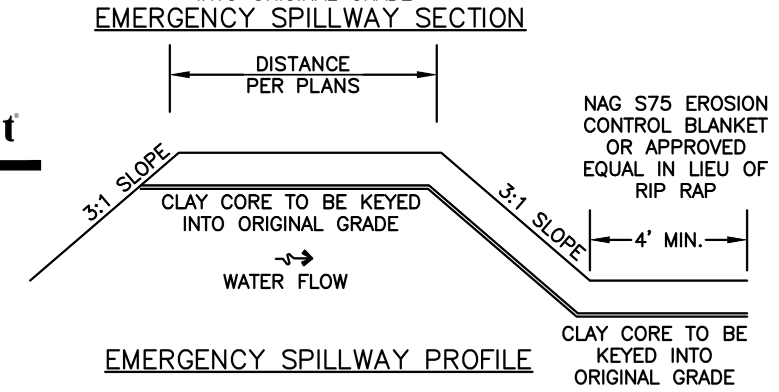
NOTES:
1 – 8" – 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 – 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 – DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 – DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 – ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 – 8" – 30" DOME GRATES HAVE NO LOAD RATING.

NYLOPLAST DRAIN BASIN (W/ DOME GRATE) (BIORETENTION RISER & YARD DRAIN SPECIFICATION)

NOT TO SCALE



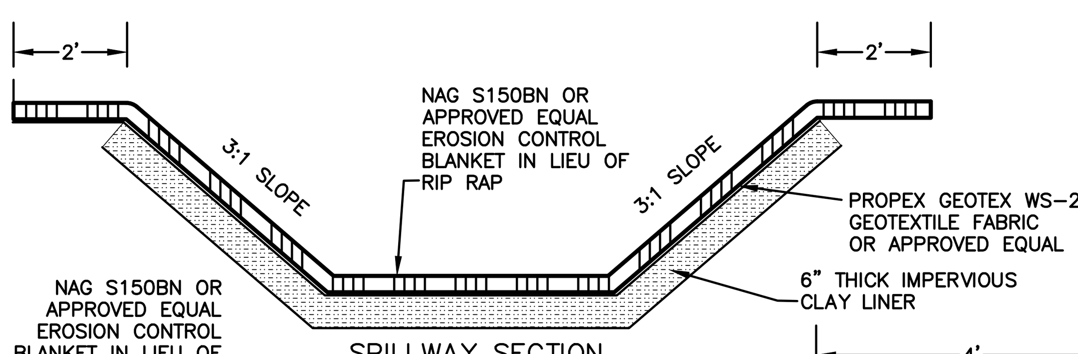
EMERGENCY SPILLWAY SECTION



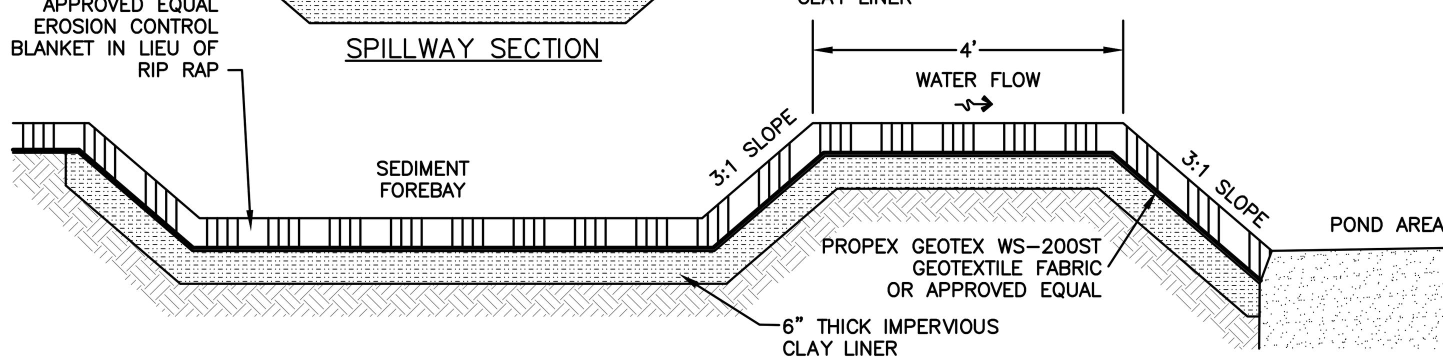
EMERGENCY SPILLWAY PROFILE

EMERGENCY SPILLWAY

NOT TO SCALE



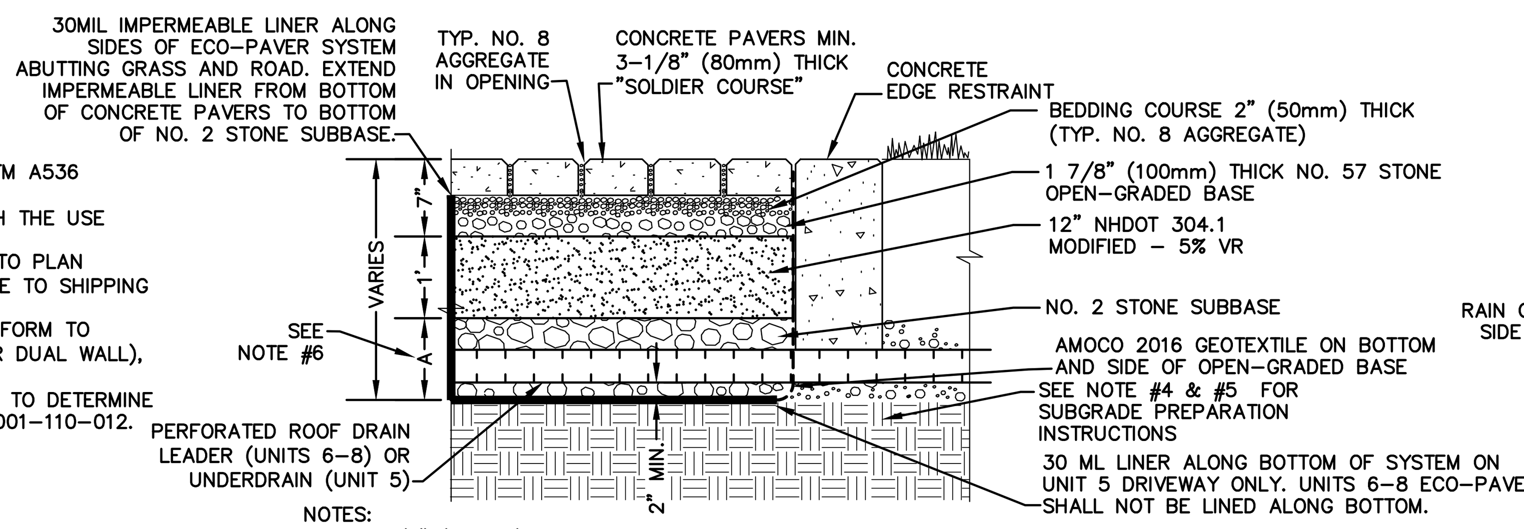
SPILLWAY SECTION



SPILLWAY PROFILE

SEDIMENT FOREBAY SPILLWAY

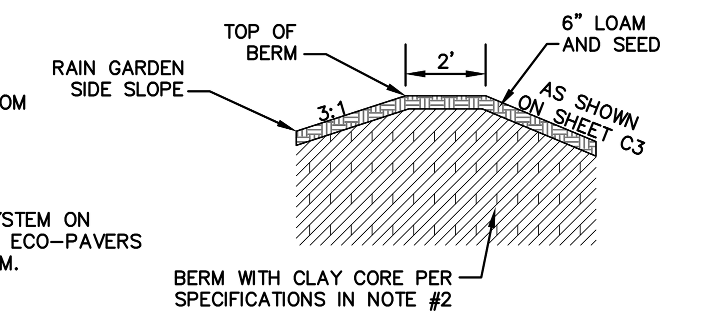
NOT TO SCALE



NOTES:
1. 2 3/8" (60 MM) THICK PAVERS MAY BE USED IN PEDESTRIAN APPLICATIONS.
2. NO. 2 STONE SUBBASE THICKNESS VARIES WITH DESIGN. CONSULT ICPI PERMEABLE INTERLOCKING CONCRETE PAVEMENT MANUAL.
3. INSTALLATION TO BE PERFORMED TO MANUFACTURER'S GUIDLINES AND THE PERMEABLE INTERLOCKING CONCRETE PAVEMENT SPECIFICATIONS.
4. THE EXISTING NATIVE SUBGRADE MATERIAL UNDER ALL BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT. WHERE EROSION OF THE NATIVE MATERIAL SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING AT THE BASE OF THE EXCAVATION, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES (15 CM) WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
5. BRING SUBGRADE OF STONE POROUS MEDIA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE PLACING OF THE STONE. THE SLOPE OF THE BOTTOM OF EXCAVATION SHALL PARALLEL THAT OF THE PROPOSED DRIVEWAY SURFACE.
6. UNIT 5: A=14"; UNIT 6: A=10"; UNIT 7: A=7"; UNIT 8: A=19"

PERMEABLE CONCRETE PAVER DETAIL ("ECO-PAVER")

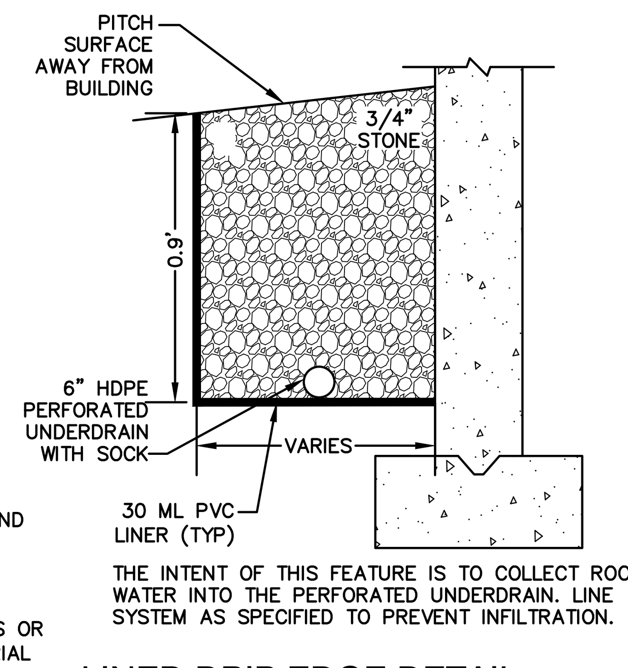
NOT TO SCALE



1. BERM SHALL BE CONSTRUCTED WITH A CLAY CORE AS DESCRIBED BELOW TO BE KEYED INTO ORIGINAL GRADE, AS WELL AS A FINE GEOTEXTILE, TO AVOID WATER SEEPAGE AND SOIL PIPING THROUGH THE EARTHEN DIVIDER.
2. MATERIAL FOR CLAY CORE 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

BIORETENTION BERM SECTION

NOT TO SCALE



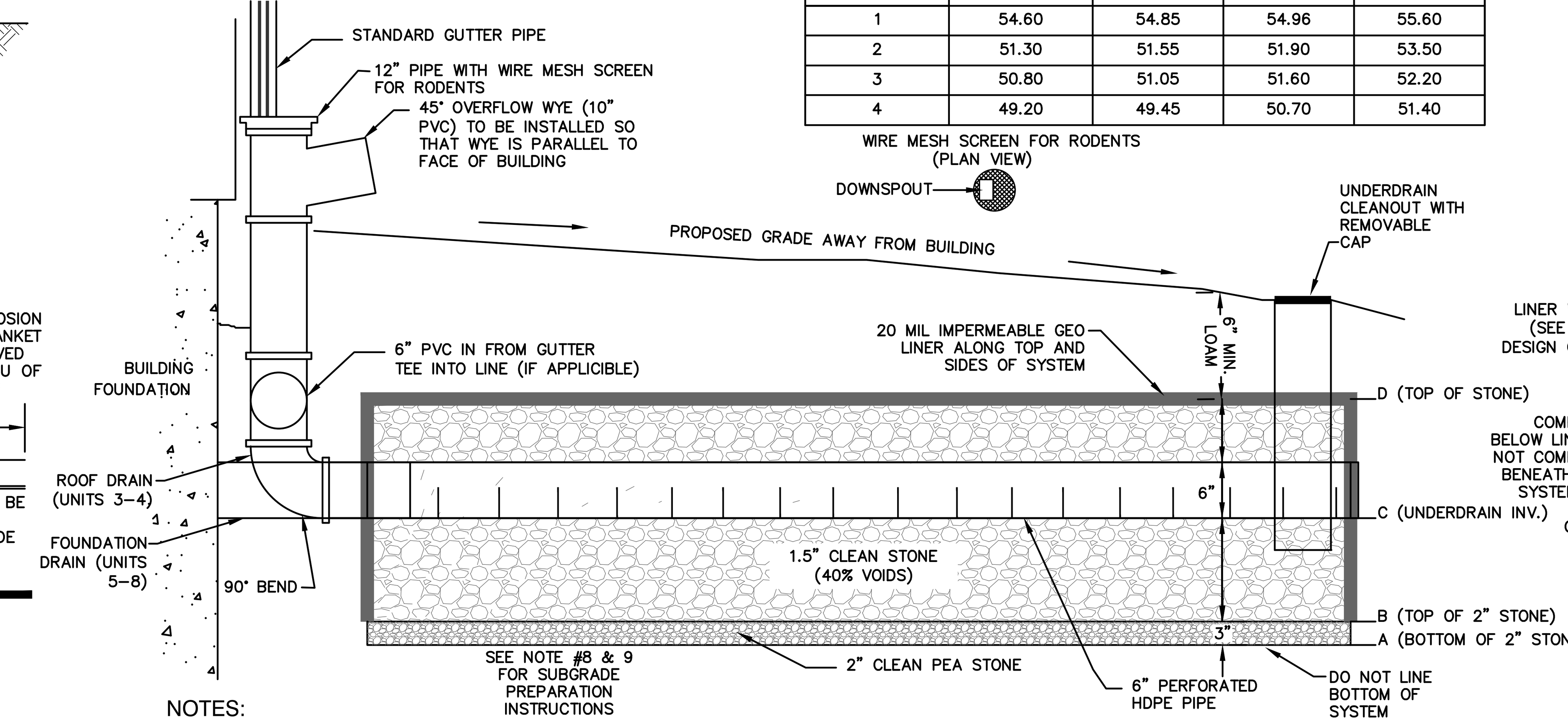
THE INTENT OF THIS FEATURE IS TO COLLECT ROOF WATER INTO THE PERFORATED UNDERDRAIN. LINE SYSTEM AS SPECIFIED TO PREVENT INFILTRATION.

LINED DRIP EDGE DETAIL

NOT TO SCALE

INFILTRATION SYSTEM ELEVATIONS

SYSTEM #	ELEV. A	ELEV. B	ELEV. C	ELEV. D
1	54.60	54.85	54.96	55.60
2	51.30	51.55	51.90	53.50
3	50.80	51.05	51.60	52.20
4	49.20	49.45	50.70	51.40



NOTES:
1. ONCE THE SYSTEM HAS BEEN CONSTRUCTED, IT SHOULD BE TESTED BY INSERTING A GARDEN HOSE INTO THE INLET AND ALLOWING THE WATER TO RUN FOR A MINIMUM OF ONE (1) HOUR. THE WATER SHOULD STAY UNDERGROUND WITHIN THE GRAVEL. IF WATER COMES OUT OF THE OVERFLOW, THE SYSTEM SHOULD BE FURTHER INSPECTED AND POSSIBLY REPLACED. THIS PROCEDURE SHOULD BE PERFORMED EVERY YEAR DURING THE FALL INSPECTION.
2. IN THE SPRING AND FALL, VISUALLY INSPECT THE AREA AROUND THE SYSTEM AND REPAIR ANY EROSION. USE SMALL STONES TO STABILIZE EROSION ALONG DRAINAGE PATHS. RE-MULCH ANY VOID AREAS BY HAND AS NEEDED. ALSO INSPECT THE ROOF COLLECTION AND PIPING AND CLEAN AND REPAIR AS NECESSARY.
3. KEEP HEAVY VEHICLES FROM DRIVING OR PARKING OVER THE SYSTEM.
4. FOR ALL DEPTHS OF COVER LESS THAN TWO (2) FEET, PIPE MUST BE SCHEDULE 40 PVC. FOR DEPTHS OF COVER GREATER THAN TWO (2) FEET, FLEXIBLE PIPE MAY BE USED. REFER TO SPECIFICATIONS FOR ALLOWABLE PIPE TYPES.
5. A WATERTIGHT CONNECTION SHALL BE MAINTAINED WITH ANY TRANSITION FROM SCHEDULE 40 PVC PIPE TO ANY OTHER PIPE TYPE.
6. THE DOWNSPOUT DRAIN LEADING INTO THE INFILTRATION PRACTICE AS WELL AS THE PERFORATED PVC UNDERDRAIN SHALL BE INSTALLED BEFORE THE DOWNSPOUTS ARE INSTALLED ON THE BUILDINGS. SITEWORK CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK INCLUDING THE RODENT SCREEN. BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION AT THE POINT OF THE RODENT SCREEN.
7. OVERFLOWS ARE TO BE INSTALLED ON EXTERIOR DOWNSPOUT LEADERS ONLY.
8. THE EXISTING NATIVE SUBGRADE MATERIAL UNDER ALL BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT. WHERE EROSION OF THE NATIVE MATERIAL SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING AT THE BASE OF THE EXCAVATION, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES (15 CM) WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
9. BRING SUBGRADE OF STONE POROUS MEDIA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE PLACING OF THE STONE. THE BOTTOM OF EXCAVATION SHALL BE LEVEL PRIOR TO INSTALLATION OF THE POROUS STONE MEDIA.
10. UNITS 3&4: STONE INFILTRATION IS FOR ROOF WATER ONLY. UNITS 5-8: STONE INFILTRATION IS FOR FOUNDATION DRAINAGE ONLY. DO NOT TIE ROOF LEADERS FROM UNITS 5-8 INTO THESE SYSTEMS.

SUBSURFACE STONE INFILTRATION BED DETAIL

NOT TO SCALE

BIORETENTION SYSTEM ELEVATIONS

BIORETENTION	SIZE OF BOTTOM (S.F.)	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F	SHWT	LEDGE
1	502	55.0	N/A	53.75	52.25	52.0	51.25	51.13	< 49.55 *
2	1,080	51.5	51.0	49.25	47.75	47.5	46.42	46.25	< 44.42 *

* TEST PITS TERMINATED AT THESE DEPTHS BELOW REFERENCE POINT WITHOUT ENCOUNTERING LEDGE.

SAND SPECIFICATION

SIEVE SIZE	% BY WEIGHT
3"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#60	10-30
#100	2-10
#200	0-5

TOPSOIL SPECIFICATION

LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.

MULCH SPECIFICATION

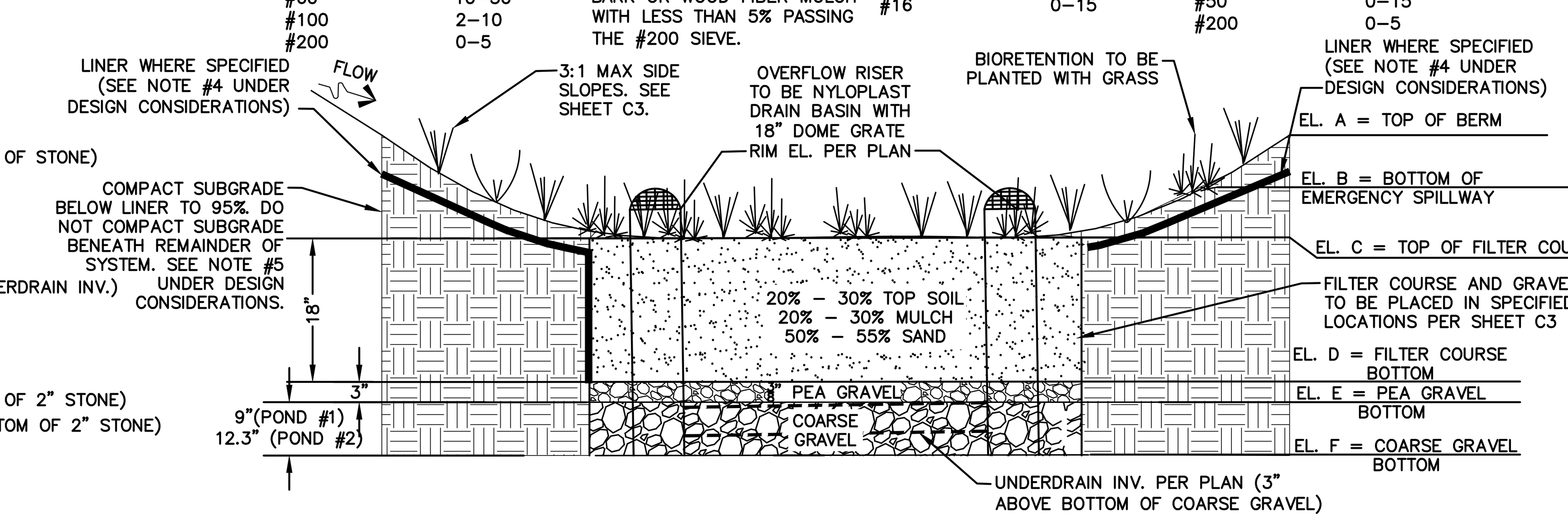
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

PEA GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
½"	100
⅜"	85-100
#4	10-30
#8	0-10
#16	0-15

COARSE GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	90-100
¾"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5



DESIGN CONSIDERATIONS

1. DO NOT DIRECT RUNOFF TO THE BIORETENTION SYSTEMS UNTIL IT HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN-OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
4. ONLY PLACE FILTER MEDIA AND STONE BENEATH DOTTED HATCH AREA ON SHEET C3. REMAINDER OF POND TO BE LINED WITH 30ML LINER 6" BELOW SURFACE. FILTER MEDIA AND STONE SECTIONS ARE NOT TO BE LINED. LINER SHALL CONTINUE DOWN THE SIDES OF THE FILTER COURSE BUT MUST NOT BE PLACED ON THE SIDES OF THE PEA GRAVEL OR COARSE GRAVEL OR PLACED BENEATH THE FILTER COURSE AND/OR GRAVELS.
5. THE EXISTING NATIVE SUBGRADE MATERIAL SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE PLACEMENT. IF SOIL MEDIA OR SUBGRADE IS OVER COMPACTED, DISTURBED, OR CONTRAMINATED BY FOREIGN OR DELETERIOUS MATERIALS OR LIQUIDS, REMOVE THE SOIL MEDIA AND CONTAMINATION; RESTORE THE SUBGRADE AS DIRECTED BY ENGINEER AND REPLACE CONTAMINATED SOIL MEDIA WITH NEW SOIL MEDIA.
6. IN ADDITION TO DESIGN CRITERIA LISTED HERE, REFER TO GUIDELINES LISTED IN UNIVERSITY OF NEW HAMPSHIRE (UNH) STORMWATER CENTER BIORETENTION SOIL SPECIFICATION.
7. BIORETENTION SYSTEM #1 HAS A SEDIMENT FOREBAYS FOR PRE-TREATMENT AND BIORETENTION SYSTEM #2 HAS A PRETX CURB INLET STRUCTURE FOR PRE-TREATMENT.

MAINTENANCE REQUIREMENTS:

1. SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
2. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
3. AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72 HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
4. VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

BIORETENTION SYSTEM

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 01/05/22	
Checked: JAC	Scale: AS NOTED	Project No.: 21254	
Drawing Name: 21254-PLAN.dwg			

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

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

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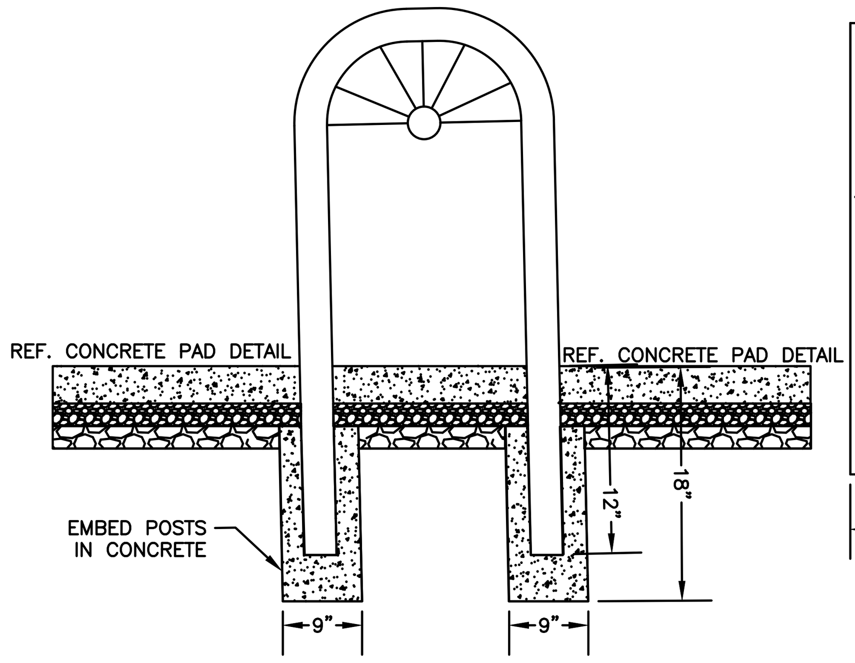
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746 FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

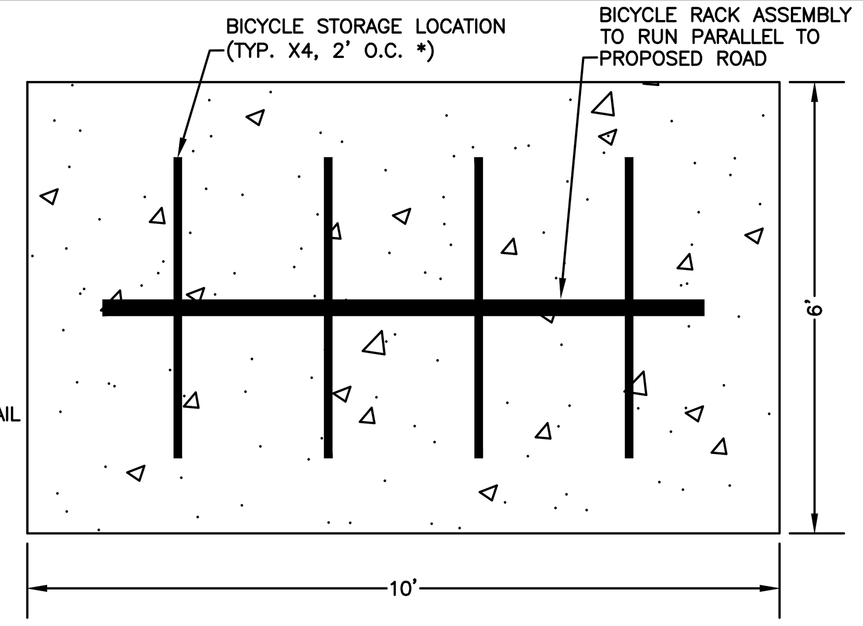
Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.

D4

SHEET 15 OF 23
JBE PROJECT NO. 21254

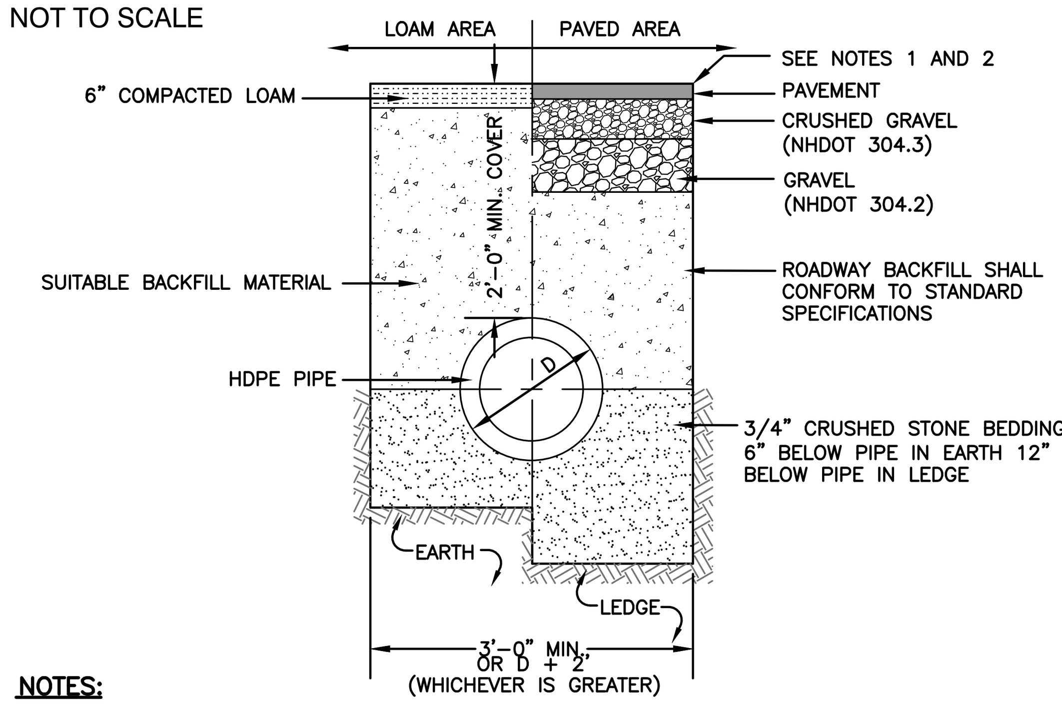




BICYCLE RACK PLAN VIEW (NOT TO SCALE)
* SEPARATION BETWEEN BICYCLE LOCATIONS MAY VARY PER PRODUCT SPECIFICATIONS AS LONG AS 4 BICYCLES CAN BE STORED ON 6'x10' CONCRETE PAD.

BICYCLE RACK

NOT TO SCALE

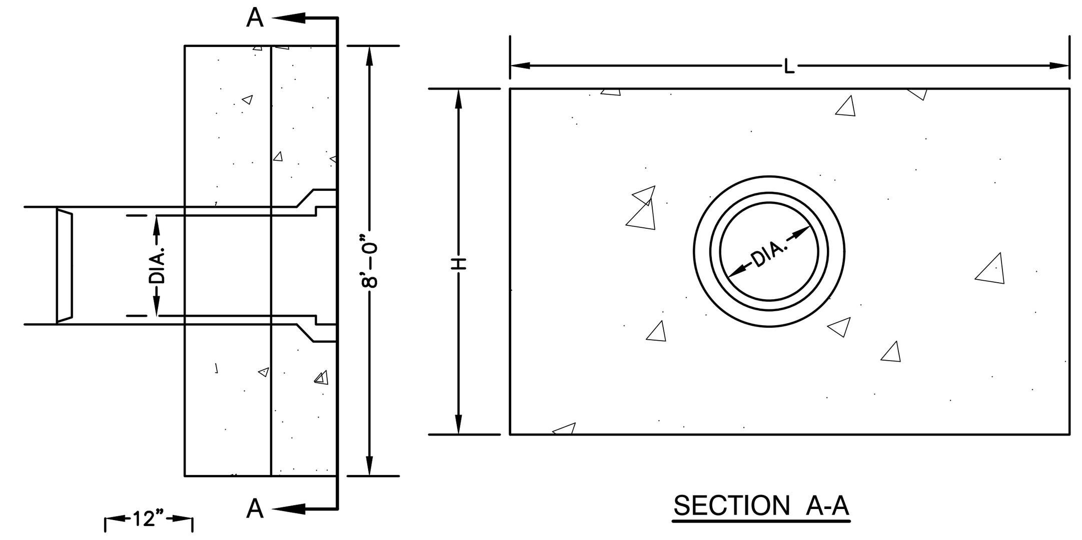


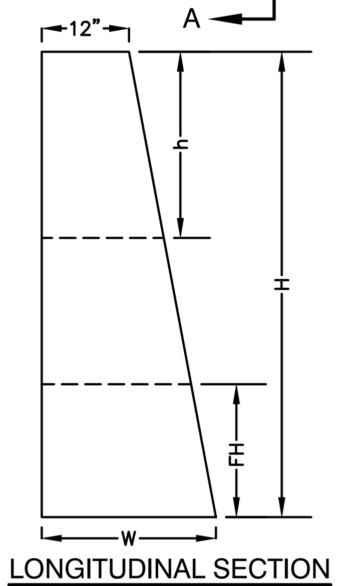
NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM WITH PROJECT AND TOWN SPECIFICATIONS.
3. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

DRAINAGE TRENCH

NOT TO SCALE





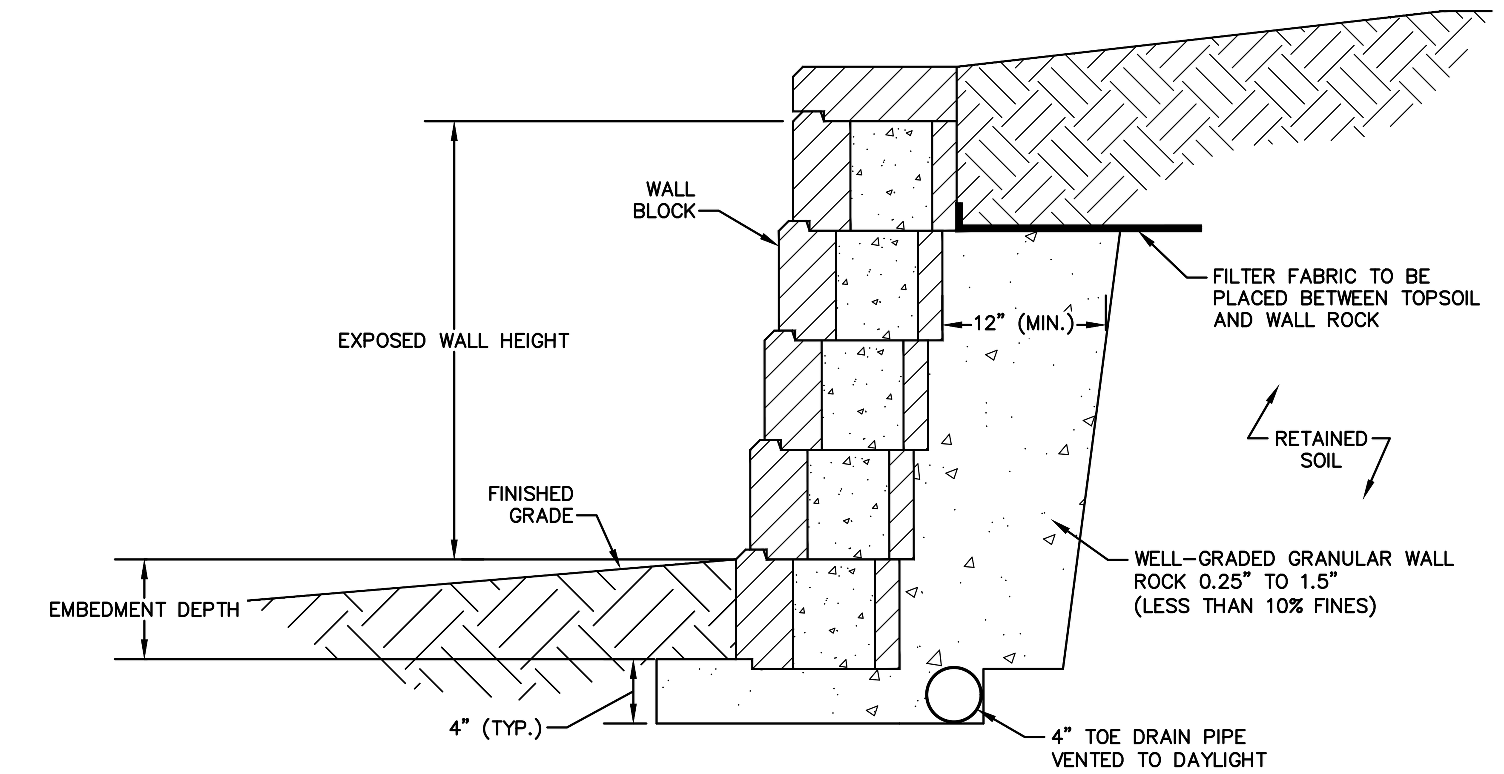
DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
8"	2'-0"	1'-6"	0'-6"	0'-3"	VARIES
12"	4'-2"	3'-9"	1'-6"	1'-3"	1'-11"
15"	5'-11"	4'-2"	1'-6"	1'-5"	2'-0"
18"	6'-11"	4'-5"	1'-6"	1'-5"	2'-1"
24"	8'-10"	4'-11"	1'-6"	1'-5"	2'-3"

NOTES:

1. ALL DIMENSIONS GIVEN IN FEET & INCHES.
2. PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
3. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS. CEMENT TO BE TYPE III PER ASTM C-150. REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
4. 1" THREADED INSERTS PROVED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

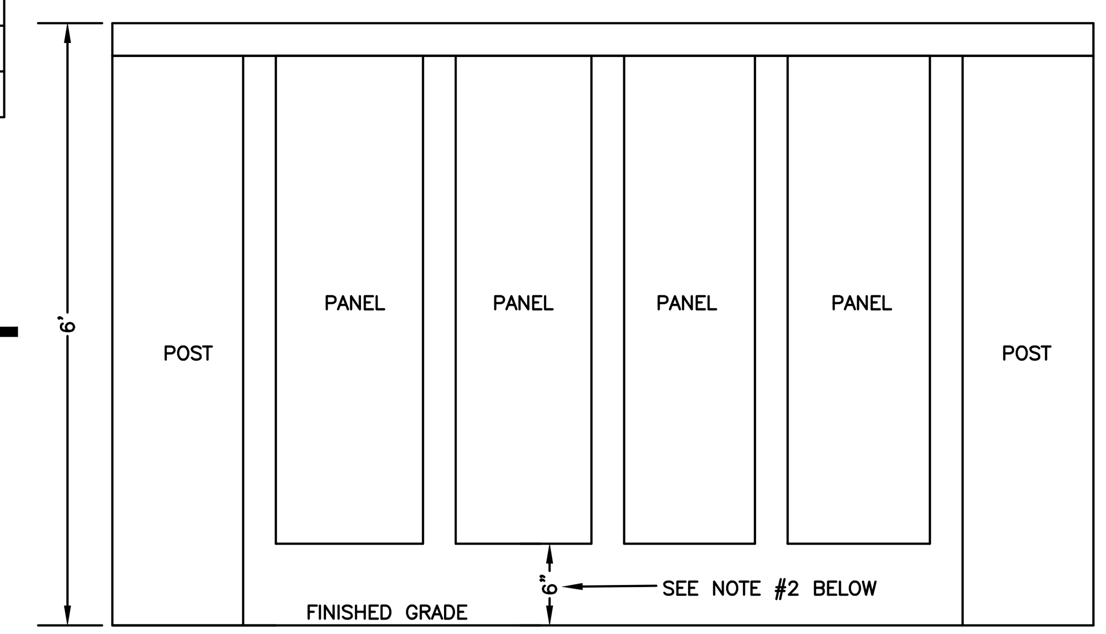
NOT TO SCALE



THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE TO DESIGN THE PROPOSED RETAINING WALL. JONES & BEACH ENGINEERS, INC. DOES NOT ACCEPT ANY LIABILITY FOR THE STRUCTURAL DESIGN AND/OR INSTALLATION OF THE WALL. THIS DETAIL IS INTENDED TO PROVIDE AN EXAMPLE OF THE RETAINING WALL FOR PLANNING PURPOSES ONLY AND IS SPECIFICALLY NOT INTENDED FOR USE BY THE CONTRACTOR IN ANY CONSTRUCTION-RELATED ACTIVITY.

TYPICAL GRAVITY WALL DETAIL

NOT TO SCALE



1. THE INTENT OF THIS DETAIL IS TO SHOW THE REQUIRED CLEARANCE FROM FINISHED GRADE TO THE BOTTOM OF THE WOODEN PANELS ON THE PROPOSED FENCE. THIS DETAIL SHALL NOT CONSTRUE A REQUIREMENT WITH REGARDS TO POST OR PANEL PLACEMENT ALONG THE LENGTH OF THE FENCE.
2. A 6" CLEARANCE MUST BE PROVIDED BETWEEN FINISHED GRADE AND THE BOTTOM OF WOODEN PANELS ON THE FENCE BEHIND BIORETENTION #2 EMERGENCY SPILLWAY. HOWEVER, 6" CLEARANCE IS NOT NECESSARY FOR THE FENCE ATOP THE RETAINING WALL BEHIND UNIT 6.

6' HIGH WOODEN FENCE DETAIL

NOT TO SCALE

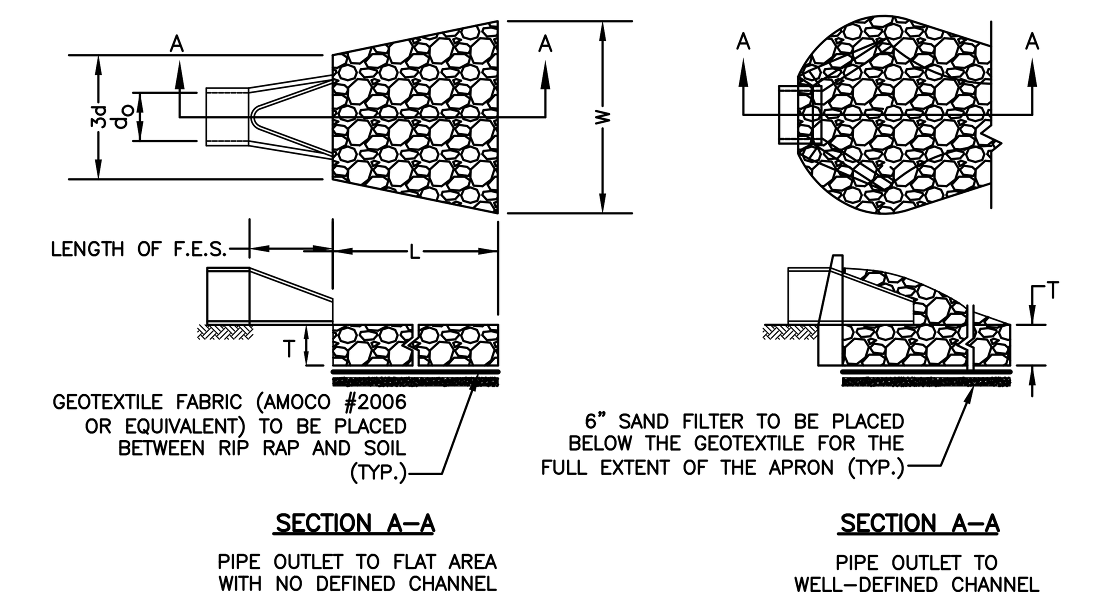


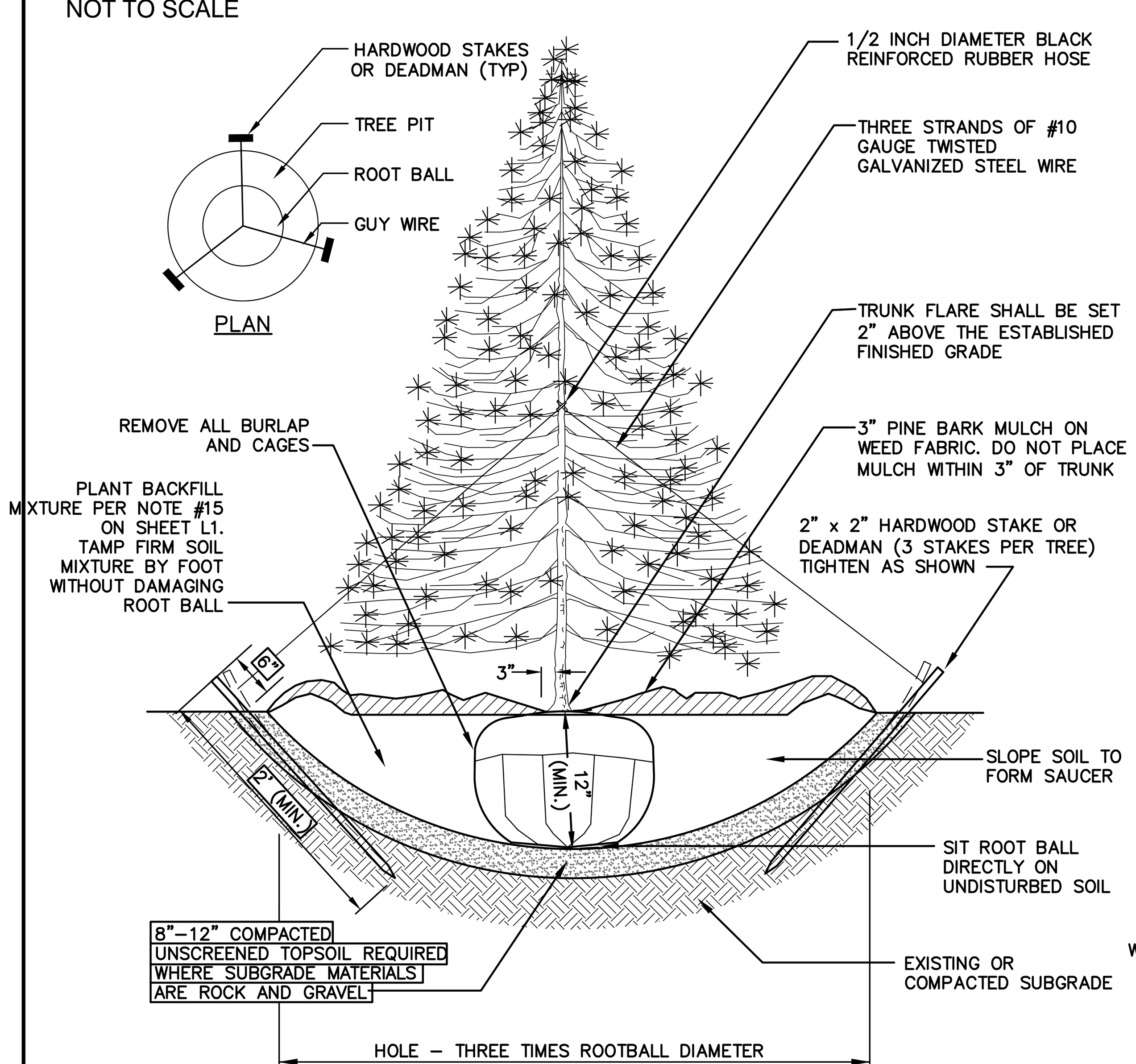
TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES		
THICKNESS OF RIP RAP = 1.5 FEET		
d50 SIZE= 0.25	FEET	3 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO
100%	5	6
85%	4	5
50%	3	5
15%	1	2

NOTES:

1. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. OUTLETS TO A DEFINED CHANNEL SHALL HAVE 2:1 OR FLATTER SIDE SLOPES AND SHOULD BEGIN AT THE TOP OF THE CULVERT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.
6. MAINTENANCE: THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

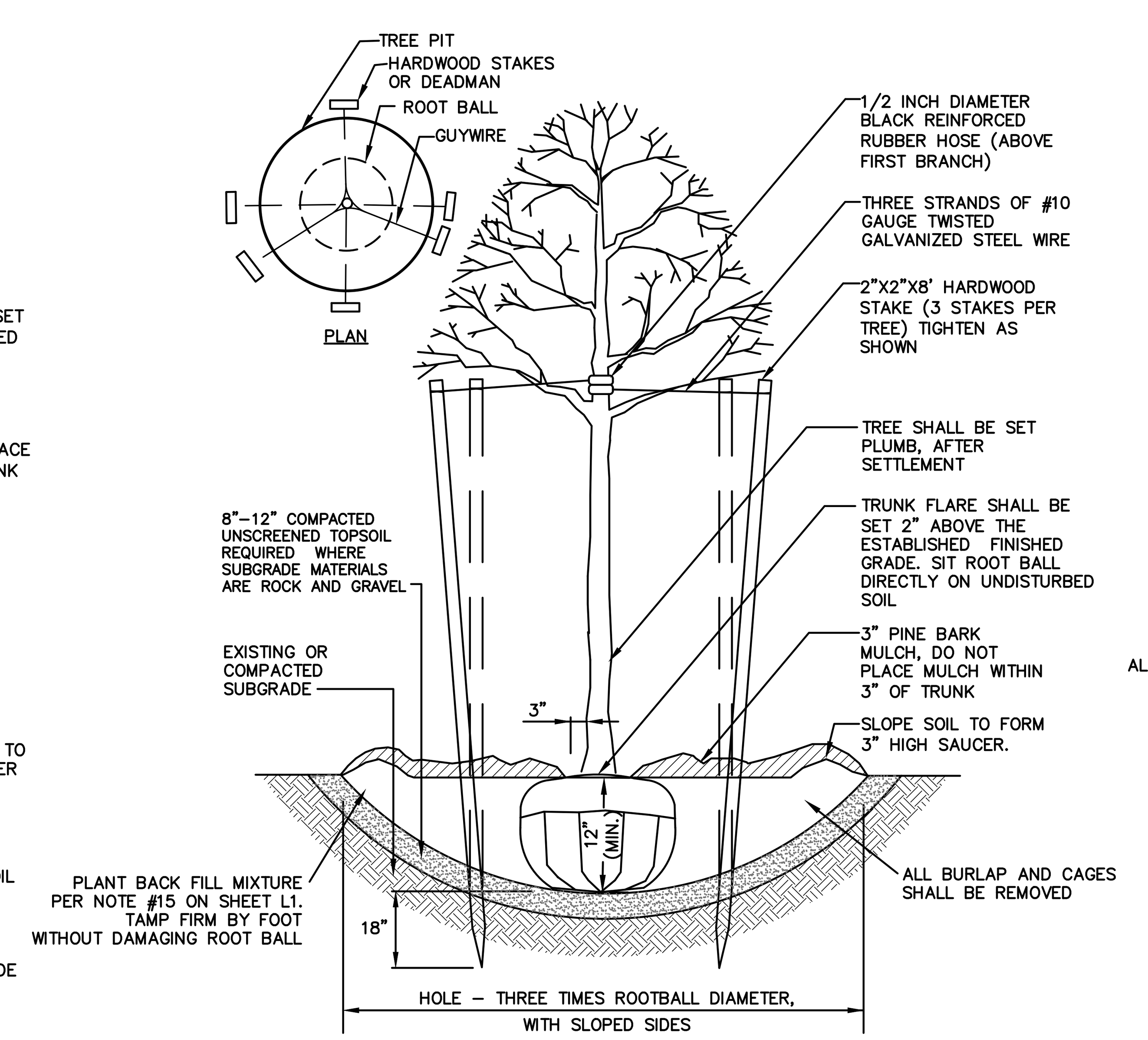
RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE



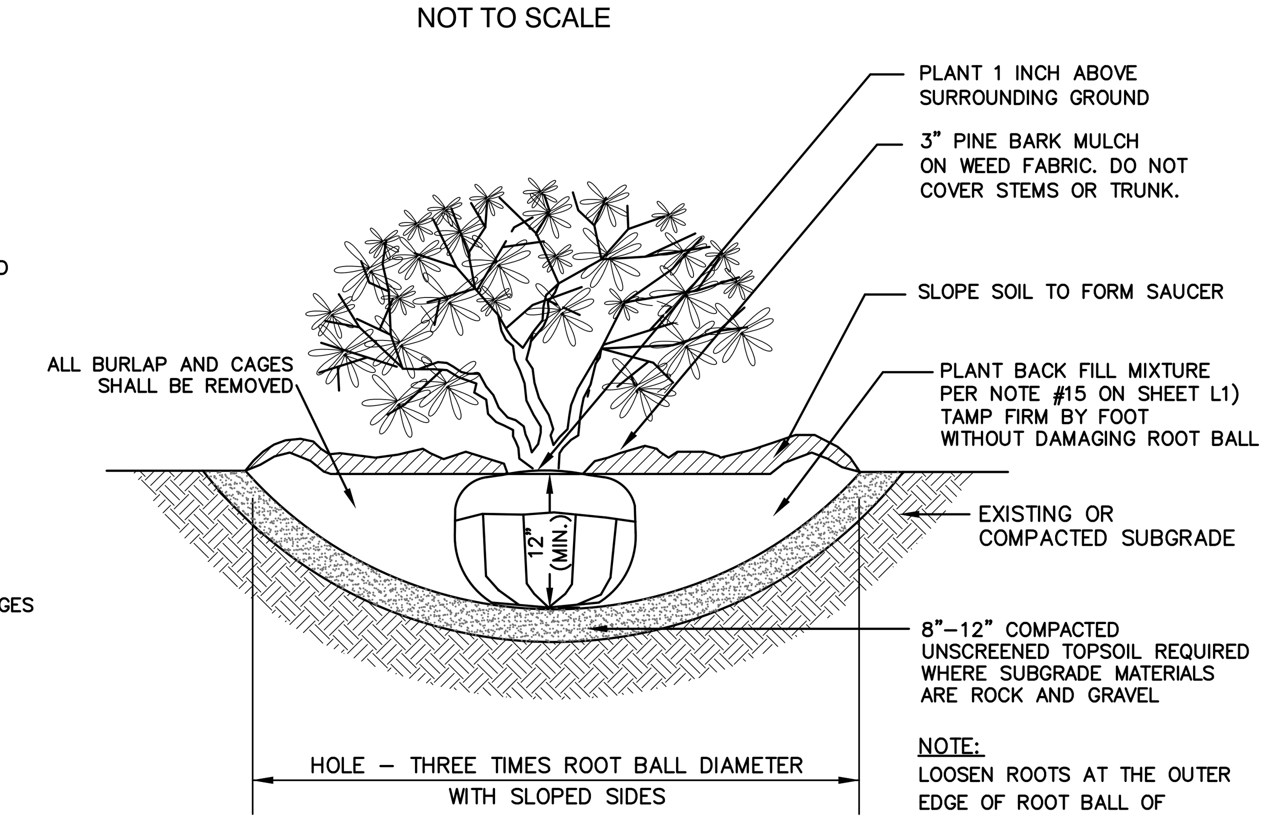
EVERGREEN PLANTING

NOT TO SCALE



TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE



NOTE:
LOOSEN ROOTS AT THE OUTER EDGE OF ROOT BALL OF CONTAINER GROWN SHRUBS.

SHRUB PLANTING

NOT TO SCALE

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Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

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STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

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Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

DRAWING No.
D5
SHEET 16 OF 23
JBE PROJECT NO. 21254

PRETX SPECIFICATIONS

A. GENERAL

1. PRETX SYSTEMS ARE A PRE-FILTER AND CRITICAL MAINTENANCE DEVICE THAT EXTENDS THE OPERATING LIFE AND REDUCES THE MAINTENANCE BURDEN OF BIORETENTION SYSTEMS, RAIN GARDENS, BIOSWALES AND OTHER TYPES OF SURFACE BEST MANAGEMENT PRACTICES BY FILTERING OUT SEDIMENT, TRASH AND DEBRIS AT THE INLET.

B. PRODUCTS

1. PRETX IS AVAILABLE IN 3 MODELS THAT MANAGE MOST BIORETENTIOIN INLET CONFIGURATIONS: CURB, DROP, AND INLINE.
2. PRETX-CURB IS FOR EDGE OF PAVEMENT RUNOFF AT A CURB CUT IN LIEU OF A STONE SPREADER.
3. PRETX-DROP IS FOR USE AS A DROP INLET CONFIGURATION ALONG A CURB LINE AND WOULD BE INSTALLED WITH A STANDARD DROP INLET GRATE.
4. PRETX-INLINE IS FOR USE WITH SUBSURFACE INLET AND OUTLET PIPE.
5. PRETX IS SIZED TO PRETREAT WATER QUALITY FLOWS AND BYPASS LARGER FLOWS THAT HAVE MINIMAL TRASH AND DEBRIS. PRETX CAN BE USED BOTH IN RETROFIT OR NEW INSTALLATIONS.
6. ACCEPTABLE SYSTEM SUPPLIER:
   CONVERGENT WATER TECHNOLOGIES, INC. OR ITS AUTHORIZED VALUE-ADDED RESELLER
   (800) 711-5428
   WWW.CONVERGENTWATER.COM

C. SUBMITTALS

1. SUBMIT PROPOSED LAYOUT DRAWINGS. DRAWINGS SHALL INCLUDE TYPICAL SECTION DETAILS ANNOTED WITH SYSTEM ELEVATIONS (E.G., RIM, PIPE INVERTS, OUTSIDE BOTTOM OF STRUCTURE, ETC.).
2. SUBMIT MATERIAL CERTIFICATES FOR FRAMES AND COVERS
3. ANY PROPOSED EQUAL ALTERNATE PRODUCT SUBSTITUION TO THIS SPECIFICATON MUST BE SUBMITTED FOR REVIEW AND APPROVED PRIOR TO BID OPENING.

D. EXECUTION

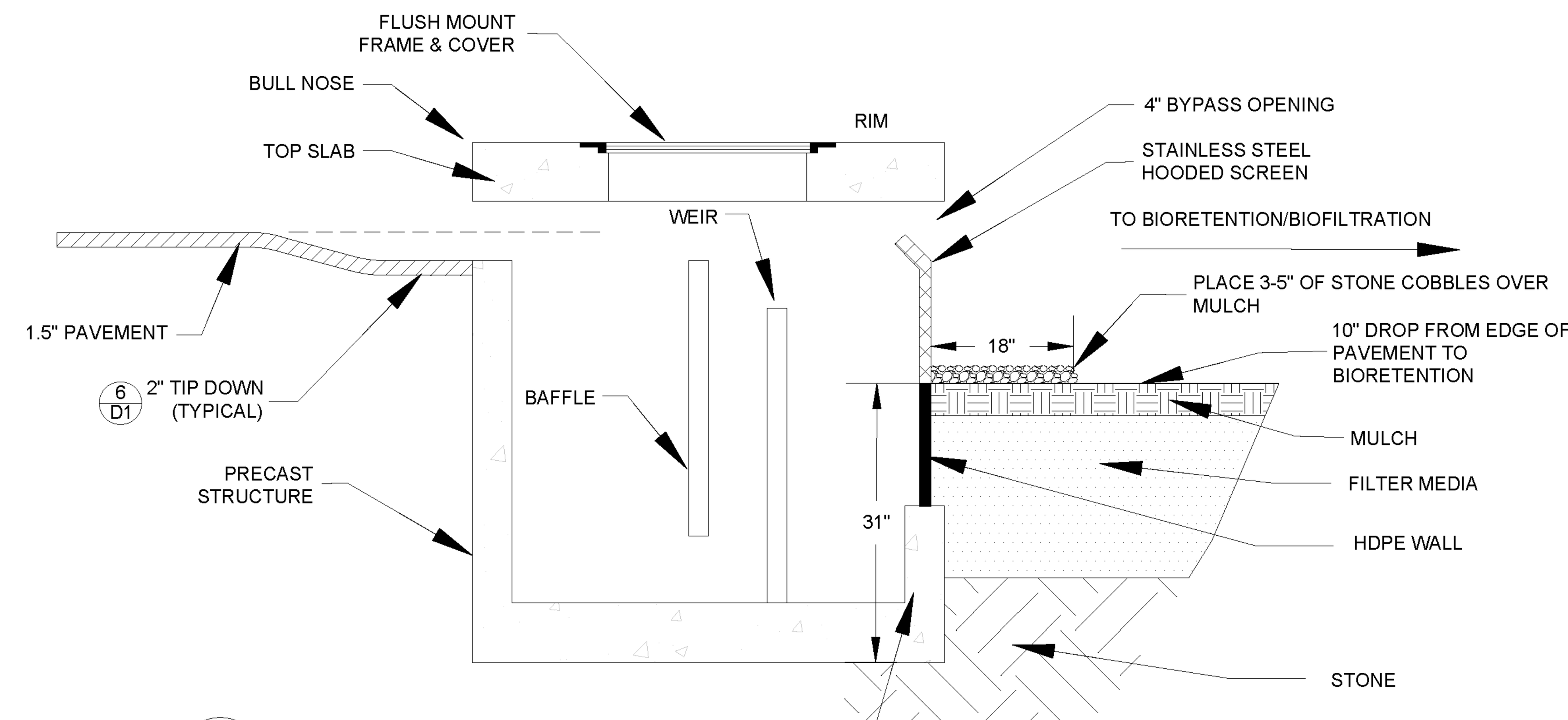
1. All PUBLIC STORM DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS AND ACCORDING TO LOCAL MUNICIPAL REQ UIREME NTS.
2. All STORM DRAINAGE SYSTEM CONSTRUCTION IS SUBJECT TO INSPECTION AND APPROVAL BY THE PROJECT ENGINEER.
3. THE CONTRACTOR SHALL NOTIFYTHE PROJECT ENGINEER A MINIMUM OF TWO FULL BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTIO N.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND OBTAINING APPROVAL FROM DIG-SAFE AND DETERMINING THE LOCATION OF All UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION/ EXCAVATI ON AND SHALL NOTIFY THE PROJECT ENGINEER OF ANY POTENTIAL CONFLICTS.
5. TO PROTECT STORMWATER FLOW CONTROL AND QUALITY TREATMENT FACILITIES FROM SEDIMENTATION, THEY SHALL BE CONNECTED TO THE STORM CONVEYANCE SYSTEM ONLY AFTER ALL SITE WORK, ROAD CONSTRUCTION, UTILITY WORK AND LANDSCAPING ARE IN PLACE IN ALL AREAS ABOVE AND UPSTREAM OF THE FACILITY.
6. THE EXISTING STORM SEWER SYSTEM SHALL STAY ISOLATED FROM THE NEW SYSTEM UNTIL THE NEW SYSTEM IS CLEANED, AND APPROVED FOR USE. THERE SHALL BE NO DEBRIS IN THE LINES OR FURTHER CLEANING Will BE REQUIRED PRIOR TO ACCEPTANCE.
7. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR
8. THE OPENING SHALL BE MEASURED ATTHE TOP OF THE PRECAST BASE SECTION.
9. All PICKUP HOLES SHALL BE GROUTED FULL AFTER THE BASIN HAS BEEN PLACED.
10. STANDARD CURB INLETS AND TIPDOWNS SHALL BE PRECAST CONCRETE OR ASPHALT.
11. PIPE ENDS SHALL BE FLUSH WITH THE INNER WALL OR 1" MAXIMUM INTRUSION. MASONRY, CINDER BLOCKS, OR SIMILIAR MATERIALS MA Y BE USED TO ADJUST THE RISERS TO GRADE PRIOR TO GROUTING.
12. GROUTING SHALL BE SUFFICIENTTO PREVENT LEAKS BETWEEN THE PRECAST COMPONENTS OF THE COMPLETED STRUCTURE & SHALL BE PERFORMED INSIDE, BETWEEN & OUTSIDE OF All RISERS, JOINTS & PIPE PENETRATIONS.
13. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
14. All REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. All PRECAST CONCRETE SHALL BE CLASS 4000.
15. RECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
16. MATING SURFACES OF MANHOLE RINGS AND COVERSSHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITIONS.

E. CONSTRUCTION AND SEQUENCING

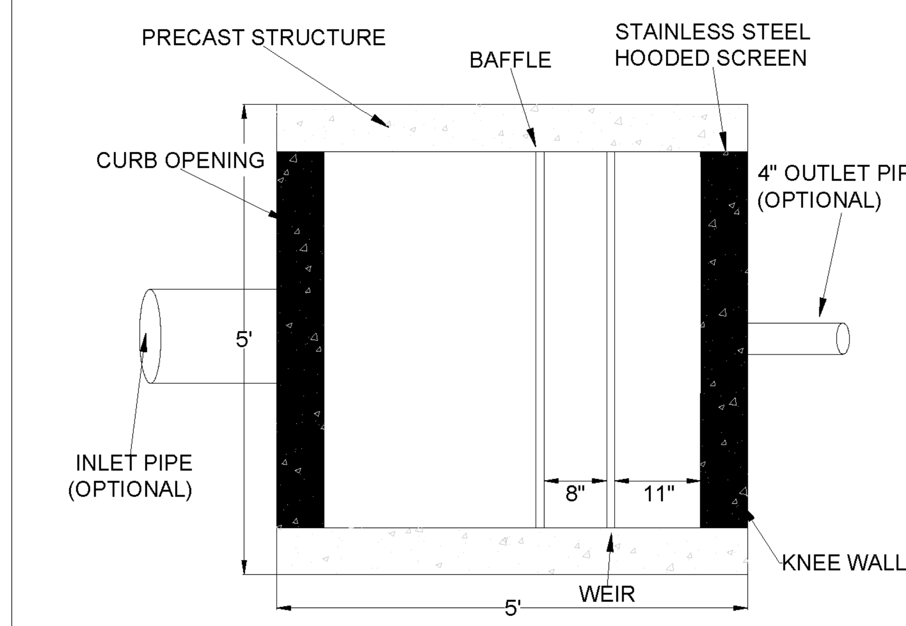
1. EXAMINATION
   A. VERIFY LAYOUT AND ORIENTATION OF PRE-TX SYSTEM AREA INCLUDING EDGE OF PAVEMENT, TIP DOWN, CURBS AND SIDEWALK, BIOFILTRATION SYSTEM, AND CONNECTIONS.
   B. VERIFY EXCAVATION BASE IS READY TO RECEIVE WORK AND EXCAVATIONS, DIMENSIONS, AND ELEVATIONS ARE AS INDICATED ON DRAWINGS.
2. PREPARATION
   A. CALL DIG SAFE AND RECEIVE APPROVAL BEFORE PERFORMING WORK.
   B. REQUEST UNDERGROUND UTILITIES TO BE LOCATED AND MARKED WITHIN AND SURROUNDING CONSTRUCTION AREAS.
   C. IDENTIFY REQUIRED LINES, LEVELS, CONTOURS, AND DATUM.
   D. CLEAR AND GRUB THE PROPOSED PRE-TX SYSTEM AREA.
3. EXCAVATION AND INSTALLATION
   A. THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE USED AS A GENERAL GUIDELINE. COORDINATE WITH THE OWNER, AND ENGINEERS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
   B. INSTALL TEMPORARY EROSION AND SEDIMENT CONTROLS TO DIVERT STORM WATER AWAY FROM THE PRE-TX SYSTEM AREA.
   C. EXCAVATE TO THE BOTTOM INVERT OF THE SYSTEM.
   D. TO MINIMIZE COMPACTION OF ADJACENT BIOFILTRATION SYSTEMS, WORK EXCAVATORS OR BACKHOES FROM THE SIDES TO EXCAVATE THE PRE-TX SYSTEM AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS.
   E. ROUGH GRADE THE PRE-TX SYSTEM AREA DURING GENERAL CONSTRUCTION. EXCAVATE THE PRE-TX SYSTEM FACILITIES TO WITHIN 1 FOOT OF STRUCTURE BOTTOM .
   F. PLACE 1 FOOT BED OF COARSE STONE TO ELEVATION OF BASE OF STRUCTURE.
   G. ESTABLISH ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT AND TIP DOWN, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS AS INDICATED ON DRAWINGS.
4. INSTALLATION
   A. PLACE THE PRECAST SYSTEM TO NECESSARY ELEVATION.
   B. VERIFY ELEVATIONS FOR ADJACENT CURBS, EDGE OF PAVEMENT, PAVEMENT GRADING FOR INLET GRATE FOR PRETX-DROP, SIDEWALK, PIPE INVERTS FOR INLETS AND OUTLETS, OUTLET INVERT FOR KNEE WALL.
   C. FOR PRETX-SURFACE:
      a. VERIFY ELEVATIONS FOR ADJACENT CURBS.
      b. VERIFY EDGE OF PAVEMENT TIP DOWN PAVEMENT GRADING FOR INLET GRATE.
      c. VERIFY CURB ELEVATION IN RELATION TO PAVEMENT AND TIP DOWN.
      d. VERIFY OUTLET INVERT FOR KNEE WALL IN RELATION TO FILTER MEDIA.
   D. FOR PRETX-DROP:
      a. VERIFY ALL INLET PIPES ENTER THE STRUCTURE UPSTREAM OF BAFFLE.
      b. VERIFY FRAME AND GRATE OFFSET ON INLET SIDE AND UPSTREAM OF BAFFLE.
      c. VERIFY CURB LOCATION WITH RESPECT TO FRAME AND GRATE ORIENTATION.
   E. INSTALL BAFFLES, WEIR, AND SCREENS AS INDICATED ON DRAWINGS.
   F. VERIFY MAINTENANCE ACCESS THROUGH GRATE OR COVER AND CLEARANCE FOR VACTOR.
   G. INSTALL TOP OF STRUCTURE LEVEL WITH ADJACENT CURB OR SIDEWALK AS PER MANUFACTURERS SPECIFICATIONS. ENGINEER FIELD VISIT REQUIRED PRIOR TO BACKFILLING.
5. BACKFILLING
   A. BACKFILL WITH APPROVED SOIL AND STONE TO THE DESIGN GRADE AS SPECIFIED IN THE DRAWINGS.
   B. BACKFILL WITH 12" OF NO. 57 STONE AROUND REAR, LEFT, AND RIGHT SIDES TO LEVEL WITH TOP OF HDPE SCREEN.
   C. BACKFILL WITH BIORETENTION SOIL MIX BEYOND STONE BACKFILL TO EQUAL ELEVATION OF THE TOP OF HDPE SCREEN.
   D. DO NOT BACKFILL SOIL OR STONE AGAINST STAINLESS SCREEN.
   E. DO NOT COMPACT ADJACENT FILTRATION SYSTEM SOIL WITH MECHANICAL EQUIPMENT.
   F. STABILIZE All REMAINING DISTURBED AREAS AND SIDE SLOPES WITH SEEDING, HYDROSEEDING, AND/ OR者EROSION CONTROL BLANKETS AS INDICATED ON DRAWINGS.
6. CLEAN UP
   A. AFTER COMPLETION OF THE WORK, REMOVE AND PROPERLY DISPOSE ALL DEBRIS, CONSTRUCTION MATERIA LS, RUBBISH, EXCESS SOIL, ETC., FROM THE PROJECT SITE. REPAIR PROMPTL Y ANY IDENTIFIED DEFICIENCIES AND LEAVE THE PROJECT SITE IN A CLEAN AND SATISFACTORY CONDITION.

PRETX-CURB ELEVATION GUIDE

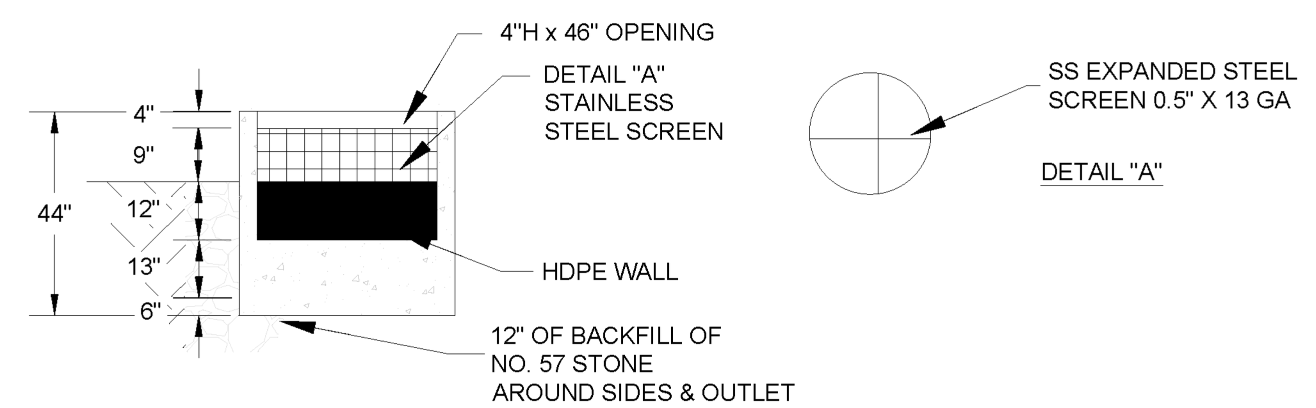
POINT	DESCRIPTION	HEIGHT IN REFERENCE TO PT. A
A	EDGE OF PAVEMENT	0 INCHES
B	OUTSIDE TOP SLAB	8 INCHES
C	TOP OF BIORETENTION	12 INCHES
D	SUMP INVERT	36 INCHES
E	OUTSIDE BOTTOM	42 INCHES



1 PRETX CURB DETAIL D1
NOT TO SCALE

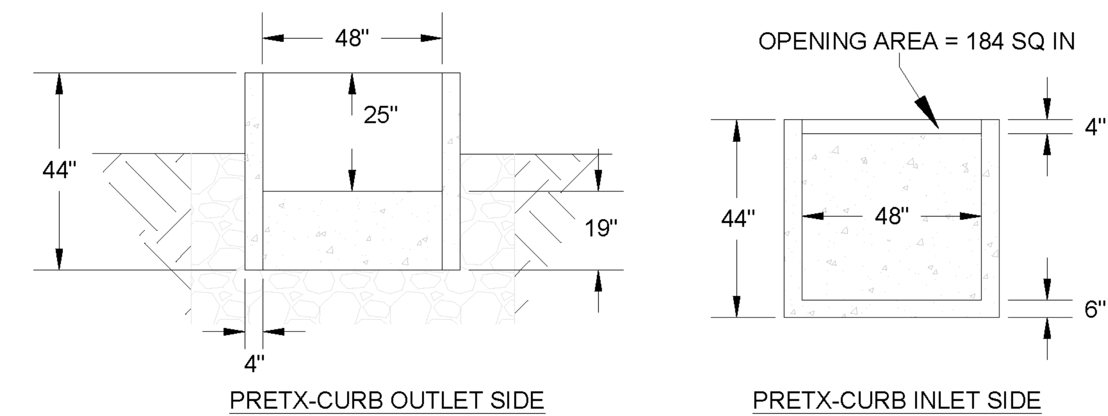


2 PRETREATMENT CATCH BASIN PLAN VIEW D1
NOT TO SCALE



3 PRETX CURB OUTLET SIDE D1
NOT TO SCALE

OUTLET SIDE INSTALLED W/ SCREEN



4 PRETX CURB SIDE DETAIL D1
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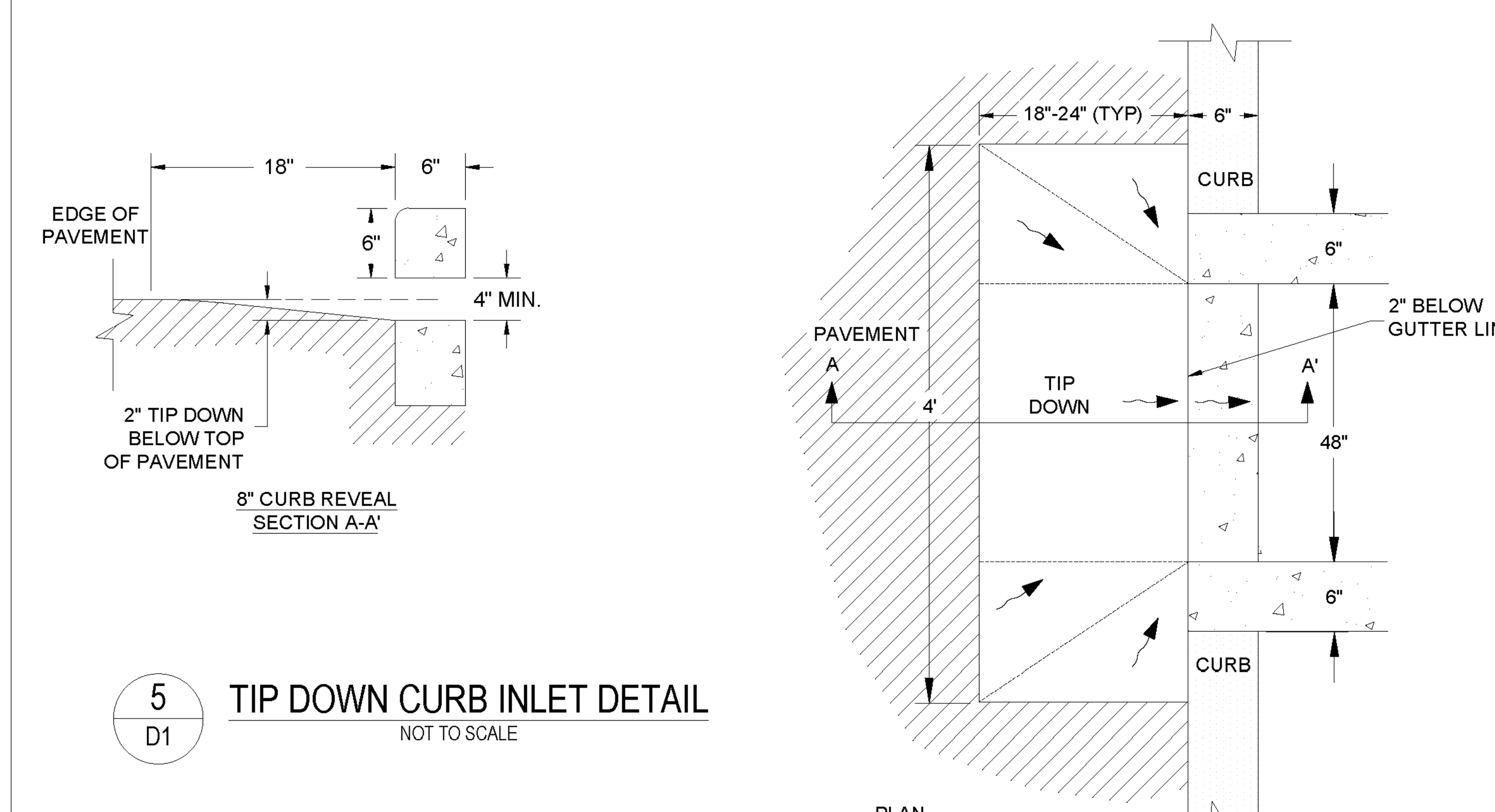
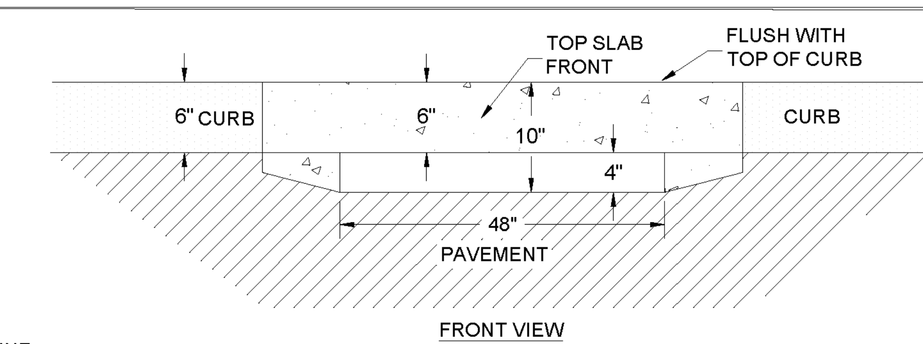
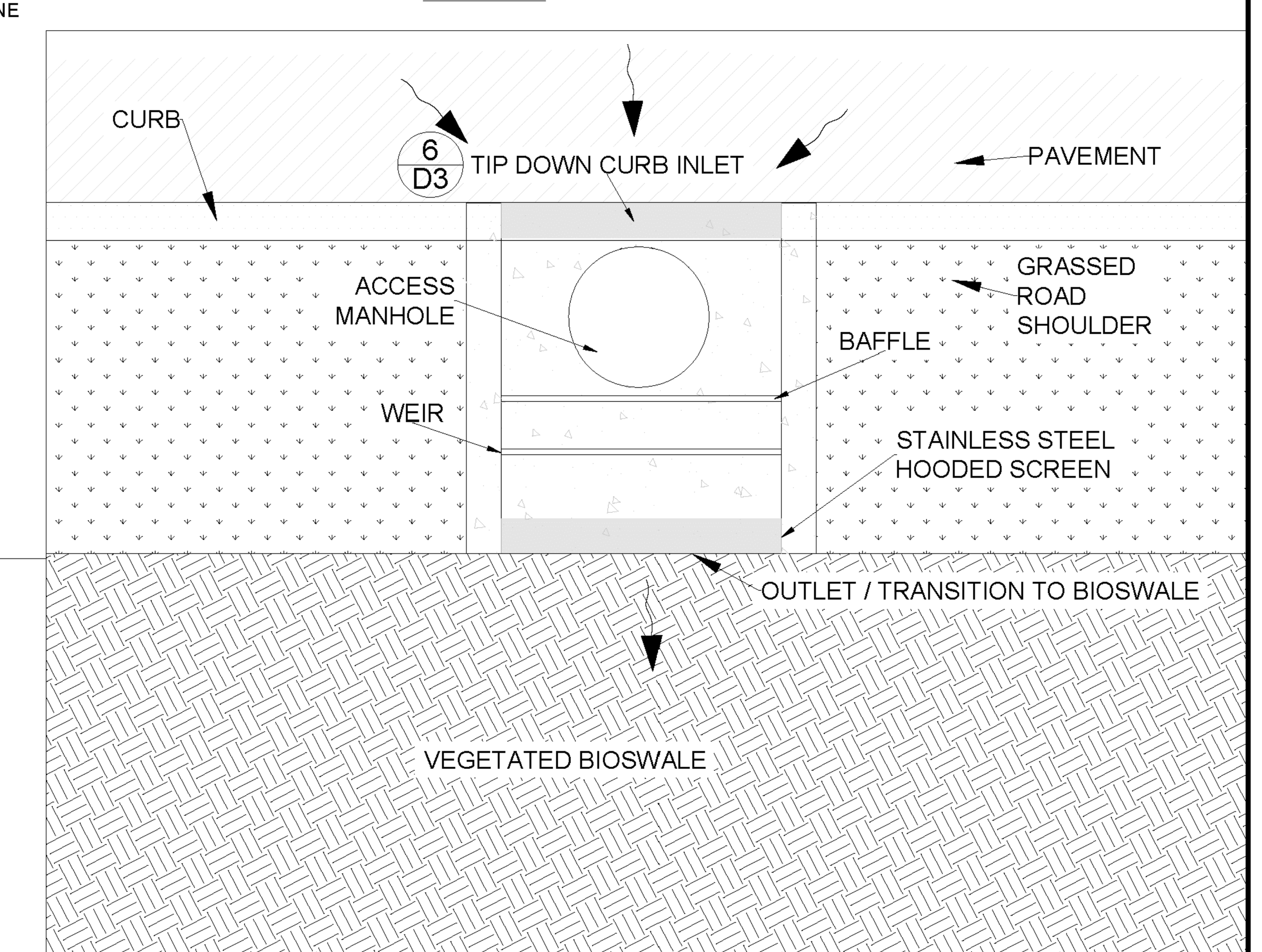
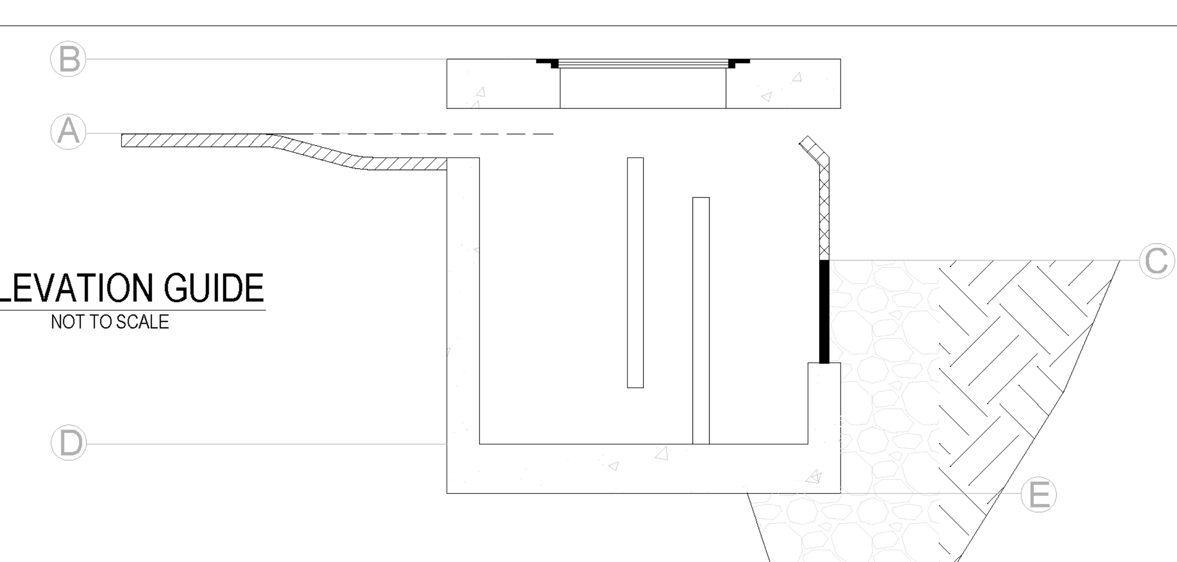


5 TIP DOWN CURB INLET DETAIL D1
NOT TO SCALE





7 PRETX CURB OUTLET TO BIORETENTION PLAN VIEW CONFIGURATION D1
NOT TO SCALE



6 ELEVATION GUIDE D1
NOT TO SCALE

D-1 PRETX™ CURB INLET SOLID HDPE WALL PRETREATMENT DETAIL

TO FIND A VALUE ADDED RESELLER IN YOUR AREA VISIT
WWW.CONVERGENTWATER.COM/STORMWATER-PRODUCTS
OR CONTACT CONVERGENT WATER TECHNOLOGIES AT
1.800.711.5428

REVISED 11/20/18, ELEVATION DETAILS ADDED; CHECKED BY RR

..\..\..\ICAD Files\Logos\ConvergentLOGO_RGB.tif

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

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

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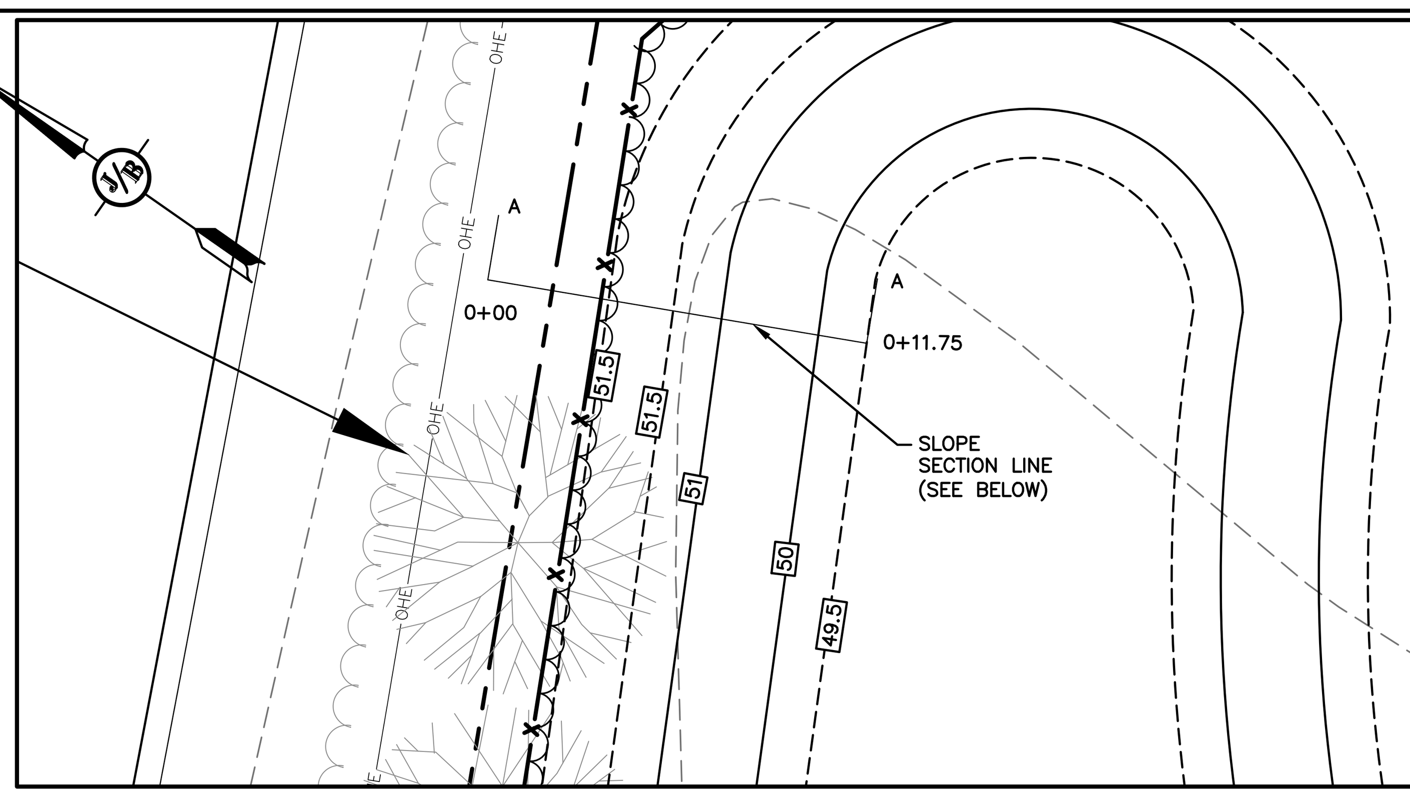
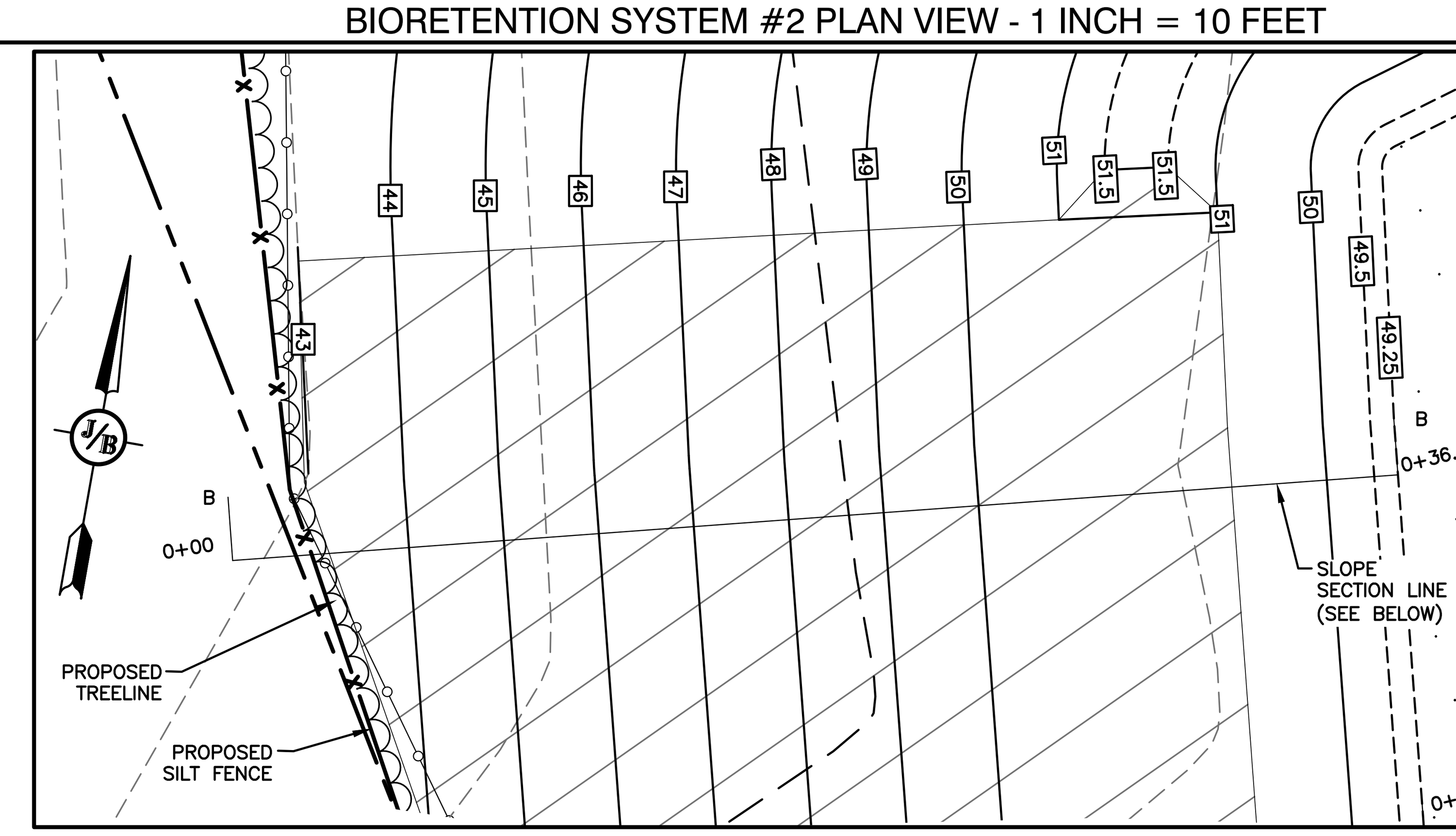
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

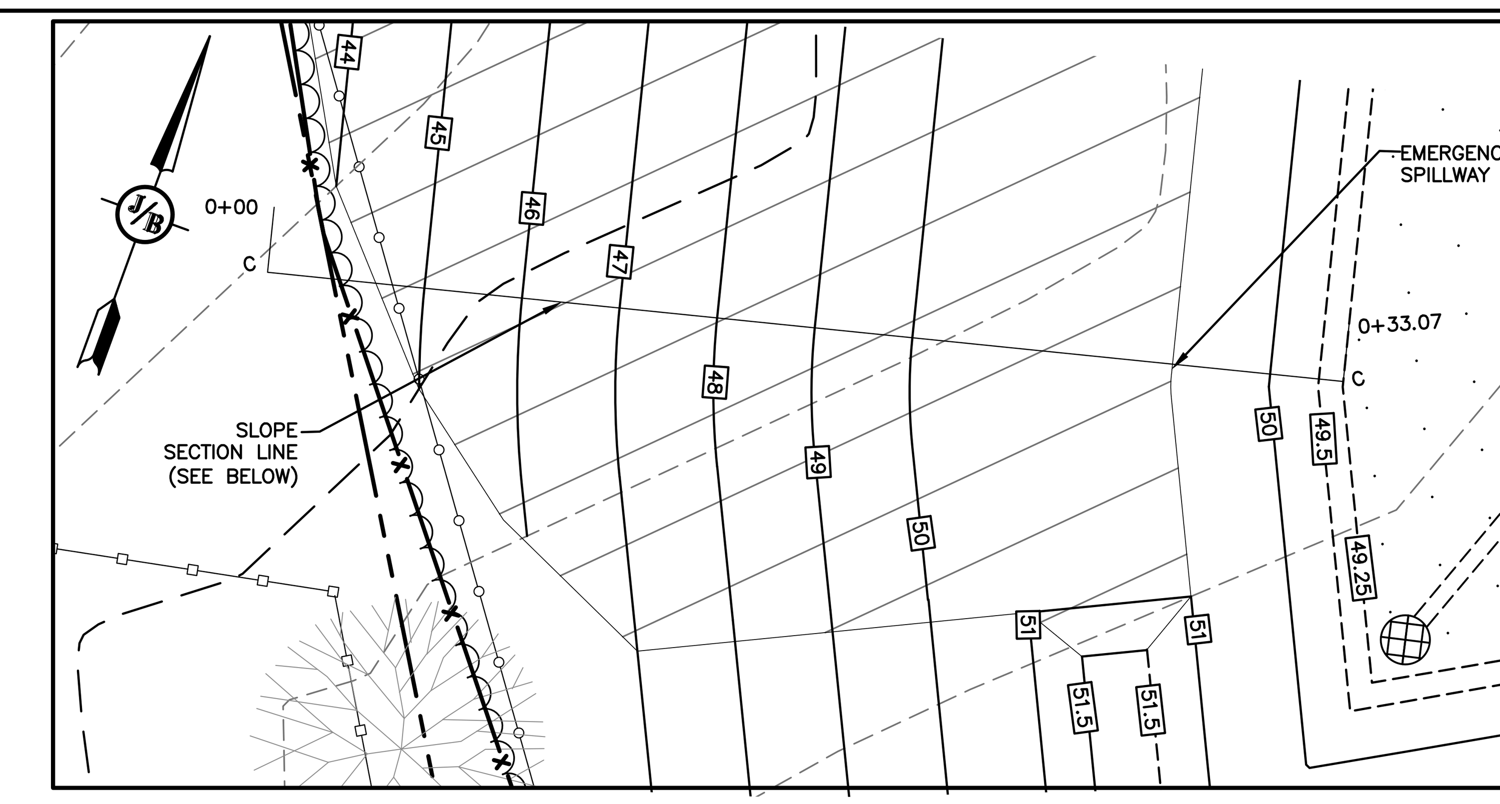
Plan Name:	DETAIL SHEET
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owner of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979 LOT 2: BK 4582 PG 888 LOT 3: BK 3919 PG 1345

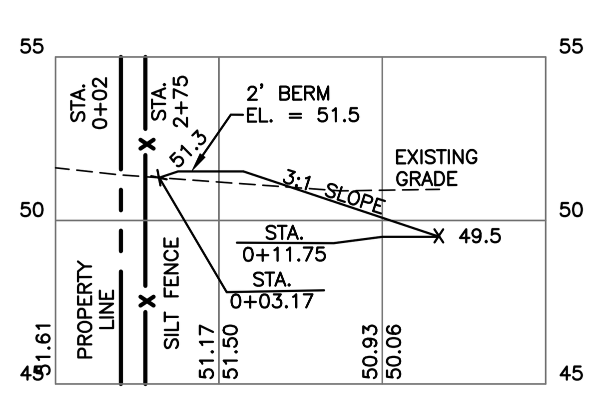
DRAWING No.
D6
SHEET 17 OF 23
JBE PROJECT NO. 21254

BIORETENTION SYSTEM #2 PLAN VIEW - 1 INCH = 10 FEET





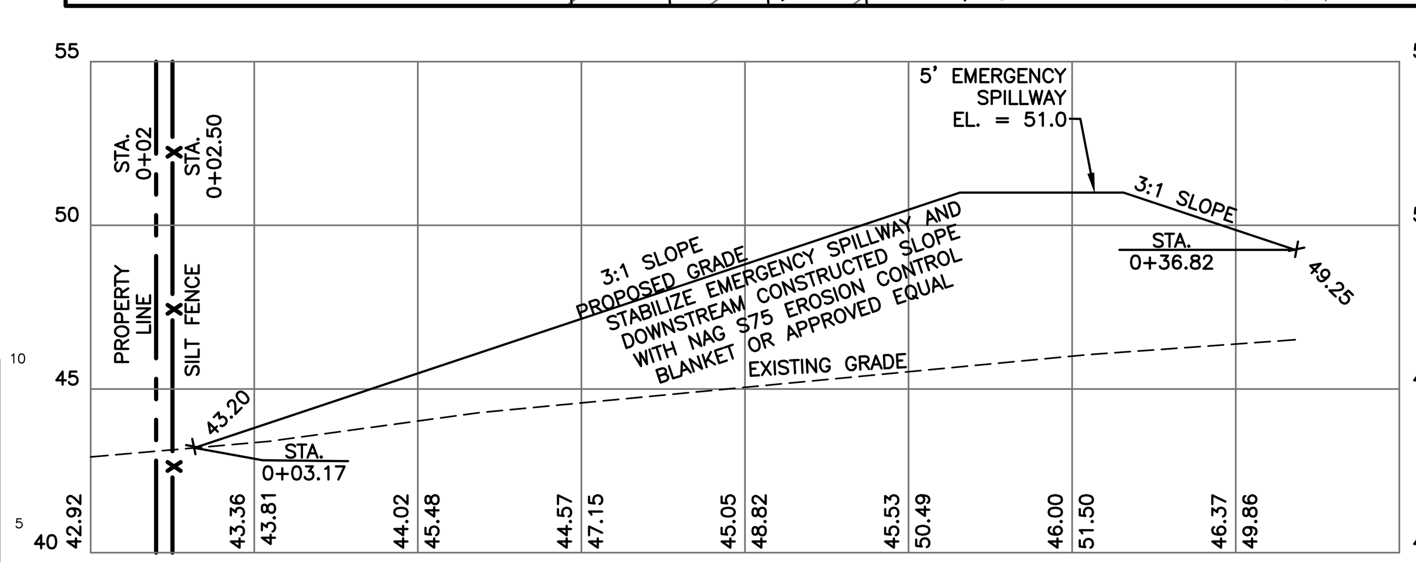




CROSS SECTION A-A - NORTHERN SIDE OF BIORETENTION #2

1 INCH = 5 FEET

GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft Horiz.
1 inch = 5 ft Vert.



CROSS SECTION B-B - SECTION THROUGH EMERGENCY SPILLWAY

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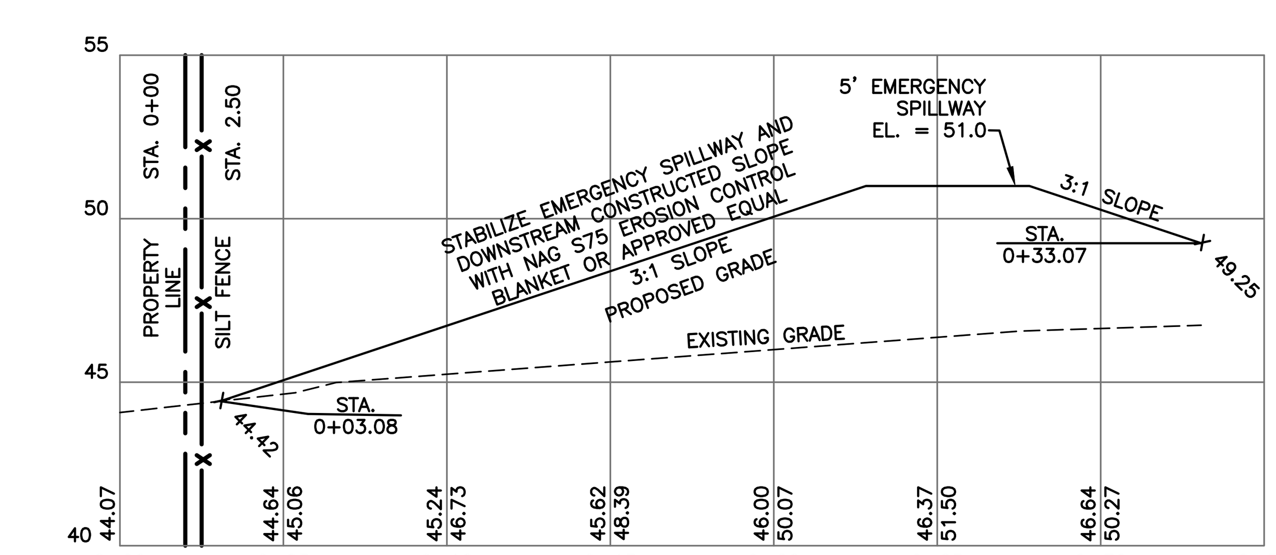
GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft Horiz.
1 inch = 5 ft Vert.



CROSS SECTION C-C - SECTION THROUGH EMERGENCY SPILLWAY

1 INCH = 5 FEET

GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft Horiz.
1 inch = 5 ft Vert.

Design: JAC	Draft: DJM	Date: 01/05/22	
Checked: JAC	Scale: AS NOTED	Project No.: 21254	
Drawing Name: 21254-PLAN.dwg			

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
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Plan Name: SLOPE CROSS SECTIONS

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

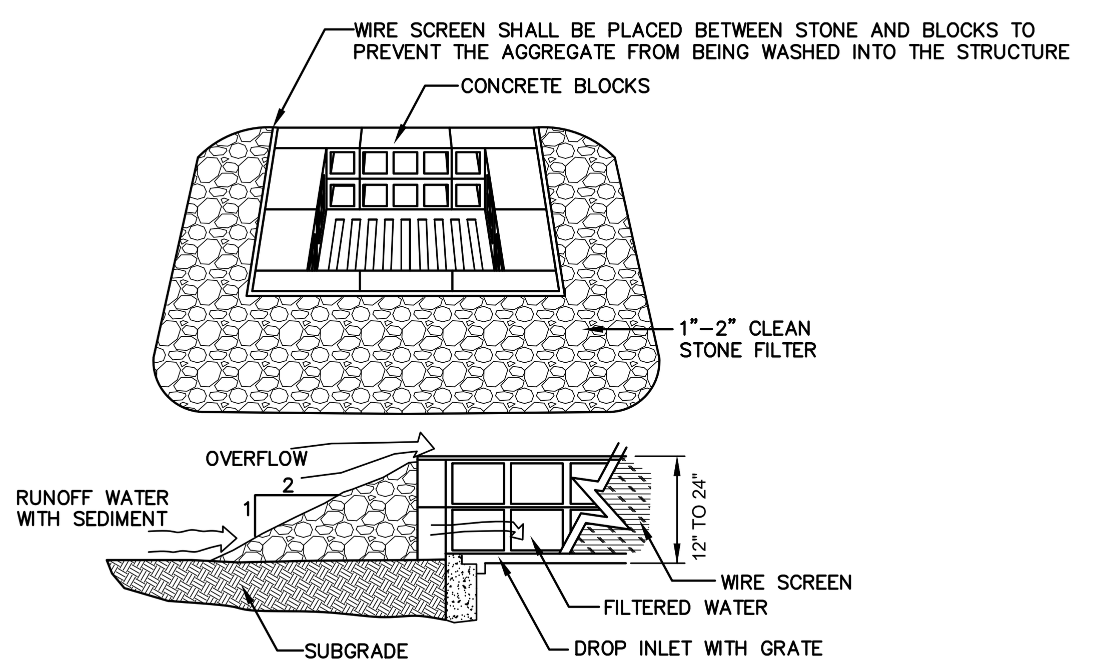
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979, LOT 2: BK 4582 PG 888, LOT 3: BK 3919 PG 1345

DRAWING No. X1

SHEET 18 OF 23
JBE PROJECT NO. 21254

TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED OR DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.5" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER OCTOBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
    b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    c. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
    d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.

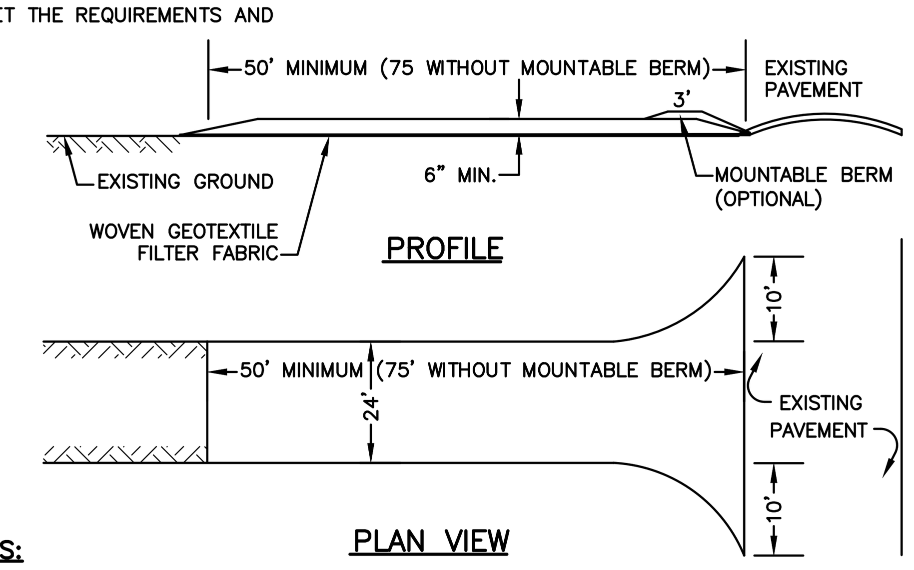


MAINTENANCE NOTE:

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

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

NOT TO SCALE

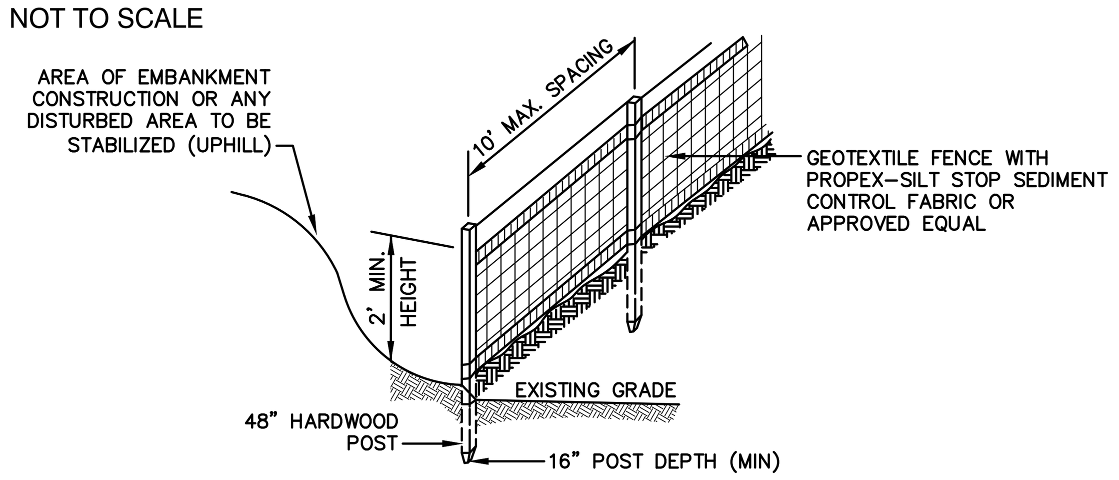


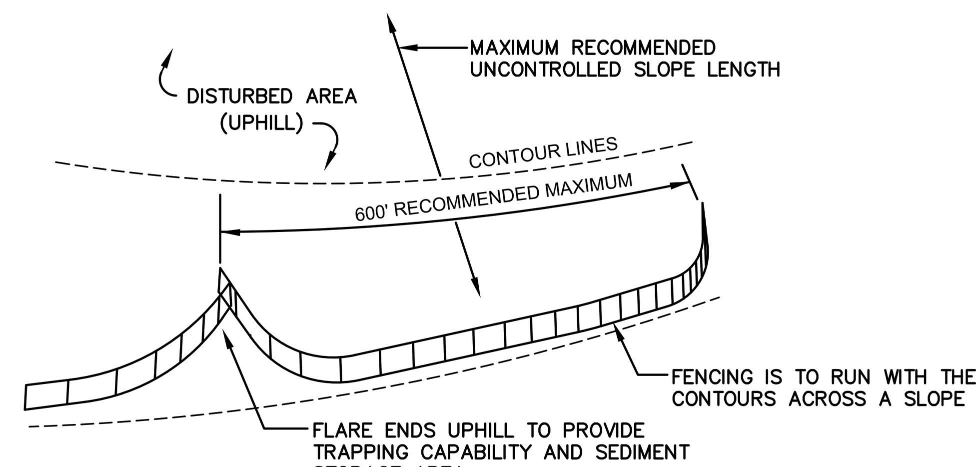
NOTES:

1. STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, 75' WITHOUT A MOUNTABLE BERM, AND EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS, OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A STONE BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE





CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCE SHALL REMAIN IN PLACE FOR 24 MONTHS.
7. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED, OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE

NOT TO SCALE

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
   B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
   AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
   NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
   PHOSPHATE(P205), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
   POTASH(K20), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
   (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A B C D	FAIR POOR POOR FAIR	GOOD GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT EXCELLENT	FAIR FAIR GOOD POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A C	GOOD GOOD	GOOD EXCELLENT	GOOD EXCELLENT	FAIR FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A B C	GOOD GOOD GOOD	GOOD GOOD EXCELLENT	GOOD FAIR EXCELLENT	FAIR POOR FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E F	FAIR FAIR	EXCELLENT EXCELLENT	EXCELLENT EXCELLENT	2/ 2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

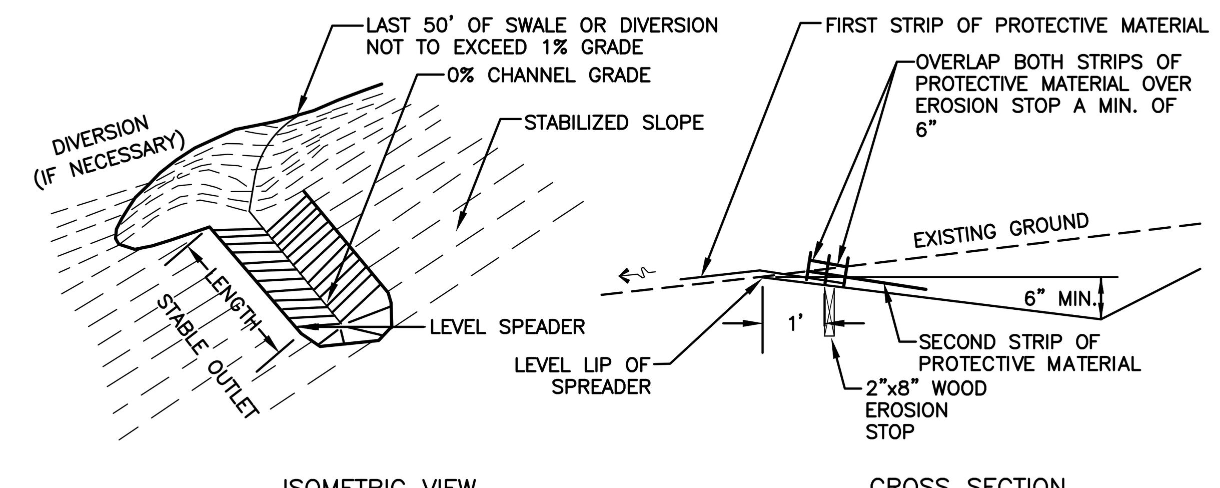
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft..
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
* C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES



NOTES:

1. CONSTRUCT THE LEVEL SPREADER LIP ON A ZERO PERCENT GRADE TO ENSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. AN EROSION STOP SHALL BE PLACED VERTICALLY A MINIMUM OF SIX INCHES DEEP IN A SLIT TRENCH ONE FOOT BACK OF THE LEVEL LIP AND PARALLEL TO THE LIP. THE EROSION STOP SHALL EXTEND THE ENTIRE LENGTH OF THE LEVEL LIP.
4. ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING TWO STRIPS OF JUTE OR EXCELSIOR MATTING ALONG THE LIP. EACH STRIP SHALL OVERLAP THE EROSION STOP BY AT LEAST SIX INCHES.
5. ENTRANCE CHANNEL TO THE LEVEL SPREADER SHALL NOT EXCEED A 1 PERCENT GRADE FOR AT LEAST 50 FEET BEFORE ENTERING THE SPREADER.
6. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER MUST NOT RECONCENTRATE IMMEDIATELY BELOW THE SPREADER.
7. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PERFORMED.
8. MAINTENANCE: THE LEVEL SPREADER SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE SPREADER HAS BEEN DAMAGED. SEDIMENT DEEPER THAN 4" ACCUMULATION SHOULD BE REMOVED. IF RILLING HAS TAKEN PLACE ON THE LIP, THEN THE DAMAGE SHOULD BE REPAIRED AND REVEGETATED. THE VEGETATION SHOULD BE MOWED OCCASIONALLY TO CONTROL WEEDS AND THE ENCROACHMENT OF WOODY VEGETATION. CLIPPINGS SHOULD BE REMOVED AND DISPOSED OF OUTSIDE THE SPREADER AND AWAY FROM OUTLET AREA. FERTILIZATION SHOULD BE DONE AS NECESSARY TO KEEP THE VEGETATION HEALTHY AND DENSE.

LEVEL SPREADER

NOT TO SCALE

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
3. INSTALL SILT FENCING, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
4. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
5. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
6. STRIP LOAM AND PAVEMENT, OR RECLAIM EXISTING PAVEMENT WITHIN LIMITS OF WORK PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
7. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
8. PREPARE BUILDING PAD(S) TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
9. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
10. INSTALL INLET PROTECTION AT ALL CATCH BASINS AS THEY ARE CONSTRUCTED IN ACCORDANCE WITH DETAILS.
11. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
12. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS AND/OR PROPERTY.
13. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
14. PAVE ROADWAY AND DRIVEWAYS WITH INITIAL 'BASE COURSE'.
15. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
16. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
17. FINISH PAVING ROADWAY AND DRIVEWAYS WITH 'FINISH' COURSE.
18. ROADWAY AND DRIVEWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
19. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
21. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
22. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
23. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
24. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
25. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

Design: JAC	Draft: DJM	Date: 01/05/22
Checked: JAC	Scale: AS NOTED	Project No.: 21254
Drawing Name: 21254-PLAN.dwg		

STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

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

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

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS

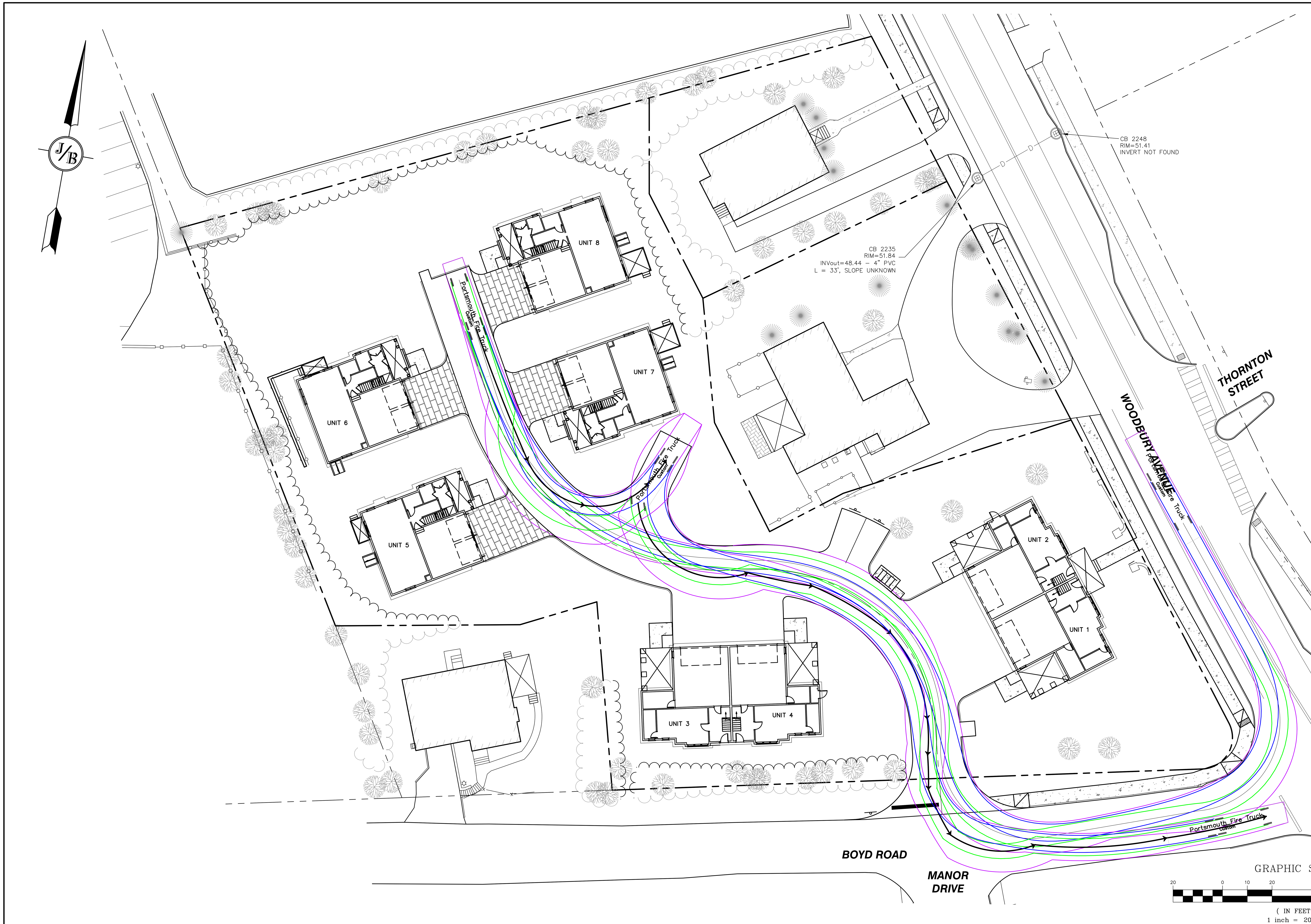
Project: "GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801

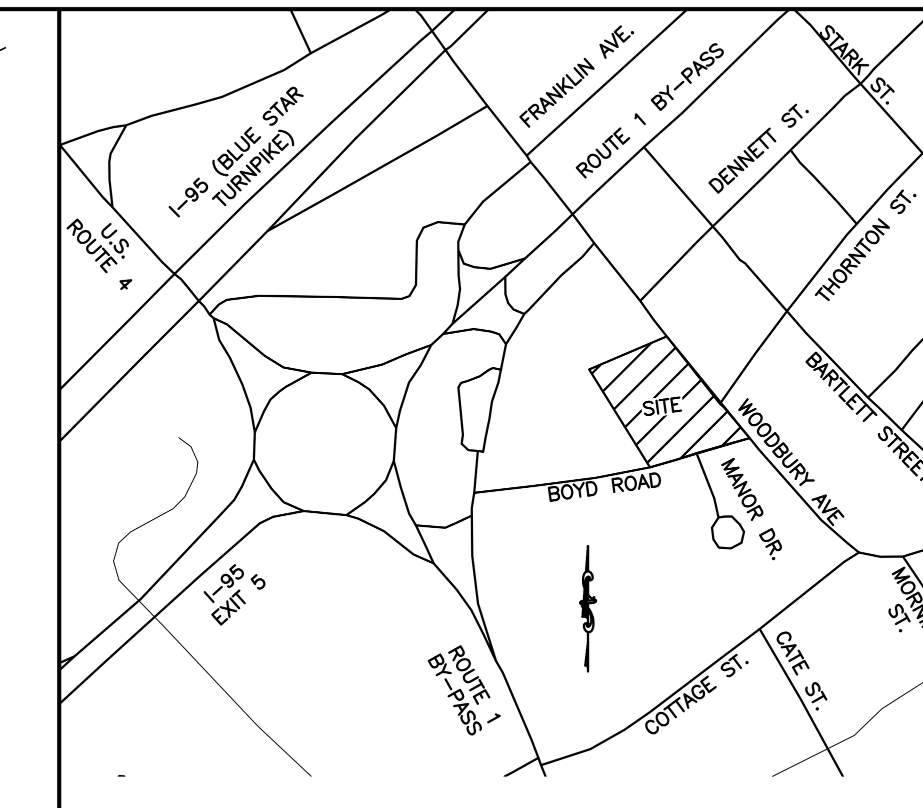
Owner of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON, 4 SHORE RD., WOLFEBORO, NH 03894
LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.

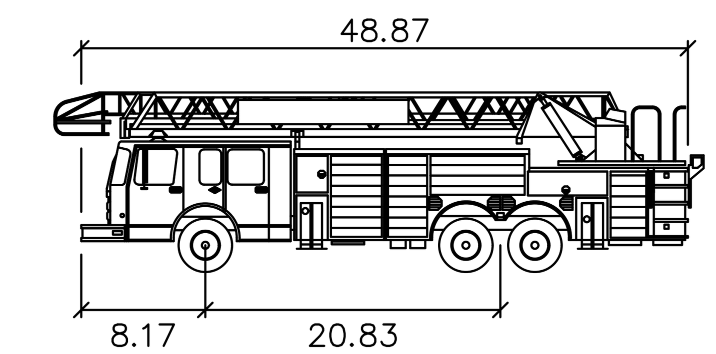
E1

SHEET 19 OF 23
JBE PROJECT NO. 21254





LOCUS SCALE: 1"=500'



Portsmouth Fire Truck

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

LEGEND:

(magenta line)	=	VEHICLE BODY
(green line)	=	FRONT WHEELS
(blue line)	=	REAR WHEELS

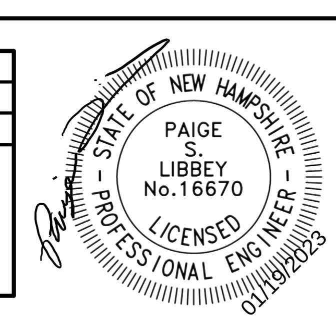
PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 175, LOTS 1, 2, & 3

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

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

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

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.



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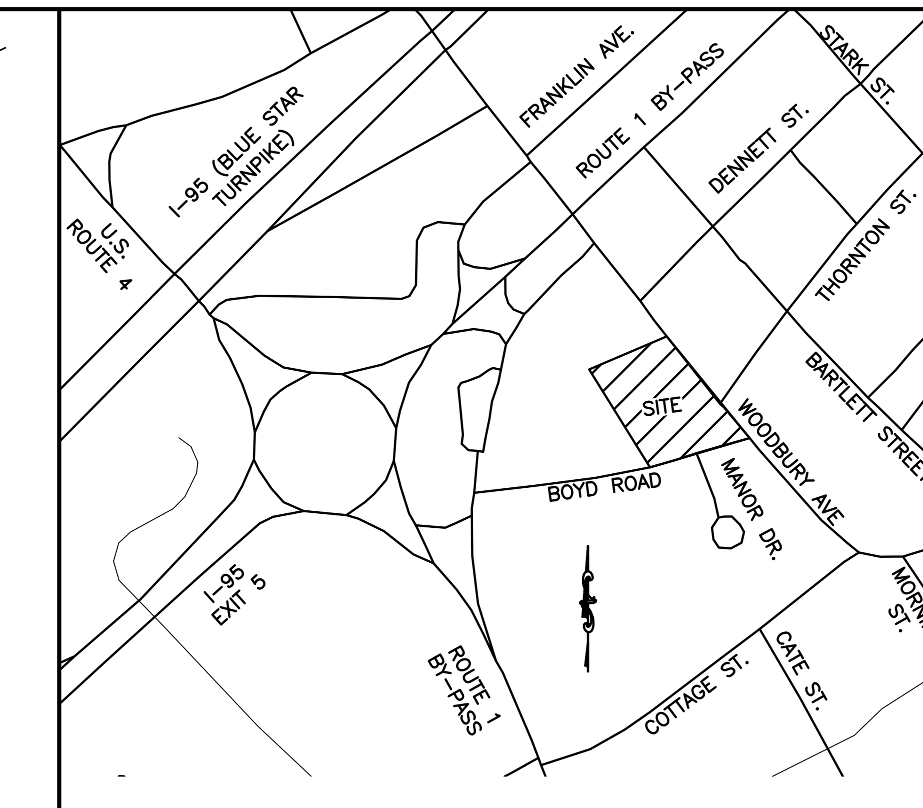
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

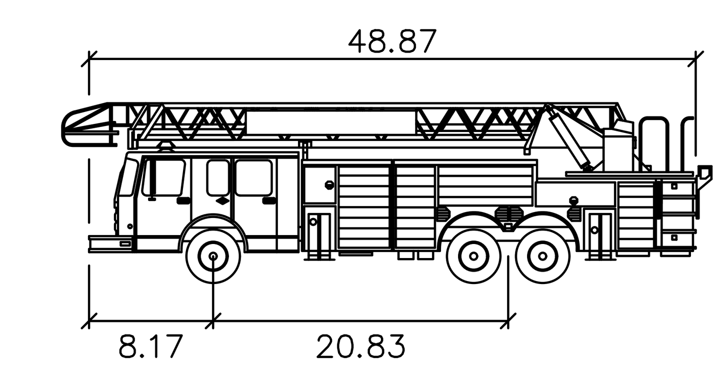
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owners of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
T1
SHEET 20 OF 23
JBE PROJECT NO. 21254



LOCUS SCALE: 1"=500'



Portsmouth Fire Truck

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

LEGEND:

- = VEHICLE BODY
- = FRONT WHEELS
- = REAR WHEELS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

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

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

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

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED PROFESSIONAL ENGINEER

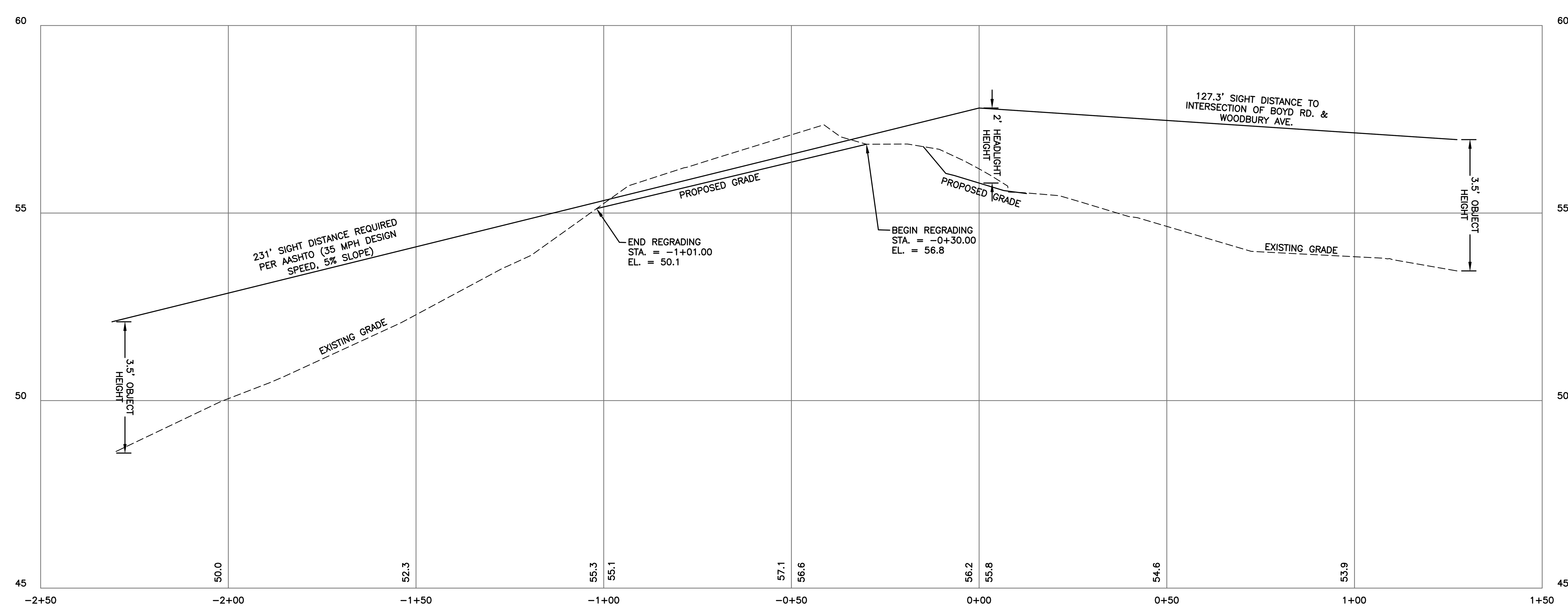
REV.	DATE	REVISION	BY
8	1/19/23	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
7	12/20/22	REVISED PER REVIEW ENGINEER AND CITY COMMENTS	DJM
6	10/18/22	REVISED PER REVIEW ENGINEER AND TAC COMMENTS	DJM
5	9/23/22	REVISED PER UTILITY COMPANY	DJM
4	9/20/22	REVISED PER REVIEW ENGINEER COMMENTS	DJM

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

Plan Name:	TRUCK TURNING PLAN
Project:	"GRAPEVINE RUN" 212, 214, & 216 WOODBURY AVE. PORTSMOUTH, NH 03801
Owners of Record:	FREDERICK J. BAILEY III & JOYCE S. NELSON 4 SHORE RD., WOLFEBORO, NH 03894 — LOT 1: BK 4708 PG 979; LOT 2: BK 4582 PG 888; LOT 3: BK 3919 PG 1345

DRAWING No.
T2

JBE PROJECT NO. 21254



GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.

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

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY
No.16670
LICENSED
PROFESSIONAL ENGINEER
01/19/2023

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

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

Plan Name: HIGHWAY ACCESS PLAN

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

Owners of Record: FREDERICK J. BAILEY III & JOYCE S. NELSON
4 SHORE RD., WOLFEBORO, NH 03894

LOT 1: BK 4708 PG 979
LOT 2: BK 4582 PG 888
LOT 3: BK 3919 PG 1345

DRAWING No.
H1
SHEET 22 OF 23
JBE PROJECT NO. 21254

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

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

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

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

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STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670
LICENSED PROFESSIONAL ENGINEER

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

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

Plan Name: **OFFSITE DRAINAGE PLAN**

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

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

DRAWING No.
DR1
SHEET 23 OF 23
JBE PROJECT NO. 21254

Tighe&Bond

P0595-015
January 25, 2023

Mr. Peter Britz, Director of Planning and Sustainability
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit & Subdivision Applications**
Proposed Advanced Manufacturing Facility

Dear Peter:

On behalf of Aviation Avenue Group, LLC, we are pleased to submit the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Site Plan Review and Subdivision for a proposed Advanced Manufacturing Facility on a previously developed site located at 80 Rochester Avenue:

- One (1) copy of TAC Comment Response Report, dated January 25, 2023;
- One (1) copy of the PDA Application for Subdivision, dated January 25, 2023;
- One (1) full size & one (1) half size copy of the Site Plan Set, dated January 25, 2023;
- Three (3) full size & one (1) half size copy of the Subdivision Plan, dated January 25, 2023;
- One (1) copy of the Truck Turning Exhibits, dated January 25, 2023;
- One (1) copy of the Drainage Analysis, dated January 25, 2023;
- One (1) copy of the Signed Eversource Will Serve Letter, dated December 6, 2022;
- One (1) copy of correspondence with Unitil; January 5, 2023

The proposed project is located at 80 Rochester Avenue which is identified as Map 308 Lot 1 on the City of Portsmouth Tax Maps. The proposed project is for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system.

There is approximately 196,665 SF of existing impervious area that is currently untreated before entering the municipal drainage system. The proposed stormwater management system has been designed to provide treatment for the existing impervious surface that is currently untreated and for ±161,130 SF of additional impervious that results from the proposed project as required by the PDA Site Plan Regulations.

On October 20, 2022, the PDA Board granted conceptual approval for the proposed project. The project was granted a variance from the Zoning Board of Adjustment for the front yard setback requirements at their meeting on November 15, 2022.

We respectfully request to be placed on the Technical Advisory Committee (TAC) meeting agenda for the February 7, 2023, meeting. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

Neil A. Hansen, PE
Project Manager

Copy: Aviation Avenue Group, LLC (via email)
Pease Development Authority

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Applications\City of Portsmouth\TAC\20230125_TAC Resubmission\TAC-Resubmission Cover Letter.docx

PROPOSED ADVANCED MANUFACTURING FACILITY - TAC COMMENTS (12/30/2022) RESPONSE

80 Rochester Avenue (100 New Hampshire Avenue)
Portsmouth, New Hampshire
January 25, 2023

Prepared by: CML
Project # P0595-015

	Comment	Response	Corresponding Plan Sheet #
1	Please confirm this project includes a lot line adjustment and not the creation of a new parcel.	The project is no longer proposing the relocation of the ROW line on Rochester Avenue. However, a subdivision application will still be required in order to create a new lease area over the parcel with the PDA.	PROPOSED SUBDIVISION PLAN (1 OF 1) & Enclosed Subdivision Application
2	Rochester Ave pavement is too far deteriorated for the mill and pave process. The road needs reclamation, fortified and new pavement. Stratham and Newfields Streets need to be reconstructed as well.	The plans have been updated to call for Rochester Avenue to be reclaimed and re-paved, and to mill and overlay Newfields & Stratham Street.	C-102
3	The new lease line may extend over the street drainage system and sidewalk. A license may be required.	See comment 1. Also a note has been added to the plans stating "Location of existing drain line to be confirmed and drainage license area within the project site to be determined prior to construction."	PROPOSED SUBDIVISION PLAN (1 OF 1)
4	PCB 18 should tie into the street drainage, not the site drainage	The proposed grading in Rochester Avenue the entrances to each of the loading areas have been revised to make highpoints at the center of the drives and provide six (6) new catch basins within Rochester Avenue. In addition, the drainage analysis was updated to identify the overall reduction of impervious area within the Rochester Avenue Right of Way.	C-104 & Drainage Analysis
5	DMH 1925 is likely not large enough to accept such a large new core. Please confirm this design will work by investigating the structure with Stormwater division from DPW.	Based on Tighe & Bonds inspection of DMH 1925, which is a vault structure and not a typical circular manhole, the structure should be capable of accepting the increased opening for a new 48" HDPE vs. the existing 36" RCP pipe at this location.	C-103.2
6	Proposed sidewalk should be at least 5.5’ wide, preferably 6’ wide.	Sidewalk widths have been increased to 5.5'	C-102
7	Third party review of stormwater design. Is location of pretreatment outlet structure after detention basin appropriate? Is treatment prior to detention basin more appropriate?	The applicant has executed a thrid party review agreement. The Jellyfish treatment unit post detention is the same configuration we have used numerous times in Portsmouth on projects that have also received City and NHDES approval. Per our prior approvals with NHDES using this configuration, the WQF is calculated to determine the sizing of the treatment unit rather than the 1" WQ Storm as would be done upstream.	
8	State sizes of domestic water and fire services.	The sizes for the domestic water and fire services have been called out on the plans.	C-104
9	Provide flow tests to show the existing water main can supply adequate water to proposed building.	Flow testing is scheduled to be completed prior to construction.	
10	Provide vehicle speed data for New Hampshire Avenue to confirm adequacy of sight lines at driveways and to determine need for additional safety measures at proposed crosswalks.	The project location on NH Ave is located near the center of a mile long stretch of road the is very flat and straight. Proposed crosswalks were requested by the PDA and have the same extended sight distance as the driveways. PDA is also currently having the traffic study reviewed by a third party who will likely also look at this aspect.	
11	Provide pedestrian counts and vehicle turning movement counts at intersections of New Hampshire Avenue with Newfields and Stratham, to document need for crosswalks across New Hampshire Ave.	Crosswalks were requested by the PDA to connect the site to the existing pedestrian infrastructure already in place	
12	A third party peer review of the traffic study should be done.	PDA is currently having the traffic study reviewed by a third party.	

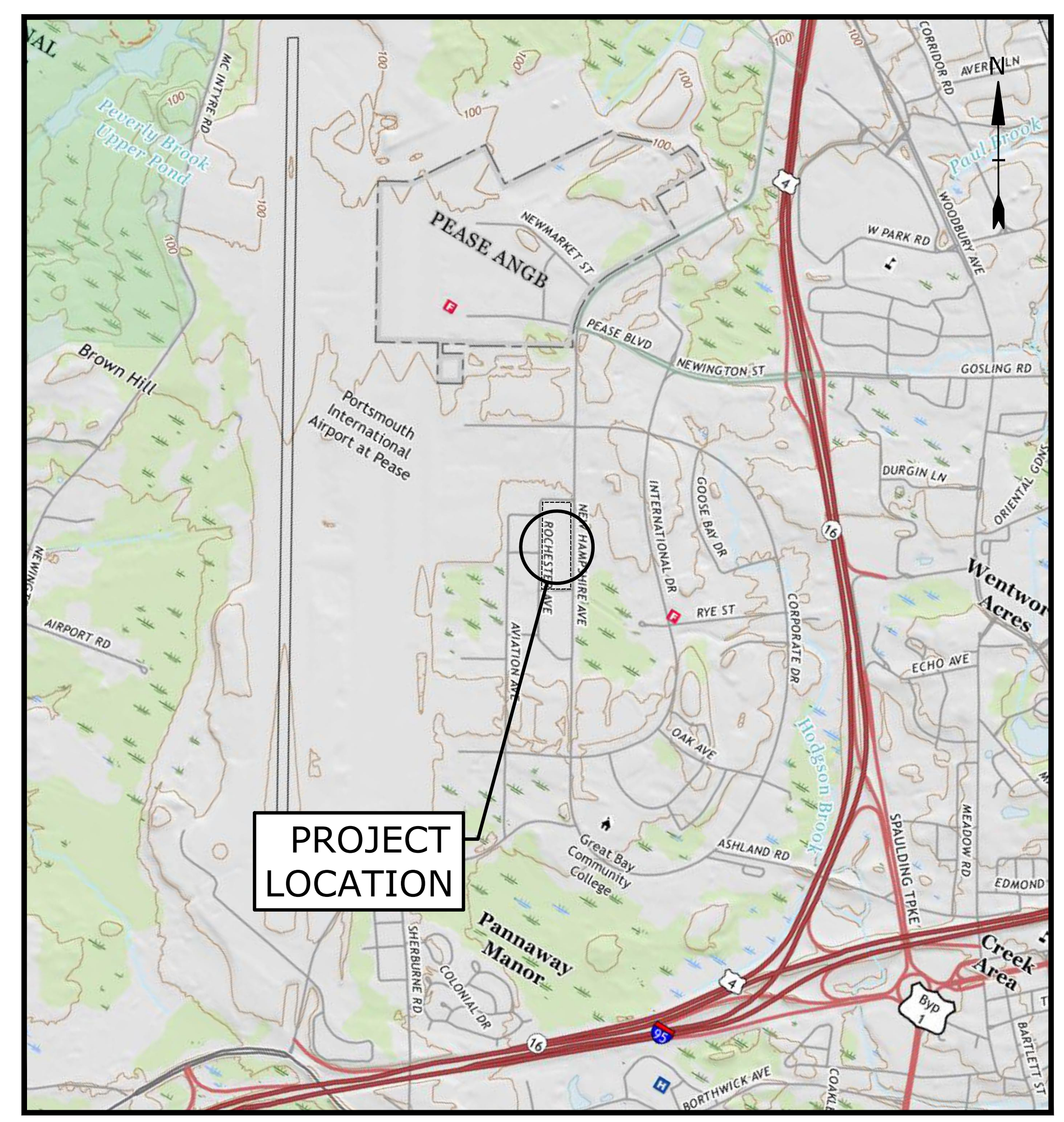
PROPOSED ADVANCED MANUFACTURING FACILITY

100 NEW HAMPSHIRE AVENUE
PORTSMOUTH, NEW HAMPSHIRE
PERMIT DRAWINGS

JANUARY 25, 2023

LIST OF DRAWINGS

SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	01/25/2023
1 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
2 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
7 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
8 OF 8	EXISTING CONDITIONS PLAN	09/21/2022
C-101	OVERALL EXISTING CONDITIONS / DEMOLITION PLAN	01/25/2023
C-101.1	EXISTING CONDITIONS / DEMOLITION PLAN	01/25/2023
C-101.2	EXISTING CONDITIONS / DEMOLITION PLAN	01/25/2023
C-102	OVERALL SITE PLAN	01/25/2023
C-102.1	SITE PLAN	01/25/2023
C-102.2	SITE PLAN	01/25/2023
C-103	OVERALL GRADING, DRAINAGE & EROSION CONTROL PLAN	01/25/2023
C-103.1	GRADING, DRAINAGE & EROSION CONTROL PLAN	01/25/2023
C-103.2	GRADING, DRAINAGE & EROSION CONTROL PLAN	01/25/2023
C-104	UTILITY PLAN	01/25/2023
C-105	OVERALL LANDSCAPE PLAN	01/25/2023
C-105.1	LANDSCAPE PLAN	01/25/2023
C-105.2	LANDSCAPE PLAN	01/25/2023
C-501	EROSION CONTROL NOTES & DETAILS SHEET	01/25/2023
C-502	DETAILS SHEET	01/25/2023
C-503	DETAILS SHEET	01/25/2023
C-504	DETAILS SHEET	01/25/2023
C-505	DETAILS SHEET	01/25/2023
C-506	DETAILS SHEET	01/25/2023
A1	PROPOSED EXTERIOR ELEVATIONS	12/12/2022
1 OF 1	PHOTOMETRICS ALT 2	12/16/2022



LOCATION MAP
SCALE: 1" = 2,000'

CONSTRUCTION NOTES:
1. THE CONTRACTOR SHALL NOT RELY ON SCALED DIMENSIONS AND SHALL CONTACT THE ENGINEER FOR CLARIFICATION IF A REQUIRED DIMENSION IS NOT PROVIDED ON THE PLANS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, AND FOR SITE CONDITIONS THROUGHOUT CONSTRUCTION. NEITHER THE PLANS NOR THE SEAL OF THE ENGINEER AFFIXED HEREON EXTEND TO OR INCLUDE SYSTEMS REQUIRED FOR THE SAFETY OF THE CONTRACTOR, THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND IMPLEMENTING SAFETY PROCEDURES AND SYSTEMS AS REQUIRED BY THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND ANY STATE OR LOCAL SAFETY REGULATIONS.
3. TIGHE & BOND. ASSUMES NO RESPONSIBILITY FOR ANY ISSUES LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION OF TIGHE & BOND.

PREPARED BY:
Tighe&Bond
177 Corporate Drive
Portsmouth New Hampshire, 03801
603.433.8818

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
1/25/23

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
1/25/23

LESSOR:
Pease Development Authority
55 International Drive
Portsmouth, NH 03801
603.433.6088

SURVEY CONSULTANT:
DOUCET SURVEY INC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
2 Commerce Drive (Suite 202) Bedford, NH 03110 (603) 614-4060
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com

APPLICANT:
Aviation Avenue Group, LLC
210 Commerce Way, Suite 300
Portsmouth New Hampshire, 03801
603.427.5500

Last Save Date: January 25, 2023 8:36 AM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_CS.dwg Layout Tab: CS

811 DigSafe MA-ME-NH-RI-VT

COMPLETE SET 26 SHEETS

NOTES:

1. REFERENCE: PEASE HANGAR 227 AREA
(ENCOMPASSING PARTS OF NEW HAMPSHIRE AVE, AVIATION AVE, STRATHAM ST, ROCHESTER AVE, NEWFIELD ST, LEE STREET, & FLIGHTLINE ROAD IN PORTSMOUTH, NH)
D.S.I. PROJECT NO. 7239

2. OWNER OF RECORD: PEASE DEVELOPMENT AUTHORITY (ALL BUT ONE PARCEL)
55 INTERNATIONAL DRIVE
PORTSMOUTH NH 03801

NEW ENGLAND TELEGRAPH & TELEPHONE (MAP 308 LOT 6 ONLY)
NKA FAIRPOINT COMMUNICATIONS
770 ELM STREET
MANCHESTER, NH 03101

3. FIELD SURVEY PERFORMED BY DOUCET SURVEY LLC STAFF DURING JANUARY & FEBRUARY 2022 USING A TRIMBLE S7 TOTAL STATION AND A TRIMBLE R10 SURVEY GRADE GPS WITH A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

4. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK INCLUDING OBSERVATIONS ON PRIMARY AIRPORT CONTROL STATION PSM C AND PSM D.

5. VERTICAL DATUM IS BASED PRIMARY AIRPORT CONTROL STATION PSM C (NAVD88 ELEVATION = 78.70 AS PUBLISHED BY NATIONAL GEODETIC SURVEY).

6. JURISDICTIONAL WETLANDS DELINEATED BY TIGHE & BOND DURING DECEMBER 2021 IN ACCORDING TO THE:
   - US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY, 1987).
   - REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION (2012).
   - NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST (REGION 1). U.S. FISH AND WILDLIFE SERVICE (2013).
   - CODE OF ADMINISTRATIVE RULES. WETLANDS BOARD, STATE OF NEW HAMPSHIRE (CURRENT).
   - FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.0, 2016 AND (FOR DISTURBED SITES) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4. NEHSTC (MAY 2017).

7. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

8. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

9. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC. SEVERAL STRUCTURES SHOWN HEREON WERE INACCESSIBLE FOR INVERT MEASUREMENTS DUE TO WINTER CONDITIONS.

10. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF (THE ROAD(S)) AS DEPICTED HEREON IS/ARE BASED ON RESEARCH CONDUCTED AT THE PEASE DEVELOPMENT AUTHORITY (PDA), NHDOT, PORTSMOUTH ENGINEERING DEPARTMENT, AND ROCKINGHAM COUNTY REGISTRY OF DEEDS. AN OFFICIAL AT PDA ADVISED DOUCET SURVEY THAT THEY HAVE PREVIOUSLY SEARCHED AND BELIEVE THAT THERE WERE NEVER ANY LAYOUT PLANS DEVELOPED FOR THE RIGHT-OF-WAYS AT PEASE. ROAD LAYOUTS FOR THE STREETS SHOWN HEREON WERE ALSO NOT FOUND AT NHDOT PROJECT VIEWER OR AT THE PORTSMOUTH CITY ENGINEERING OFFICES.

11. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

12. AERIAL TOPOGRAPHY WAS CONDUCTED BY EASTERN TOPOGRAPHICS FROM IMAGES TAKEN DURING DECEMBER 2021 WITH A PHOTO SCALE OF 40 FEET. AERIAL MAPPING CONTOURS AND OBJECTS SHOWN WITHIN OBSCURED AREAS ARE APPROXIMATE AND SHOULD BE VERIFIED BEFORE USE FOR DESIGN & CONSTRUCTION PURPOSES.

13. THIS FIELD SURVEY WAS PERFORMED IN WINTER CONDITIONS WITH SNOW AND ICE COVER ON THE GROUND. A SITE CHECK IS RECOMMENDED IN THE SPRING TO ENSURE THE COMPLETENESS/ACCURACY OF THE INFORMATION SHOWN HEREON.

14. THIS PLAN WAS PREPARED FROM RECORD RESEARCH, OTHER MAPS, LIMITED FIELD MEASUREMENTS AND OTHER SOURCES. IT IS NOT TO BE CONSTRUED AS A PROPERTY / BOUNDARY SURVEY FOR THE COMPLETE SET OF TAX MAP AND LOTS SHOWN HEREON, AND IS SUBJECT TO SUCH FACTS AS SAID SURVEYS MAY DISCLOSE. THIS PLAN DOES, HOWEVER, ILLSTRATE THE BOUNDARIES OF THE FOLLOWING TAX MAP AND LOT NUMBERS PER THE REFERENCE PLANS INDICATED BELOW AND RECORD MONUMENTS RECOVERED BY THIS SURVEY:
    A. MAP 307 LOT 1 (PER REF. PLAN 3)
    B. MAP 307 LOT 2 (PER REF. PLAN 7)
    C. MAP 306 LOT 4 (PER REF. PLAN 12)

15. THE LOCATIONS OF THE VARIOUS RESTRICTED ZONES CALLED FOR IN REFERENCE PLANS 8, 9, 10, 12, AND 14 ARE SHOWN HEREON BASED ON COORDINATE VALUES PROVIDED IN THOSE PLANS AND/OR FEATURES SHOWN IN THOSE PLANS (E.G. MONITORING WELLS) THAT WERE LOCATED DURING THIS SURVEY.

REFERENCE PLANS:

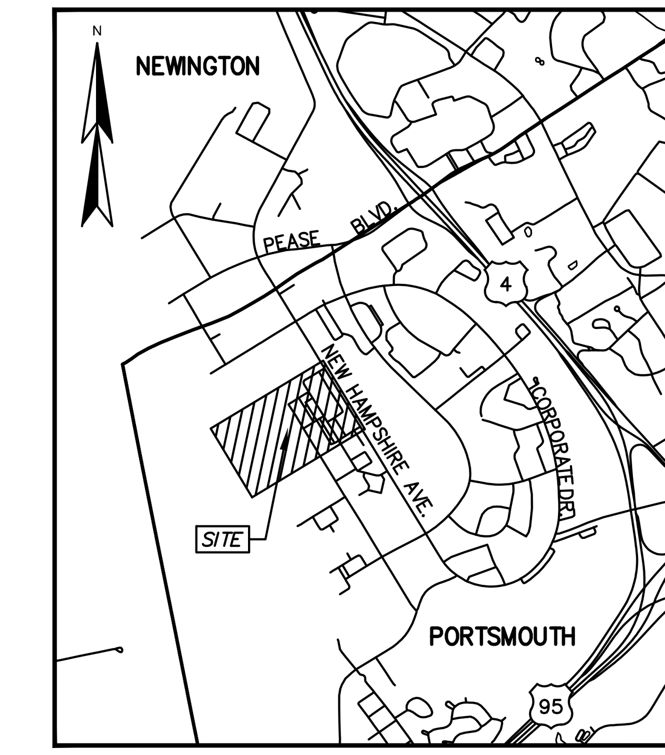
1. "SUBLEASE BOUNDARY PLAN FOR PEASE DEVELOPMENT AUTHORITY – BUILDINGS 115 AND 116 – 31 ROCHESTER AVENUE – PEASE INTERNATIONAL TRADEPORT – PORTSMOUTH, N.H.: DATED NOV. 6, 1995 AND LAST REVISED (REV-2) ON 03/03/97 BY RICHARD P. MILLETTE AND ASSOCIATES.
2. "SUBDIVISION PLAN FOR 5, 7, 19, AND 21 HAMPTON STREET – PORTSMOUTH, NH – LAND OF PEASE DEVELOPMENT AUTHORITY LEASED TO EXECUTIVE AIRDOCK, LLC (A PORTION OF TAX MAP 310, LOT 0) HAMPTON ST. & AVIATION AVE. PORTSMOUTH, NEW HAMPSHIRE" DATED JULY 1, 2021 AND REVISED (REV-1) NOV 30, 2021 BY DOUCET SURVEY LLC
3. "ALTA/NSPS LAND TITLE SURVEY FOR CINTHESYS REAL ESTATE MANAGEMENT LLC (LESSEE) C/O THE KANE COMPANY AND PEASE DEVELOPMENT AUTHORITY (LESSOR) OF TAX MAP 307, LOT 1 – 68 NEW HAMPSHIRE AVE. PORTSMOUTH, NEW HAMPSHIRE" DATED DECEMBER 21, 2021 BY DOUCET SURVEY LLC.
4. "APPENDIX VI MUNICIPAL SERVICES AGREEMENT BETWEEN CITY OF PORTSMOUTH – TOWN OF NEWINGTON– AND PEASE DEVELOPMENT AUTHORITY EFFECTIVE AS OF JULY 1, 1998".
5. "SUBDIVISION PLAN 68 NEW HAMPSHIRE AVENUE"FOR LONDAVIA, INC. DATED 29-SEPT-1998 BY KIMBALL CHASE. R.C.R.D. PLAN 26777.
6. "SUBDIVISION PLAN – AIR CARGO FACILITY 139 FLIGHTLINE ROAD" DATED 20-FEB-1998 AND REVISED (REV-1) 26-OCT-98 BY KIMBALL CHASE. R.C.R.D. PLAN 26778.
7. "SUBDIVISON PLAN FOR LAND TO BE LEASED TO PAN-AM 14 AVIATION AVE. PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH" LAST REVISED (REV-3) ON AUG. 26, 1999 BY EMANUEL ENGINEERING, INC. R.C.R.D. PLAN 27540.
8. "EXCEPTED SUBPARCEL ZONE 3 PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED OCTOBER 22, 2002 AND LAST REVISED (REV-3) 10/22-03 BY TFM. R.C.R.D. PLAN 31494.
9. "PLAN OF GROUNDWATER MANAGEMENT ZONE – ZONE 3 – PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 4, 2002 AND LAST REVISED (REV-2) 6/27/02 BY TFM. R.C.R.D. PLAN 31503.
10. "PLAN OF USE RESTRICTION ZONE SITE 32 PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JULY 11, 2002 AND REVISED (REV-1) 7/18/02 BY TFM. R.C.R.D. PLAN 31506.
11. "PLAN OF USE RESTRICTION ZONE SITE 81 PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 BY TFM. R.C.R.D. PLAN 33301.
12. "PLAN OF USE RESTRICTION ZONE SITE 72 – BASE MOTOR POOL – PEASE AIR FORCE BASE PORTSMOUTH, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 BY TFM. R.C.R.D. PLAN 33302.
13. "SUBDIVISION PLAN DEPICTING PORTSMOUTH TAX MAP 306 LOT 3" DATED AUGUST 1, 2005 AND LAST REVISED (REV-2) SAME DATE AUGUST 1, 2005 BY ALTUS ENGINEERING. R.C.R.D. PLAN 33592.
14. "USE RESTRICTION ZONE – ZONE 3 – PEASE AIR FORCE BASE PORTSMOUTH AND NEWINGTON, NEW HAMPSHIRE PREPARED FOR MWH AMERICAS MALVERN, PA" DATED JUNE 10, 2005 AND REVISED (REV-1) JUNE 17, 2005 BY TFM. R.C.R.D. PLAN 33593.
15. "SUBDIVISION PLAN FOR 75 NEW HAMPSHIRE LLC – 75 NEW HAMPSHIRE AVENUE – 50 INTERNATIONAL DRIVE & 80 INTERNATIONAL DRIVE (TAX MAP 306, LOTS 1, 2, 4 & 5) PEASE INTERNATIONAL TRADEPORT ROCKINGHAM COUNTY PORTSMOUTH, NEW HAMPSHIRE" DATED AUG 14, 2007 AND LAST REVISED (REV-4) 10/15/07 BY DOUCET SURVEY INC. R.C.R.D. PLAN 35260.
16. "PLAN FOR NEW HAMPSHIRE AIR NATIONAL GUARD PEASE BLVD, AIRLINE AVE & NEW HAMSHIRE AVE PEASE INTERNATIONAL TRADEPORT, NEWINGTON ROCKINGHAM COUNTY, NH" DATED 7-DEC-2009 AND LAST REVISED 1/21/11 BY EASTERLY SURVEYING, INC.
17. "PROPOSED 4 STORY OFFICE BUILDING 100 NEW HAMPSHIRE AVENUE PORTSMOUTH, NH" DATED NOVEMBER 16, 2018 AND LAST REVISED 12/04/18 BY HOYLE, TANNER & ASSOCIATES.

FILE NAME: C:\Users\whitney\AppData\Local\Temp\AcPublish_7172\7239A (REV 1) 2022-09-21.dwg LAYOUT NAME: COVER PLOTTED: Wednesday, September 21, 2022 - 11:20am

KEY MAP

LEGEND

	LOT LINE		MEDIUM LONE TREE		RIP RAP	×100.0	SPOT GRADE
	APPROXIMATE LOT LINE		SMALL LONE TREE		RETAINING WALL	TYP.	TYPICAL
	APPROXIMATE ABUTTERS LOT LINE		UTILITY COVER		DRIVEWAY	BND. FND.	BOUND FOUND
	EXISTING EASEMENT LINE		UTILITY COVER		DRIVEWAY OBSCURED	I.P.F.	IRON PIPE FOUND
	APPROXIMATE RIGHT-OF-WAY LINE		FIRE HYDRANT		ASPHALT TAXIWAY	CONC.	CONCRETE
	CHAIN LINK FENCE	WV	WATER GATE VALVE		CONCRETE TAXIWAY	GRAN.	GRANITE
	FENCE	GV	GAS GATE VALVE		CURB BOTTOM	HDWL	HEADWALL
	FENCE OBSCURED	VP	VENT PIPE		CURB BACK	SGC	SLOPED GRANITE CURB
OHW	OVERHEAD WIRE	E	ELECTRIC BOX		PIPELINES	"NP"	NO PARKING SIGN
SS	SEWER LINE	TB	TELEPHONE BOX		UTILITY POLE	"NT"	NO TRESPASSING SIGN
SD	DRAIN LINE		DRAIN		UTILITY POLE & GUY WIRE	"NTT"	NO THRU TRAFFIC SIGN
G	GAS LINE		CATCH BASIN		UTILITY POLE W/LIGHT	ACP	ASBESTOS CEMENT PIPE
W	WATER LINE	D	DRAIN MANHOLE		UTILITY POLE OBSCURED	CIP	CAST IRON PIPE
100	MAJOR CONTOUR LINE	F.E.S	FLARED END SECTION		LIGHT POLE	CMP	CORRUGATED METAL PIPE
98	MINOR CONTOUR LINE	M	MANHOLE		SIGN	RCP	REINFORCED CONCRETE PIPE
100	LIDAR MAJOR CONTOUR LINE	E	ELECTRIC MANHOLE		SIGN (TWO POSTS)	HDPE	HIGH DENSITY POLYETHYLENE PIPE
98	LIDAR MINOR CONTOUR LINE	T	TELEPHONE MANHOLE		BOUND FOUND	PVC	POLYVINYL CHLORIDE PIPE
	TREE LINE	S	SEWER MANHOLE		IRON PIPE/ROD FOUND	UNK	UNKNOWN
	SHRUB LINE	CO	CLEANOUT		POST	VCP	VITREOUS CLAY PIPE
	EDGE OF WETLAND		FLAG POLE		POST	TOP	TOP OF PIPE
	EDGE OF WETLAND (PER CLIENT)		MONITORING WELL LOCATION		BOLLARD	NM	NOT MEASURED
	EDGE OF WATER		ACCESSIBLE PARKING SPACE		LOCATED OBJECT		
	WATERCOURSE						
	WETLAND AREA						
	CONCRETE						



LOCATION MAP (n.t.s.)

300 0 300 600
SCALE: 1 INCH = 300 FT.

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
OF
PEASE HANGAR 227 AREA
PORTIONS OF AVIATION AVENUE,
FLIGHTLINE ROAD, LEE STREET,
NEWFIELDS STREET,
NEW HAMPSHIRE AVENUE
ROCHESTER AVENUE
AND STRATHAM STREET
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	09/21/22	UPDATED DMH 1925 OUTLET SIZE	W.D.C.

DRAWN BY: W.D.C.	DATE: FEBRUARY 2022
CHECKED BY: M.J.C.	DRAWING NO. 7239A
JOB NO. 7239	SHEET 1 OF 8

DOUCET SURVEY LLC
Serving Your Professional Surveying & Mapping Needs
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
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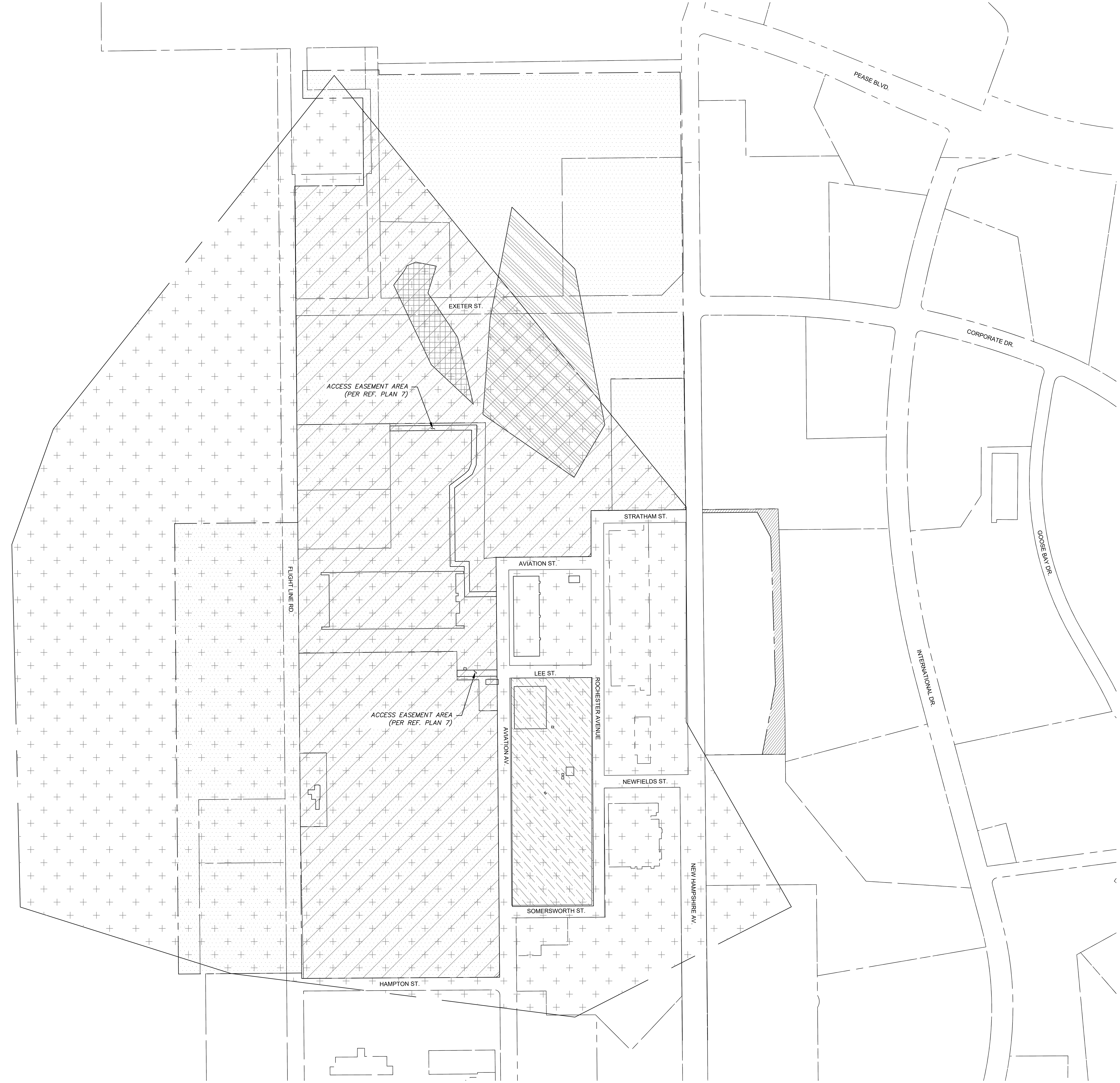
10 Storer Street (Riverview Suite) Kennebunk, ME (207) 502-7005
http://www.doucetsurvey.com



DOUCET SURVEY
N E S W
NHSPC (NAD83 / 2011)

LEGEND

- EXCEPTED SUBPARCEL ZONE 3 (PER REF. PLAN 8)
- GROUNDWATER MANAGEMENT ZONE 3 (PER REF. PLAN 9)
- USE RESTRICTION ZONE SITE 32 (PER REF. PLAN 10)
- USE RESTRICTION ZONE SITE 81 (PER REF. PLAN 11)
- USE RESTRICTION ZONE SITE 72 (PER REF. PLAN 12)
- LIMIT OF DRAINAGE LICENSE RESERVED BY OWNER (PER REF. PLAN 13)
- USE RESTRICTION ZONE SITE 3 (PER REF. PLAN 14)

250 0 250 500
SCALE: 1 INCH = 250 FT.

EXISTING CONDITIONS PLAN
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PEASE HANGAR 227 AREA
PORTIONS OF AVIATION AVENUE,
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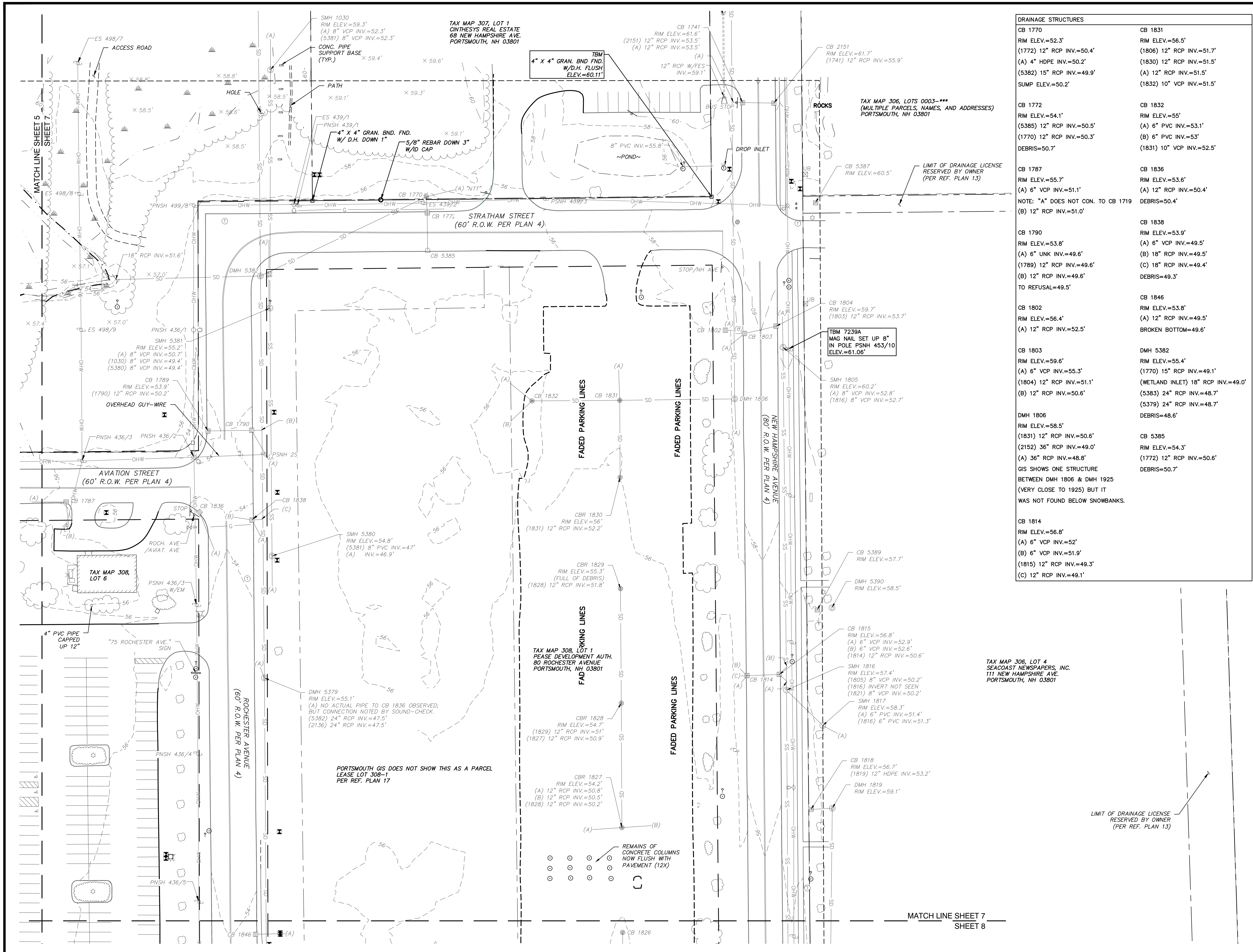

DRAINAGE STRUCTURES	
CB 1770	CB 1831
RIM ELEV.=52.3'	RIM ELEV.=56.5'
(1772) 12" RCP INV.=50.4'	(1806) 12" RCP INV.=51.7'
(A) 4" HDPE INV.=50.2'	(1830) 12" RCP INV.=51.5'
(5382) 15" RCP INV.=49.9'	(A) 12" RCP INV.=51.5'
SUMP ELEV.=50.2'	(1832) 10" VCP INV.=51.5'
CB 1772	CB 1832
RIM ELEV.=54.1'	RIM ELEV.=55'
(5385) 12" RCP INV.=50.5'	(A) 6" PVC INV.=53.1'
(1770) 12" RCP INV.=50.3'	(B) 6" PVC INV.=53'
DEBRIS=50.7'	(1831) 10" VCP INV.=52.5'
CB 1787	CB 1836
RIM ELEV.=55.7'	RIM ELEV.=53.6'
(A) 6" VCP INV.=51.1'	(A) 12" RCP INV.=50.4'
NOTE: "A" DOES NOT CON. TO CB 1719	DEBRIS=50.4'
(B) 12" RCP INV.=51.0'	
	CB 1838
CB 1790	RIM ELEV.=53.9'
RIM ELEV.=53.8'	(A) 6" VCP INV.=49.5'
(A) 6" UNK INV.=49.6'	(B) 18" RCP INV.=49.5'
(1789) 12" RCP INV.=49.6'	(C) 18" RCP INV.=49.4'
(B) 12" RCP INV.=49.6'	DEBRIS=49.3'
TO REFUSAL=49.5'	
	CB 1846
CB 1802	RIM ELEV.=53.8'
RIM ELEV.=56.4'	(A) 12" RCP INV.=49.5'
(A) 12" RCP INV.=52.5'	BROKEN BOTTOM=49.6'
CB 1803	DMH 5382
RIM ELEV.=59.6'	RIM ELEV.=55.4'
(A) 6" VCP INV.=55.3'	(1770) 15" RCP INV.=49.1'
(1804) 12" RCP INV.=51.1'	(WETLAND INLET) 18" RCP INV.=49.0'
(B) 12" RCP INV.=50.6'	(5383) 24" RCP INV.=48.7'
	(5379) 24" RCP INV.=48.7'
DMH 1806	DEBRIS=48.6'
RIM ELEV.=58.5'	
(1831) 12" RCP INV.=50.6'	CB 5385
(2152) 36" RCP INV.=49.0'	RIM ELEV.=54.3'
(A) 36" RCP INV.=48.8'	(1772) 12" RCP INV.=50.6'
GIS SHOWS ONE STRUCTURE	DEBRIS=50.7'
BETWEEN DMH 1806 & DMH 1925	
(VERY CLOSE TO 1925) BUT IT	
WAS NOT FOUND BELOW SNOWBANKS.	
CB 1814	
RIM ELEV.=56.8'	
(A) 6" VCP INV.=52'	
(B) 6" VCP INV.=51.9'	
(1815) 12" RCP INV.=49.3'	
(C) 12" RCP INV.=49.1'	

40 0 40 80
SCALE: 1 INCH = 40 FT.

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
OF
PEASE HANGAR 227 AREA
PORTIONS OF AVIATION AVENUE,
FLIGHTLINE ROAD, LEE STREET,
NEWFIELDS STREET,
NEW HAMPSHIRE AVENUE
ROCHESTER AVENUE
AND STRATHAM STREET
PORTSMOUTH, NEW HAMPSHIRE

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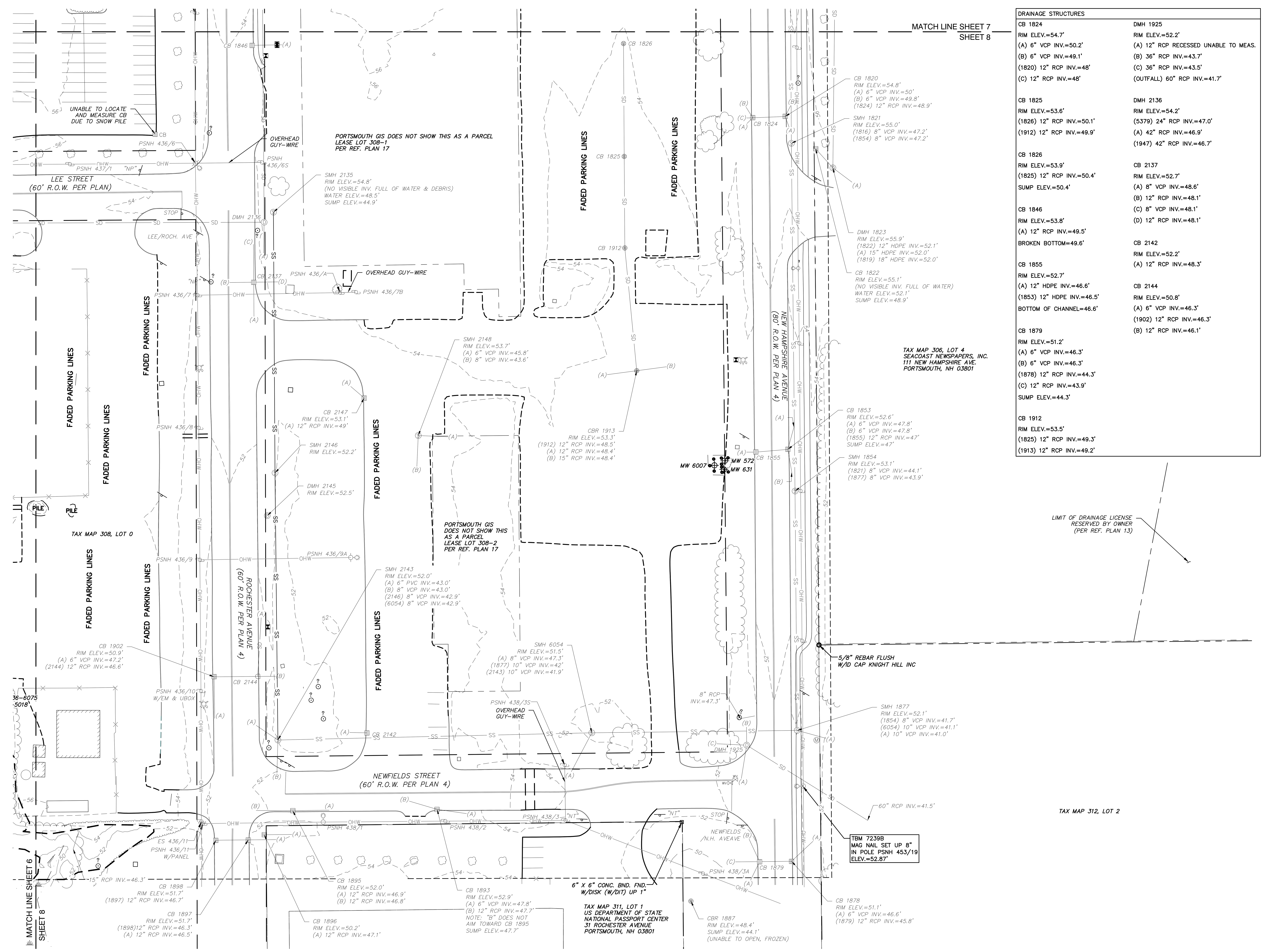

DRAINAGE STRUCTURES	
CB 1824	DMH 1925
RIM ELEV.=54.7'	RIM ELEV.=52.2'
(A) 6" VCP INV.=50.2'	(A) 12" RCP RECESSED UNABLE TO MEAS.
(B) 6" VCP INV.=49.1'	(B) 36" RCP INV.=43.7'
(1820) 12" RCP INV.=48'	(C) 36" RCP INV.=43.5'
(C) 12" RCP INV.=48'	(OUTFALL) 60" RCP INV.=41.7'
CB 1825	DMH 2136
RIM ELEV.=53.6'	RIM ELEV.=54.2'
(1826) 12" RCP INV.=50.1'	(5379) 24" RCP INV.=47.0'
(1912) 12" RCP INV.=49.9'	(A) 42" RCP INV.=46.9'
	(1947) 42" RCP INV.=46.7'
CB 1826	
RIM ELEV.=53.9'	CB 2137
(1825) 12" RCP INV.=50.4'	RIM ELEV.=52.7'
SUMP ELEV.=50.4'	(A) 8" VCP INV.=48.6'
	(B) 12" RCP INV.=48.1'
CB 1846	(C) 8" VCP INV.=48.1'
RIM ELEV.=53.8'	(D) 12" RCP INV.=48.1'
(A) 12" RCP INV.=49.5'	
BROKEN BOTTOM=49.6'	CB 2142
	RIM ELEV.=52.2'
CB 1855	(A) 12" RCP INV.=48.3'
RIM ELEV.=52.7'	
(A) 12" HDPE INV.=46.6'	CB 2144
(1853) 12" HDPE INV.=46.5'	RIM ELEV.=50.8'
BOTTOM OF CHANNEL=46.6'	(A) 6" VCP INV.=46.3'
	(1902) 12" RCP INV.=46.3'
CB 1879	(B) 12" RCP INV.=46.1'
RIM ELEV.=51.2'	
(A) 6" VCP INV.=46.3'	
(B) 6" VCP INV.=46.3'	
(1878) 12" RCP INV.=44.3'	
(C) 12" RCP INV.=43.9'	
SUMP ELEV.=44.3'	
CB 1912	
RIM ELEV.=53.5'	
(1825) 12" RCP INV.=49.3'	
(1913) 12" RCP INV.=49.2'	

EXISTING CONDITIONS PLAN

FOR

TIGHE & BOND

OF

PEASE HANGAR 227 AREA

PORTIONS OF AVIATION AVENUE, FLIGHTLINE ROAD, LEE STREET, NEWFIELDS STREET, NEW HAMPSHIRE AVENUE ROCHESTER AVENUE AND STRATHAM STREET

PORTSMOUTH, NEW HAMPSHIRE

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EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY LLC DURING JANUARY & FEBRUARY 2022.
2. JURISDICTIONAL WETLANDS DELINEATED BY TIGHE & BOND, DURING DECEMBER 2021.

REFERENCE PLANS:

1. "EXISTING CONDITIONS PLAN FOR TIGHE & BOND OF PEASE HANGAR 227 AREA, PORTIONS OF AVIATION AVENUE, FLIGHTLINE ROAD, LEE STREET, NEWFIELDS STREET, NEW HAMPSHIRE AVENUE, ROCHESTER AVENUE, AND STRATHEM STREET" PREPARED BY DOUCET SURVEY LLC, LAST REVISED 09/21/2022.

DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS. MATERIAL DEMOLITION AND DISPOSAL SHALL BE DONE IN CONFORMANCE WITH THE PEASE WASTE MANAGEMENT PLAN REQUIREMENTS.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARD. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, SIGNS, BOLLARDS, TREES AND LANDSCAPING.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
15. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
16. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
18. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
19. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
20. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
21. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
22. BEFORE ANY DEWATERING IS PERFORMED A TEMPORARY DISCHARGE PERMIT FROM THE NHDES IS REQUIRED.
23. THE SITE IS IN A GROUNDWATER MANAGEMENT ZONE (GMZ). THE APPLICANT SHALL COORDINATE WITH PDA, NHDES AND THE AIR FORCE TO DETERMINE IF ANY SPECIAL MEASURES ARE REQUIRED DURING CONSTRUCTION TO ENSURE THE SAFETY OF WORKERS AND PROPER HANDLING OF MATERIALS. NO EXISTING SOILS OR MATERIALS MAY BE REMOVED AND DISPOSED OF OFFSITE UNLESS TESTING AND PROTOCOLS ESTABLISHED ARE FOLLOWED. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPROVED AREA OF SPECIAL NOTICE PROVISIONS ISSUED BY THE AIR FORCE.
24. THE CONTRACTOR SHALL ACQUIRE A PDA DIG PERMIT BEFORE ANY DISTURBANCE CAN TAKE PLACE. ALLOW 7 CALENDAR DAYS FOR PROCESSING.
25. ALL MONITORING WELLS WITHIN THE LIMIT OF WORK SHALL BE PROTECTED DURING CONSTRUCTION. IF ANY MONITORING WELL NEEDS TO BE REMOVED OR ADJUSTED THIS WORK SHALL BE COORDINATED WITH PDA AND THE AIR FORCE.

DEMOLITION LEGEND

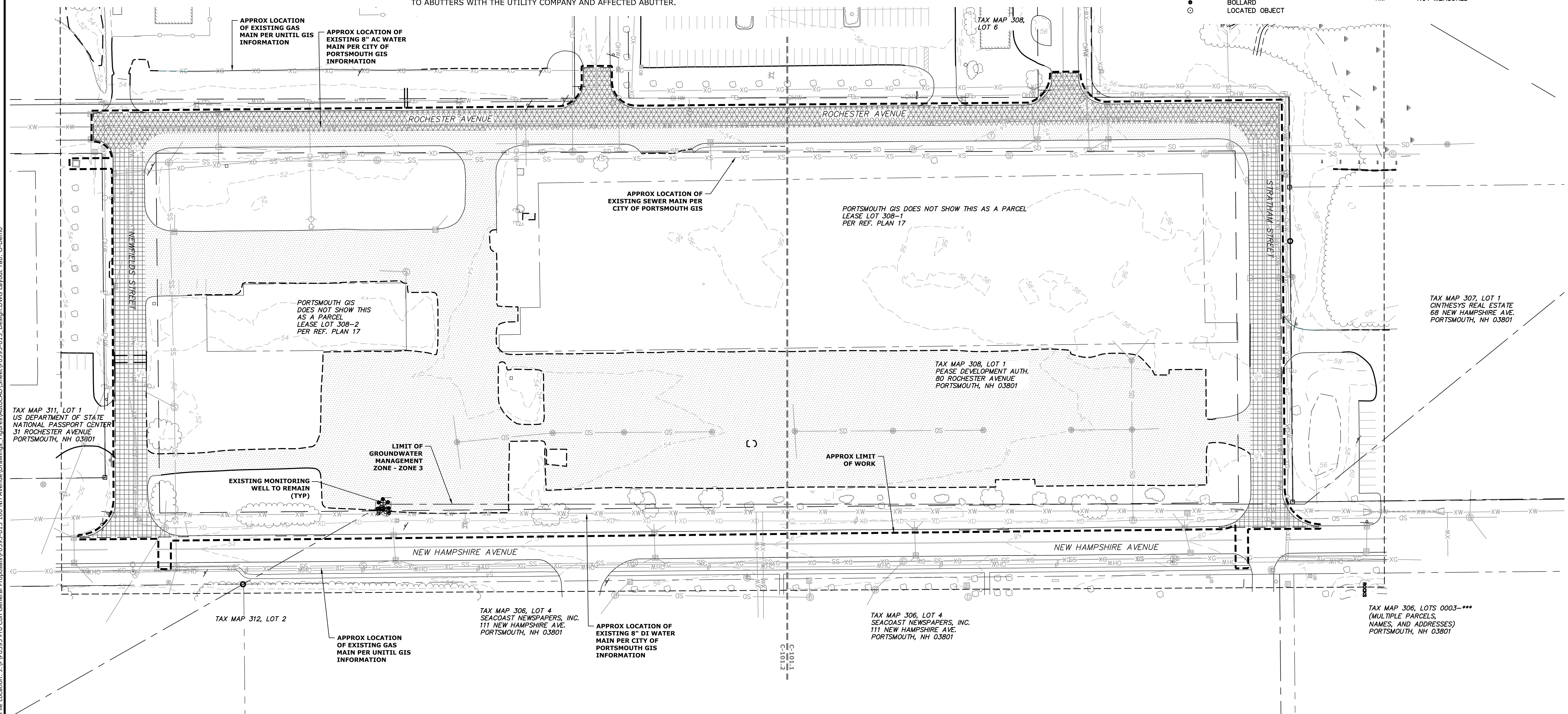
APPROXIMATE LIMIT OF WORK
APPROXIMATE LIMIT OF SAWCUT
APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
APPROXIMATE LIMIT OF PAVEMENT TO BE RECLAIMED
APPROXIMATE LIMIT OF PAVEMENT TO BE MILL AND OVERLAID

LEGEND

LOT LINE
APPROXIMATE LOT LINE
APPROXIMATE ABUTTERS LOT LINE
EXISTING EASEMENT LINE
APPROXIMATE RIGHT-OF-WAY LINE
CHAIN LINK FENCE
FENCE
FENCE OBSCURED
OVERHEAD WIRE
SEWER LINE
DRAIN LINE
GAS LINE
WATER LINE
MAJOR CONTOUR LINE
MINOR CONTOUR LINE
LIDAR MAJOR CONTOUR LINE
LIDAR MINOR CONTOUR LINE
TREE LINE
SHRUB LINE
EDGE OF WETLAND
EDGE OF WETLAND (PER CLIENT)
EDGE OF WATER
WATERCOURSE
WETLAND AREA
CONCRETE
RIP RAP
RETAINING WALL
DRIVEWAY
DRIVEWAY OBSCURED
ASPHALT TAXIWAY
CONCRETE TAXIWAY
CURB BOTTOM
CURB BACK
PIPELINES
UTILITY POLE
UTILITY POLE & GUY WIRE
UTILITY POLE W/LIGHT
UTILITY POLE OBSCURED
LIGHT POLE
SIGN
SIGN (TWO POSTS)
BOUND FOUND
IRON PIPE/ROD FOUND
POST
POST
BOLLARD
LOCATED OBJECT

MEDIUM LONE TREE
SMALL LONE TREE
UTILITY COVER
UTILITY COVER
FIRE HYDRANT
WATER GATE VALVE
GAS GATE VALVE
VENT PIPE
ELECTRIC BOX
TELEPHONE BOX
DRAIN
CATCH BASIN
DRAIN MANHOLE
F.E.S FLARED END SECTION
MANHOLE
ELECTRIC MANHOLE
TELEPHONE MANHOLE
SEWER MANHOLE
CLEANOUT
FLAG POLE
MONITORING WELL LOCATION
ACCESSIBLE PARKING SPACE
×100.0 SPOT GRADE

TYP.	TYPICAL
BND. FND.	BOUND FOUND
I.P.F.	IRON PIPE FOUND
CONC.	CONCRETE
GRAN.	GRANITE
HDWL	HEADWALL
SGC	SLOPED GRANITE CURB
"NP"	NO PARKING SIGN
"NT"	NO TRESPASSING SIGN
"NTT"	NO THRU TRAFFIC SIGN
ACP	ASBESTOS CEMENT PIPE
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
RCP	REINFORCED CONCRETE PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
UNK	UNKNOWN
VCP	VITREOUS CLAY PIPE
TOP	TOP OF PIPE
NM	NOT MEASURED



Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 1/25/23

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 1/25/23

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
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A	12/19/2022	TAC Submission

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CHECKED:	NAH
APPROVED:	PMC

OVERALL EXISTING CONDITIONS / DEMOLITION PLAN

SCALE: AS SHOWN

C-101

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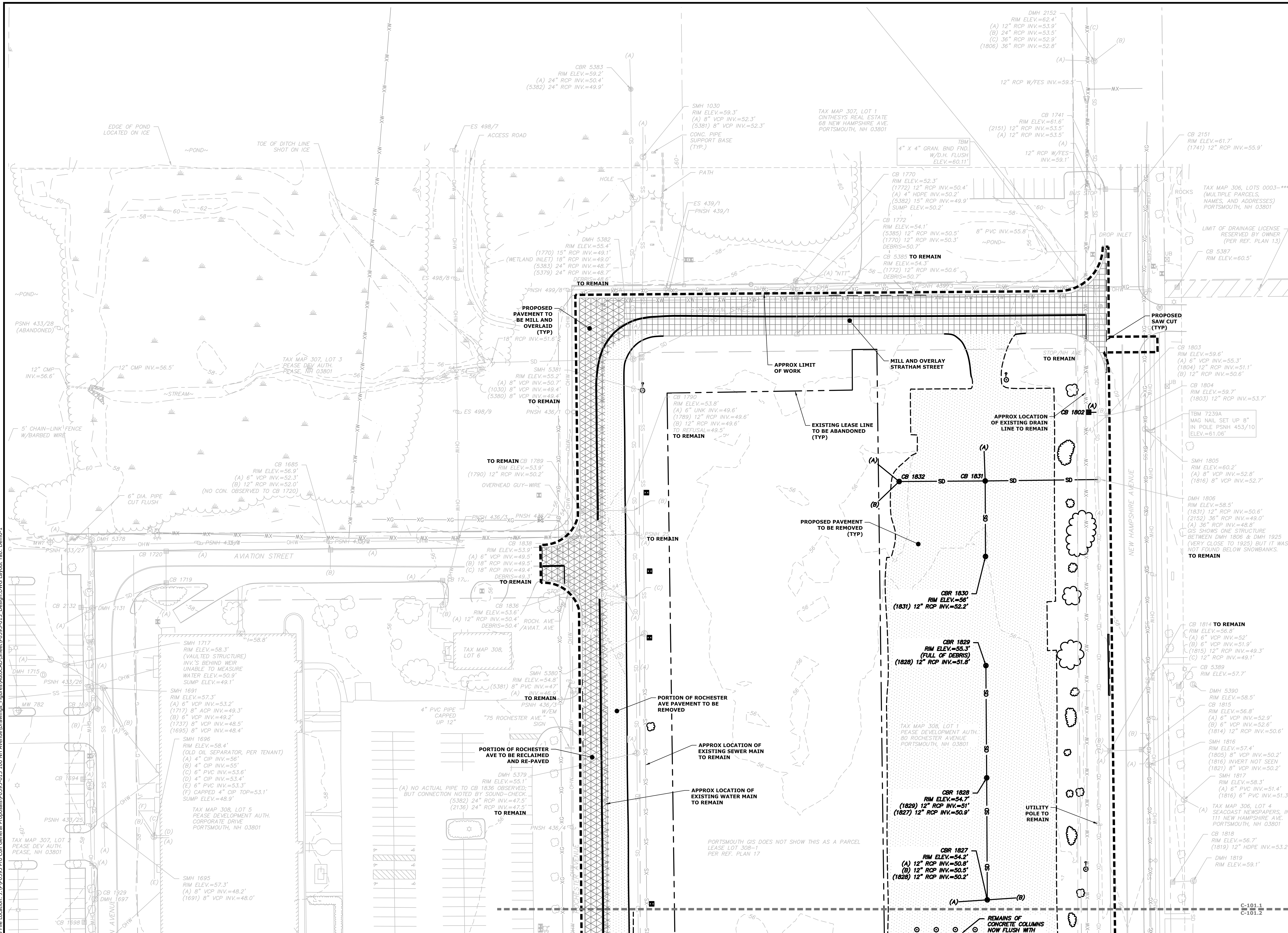

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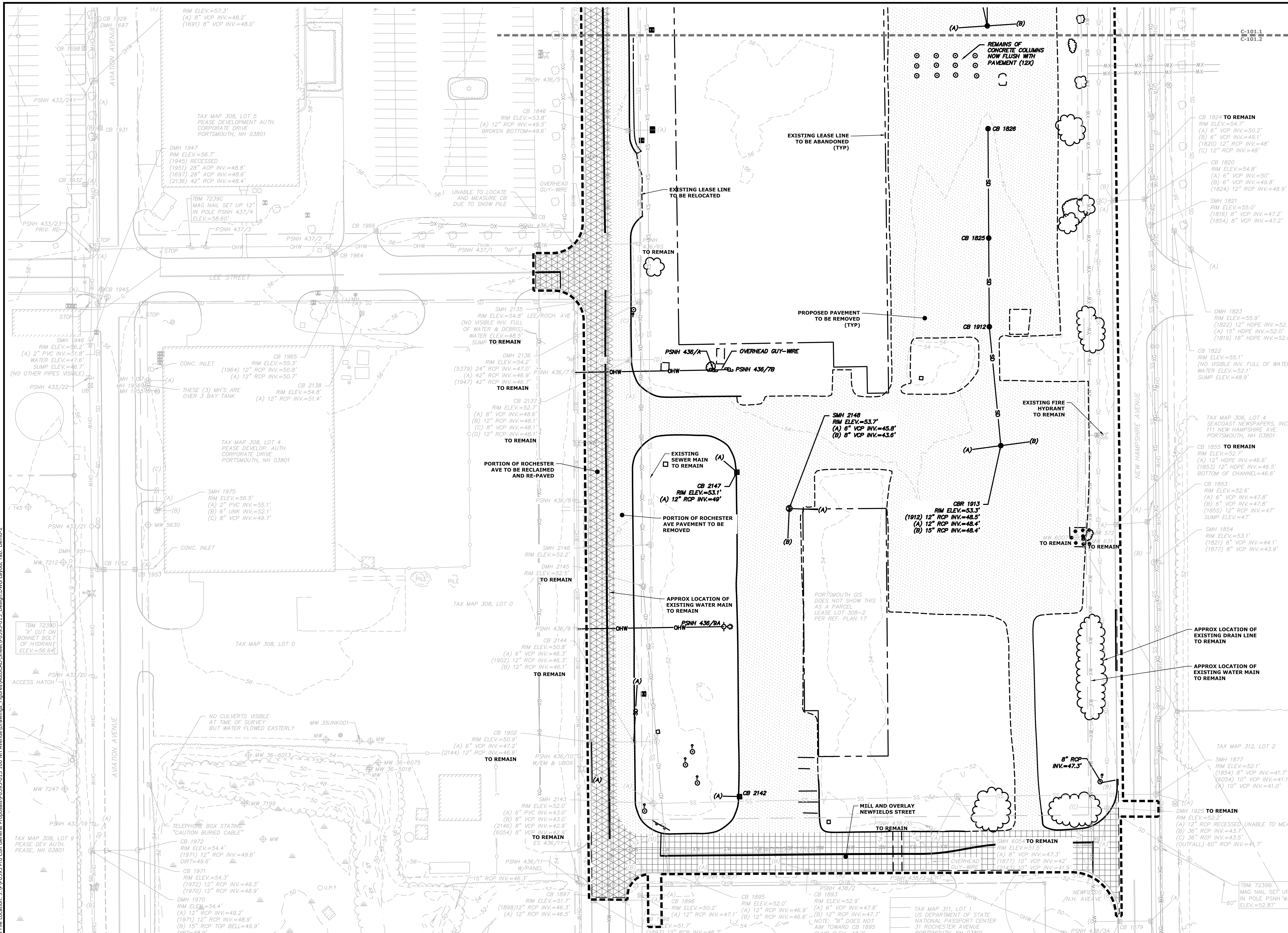

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SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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SCALE: AS SHOWN

C-101.2

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SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
15. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
16. THE SITE ENGINEER SHALL OBSERVE THE CONSTRUCTION AND SHALL SUBMIT TO THE PDA A LETTER STATING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE PLANS.
17. CONSTRUCTION CANNOT BEGIN UNTIL A DETERMINATION OF NO OBJECTION IS ISSUED BY FAA. TO OBTAIN THE FAA DETERMINATION, THE CONTRACTOR/DEVELOPER MUST SUBMIT TO FAA A NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION FORM 7460-1, AVAILABLE AT "https://www.faa.gov/documentLibrary/media/Form/FAA_Form_7460-1_042023.pdf".
18. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PUBLIC WALKS, DRIVES, AND AIRSIDE PAVEMENT AREAS ON-SITE. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.
19. RETAINING WALL SHALL BE DESIGNED AND STAMPED BY A NEW HAMPSHIRE LICENSED PROFESSIONAL ENGINEER AND SHALL BE SUBMITTED TO PEASE DEVELOPMENT AUTHORITY FOR REVIEW.

SITE DATA:
LOCATION: TAX MAP 308, LOT 1
80 ROCHESTER AVENUE
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: INDUSTRIAL
ALLOWED USE: INDUSTRIAL / WAREHOUSE

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA:	10 ACRES	±10.9 ACRES
MINIMUM STREET FRONTAGE:	200 FT	±1,200 FT
MINIMUM SETBACKS:		
• FRONT:	70 FT	±51 FT(1)
• SIDE:	50 FT	±202 FT
• REAR:	50 FT	±28.4 FT(2)
MAXIMUM BUILDING HEIGHT:	PER FAA	36 FT
MINIMUM OPEN SPACE:	25%	±30%

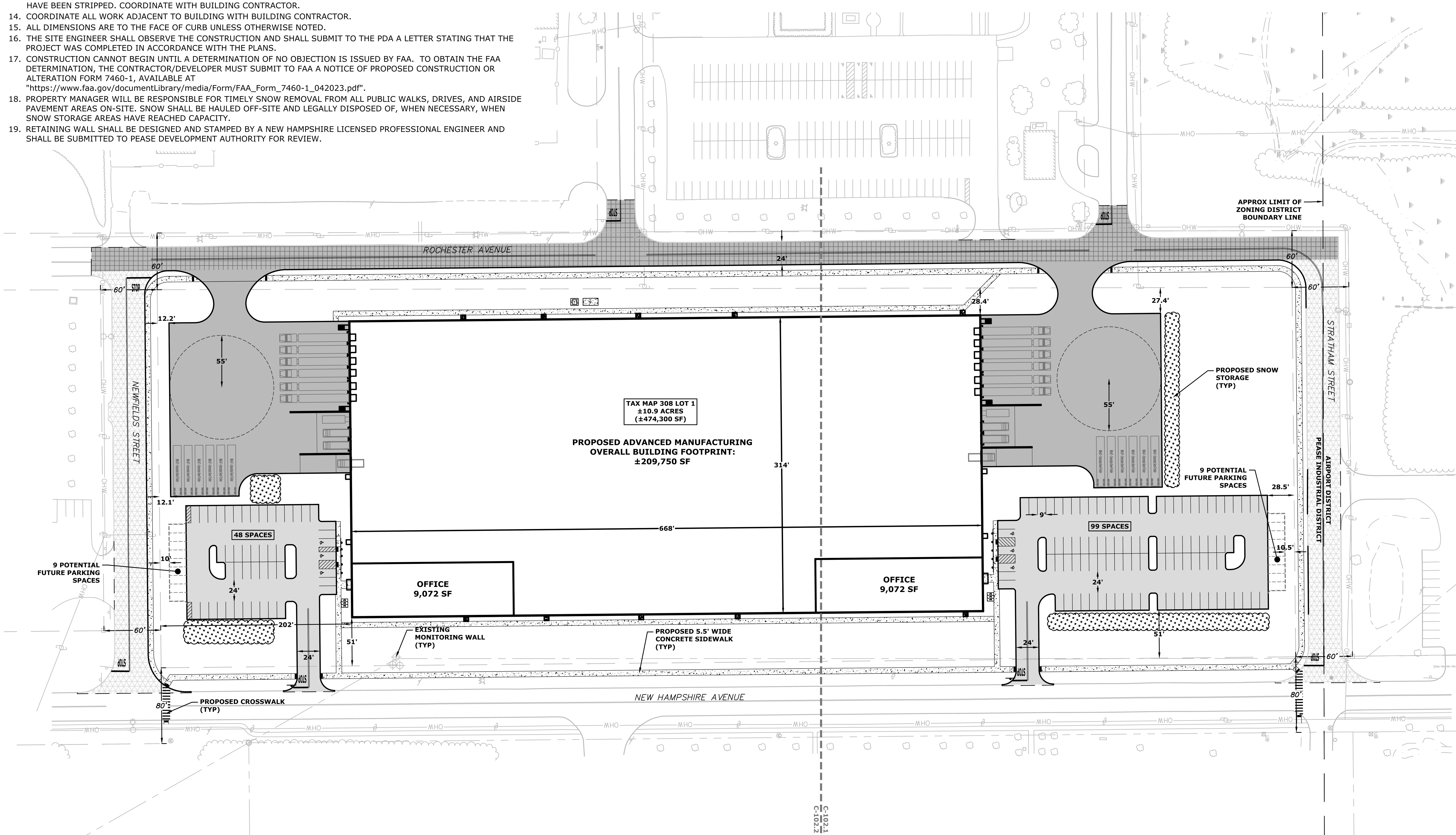
(1) - ON NOVEMBER 15, 2022 THE CITY OF PORTSMOUTH ZONING BOARD OF ADJUSTMENT VOTED TO RECOMMEND APPROVAL TO THE PDA BOARD FOR A VARIANCE FROM PART 304.03(C) TO ALLOW A 51 FOOT FRONT YARD WHERE 70 FEET IS REQUIRED.
(2) - VARIANCE REQUIRED FROM PART 304.03(E) OF THE PEASE INTERNATIONAL TRADEPORT ZONING ORDINANCE TO ALLOW FOR A ±28.4 FOOT REAR YARD WHERE 70 FEET IS REQUIRED.

PARKING REQUIREMENTS:	REQUIRED	PROPOSED
PARKING STALL LAYOUT:		
• STANDARD 90°	WIDTH: 8.5' MIN AREA: 160 SF MIN	9' X 18' (162 SF)
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT (MIN)
PARKING SPACE REQUIREMENTS: INDUSTRIAL: 2 / 3 EMPLOYEES (LARGEST SHIFT) +1 / COMPANY-OWNED-VEHICLE = 161 EMPLOYEES x 2/3 EMPLOYEES) + 2 COMPANY-OWNED-VEHICLE =	110 SPACES	
OFFICE: 1 / 2 EMPLOYEES = 73 EMPLOYEES x (1 / 2 EMPLOYEES) =	37 SPACES	
TOTAL REQUIRED PARKING:	147 SPACES	147 SPACES(1)

(1) - SIX (6) ADA SPACES PROVIDED

LEGEND

- PROPOSED LEASE LINE
- PROPOSED CONCRETE
- PROPOSED STANDARD DUTY PAVEMENT SECTION
- PROPOSED HEAVY DUTY PAVEMENT SECTION
- PROPOSED RECLAIM AND RE-PAVE
- PROPOSED MILL AND OVERLAY
- PROPOSED SNOW STORAGE AREA
- APPROXIMATE LIMIT OF SAWCUT
- PROPOSED LIGHT POLE BASE
- EXISTING PROPOSED SIGN
- PROPOSED BOLLARD



SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

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OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

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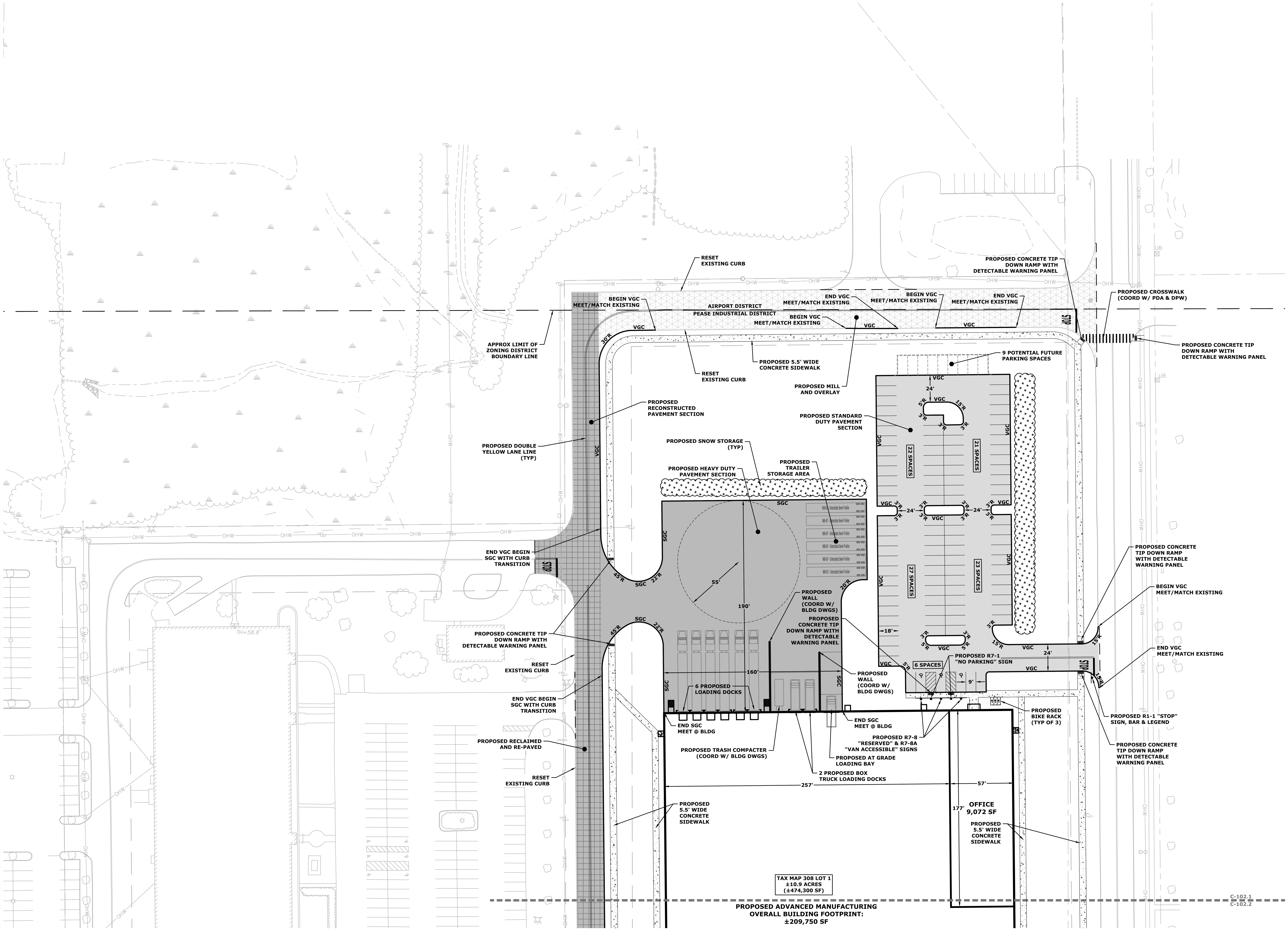

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SITE PLAN

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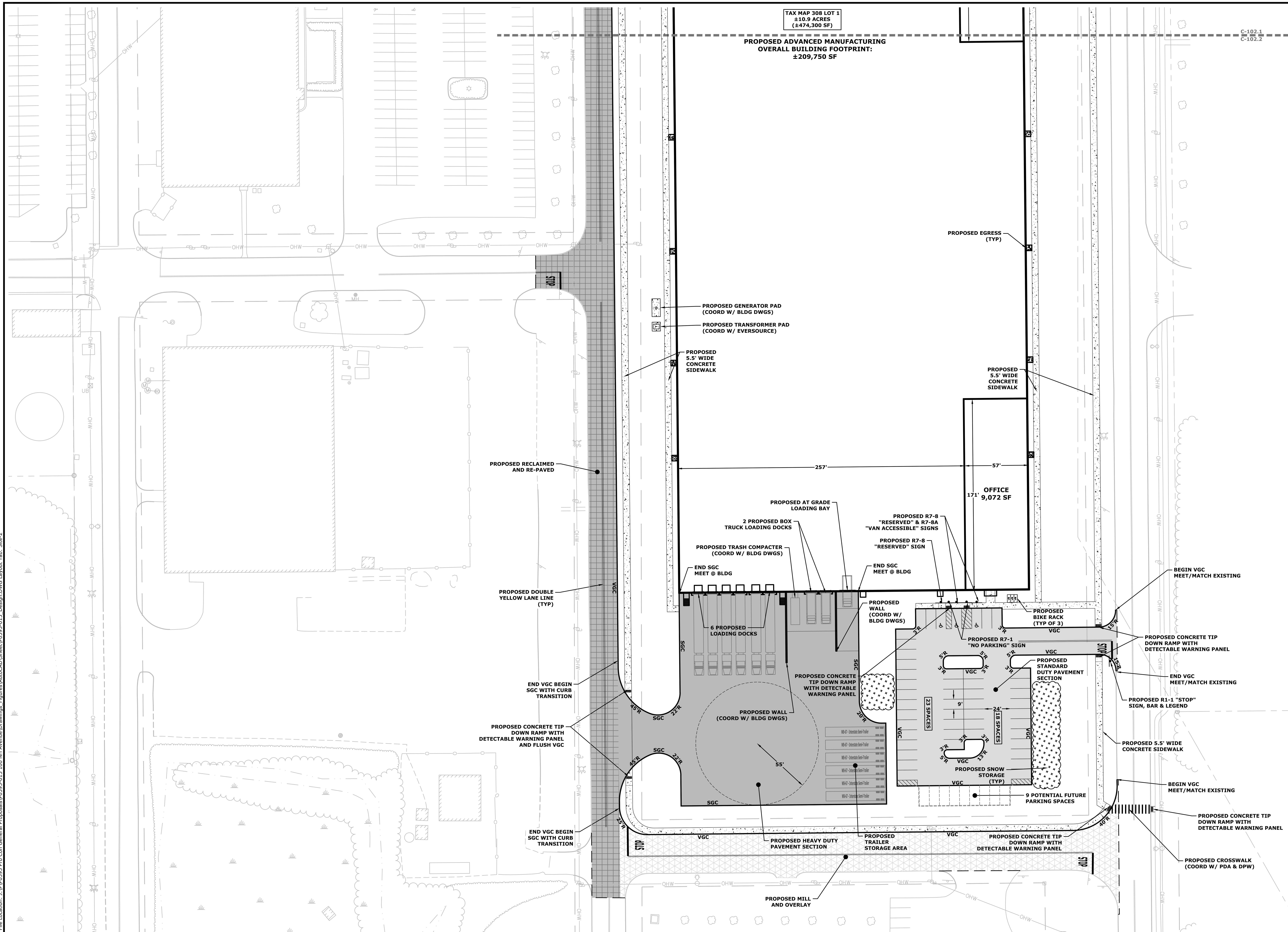
C-102.1



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Tighe&Bond

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SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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SITE PLAN

SCALE: AS SHOWN

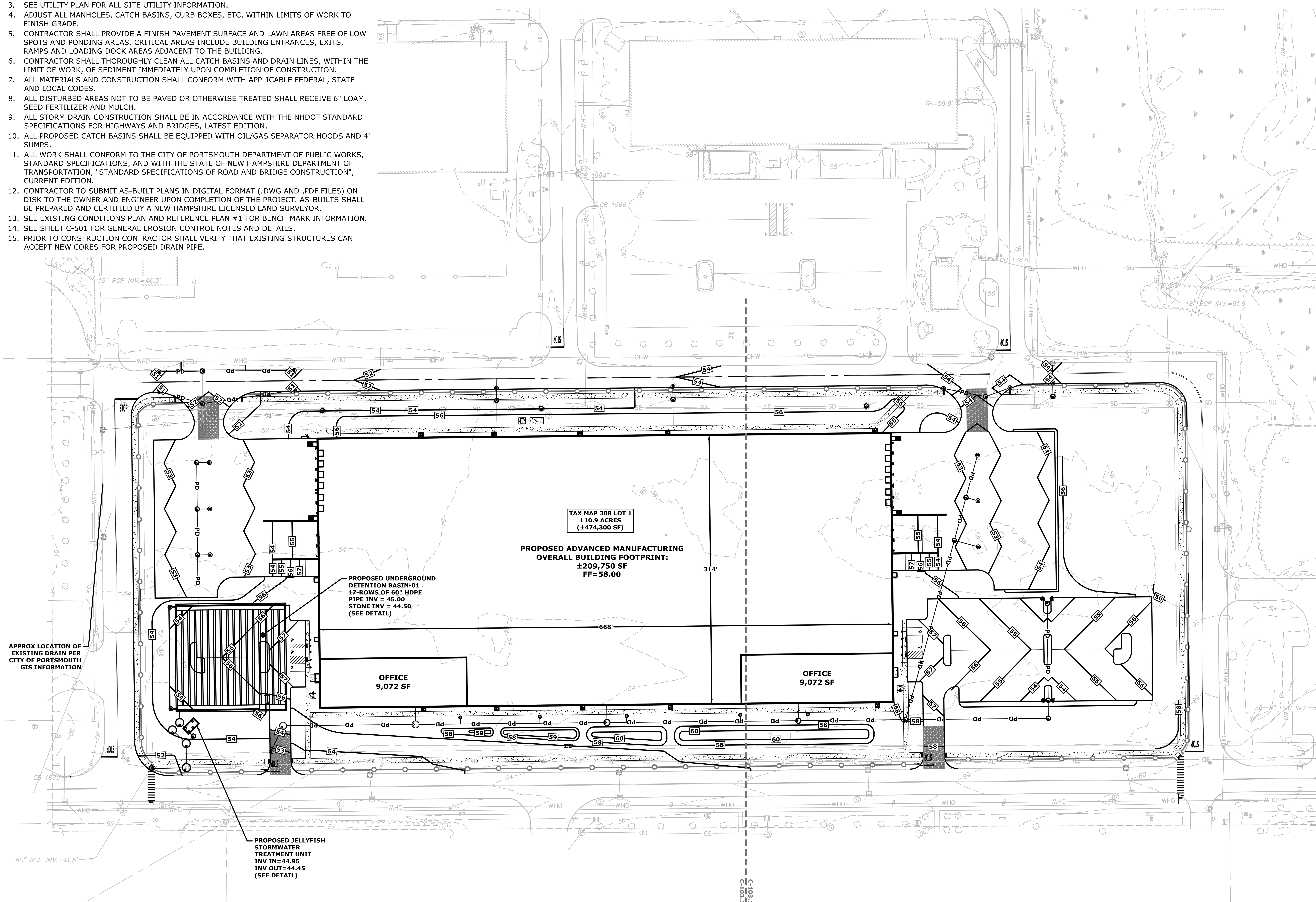
C-102.2

GRADING AND DRAINAGE & EROSION CONTROL NOTES:

1. COMPACTION REQUIREMENTS:
   BELOW PAVED OR CONCRETE AREAS 95%
   TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL 95%
   BELOW LOAM AND SEED AREAS 90%
   * ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS, AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
12. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
13. SEE EXISTING CONDITIONS PLAN AND REFERENCE PLAN #1 FOR BENCH MARK INFORMATION.
14. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.
15. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT EXISTING STRUCTURES CAN ACCEPT NEW CORES FOR PROPOSED DRAIN PIPE.

LEGEND

PD — PD	PROPOSED DRAIN LINE
100	EXISTING MAJOR CONTOUR LINE
98	EXISTING MINOR CONTOUR LINE
56	PROPOSED CONTOUR LINE
	PROPOSED CATCH BASIN
	PROPOSED YARD DRAIN
	PROPOSED DRAIN MANHOLE
±44.45	APPROX EXISTING SPOT GRADE
44.45	PROPOSED SPOT GRADE



Tighe&Bond

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
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FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

OVERALL GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Save Date: January 24, 2023 5:03 PM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton
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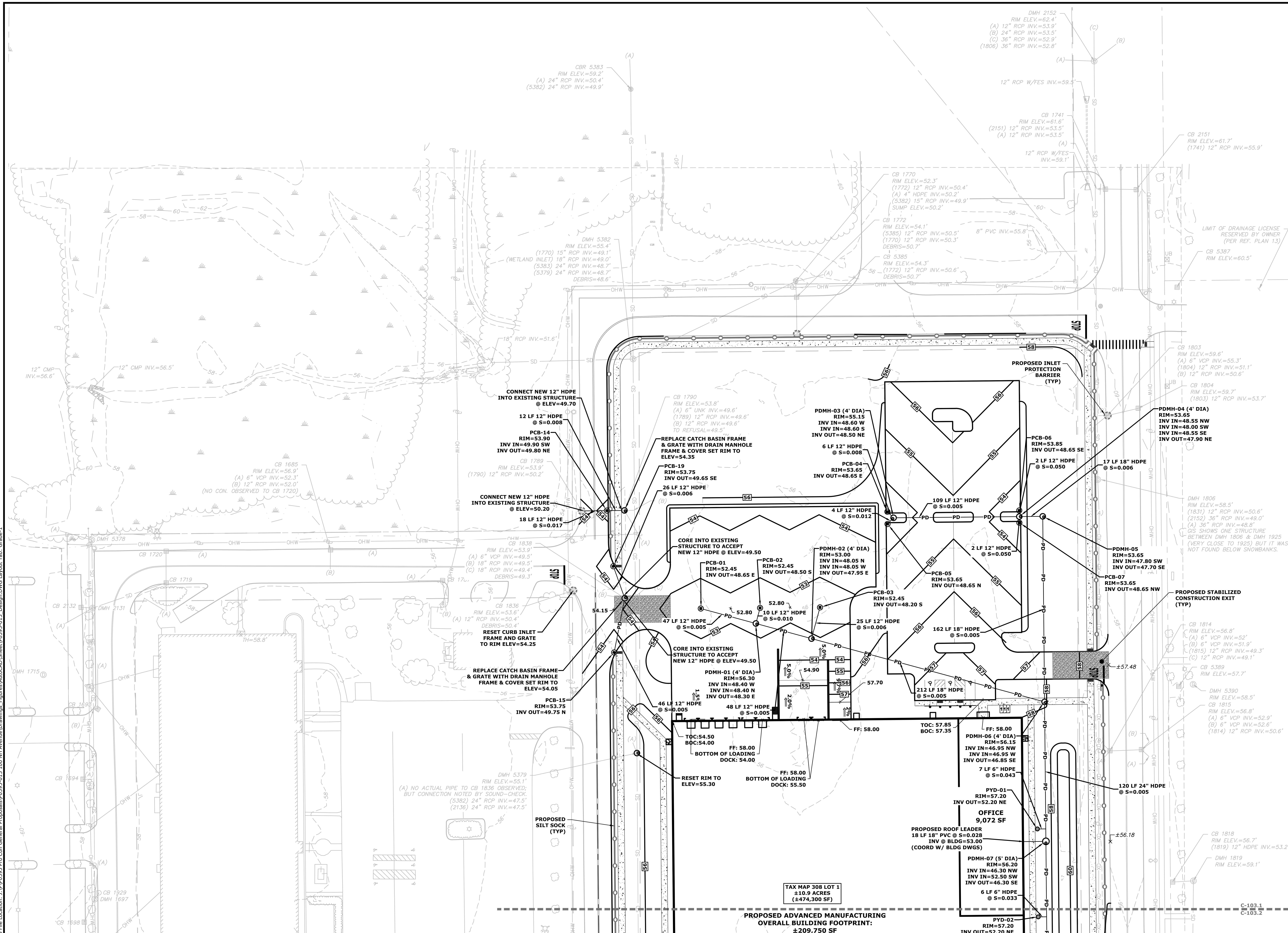

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Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 1/25/23

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 1/25/23

SCALE IN FEET 0 40' 80'
GRAPHIC SCALE

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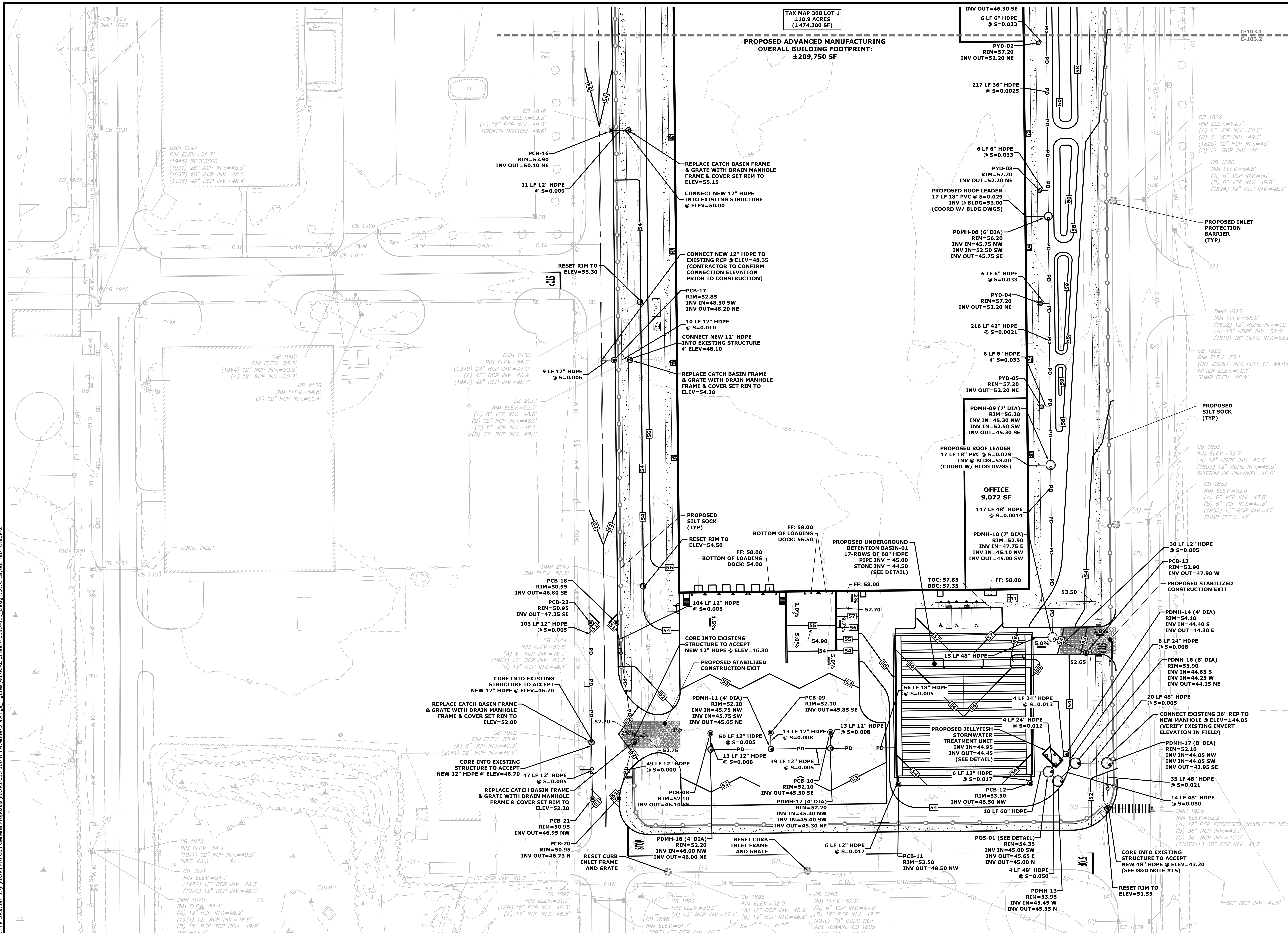
GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103.1



Tighe&Bond

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GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103.2

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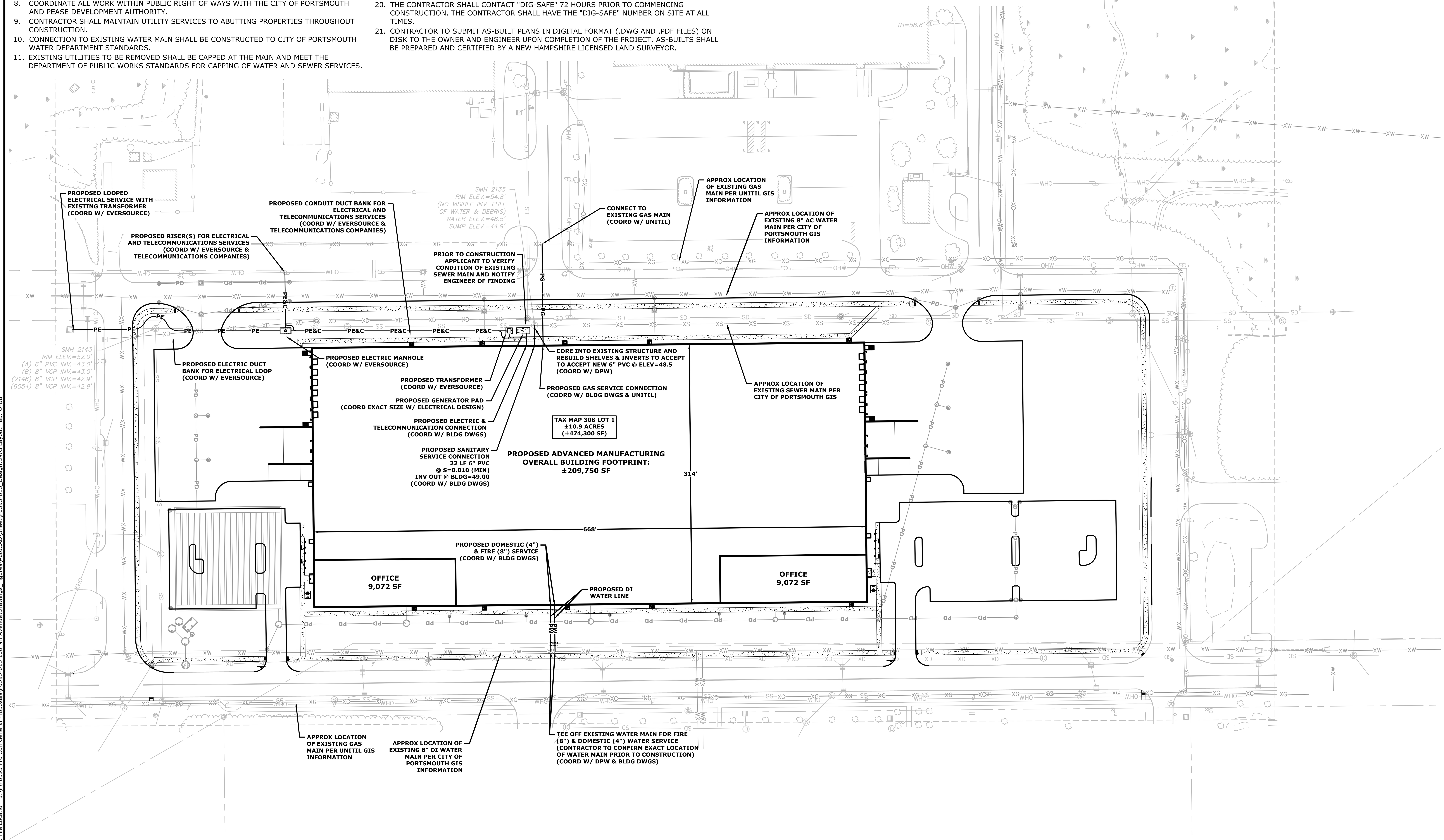
UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL / NORTHERN UTILITIES
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - FAIRPOINT COMMUNICATIONS
3. SEE EXISTING CONDITIONS PLAN AND REFERENCE PLAN #1 FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
6. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
7. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
8. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH AND PEASE DEVELOPMENT AUTHORITY.
9. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
10. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.
11. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
12. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
13. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
15. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
16. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
17. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
18. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
19. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
20. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
21. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
22. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
23. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH / PEASE FIRE DEPARTMENT.
24. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
25. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
26. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
27. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
28. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
29. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
30. FINAL LOCATION OF ALL WATER METER AND VALVE SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DPW PRIOR TO CONSTRUCTION.

LEGEND

PS	PROPOSED SEWER LINE
PG	PROPOSED GAS LINE
PC	PROPOSED COMMUNICATIONS LINE
PE	PROPOSED ELECTRIC LINE
PE&C	PROPOSED ELECTRIC & COMMUNICATIONS LINE
PW	PROPOSED WATER LINE
	PROPOSED WATER GATE VALVE
	PROPOSED ELECTRIC MANHOLE
	PROPOSED SEWER MANHOLE



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Tighe&Bond

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STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 1/25/23

SCALE IN FEET 0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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UTILITY PLAN

SCALE: AS SHOWN

C-104

LANDSCAPE NOTES:

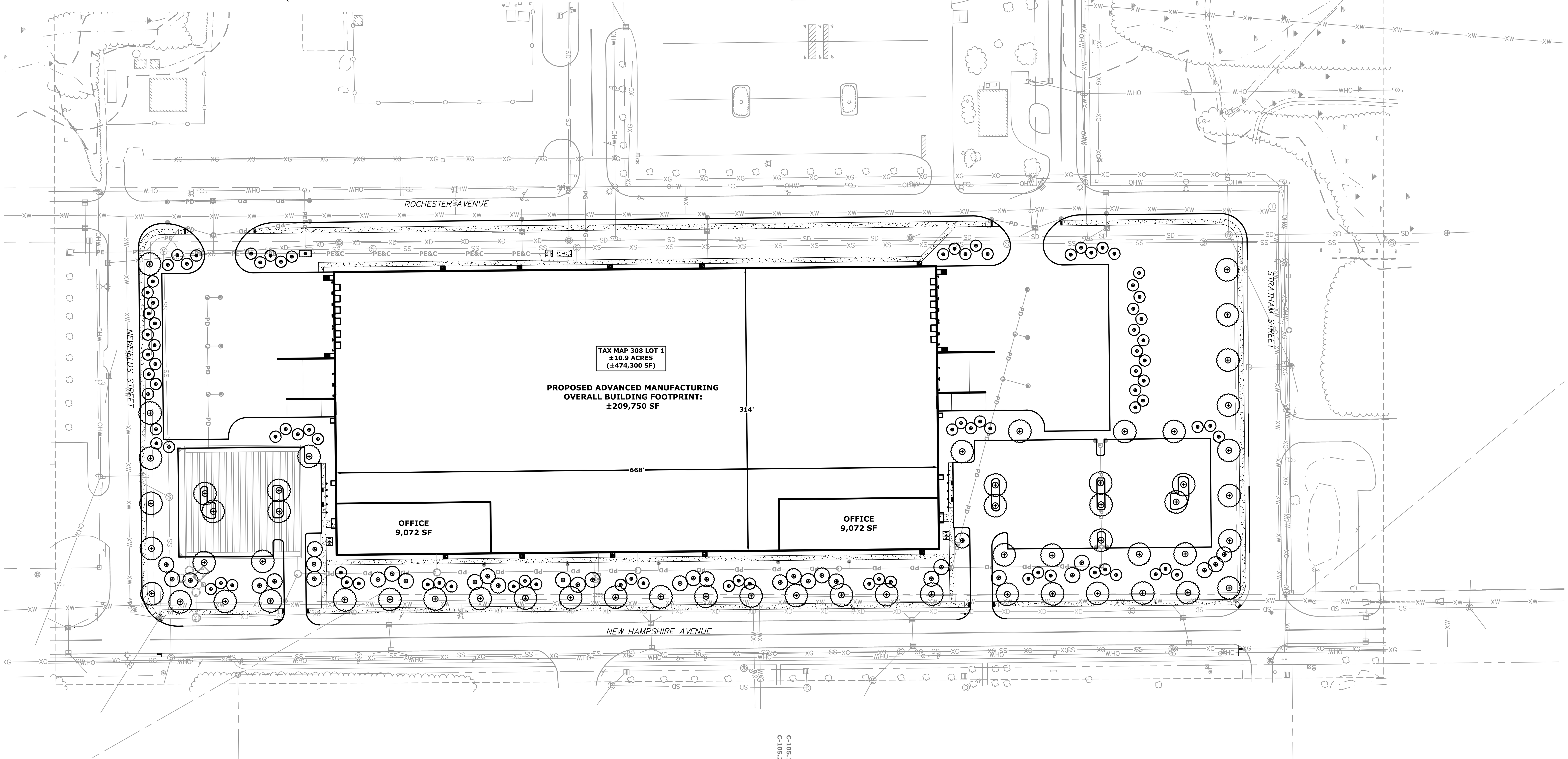
1. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
2. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
3. PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
4. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
5. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
6. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
9. THREE INCHES (3") OF BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
10. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
11. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
12. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
13. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
14. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
15. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
16. EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
17. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
18. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
20. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

PLANT SCHEDULE				
CODE	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES				
AF	ACER FREEMANII	AUTUM BLAZE MAPLE	2-1/2" - 3"	CALIPER
GD	GYMNOCLADUS DIOICUS 'ESPROSSO'	KENTUCKY COFFEE	2-1/2" - 3"	CALIPER
LT	LIRIODENDRON TULIPIFERA	TULIP TREE	2-1/2" - 3"	CALIPER
QR	QUERCUS RUBRA	RED OAK	2-1/2" - 3"	CALIPER
MS	MALUS 'SUTYZAM'	SUGAR TYME CRABAPPLE	2" - 2-1/2"	CALIPER
MP	MALUS 'PRAIRIE FIRE'	PRAIRIE FIRE CRABAPPLE	2" - 2-1/2"	CALIPER
CK	CORNUS KOUSA	KOUSA DOGWOOD	2" - 2-1/2"	CALIPER
PG	PICEA GLAUCA	WHITE SPRUCE	7' - 8' HT	
PN	CASUARINA EQUISETIFOLIA	AUSTRALIAN PINE	7' - 8' HT	

LEGEND

PROPOSED DECIDUOUS TREE (W/ BARK MULCH)

PROPOSED DECICUOUS TREE (W/O BARK MULCH)



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Tighe&Bond

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1/25/23

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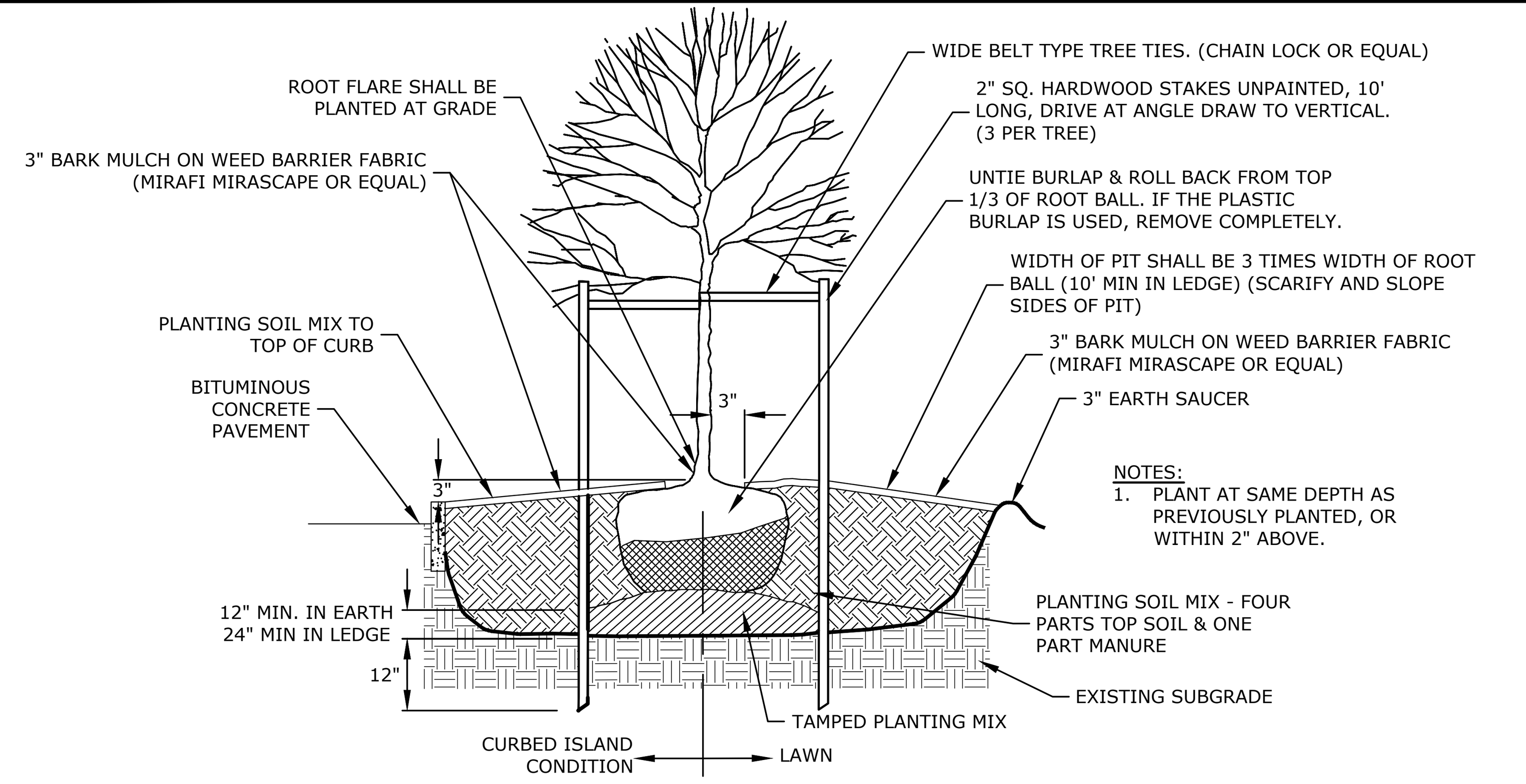
OVERALL LANDSCAPE PLAN

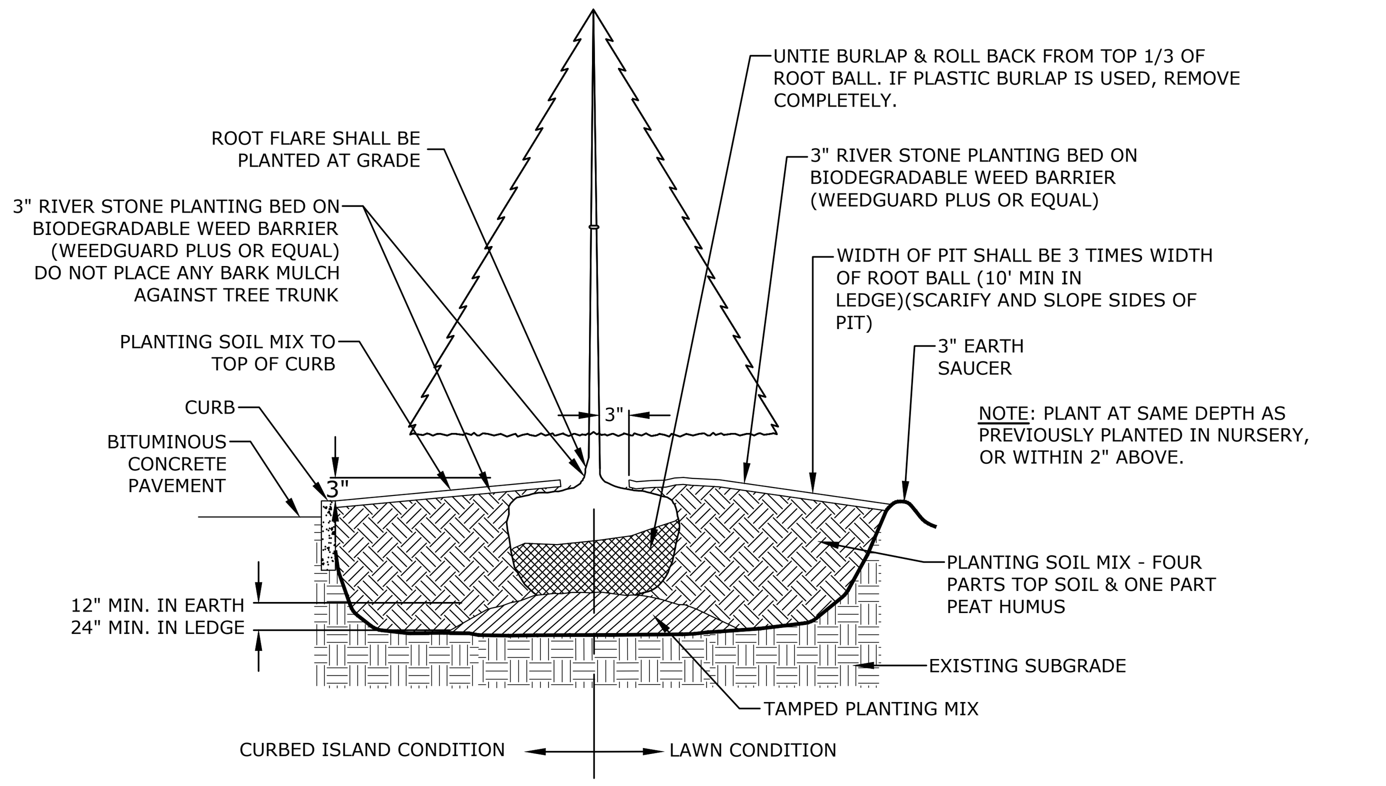
SCALE: AS SHOWN

C-105



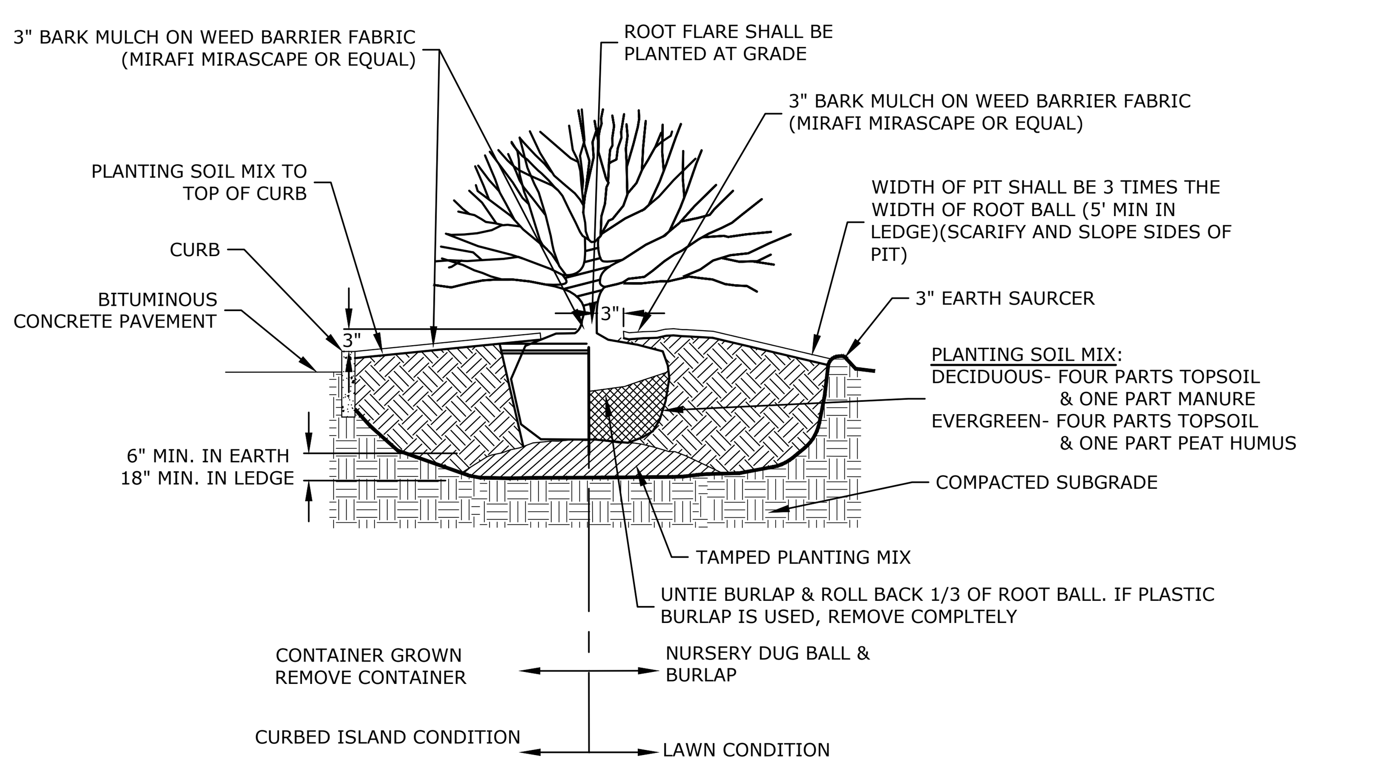
DECIDUOUS TREE PLANTING

NO SCALE



EVERGREEN TREE PLANTING

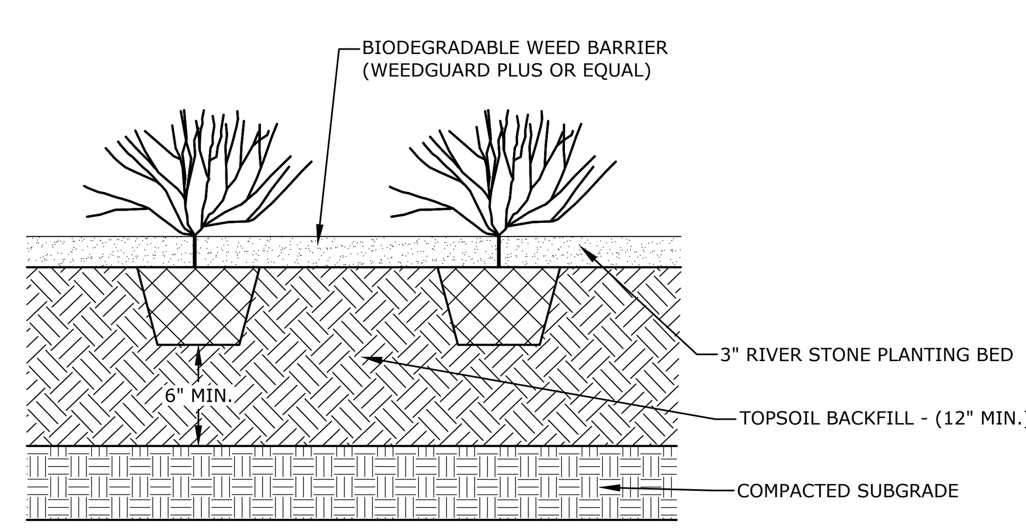
NO SCALE



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

SHRUB PLANTING

NO SCALE



PERENNIAL PLANTING

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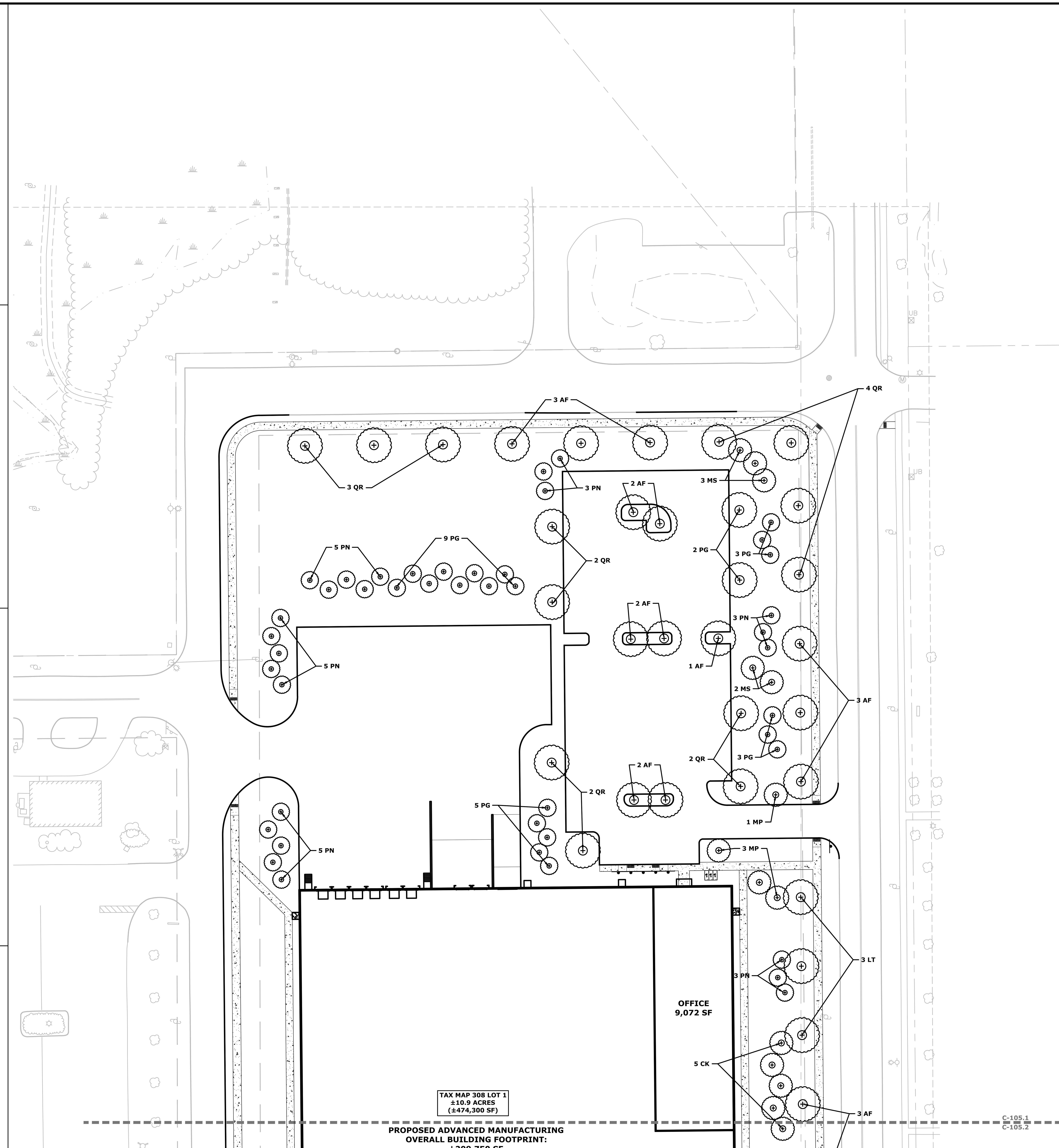

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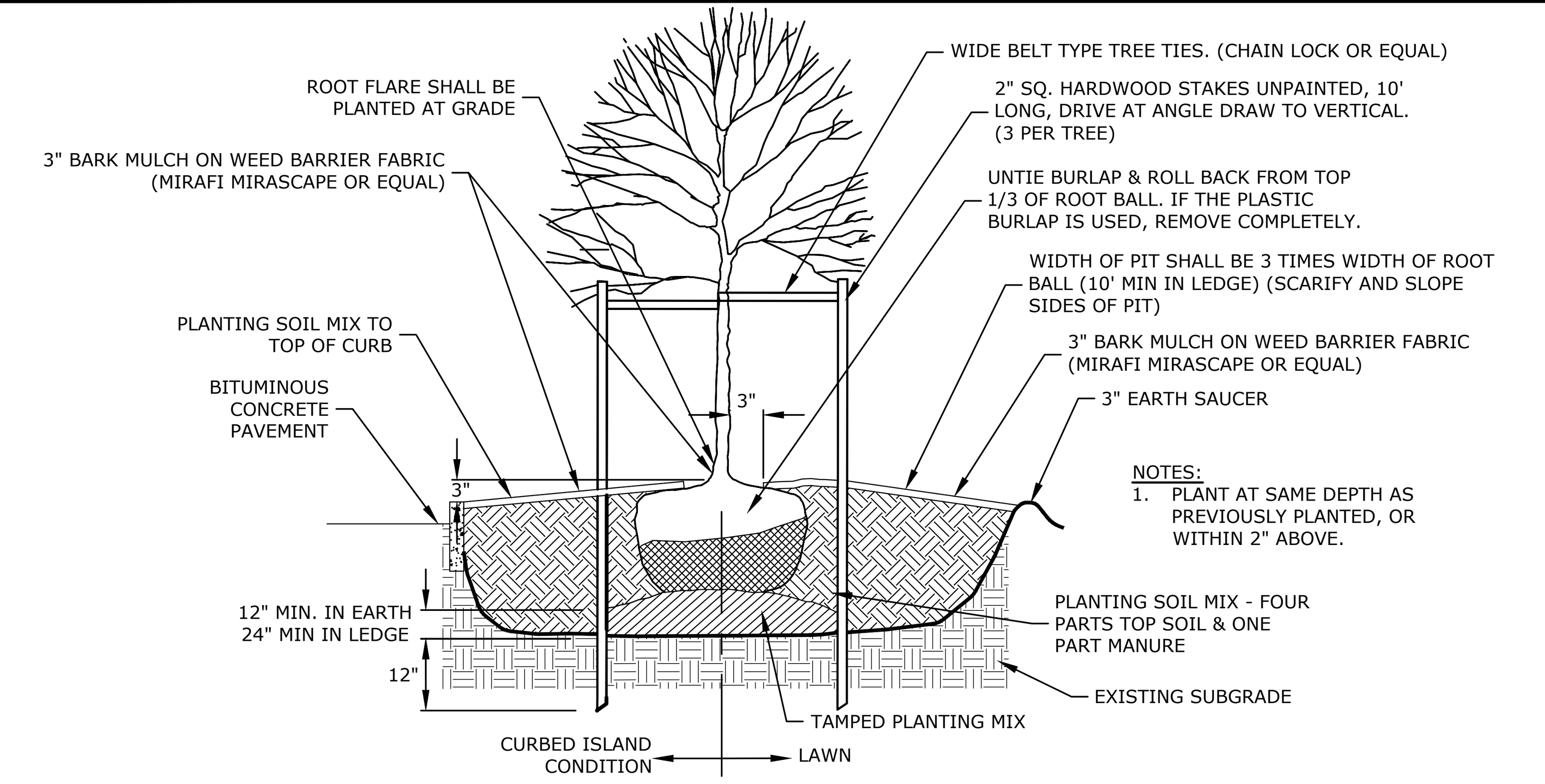
LANDSCAPE PLAN

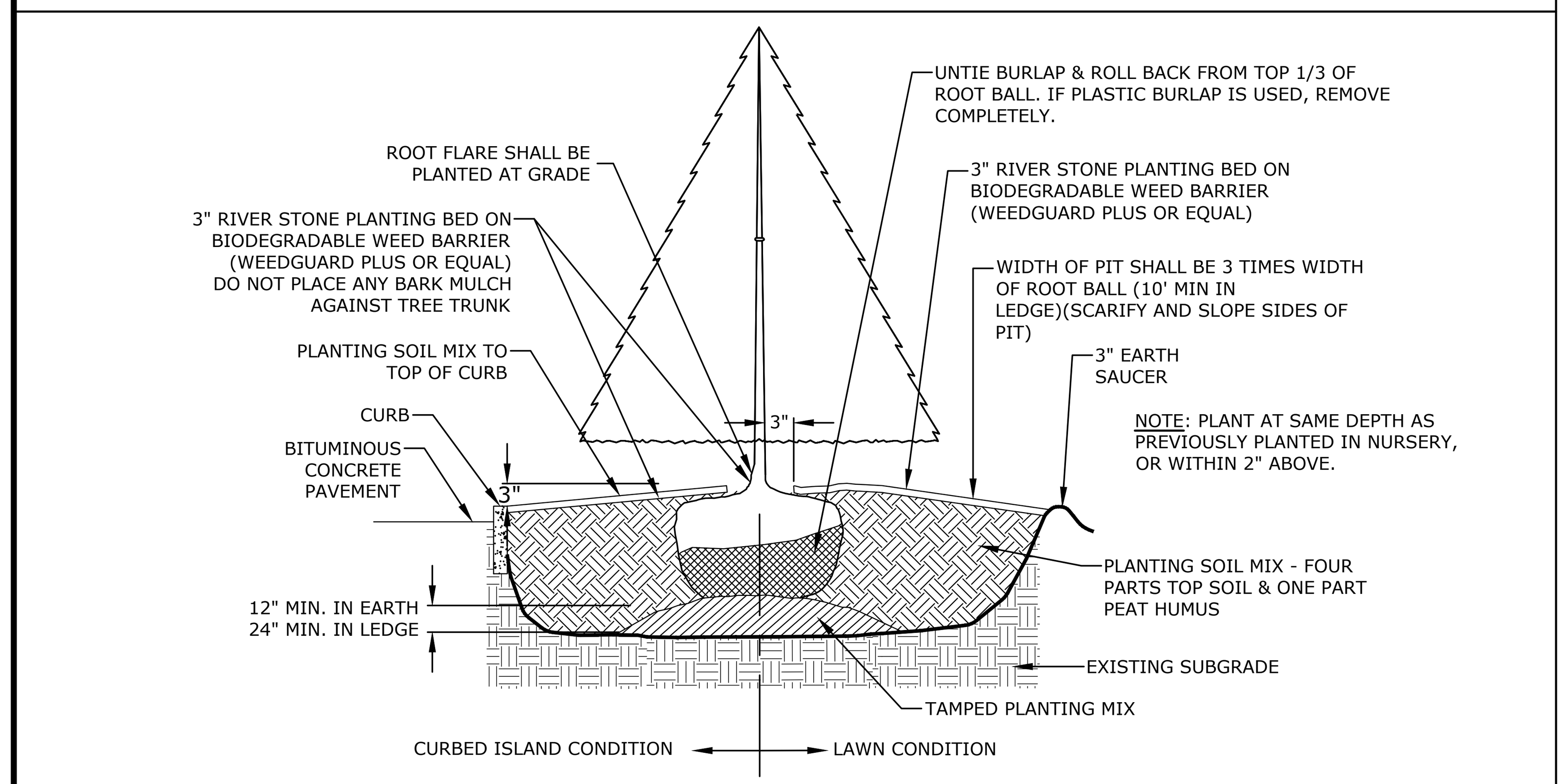
SCALE: AS SHOWN

C-105.1



DECIDUOUS TREE PLANTING

NO SCALE



EVERGREEN TREE PLANTING

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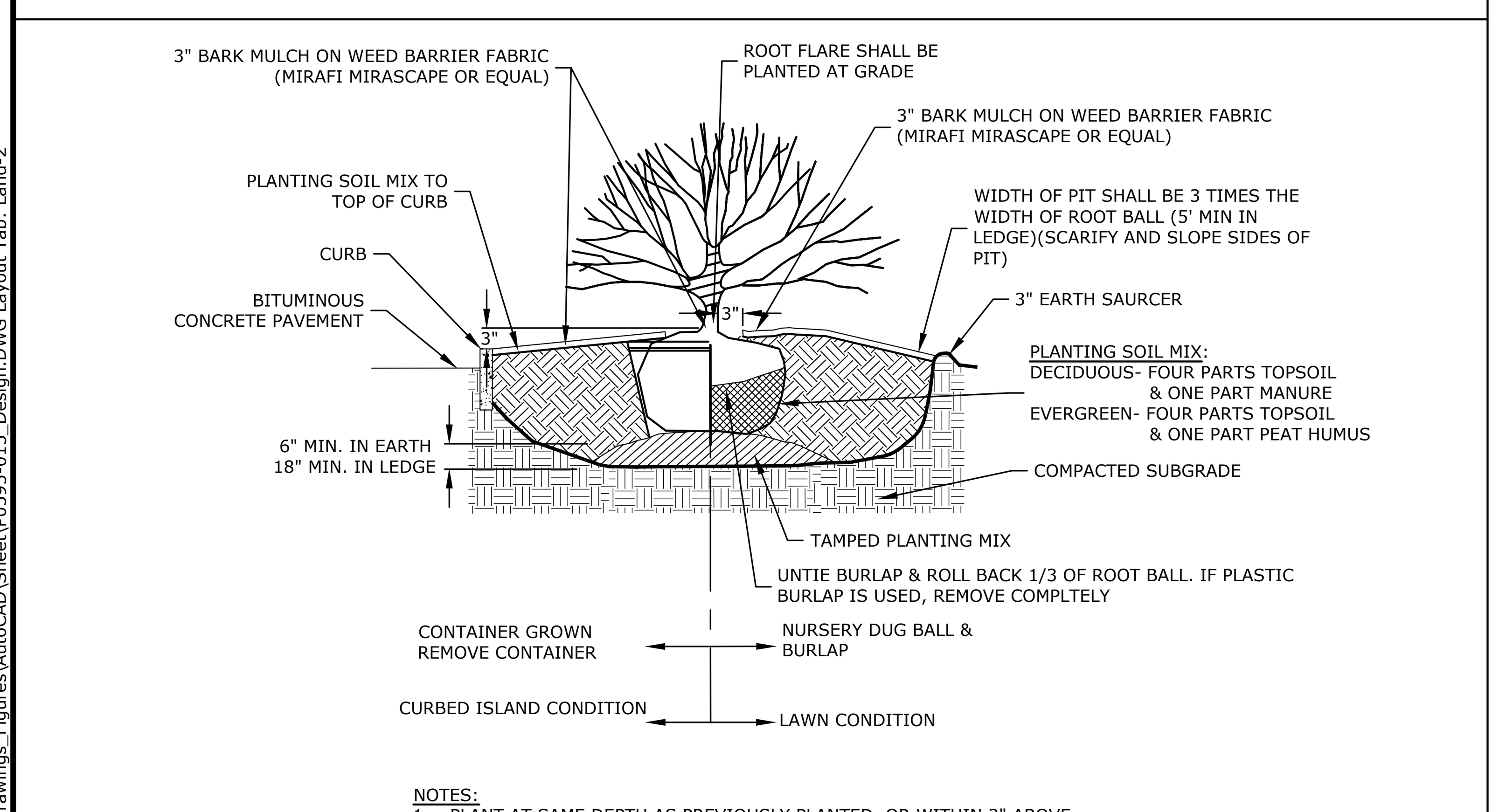

SHRUB PLANTING

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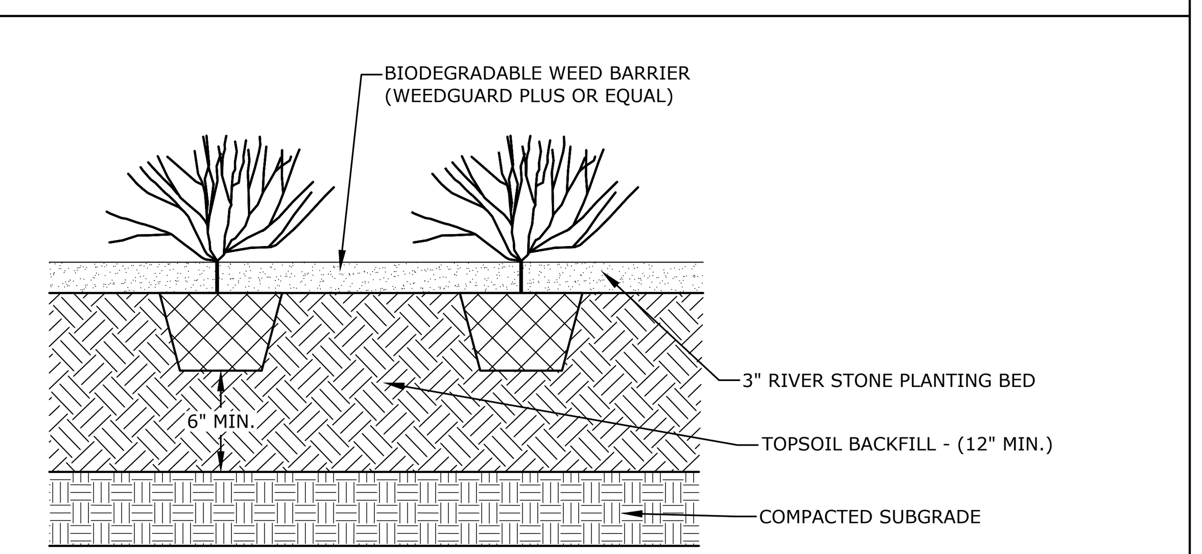

PERENNIAL PLANTING

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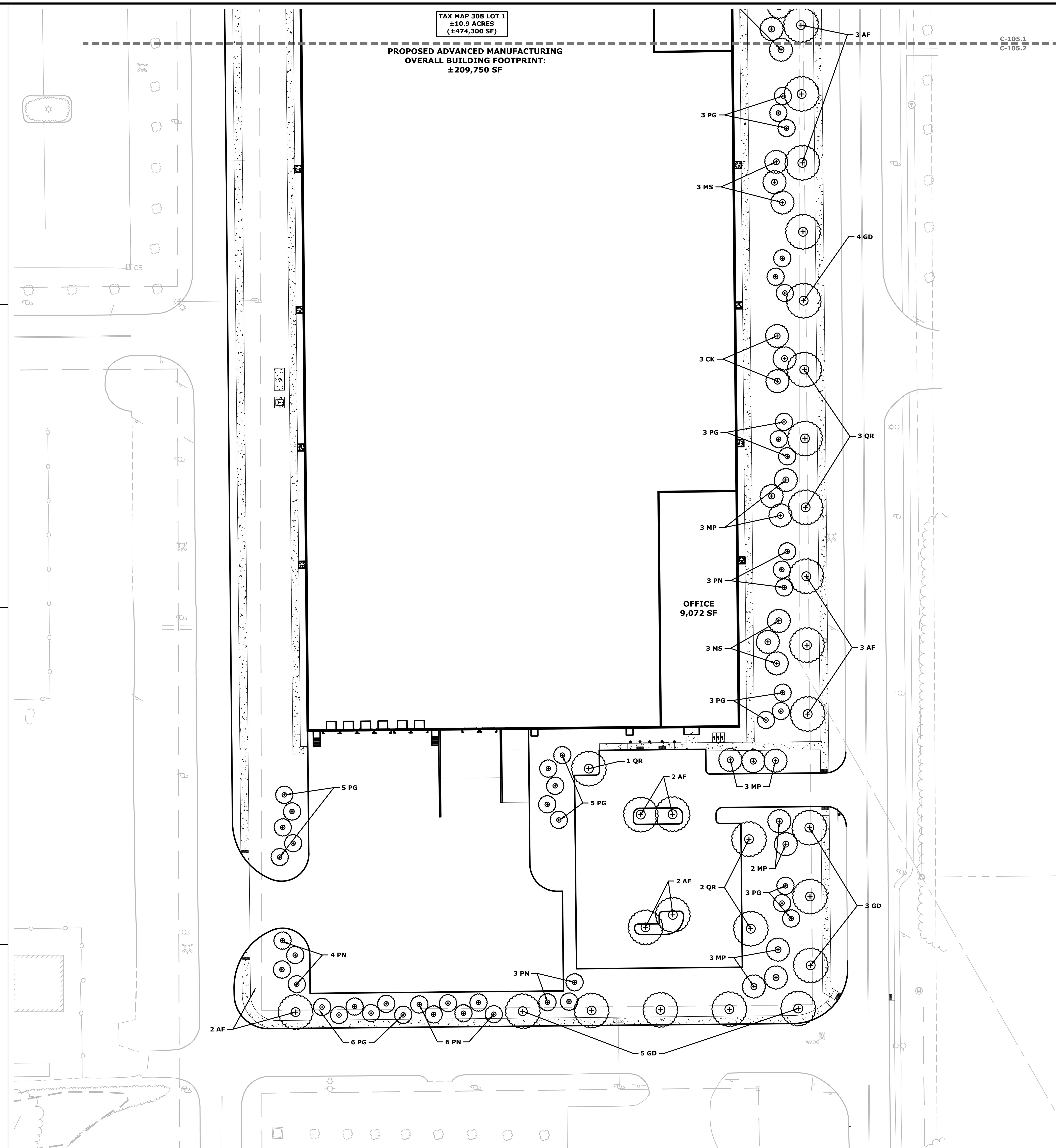

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LANDSCAPE PLAN

SCALE: AS SHOWN

C-105.2

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GENERAL PROJECT INFORMATION

PROJECT LESSOR: PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

PROJECT APPLICANT: AVIATION AVENUE GROUP, LLC
210 COMMERCE WAY, SUITE 300

PROJECT NAME: PROPOSED ADVANCED MANUFACTURING FACILITY

PROJECT ADDRESS: 80 ROCHESTER AVE (100 NEW HAMPSHIRE AVE)
PORTSMOUTH, NH 03801

PROJECT MAP / LOT: MAP 308 / LOT 1

PROJECT LATITUDE: 43°04'49.9"N

PROJECT LONGITUDE: 70°48'33.6"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OR A NEW INDUSTRIAL WAREHOUSE ON A PREVIOUSLY DEVELOPED LOT THE WORK IS ANTICIPATED TO START IN SUMMER OF 2023, AND BE COMPLETED BY WINTER OF 2025.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 11.4 ACRES.

SOIL CHARACTERISTICS

BASED ON THE NRCS WEB SOIL SURVEY FOR ROCKINGHAM COUNTY - NEW HAMPSHIRE. THE SOILS ON SITE CONSIST OF URBAN LAND AS THE SITE HAS BEEN PREVIOUSLY DEVELOPED AND THE HYDROLOGIC SOIL GROUP RATING(S) IS ASSUMED TO BE "C".

NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA OVERLAND FLOW TO A CLOSED DRAINAGE SYSTEM AND ULTIMATELY FLOWS TO NEWFIELDS DITCH.
(STATE WATERBODY ID: NHRIV600031001-10).

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

1. CUT AND CLEAR TREES.
2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - CONTROL OF DUST
   - CONSTRUCTION OF ACCESS DRIVES
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR AND DISPOSE OF DEBRIS.
5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:

1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:

1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:

1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. PERMANENT MEASURES AND PLANTINGS:
   A. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
   B. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
   C. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
   D. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
   E. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
   F. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
   G. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
   H. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE	MINIMUM GERMINATION (%)	MINIMUM PURITY (%)
TALL FESCUE (*FESTUCA ARUNDINACEA*)	72 LBS/ACRE	85%	96%
SALTY ALKALI GRASS (*PUCCINELLIA TENUIFLORA*)	36 LBS/ACRE	85%	96%
RELIANT HARD FESCUE / CREEPING RED FESCUE	12 LBS/ACRE	85%	96%

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.

3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

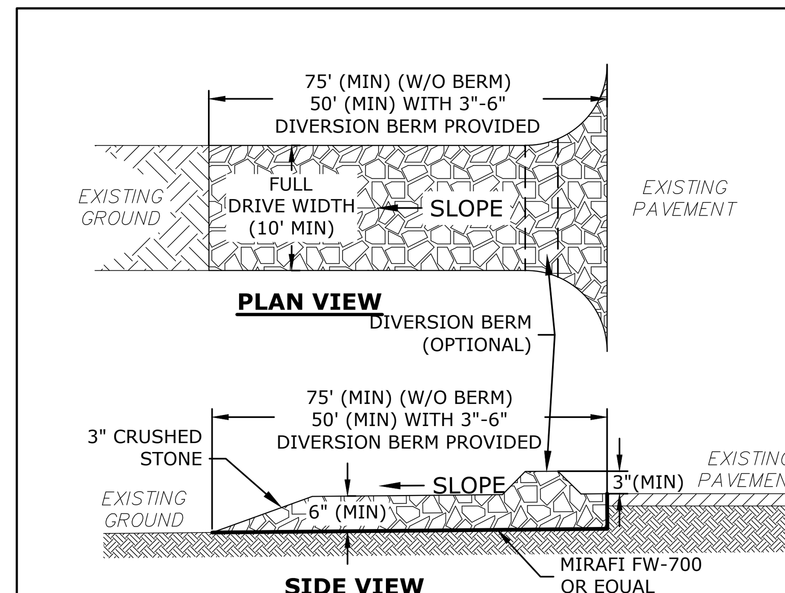
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:

1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
         - SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
         - INSPECT FUEL STORAGE AREAS WEEKLY;
         - WHENEVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
         - COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
         - SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
         - THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
           (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
           (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
           (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
           (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
           (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
         - FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
           HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
         - PAINTS:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

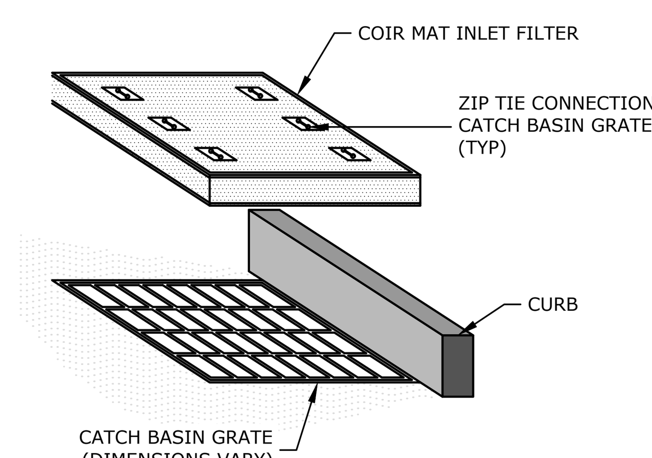
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES CONSTRUCTION GENERAL PERMIT (CGP), FILING OF AN NOTICE OF INTENT (NOI), AND THE PREPARATION OF A STORMWATER POLLUTION PREVENTION PLAN (SWPPP).
2. THE SWPPP SHALL BE PREPARED BY A QUALIFIED ENGINEER. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
3. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
   A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY A QUALIFIED PERSON AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
   B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
   C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
   D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.



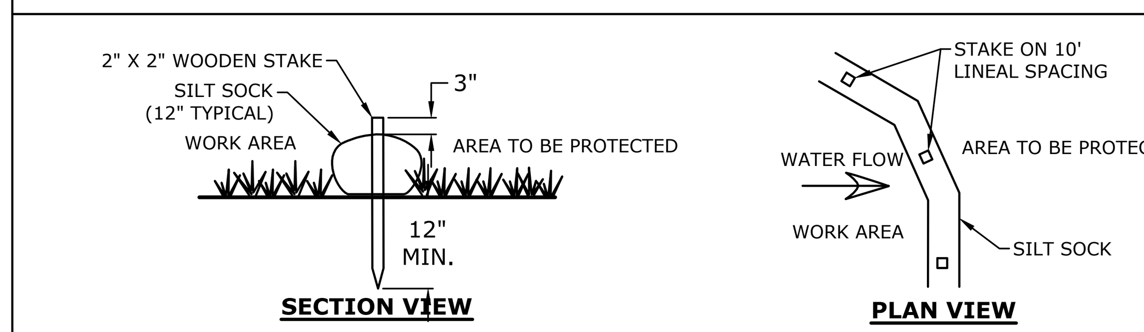
NOTES:
1. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



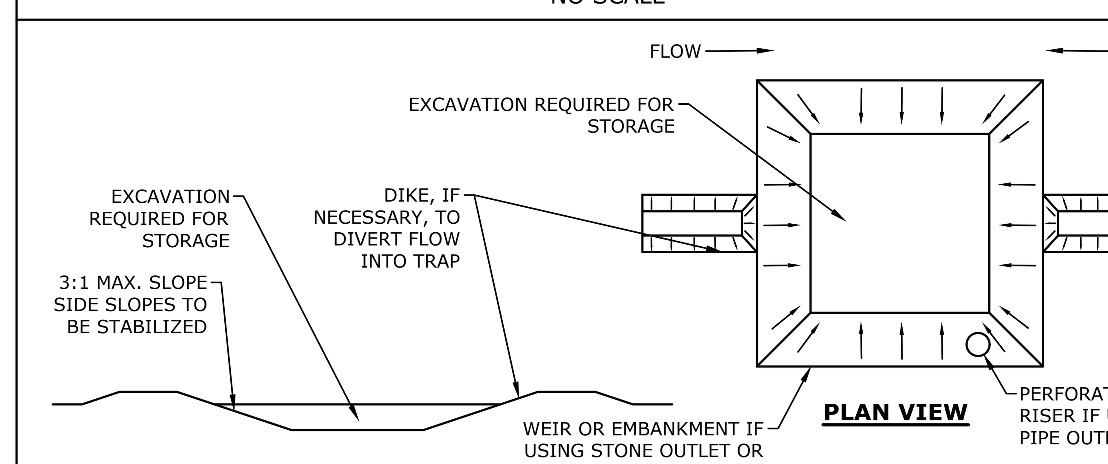
NOTES:
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

INLET PROTECTION BARRIER
NO SCALE



NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL.
2. SILT SOCK SHALL BE FILLED WITH FILTERMEDIA BY FILTREXX OR APPROVED EQUAL.
3. WHERE TWO SILT SOCKS ARE JOINED, A MINIMUM OF 2 FEET OF OVERLAP SHALL BE MAINTAINED.
4. SILT SOCKS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

SILT SOCK
NO SCALE



NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
5. TRAP SHALL DISCHARGE TO A STABILIZED AREA.
6. TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
8. SEDIMENT TRAPS MUST BE USED AS NEEDED TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.

SEDIMENT TRAP
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
1/25/23

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
1/25/23

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
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A	12/19/2022	TAC Submission

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DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

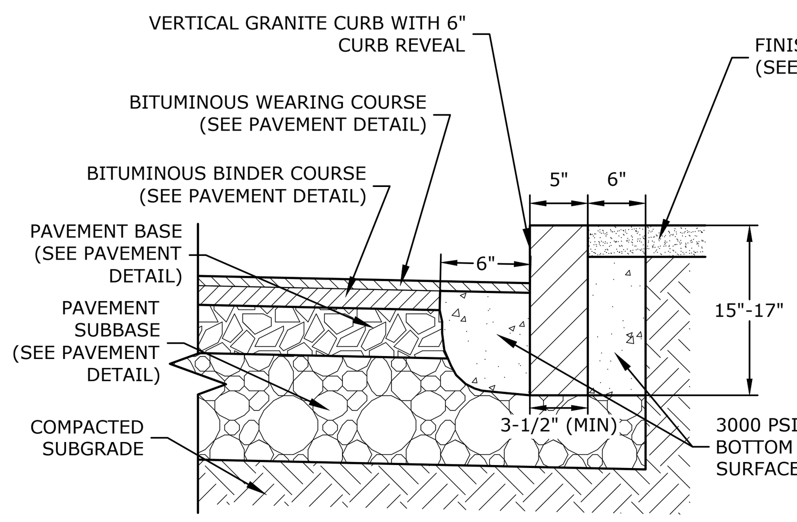
EROSION CONTROL NOTES & DETAILS SHEET

SCALE: AS SHOWN

C-501

Last Save Date: January 25, 2023 8:25 AM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Details.DWG Layout Tab: C-501

Tighe&Bond

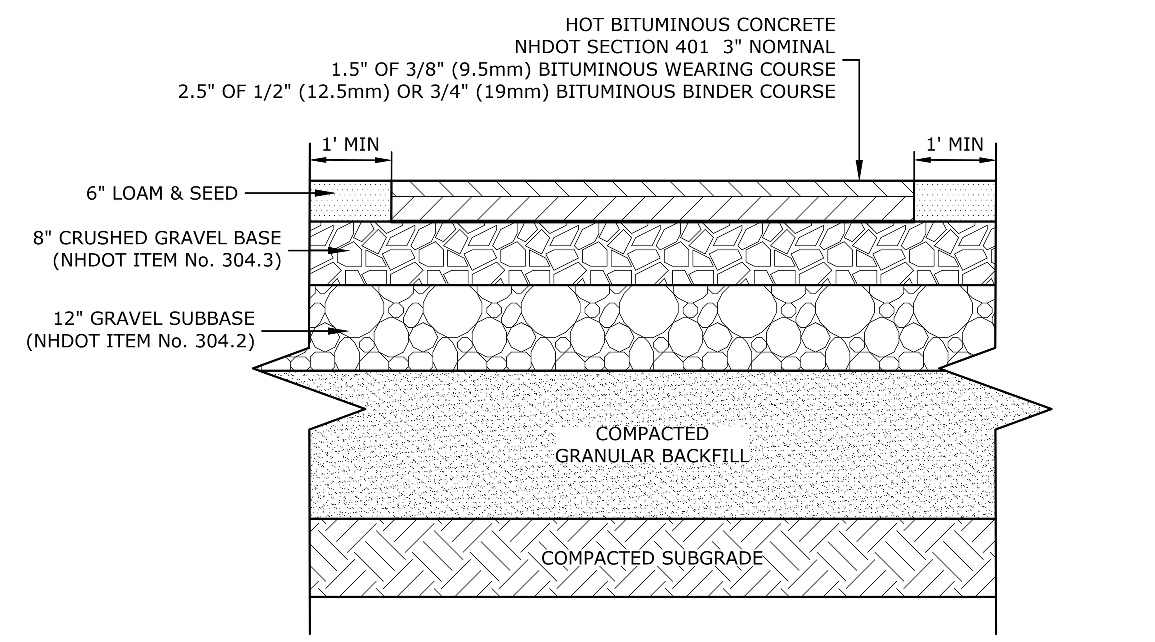


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
7. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

VERTICAL GRANITE CURB

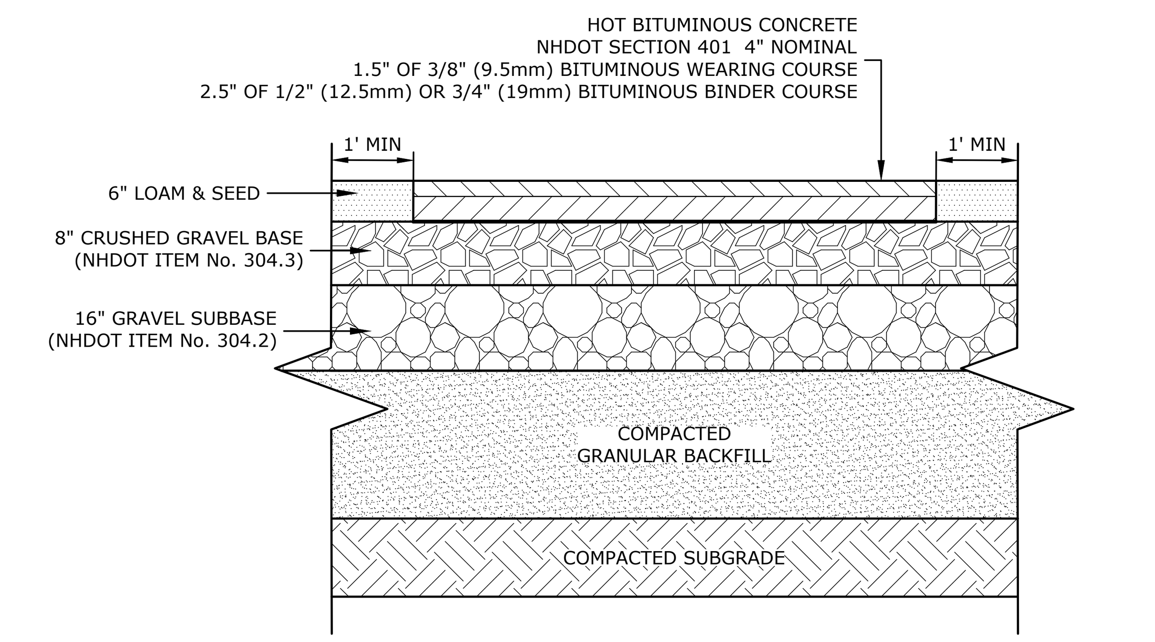
NO SCALE



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT SECTION DESIGN SHALL BE APPROVED BY THE PROJECTS GEOTECHNICAL ENGINEER.

TYPICAL STANDARD DUTY PAVEMENT SECTION

NO SCALE



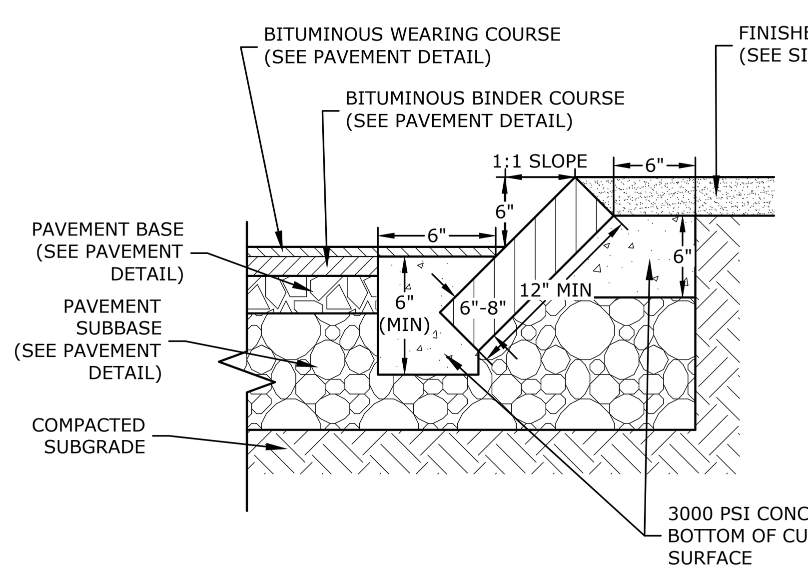
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. FINAL PAVEMENT SECTION DESIGN SHALL BE APPROVED BY THE PROJECTS GEOTECHNICAL ENGINEER.

TYPICAL HEAVY DUTY PAVEMENT SECTION

NO SCALE

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER
1/25/23

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
1/25/23

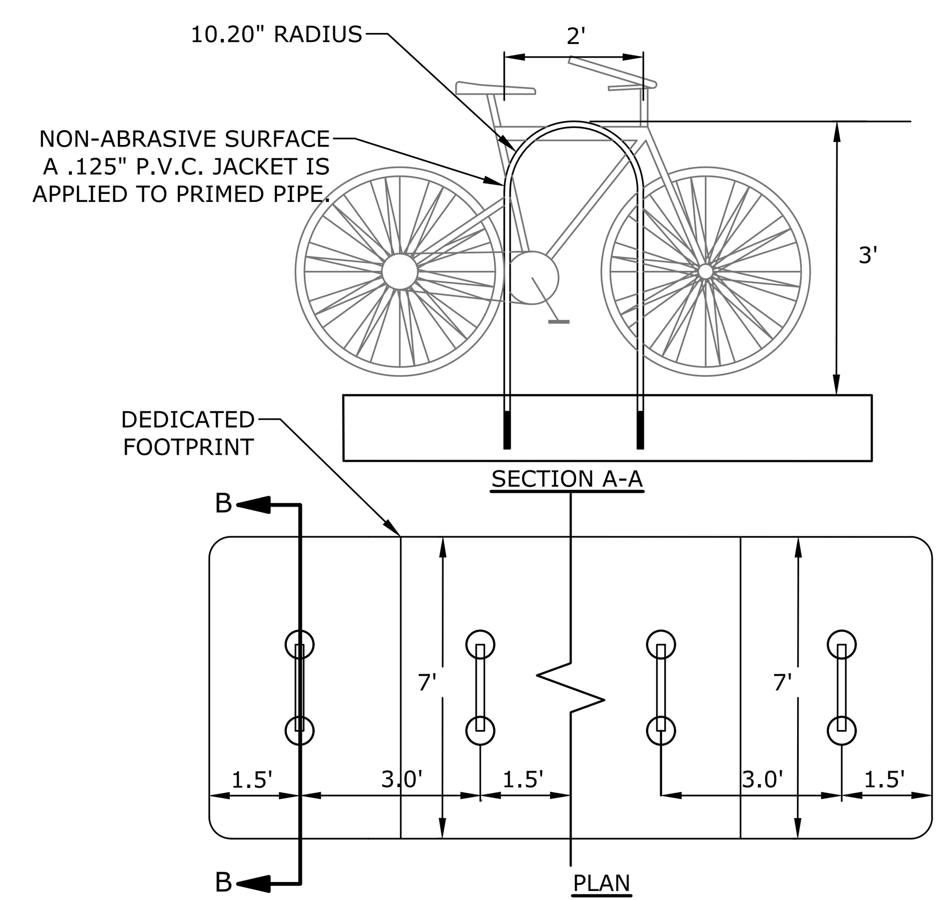


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

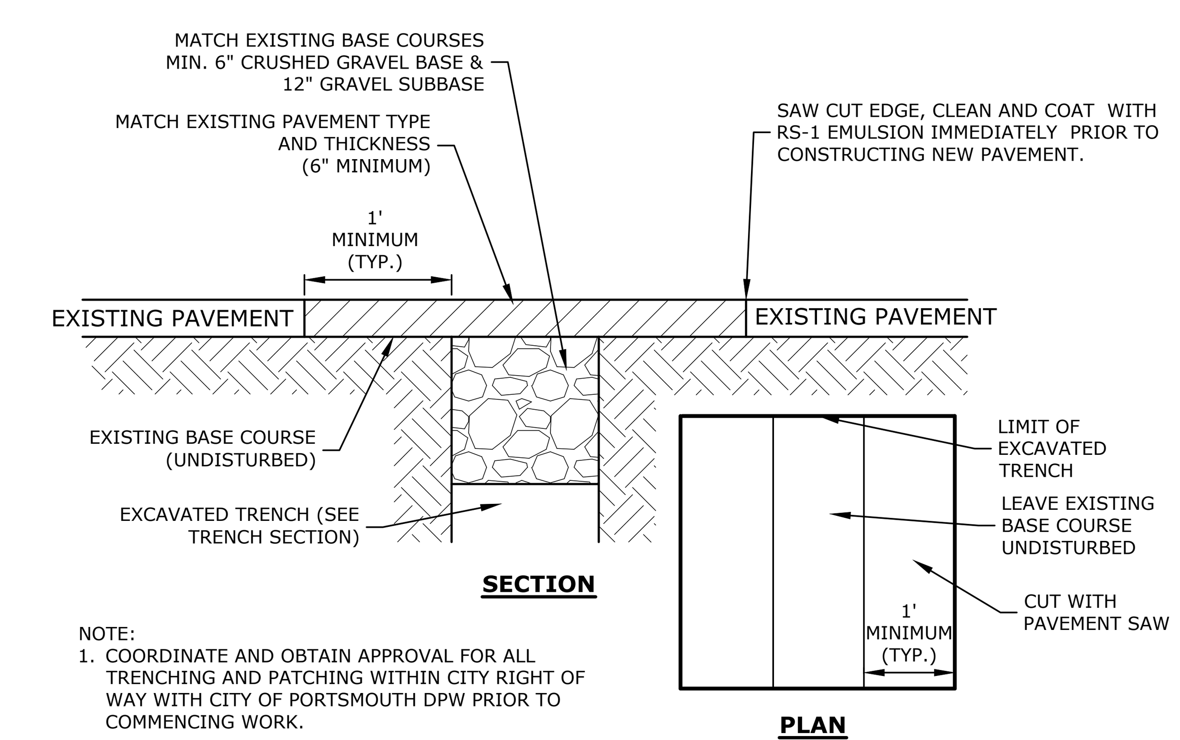
SLOPED GRANITE CURB

NO SCALE



BIKE RACK

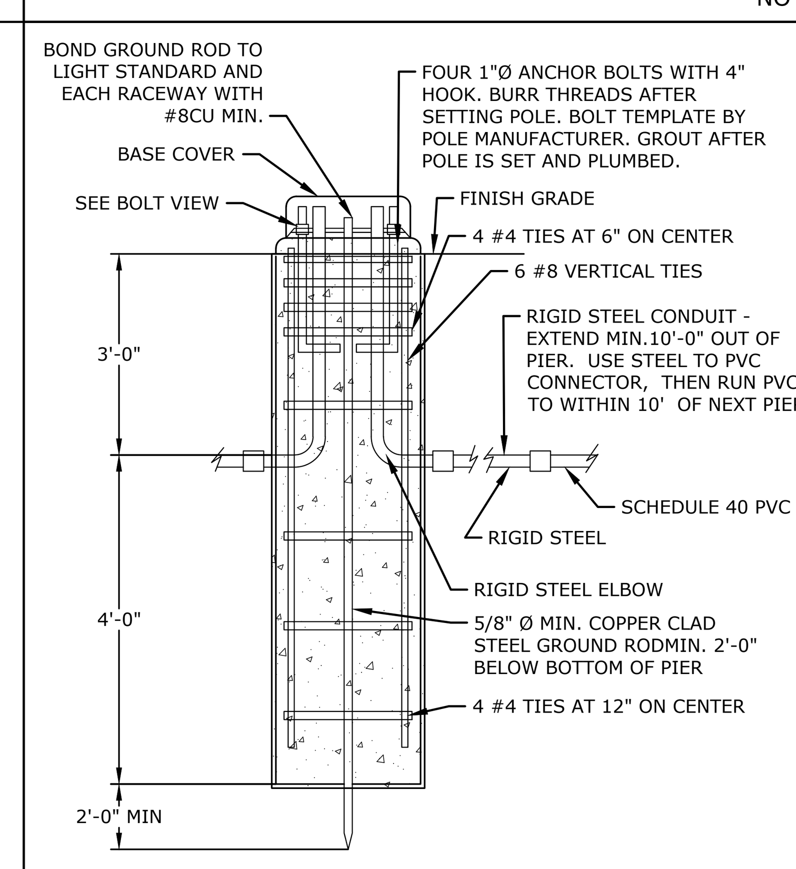
NO SCALE

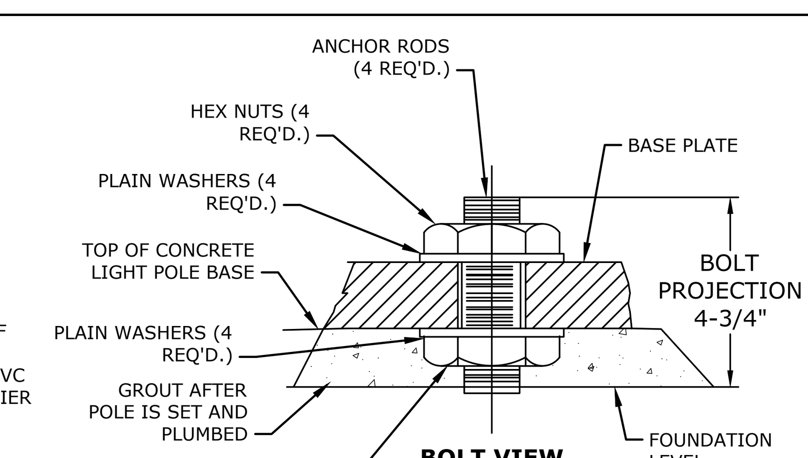


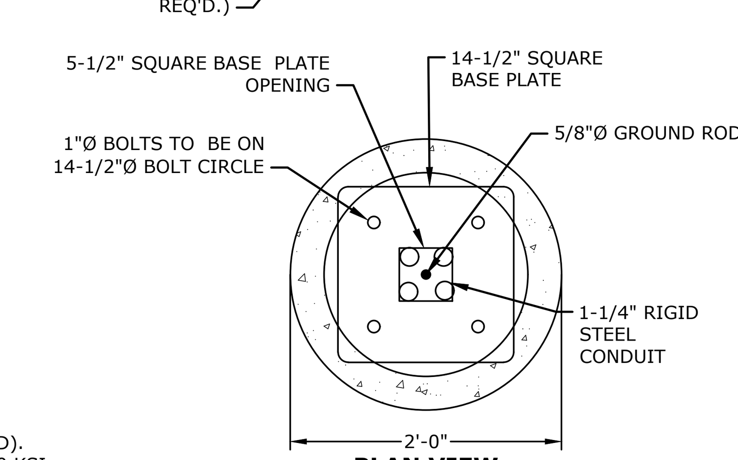
NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH

NO SCALE



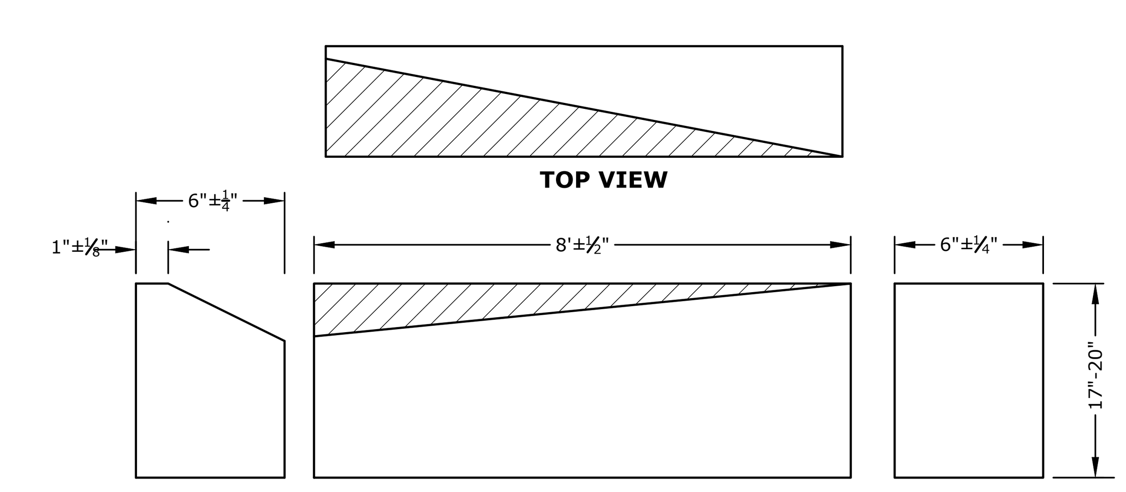




NOTES:
1. PAINT BASE SAFETY YELLOW (UNLESS PROTECTED BY CURBED ISLAND).
2. CONCRETE TO BE CLASS A, 4000 PSI, AIR ENTRAINED STEEL TO BE 60 KSI
3. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.

TYPICAL LIGHT POLE BASE

NO SCALE



TRANSITION SECTION

GRANITE SLOPE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN STRAIGHT GRANITE CURB AND SLOPE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE SLOPE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SLOPE CURB TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

CURB TRANSITION

NO SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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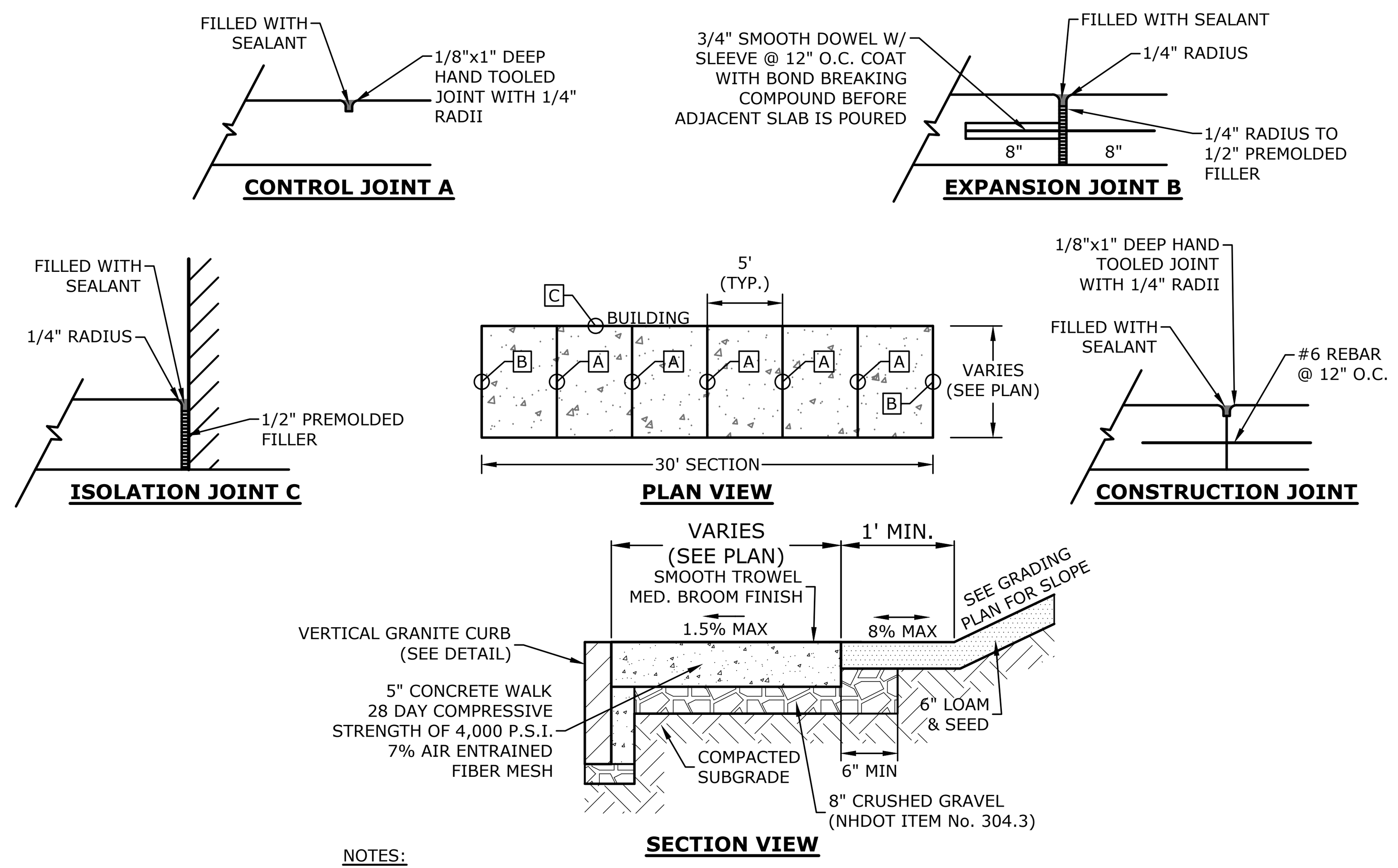
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

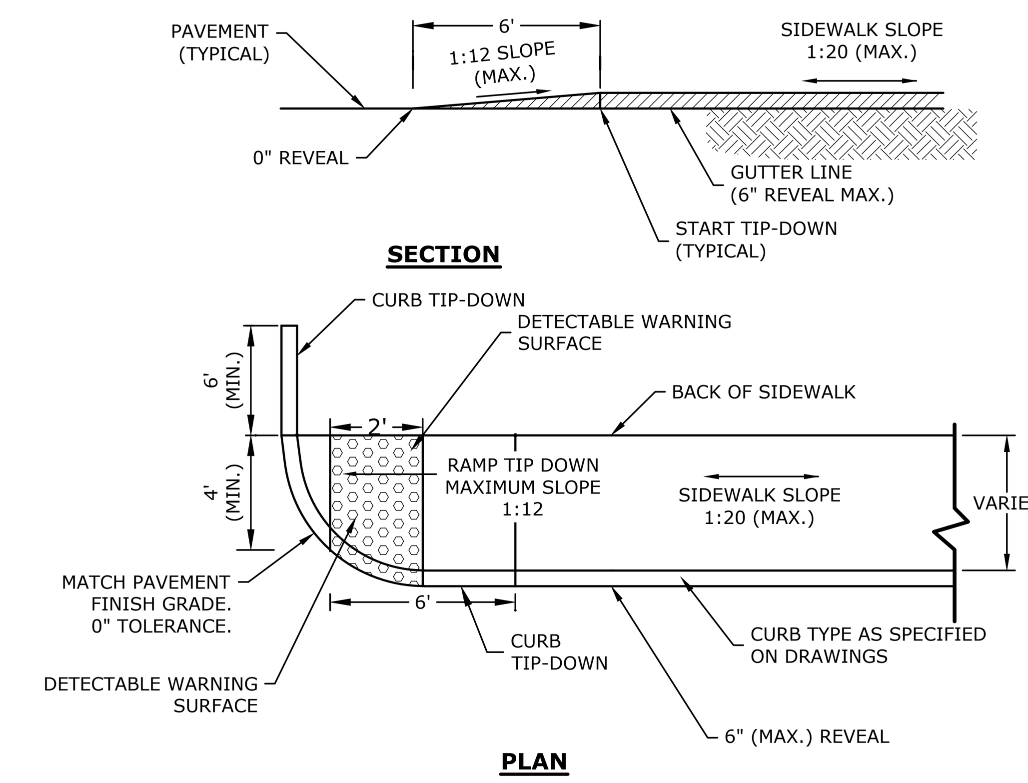
C-502

Tighe&Bond



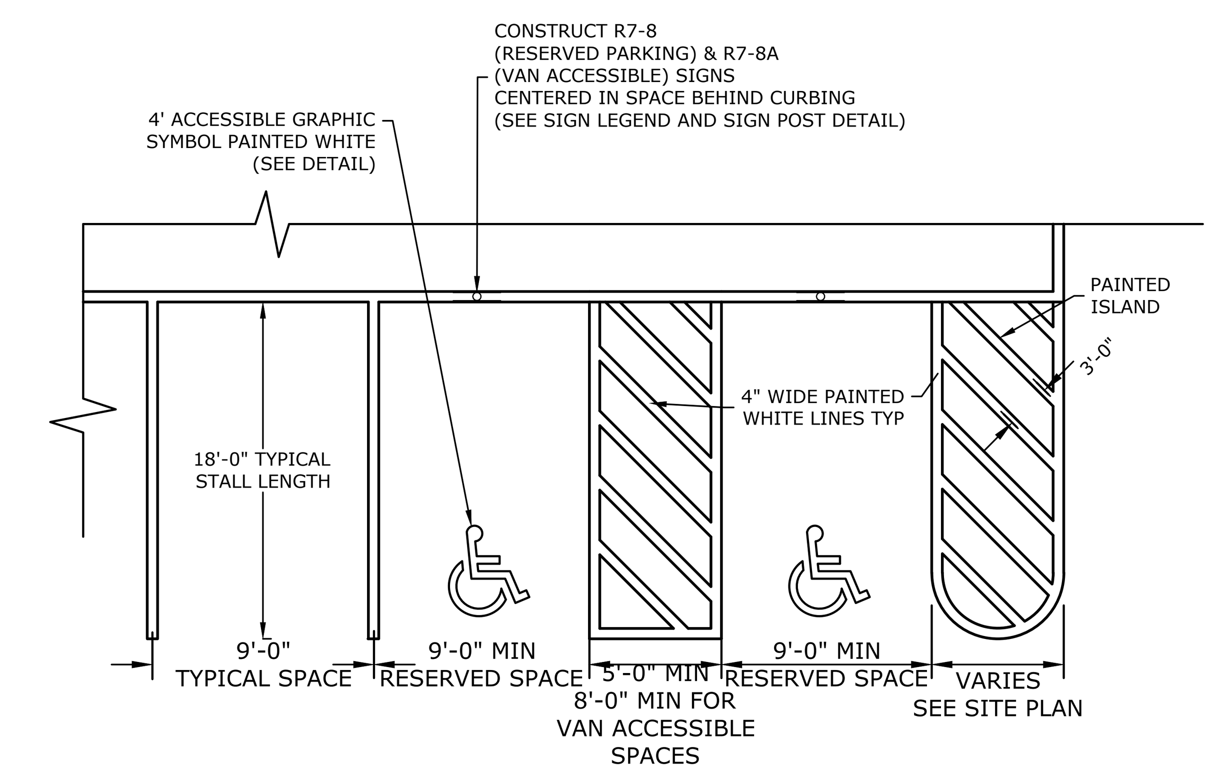
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
3. ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



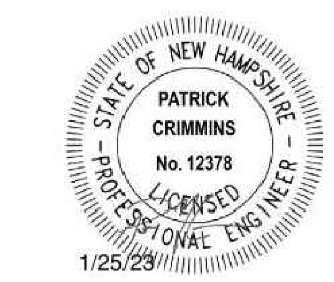
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 8" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

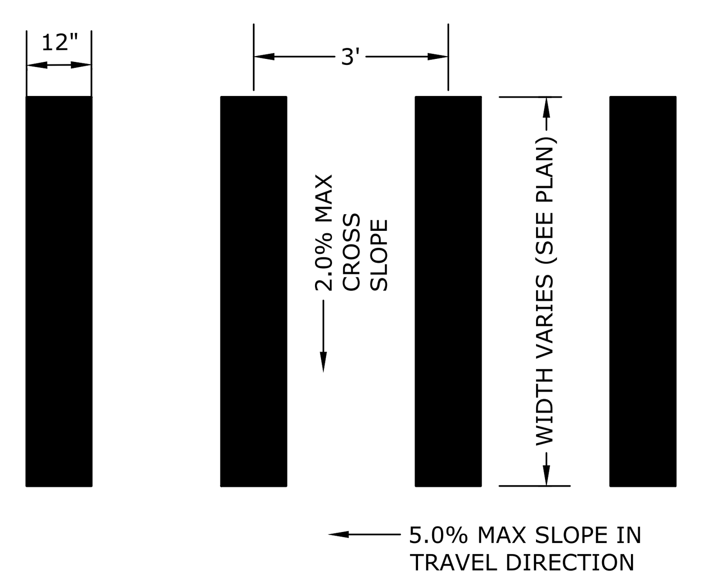
CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



NOTE:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

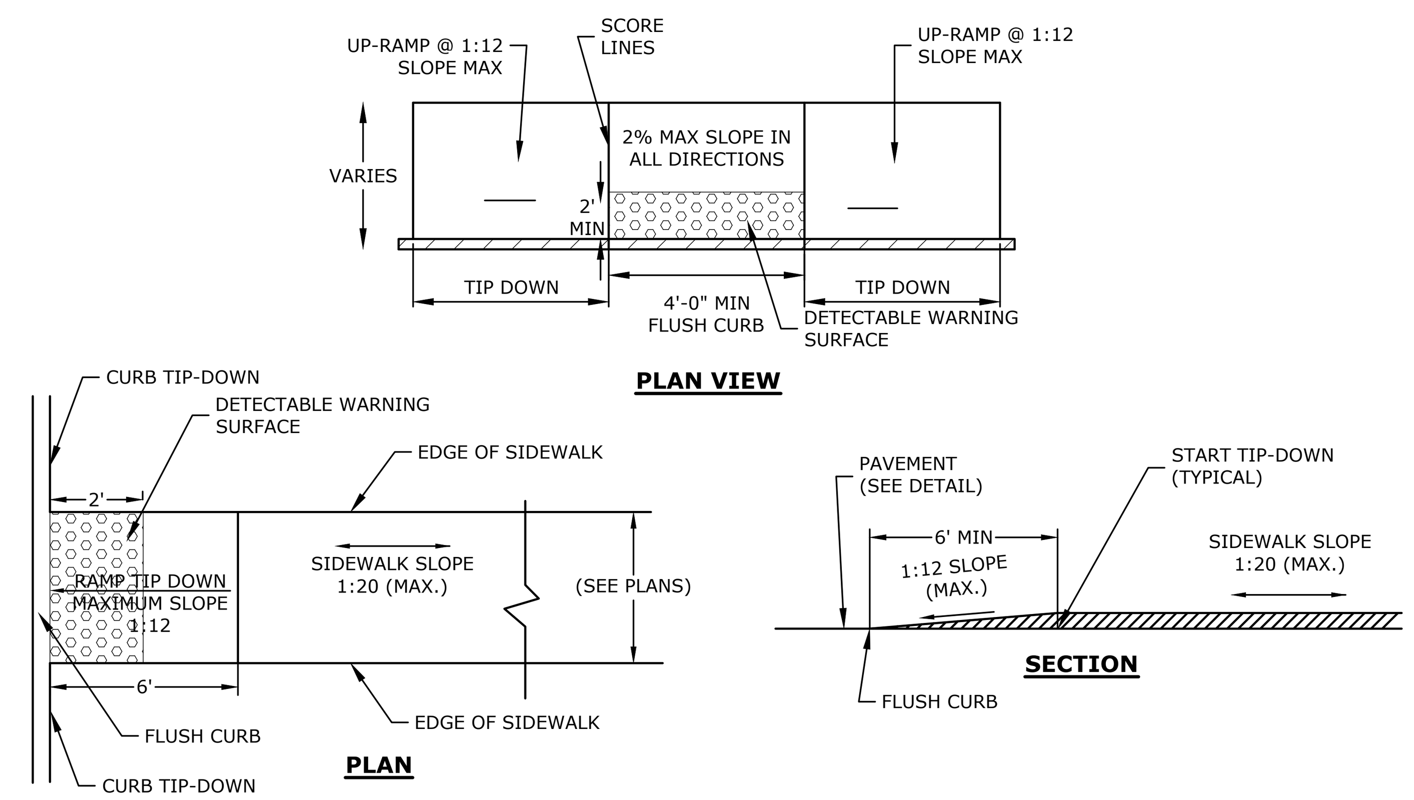
PARKING SPACE STRIPING
NO SCALE





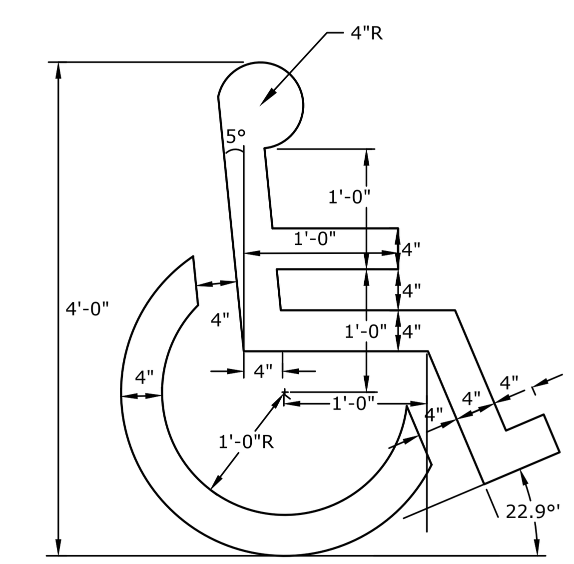
NOTE:
STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

CROSSWALK STRIPING
NO SCALE



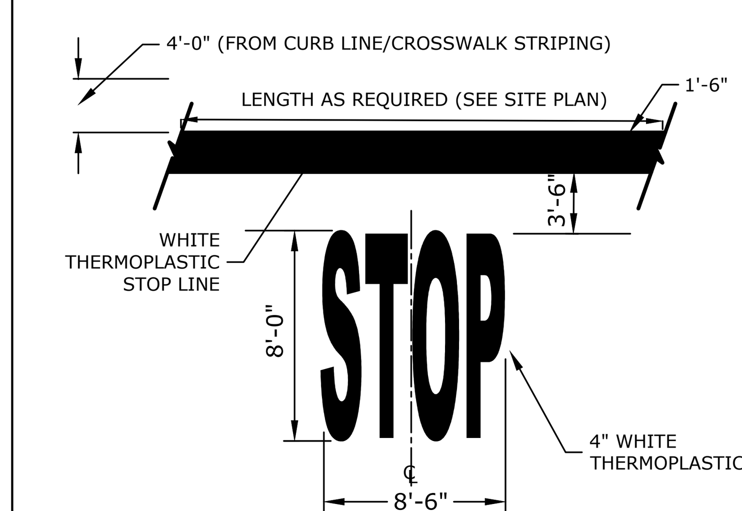
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 8" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON WITH BLACK COATING

CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



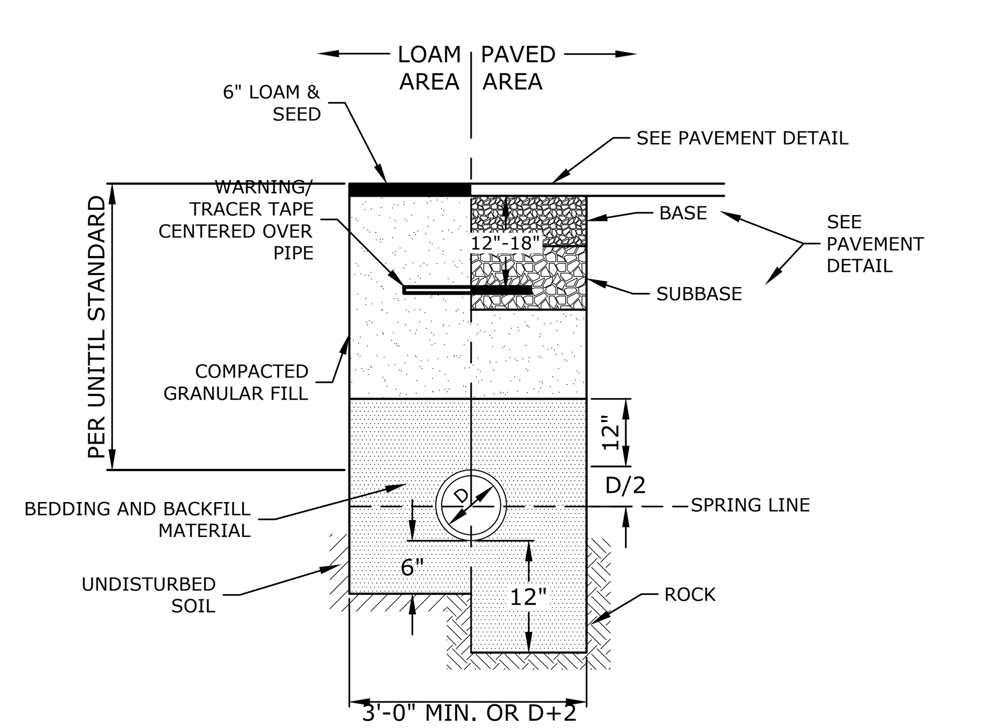
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



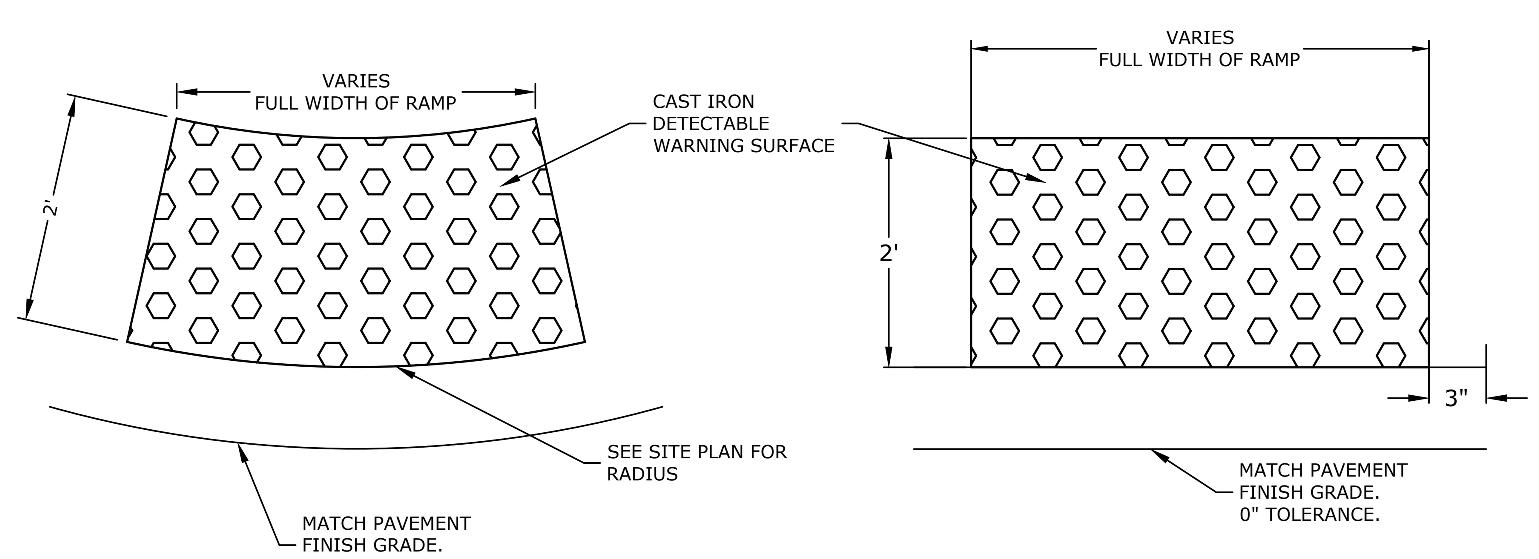
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR & LEGEND
NO SCALE



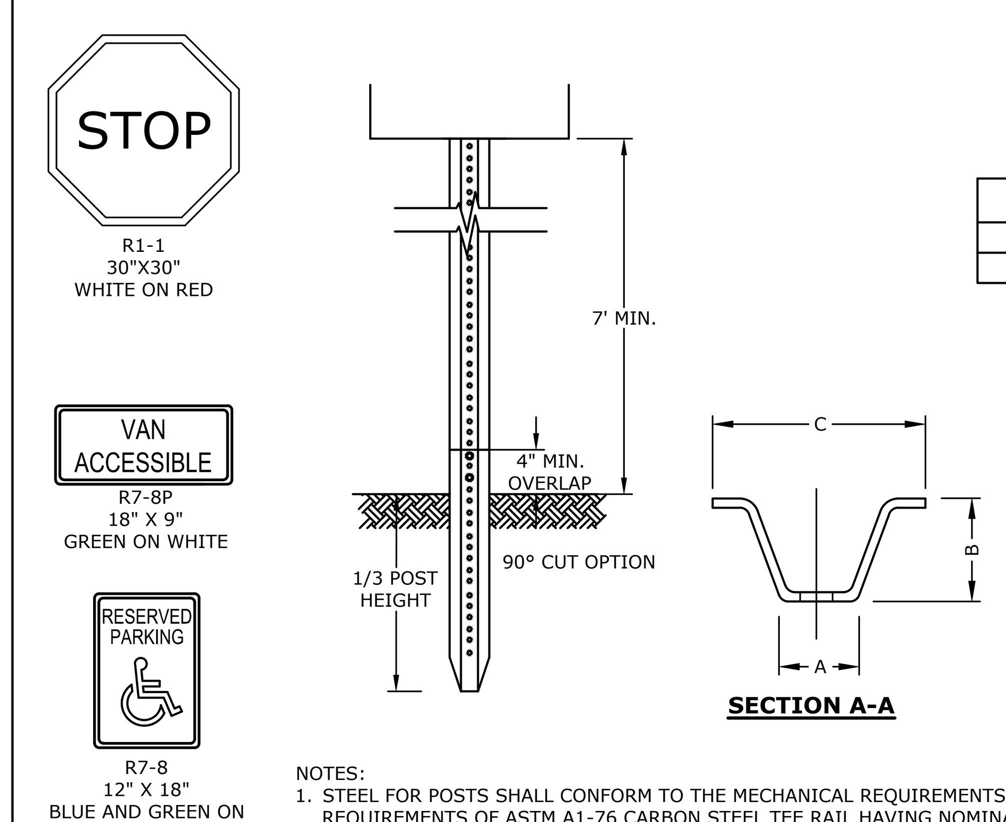
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

TYPICAL GAS TRENCH
NO SCALE



NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
2. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



WT.	A	B	C
3 LBS	1 3/8" OR 1 7/16"	1 1/2" OR 1 5/8"	3 1/2"
4 LBS	1 3/8"	1 1/2"	3 1/2"

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

SIGN POST TO COMPLY WITH ALL ASPECTS OF NHDOT SECTION 615.

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASSTM A-576 (GRADE 1070 - 1080)
FINISH: SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

NOTES:
1. STEEL FOR POSTS SHALL CONFORM TO THE MECHANICAL REQUIREMENTS OF ASTM A 499-81 GRADE 60 AND TO THE CHEMICAL REQUIREMENTS OF ASTM A1-76 CARBON STEEL TEE RAIL HAVING NOMINAL WEIGHT OF 91 LBS. OR GREATER PER LINEAR YARD.
2. AFTER FABRICATION, ALL STEEL POSTS SHALL BE GALVANIZED TO MEET THE REQUIREMENTS OF ASTM A 123.
3. ALL SIGN POSTS SHALL HAVE "BREAKAWAY" FEATURES THAT MEET AASHTO REQUIREMENTS CONTAINED IN "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS-1985." THE "BREAKAWAY" FEATURES SHALL BE STRUCTURALLY ADEQUATE TO CARRY THE SIGNS SHOWN IN THE PLANS AT 60 MPH WIND LOADINGS. INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
4. TYPE A POSTS - 3 LB/FT TYPE B POSTS - 4 LB/FT.
5. ALL SIGNS TO BE CONSTRUCTED PER THE LATEST EDITION OF THE FHWA STANDARD HIGHWAY SIGNS MANUAL AND INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
6. MEET REQUIREMENTS OF SECTION 615 SIGNS OF NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2010 EDITION, AS AMENDED.

SIGN LEGEND & POST
NO SCALE

Proposed Advanced Manufacturing Facility

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SCALE: AS SHOWN

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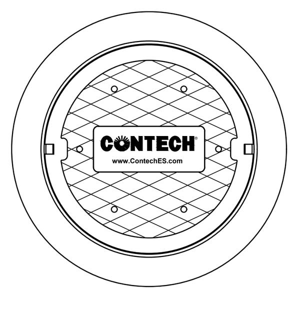
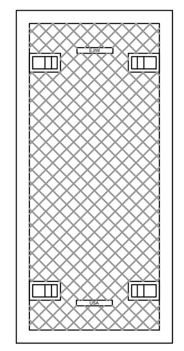
JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD				
CARTRIDGE SELECTION				
CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	7.84	5.88	3.92	2.16
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

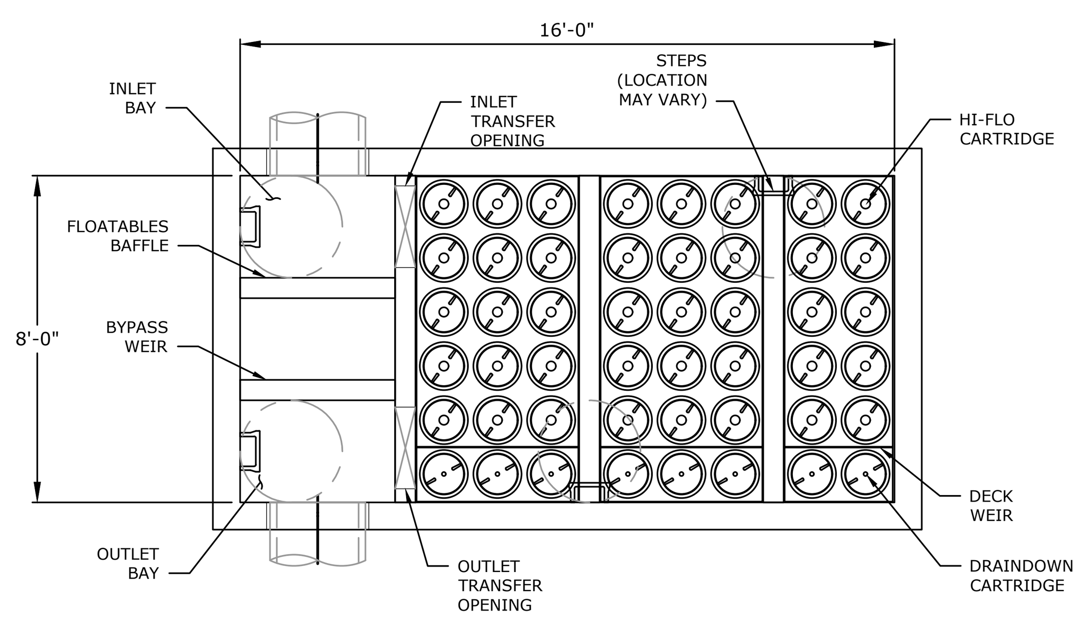


FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

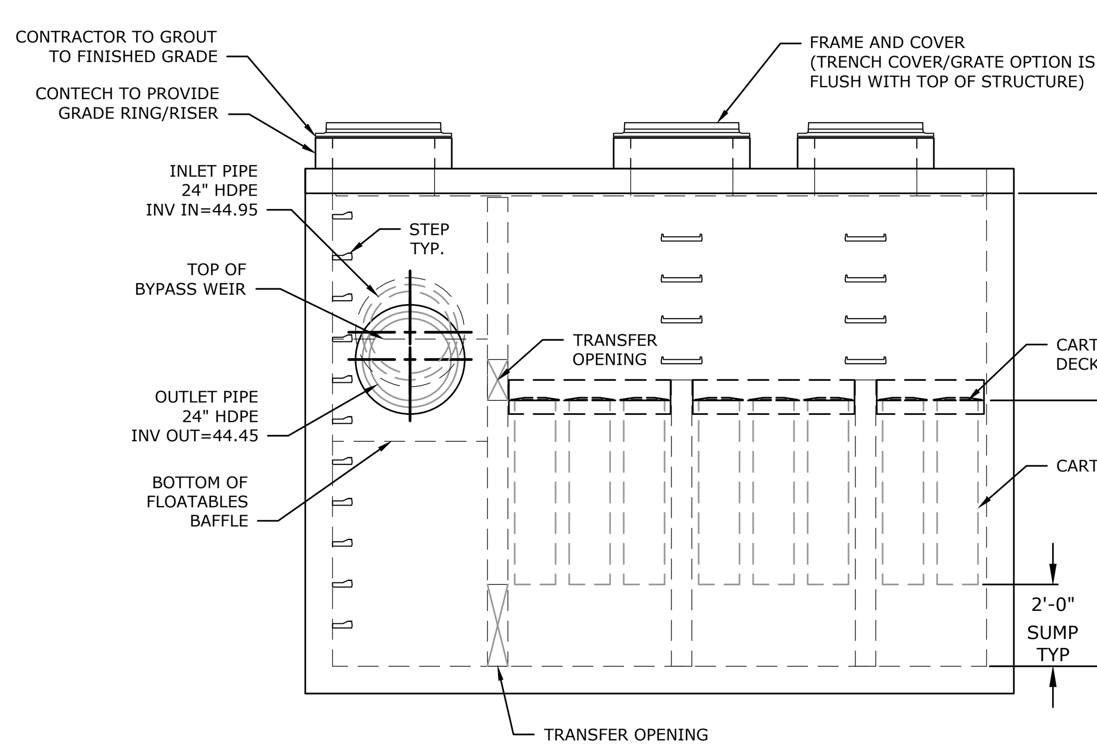


24" TRENCH COVER
(LENGTH VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	JFPD0816
WATER QUALITY FLOW RATE (cfs)	7.46
PEAK FLOW RATE (cfs)	23.8
RETURN PERIOD OF PEAK FLOW (yrs)	50
# OF CARTRIDGES REQUIRED (HF / DD)	(40/8)
CARTRIDGE LENGTH	54"



PLAN VIEW

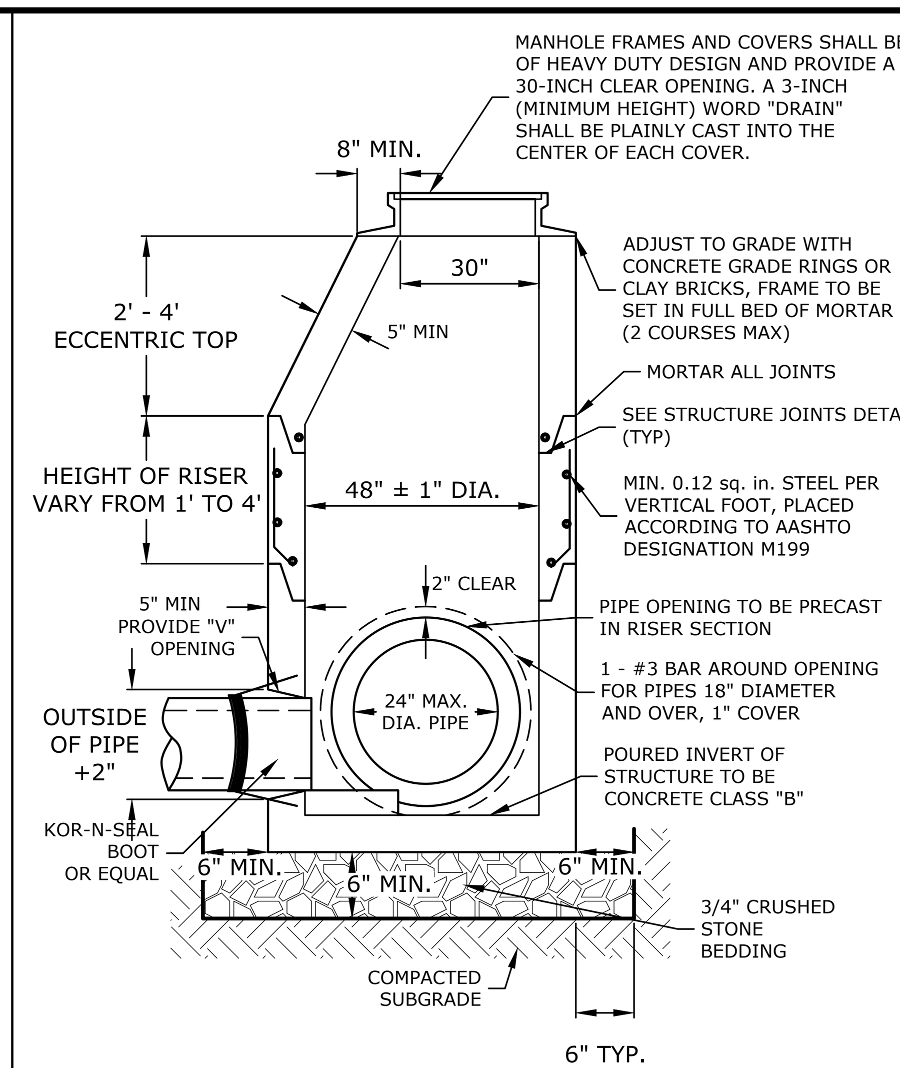


ELEVATION VIEW

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

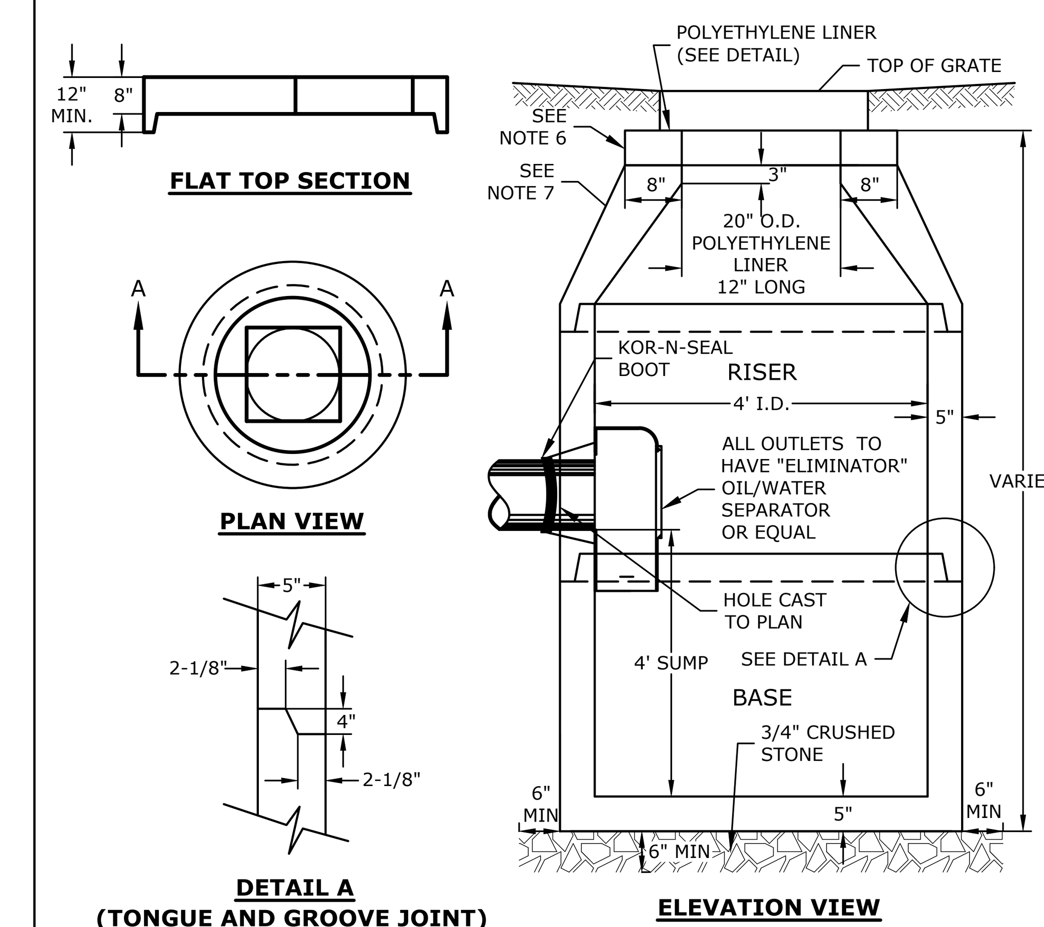
INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

JELLYFISH (JFPD0816) TREATMENT UNIT
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
9. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

4' DIAMETER DRAIN MANHOLE
NO SCALE

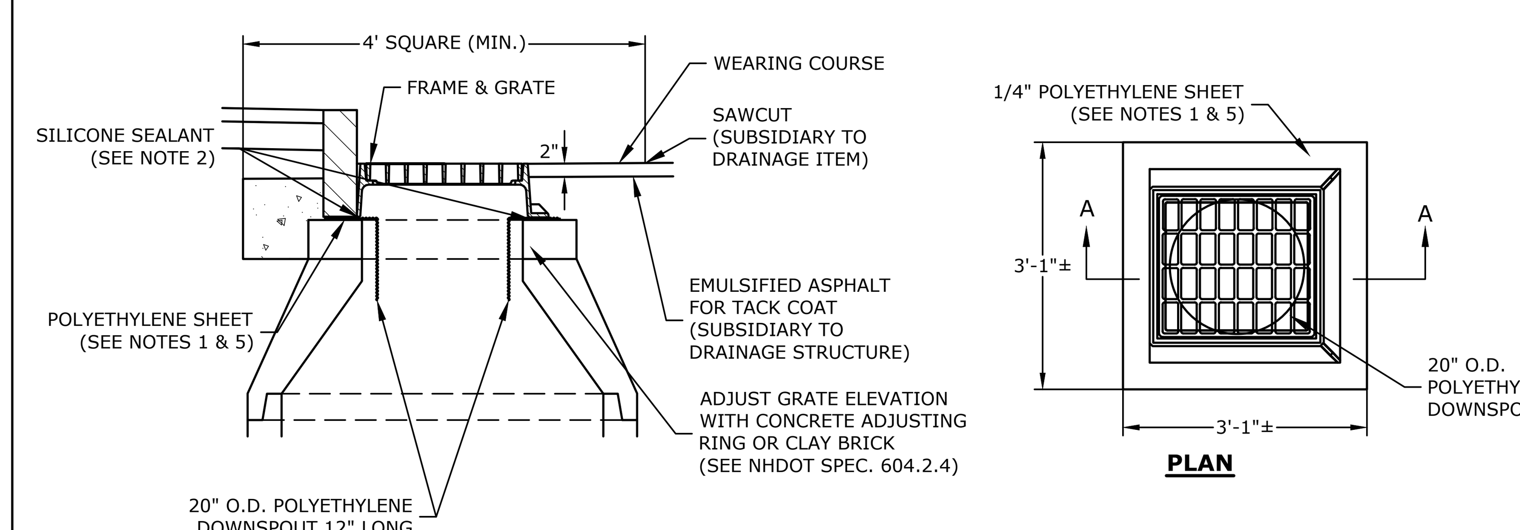


NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCH BASIN
NO SCALE

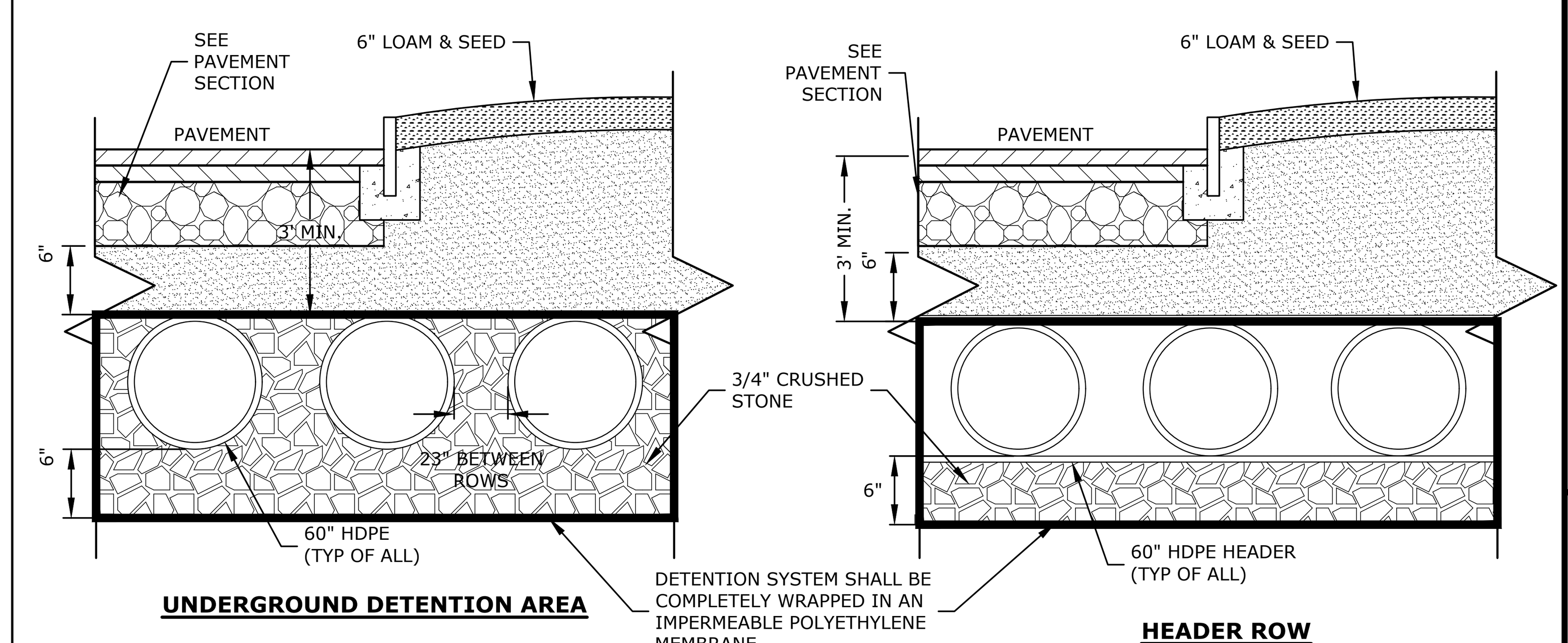
STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
1/25/23

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
1/25/23



NOTES:
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE).
4. USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
5. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3-FLANGE FRAME AND CURB).
6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
7. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.
8. SEE NHDOT DR-04, "DI-DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.
9. CATCHBASINS WITHIN CITY RIGHT OF WAY SHALL HAVE A POLYETHYLENE LINER

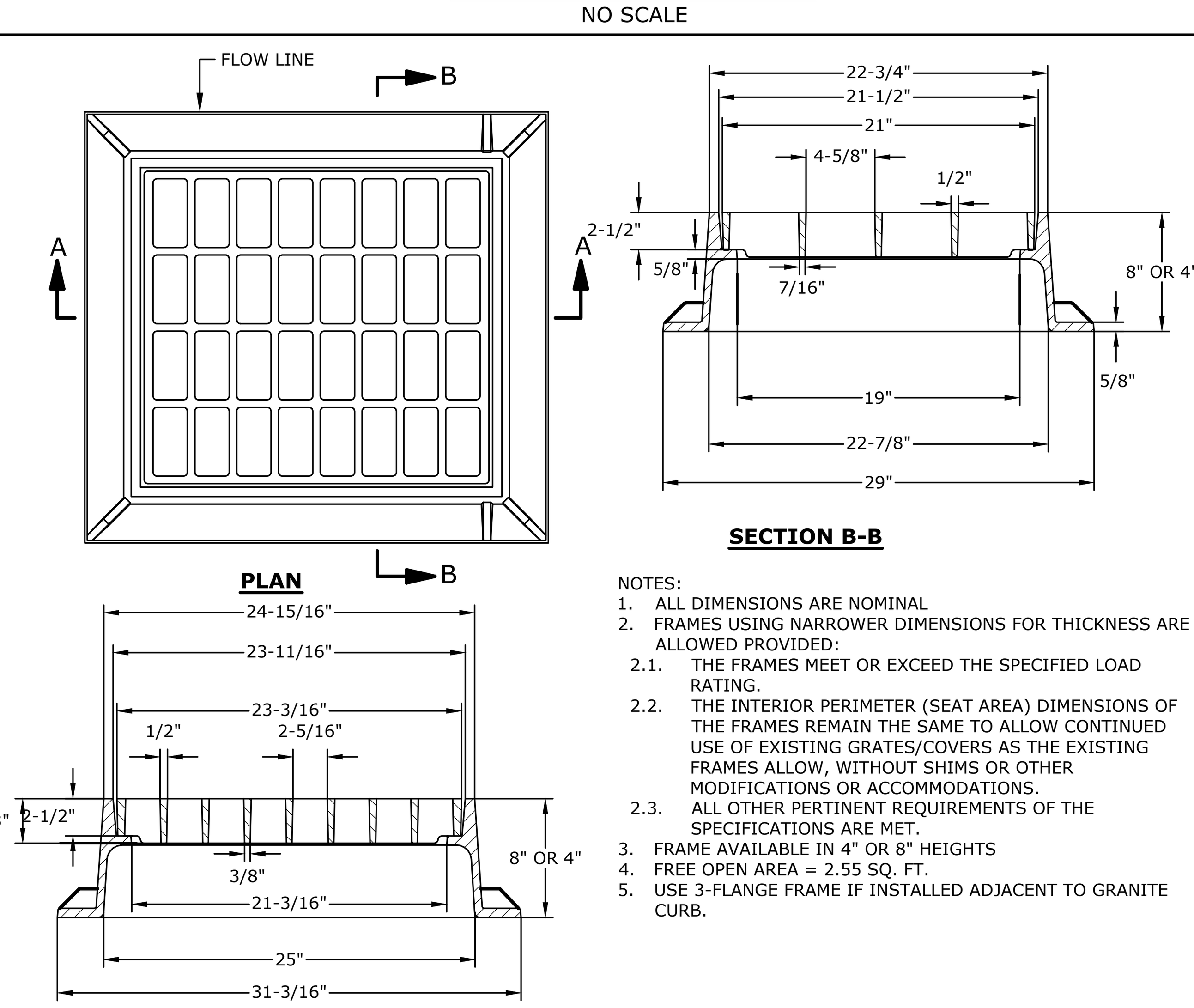
POLYETHYLENE LINER
NO SCALE



FIELD ELEVATIONS				
	TOP OF STONE ELEV	TOP OF PIPE ELEV	BOTTOM OF PIPE ELEV	BOTTOM OF STONE ELEV
PUD-01	50.50'	50.50'	45.00'	44.50'

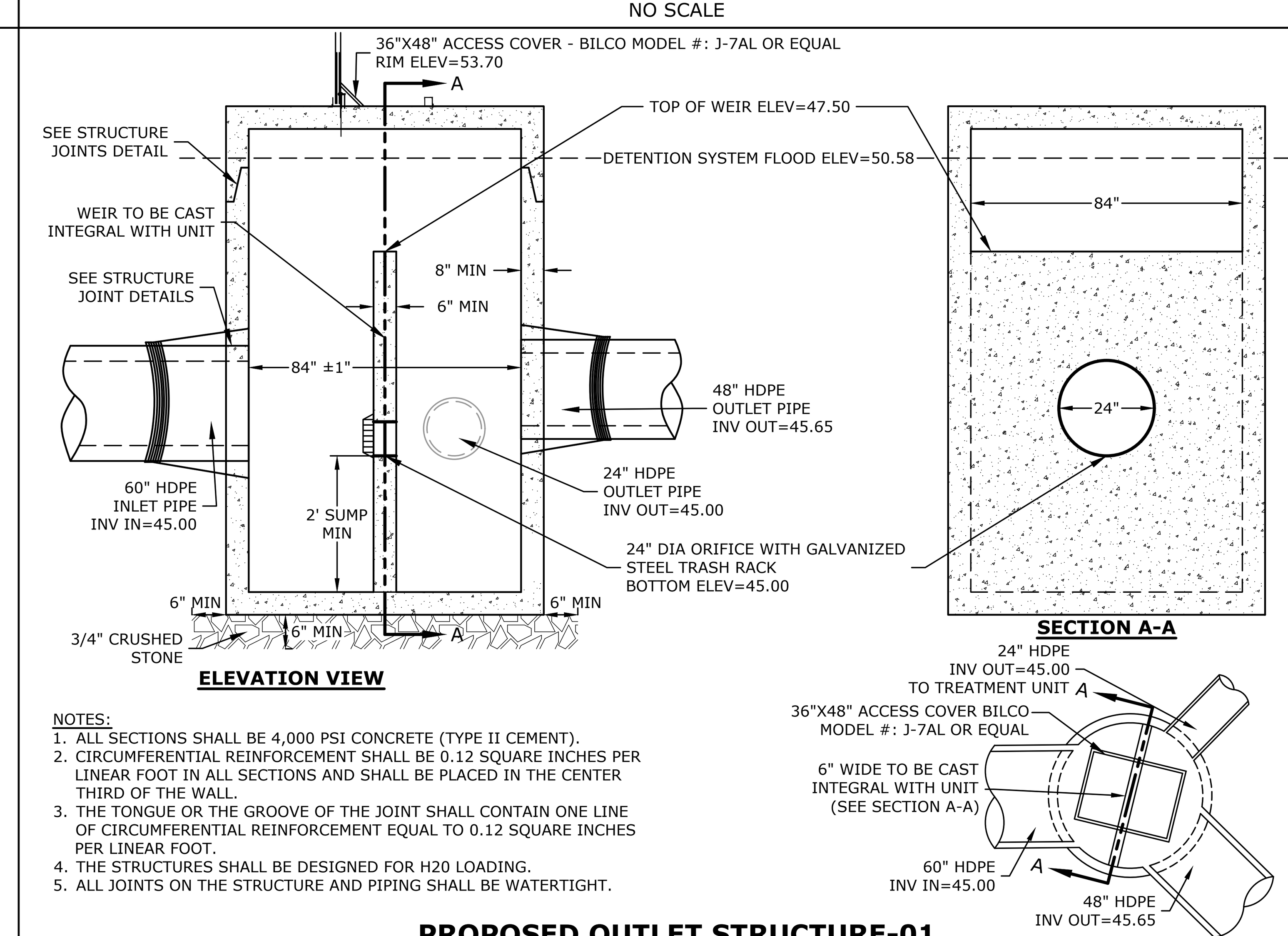
NOTES:
1. UNDERGROUND DETENTION SYSTEM TO BE 60" HDPE PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURES DESIGN TO ENGINEER FOR APPROVAL.
2. MANUFACTURER TO SUBMIT PLANS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.
3. THE DESIGN ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED PER THE APPROVED DESIGN PLAN.

UNDERGROUND DETENTION SYSTEM
NO SCALE



NOTES:
1. ALL DIMENSIONS ARE NOMINAL
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   2.1. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   2.2. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   2.3. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. FRAME AVAILABLE IN 4" OR 8" HEIGHTS
4. FREE OPEN AREA = 2.55 SQ. FT.
5. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

CATCH BASIN FRAME & GRATE
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

PROPOSED OUTLET STRUCTURE-01
NO SCALE

Tighe&Bond

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DETAILS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-504

Last Save Date: January 25, 2023 8:25 AM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton
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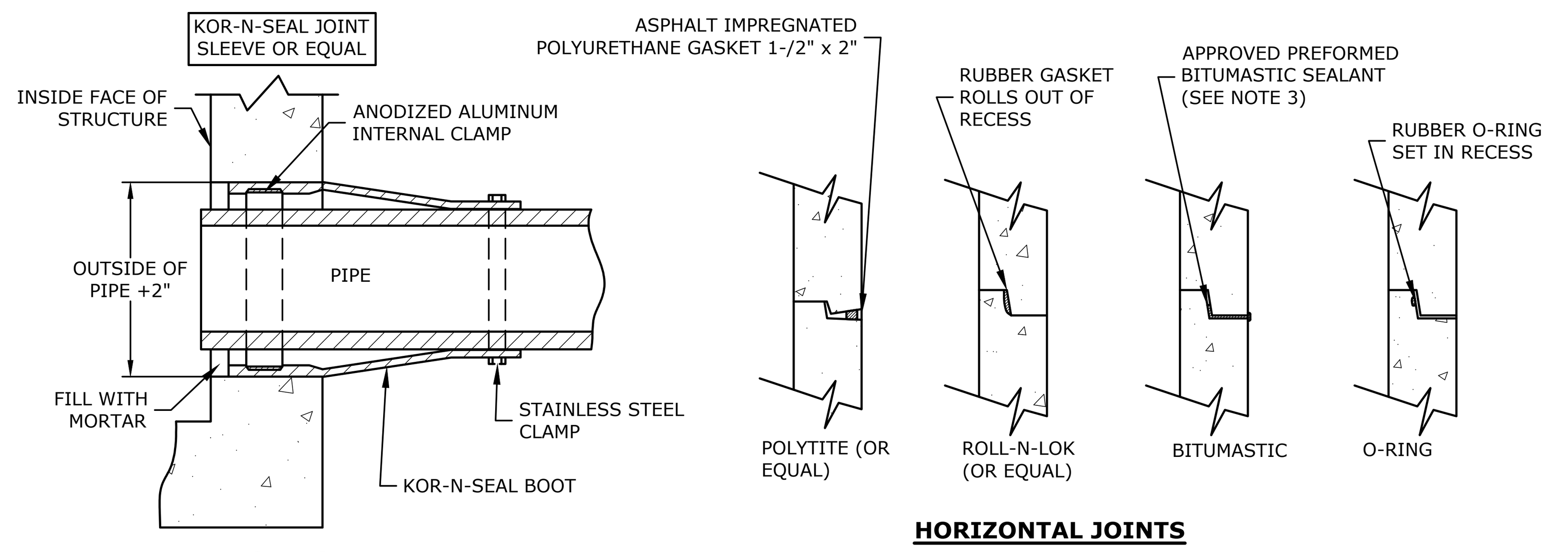
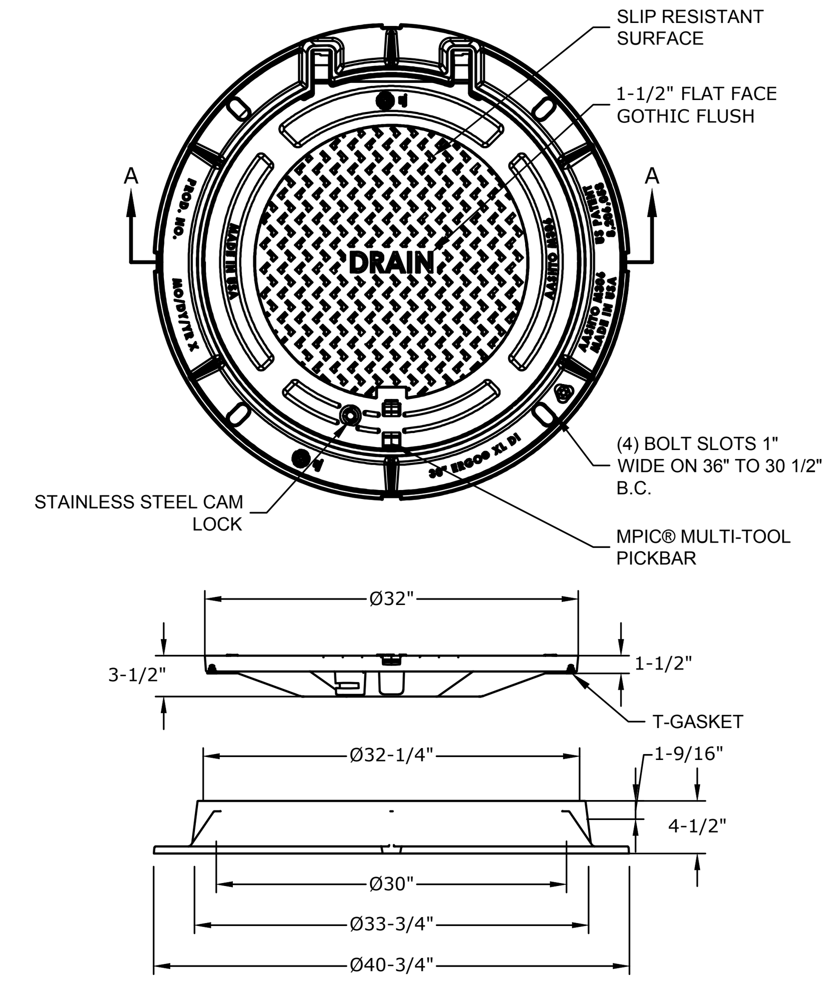


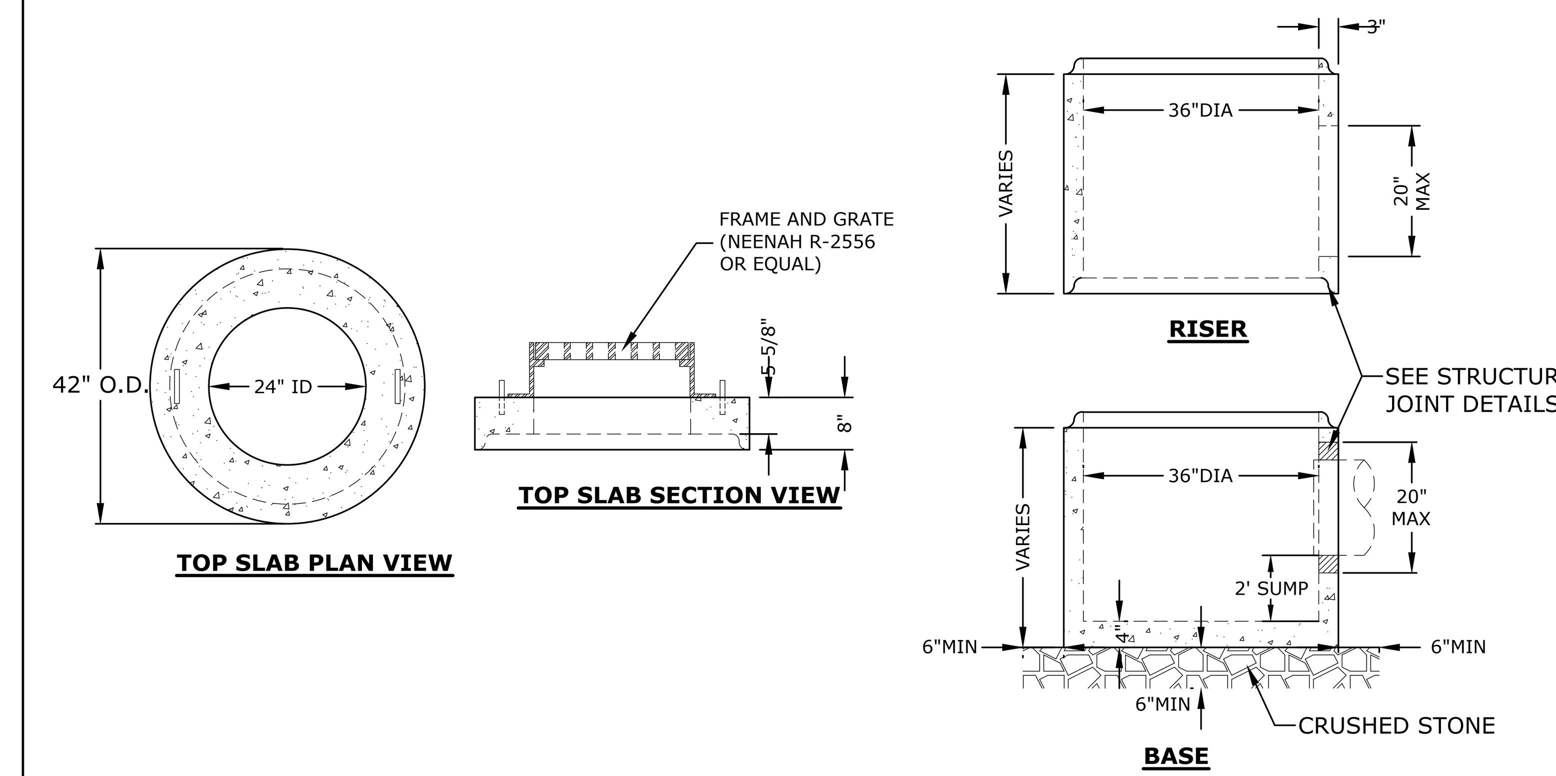
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

STRUCTURE JOINTS
NO SCALE



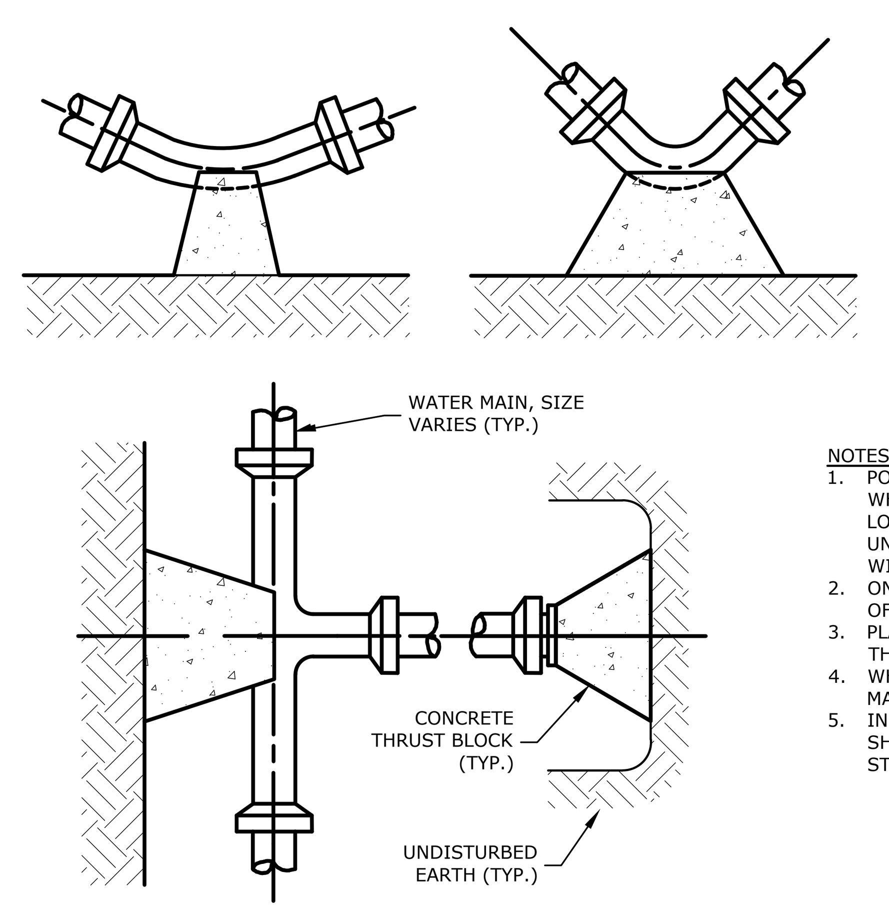
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
3. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.
4. PRECAST CONCRETE YARD DRAINS SHALL BE PHOENIX PRECAST PRODUCTS OR EQUAL.

YARD DRAIN
NO SCALE

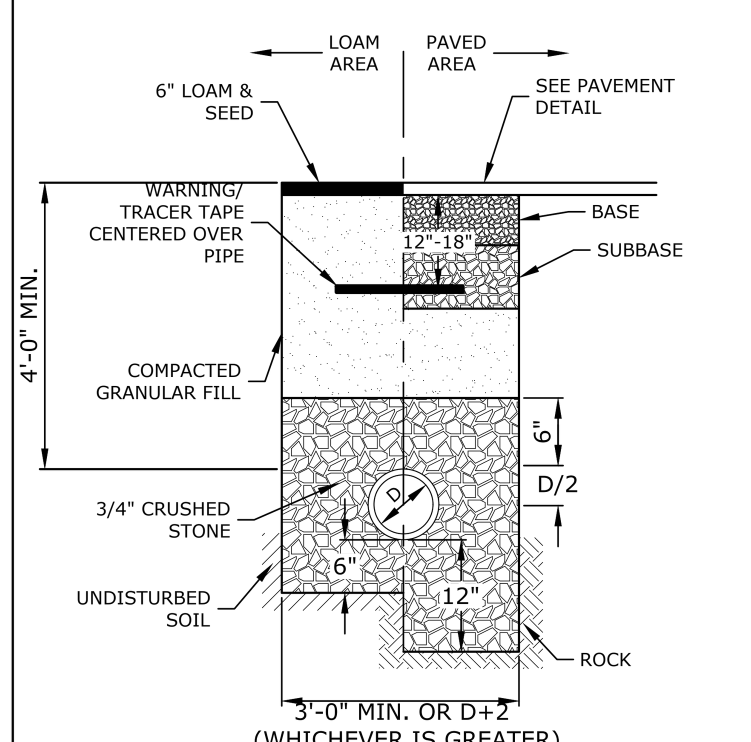


TEST PRESSURE = 200psi

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

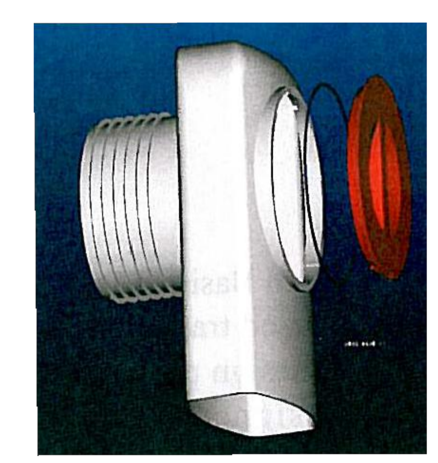
NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT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

THRUST BLOCKING
NO SCALE



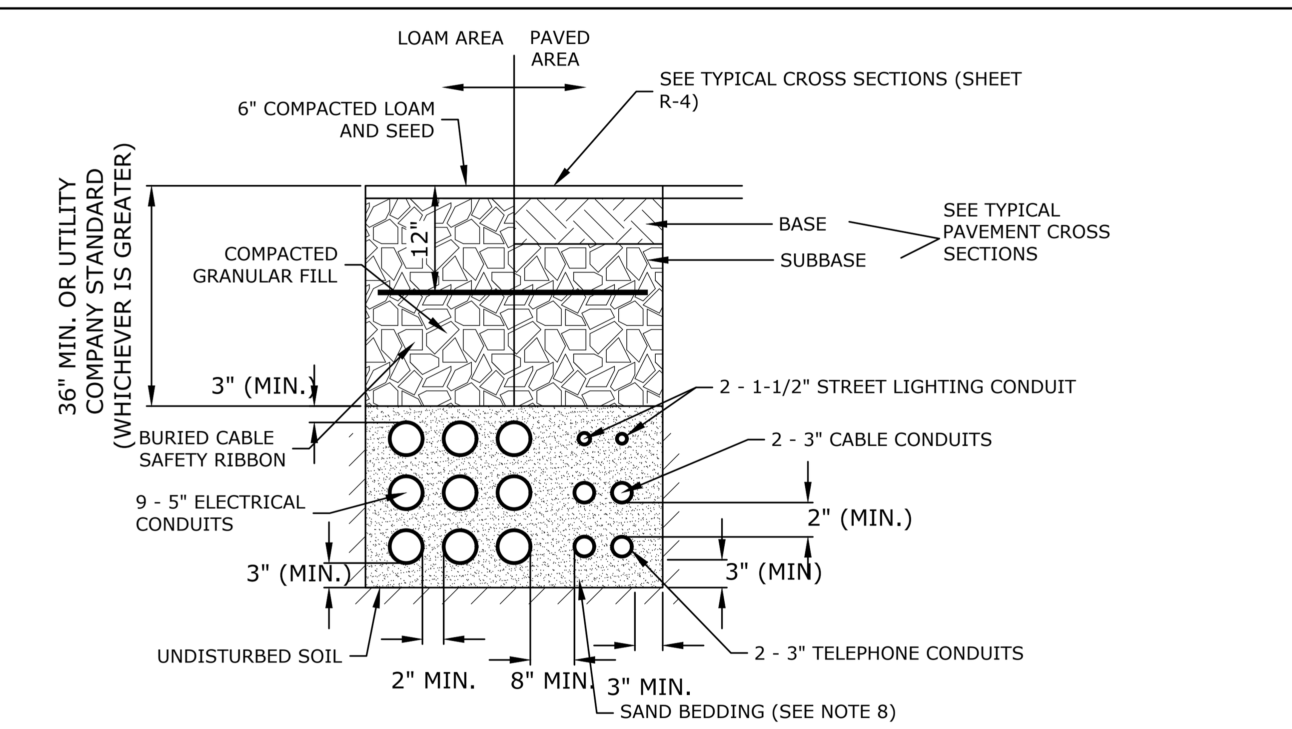
NOTE:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

STORM DRAIN TRENCH
NO SCALE



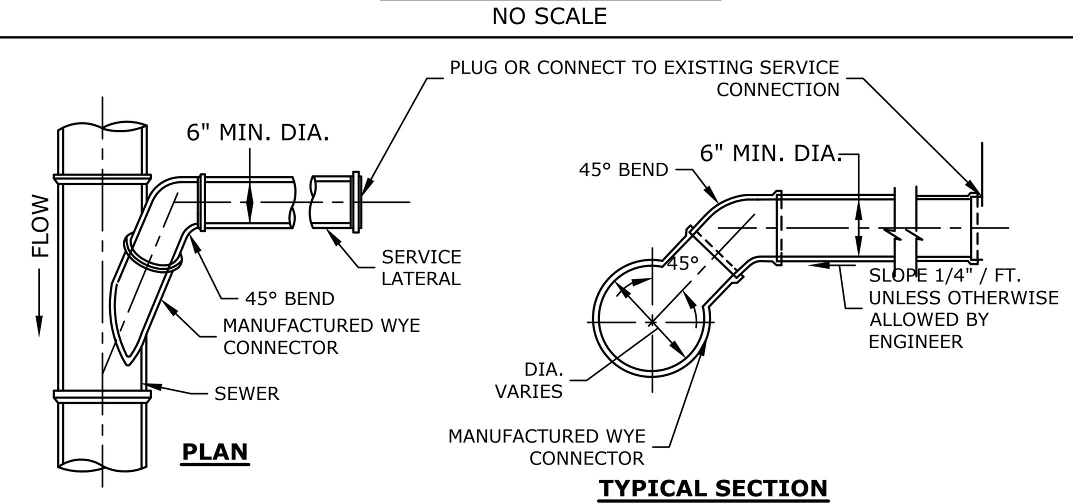
NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE

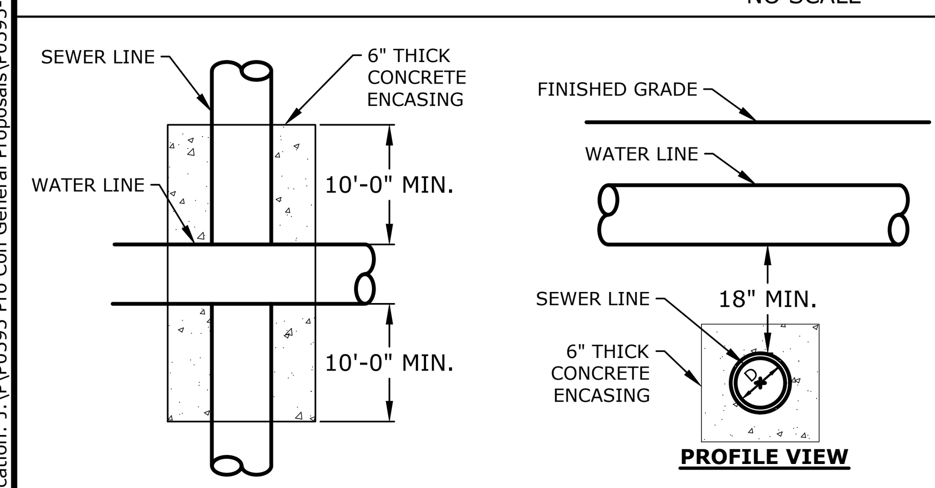


NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.

TYPICAL ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE

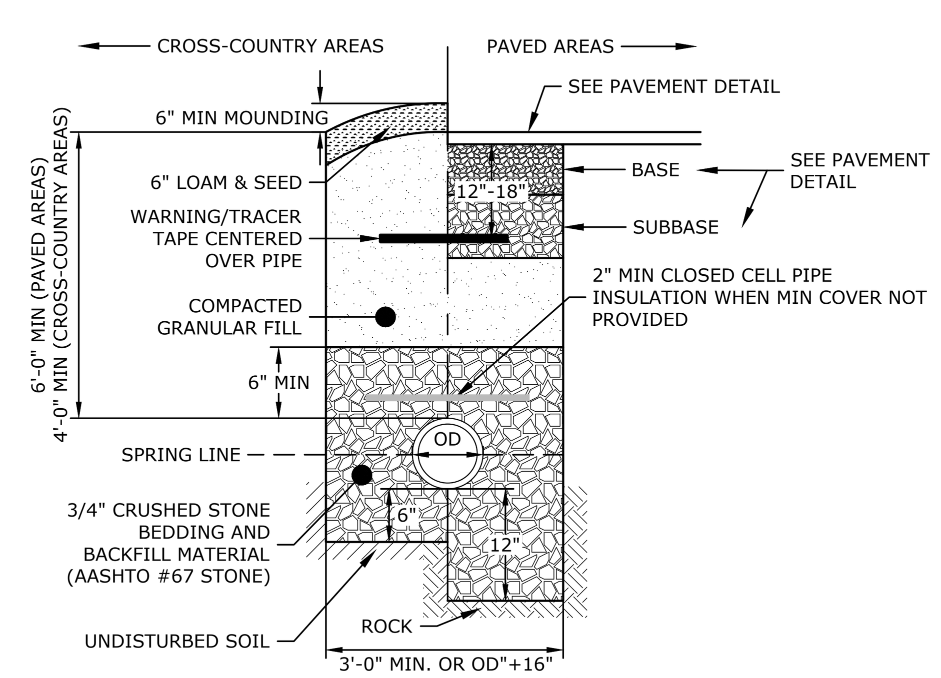


STANDARD SERVICE LATERAL CONNECTION
NO SCALE



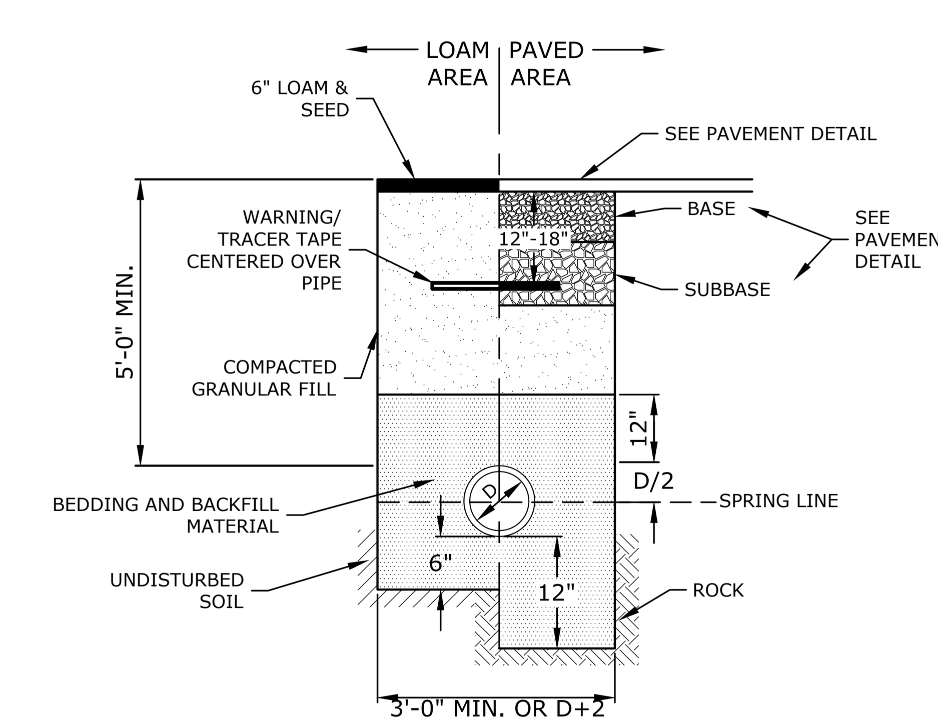
NOTES:
1. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED FROM ANY EXISTING OR PROPOSED WATER LINE.
2. AN 18" MINIMUM EDGE TO EDGE VERTICAL SEPARATION SHALL BE PROVIDED, WITH WATER ABOVE SEWER, AT ALL CROSSINGS.
3. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
4. WHERE AN 18" VERTICAL SEPARATION CANNOT BE PROVIDED, SEWER PIPE SHALL BE CONSTRUCTED USING A SDR 26 PVC PIPE OR ENCASED CONCRETE FOR A MINIMUM DISTANCE OF 10 FEET ON BOTH SIDES OF THE LINE BEING CROSSED, AS SHOWN ABOVE.
5. CROSSINGS SHALL CONFORM TO THE CITY PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS.

WATER SEWER CROSSING
NO SCALE



NOTES:
1. 3/4" CRUSHED STONE BEDDING AND BACKFILL MATERIAL FOR FULL WIDTH OF THE TRENCH FROM MINIMUM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO MINIMUM OF 6" OVER THE TOP OF THE PIPE.
2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

TYPICAL SEWER TRENCH
NO SCALE



NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

TYPICAL WATER TRENCH
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
1/25/23

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
1/25/23

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
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DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-505

Last Save Date: January 25, 2023 8:25 AM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton
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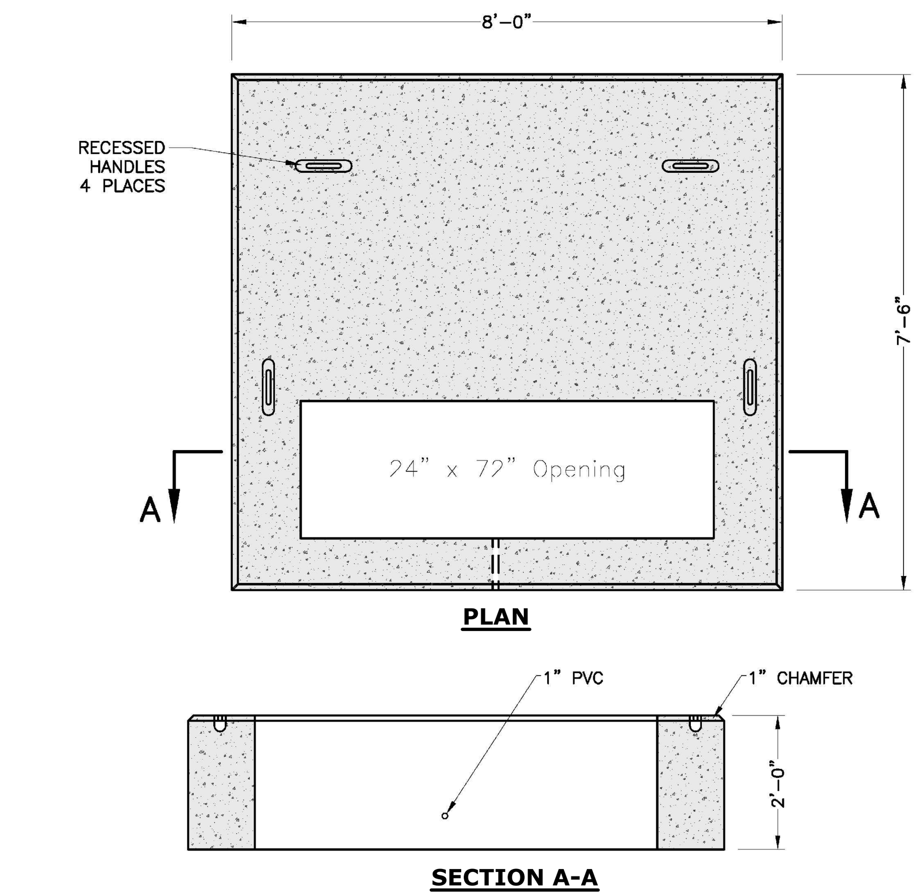
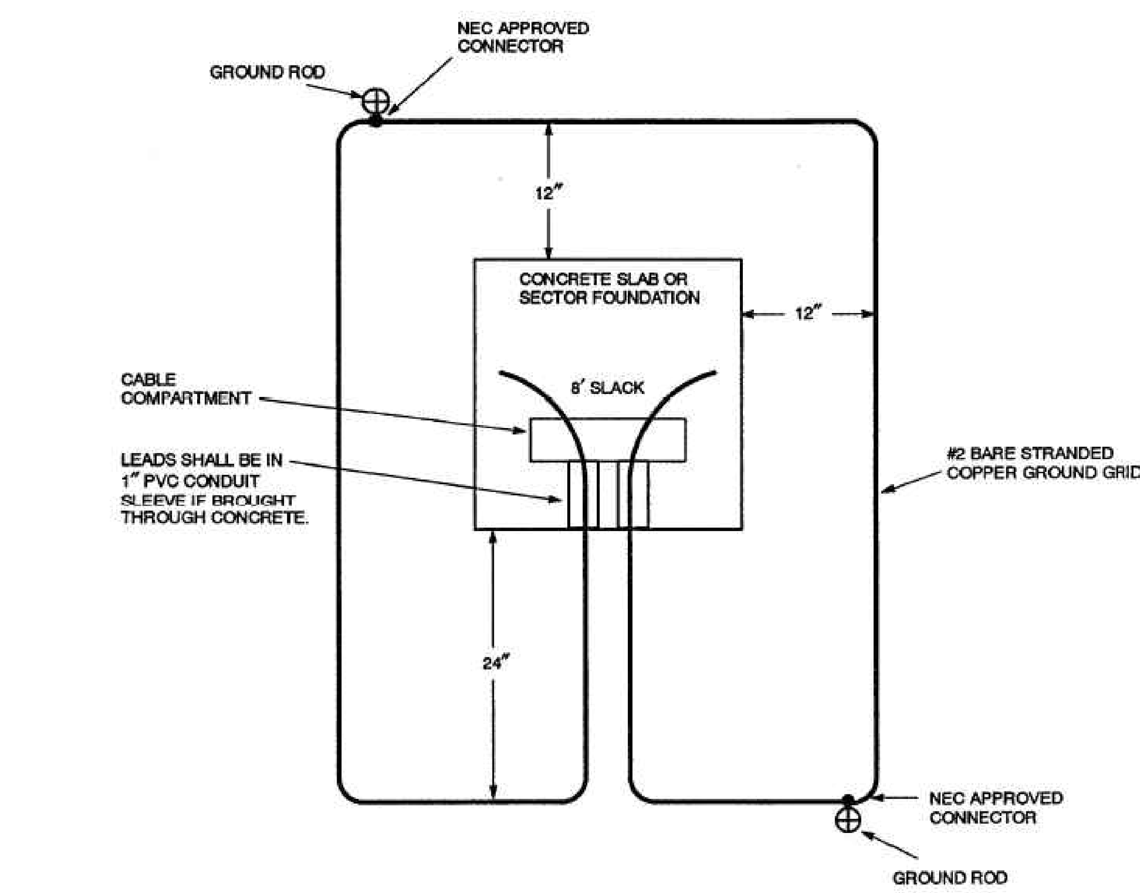


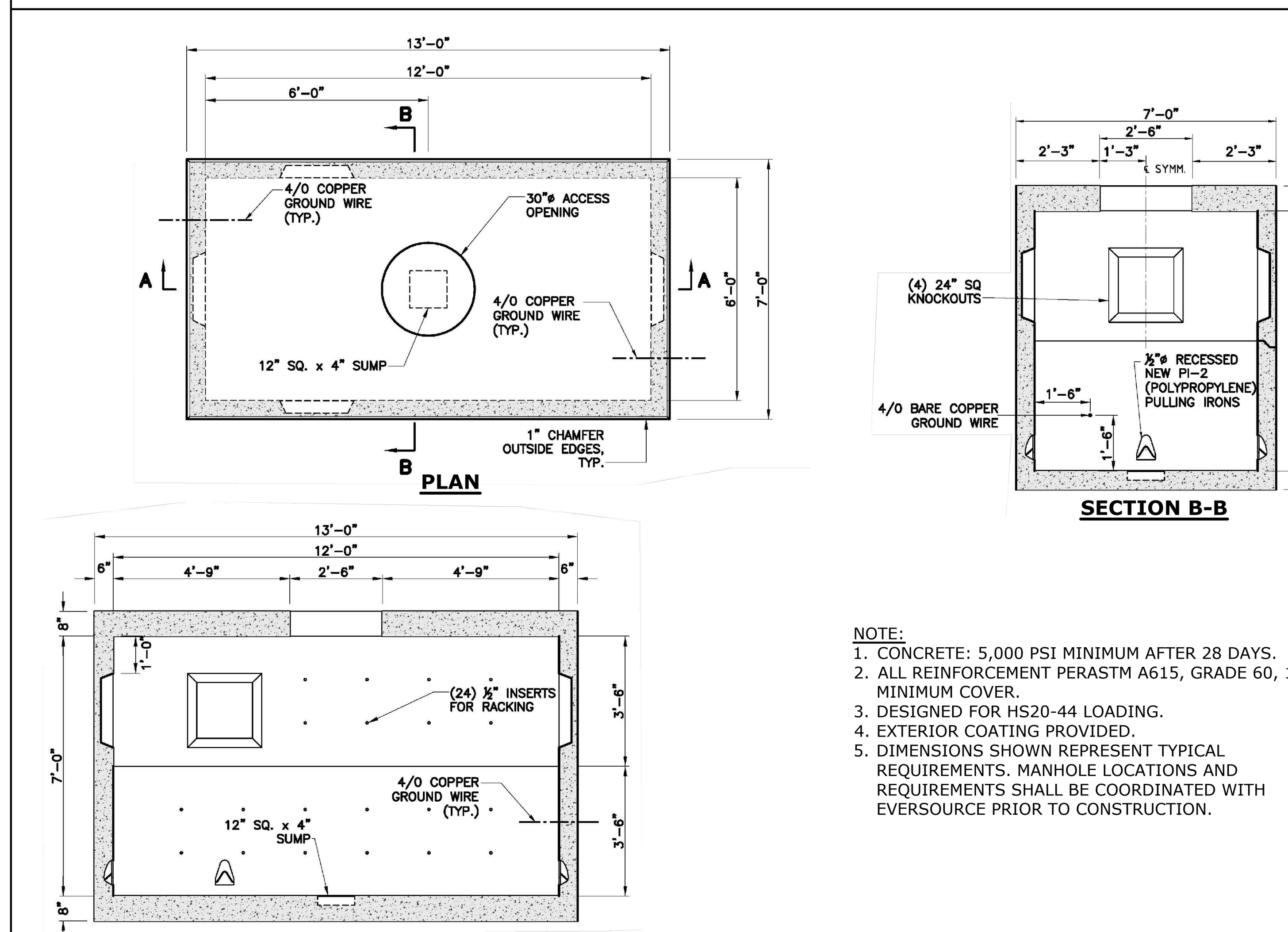
NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

TYPICAL 3-PHASE TRANSFORMER PAD
NO SCALE



NOTES:
1. THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.

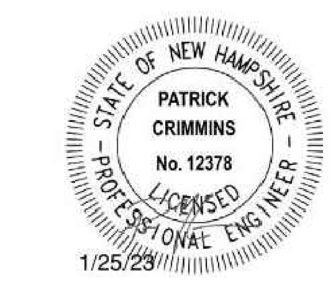
TYPICAL PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL
NO SCALE



NOTE:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. ALL REINFORCEMENT PERASTM A615, GRADE 60, 1" MINIMUM COVER.
3. DESIGNED FOR HS20-44 LOADING.
4. EXTERIOR COATING PROVIDED.
5. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION.

TYPICAL ELECTRIC MANHOLE
NO SCALE

Tighe&Bond



Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
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A	12/19/2022	TAC Submission

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SCALE: AS SHOWN

C-506

Last Save Date: January 25, 2023 8:25 AM By: CML
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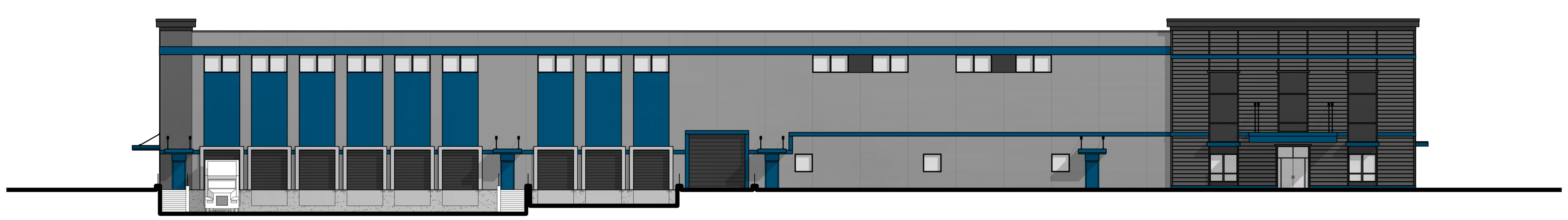
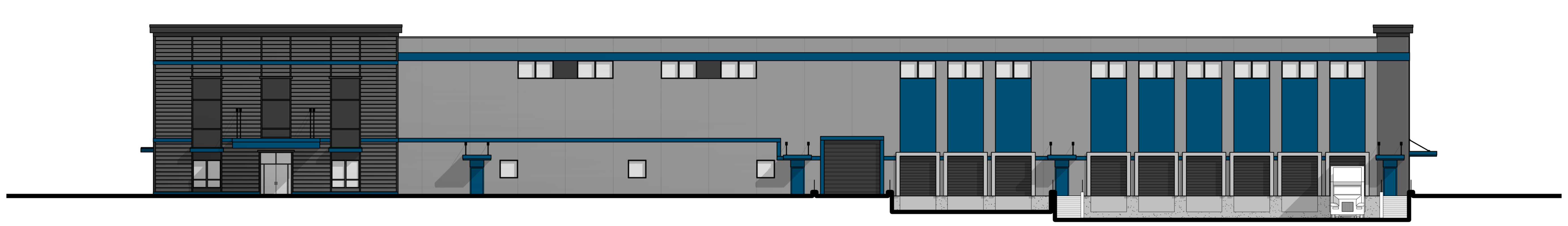
1 NEW HAMPSHIRE AVENUE ELEVATION
3/64" = 1'-0"

2 ROCHESTER AVENUE ELEVATION
3/64" = 1'-0"



3 NEWFIELDS AVENUE ELEVATION
3/64" = 1'-0"



4 STRATHAM STREET ELEVATION
3/64" = 1'-0"

PROCON
CONNECT • CREATE • CONSTRUCT

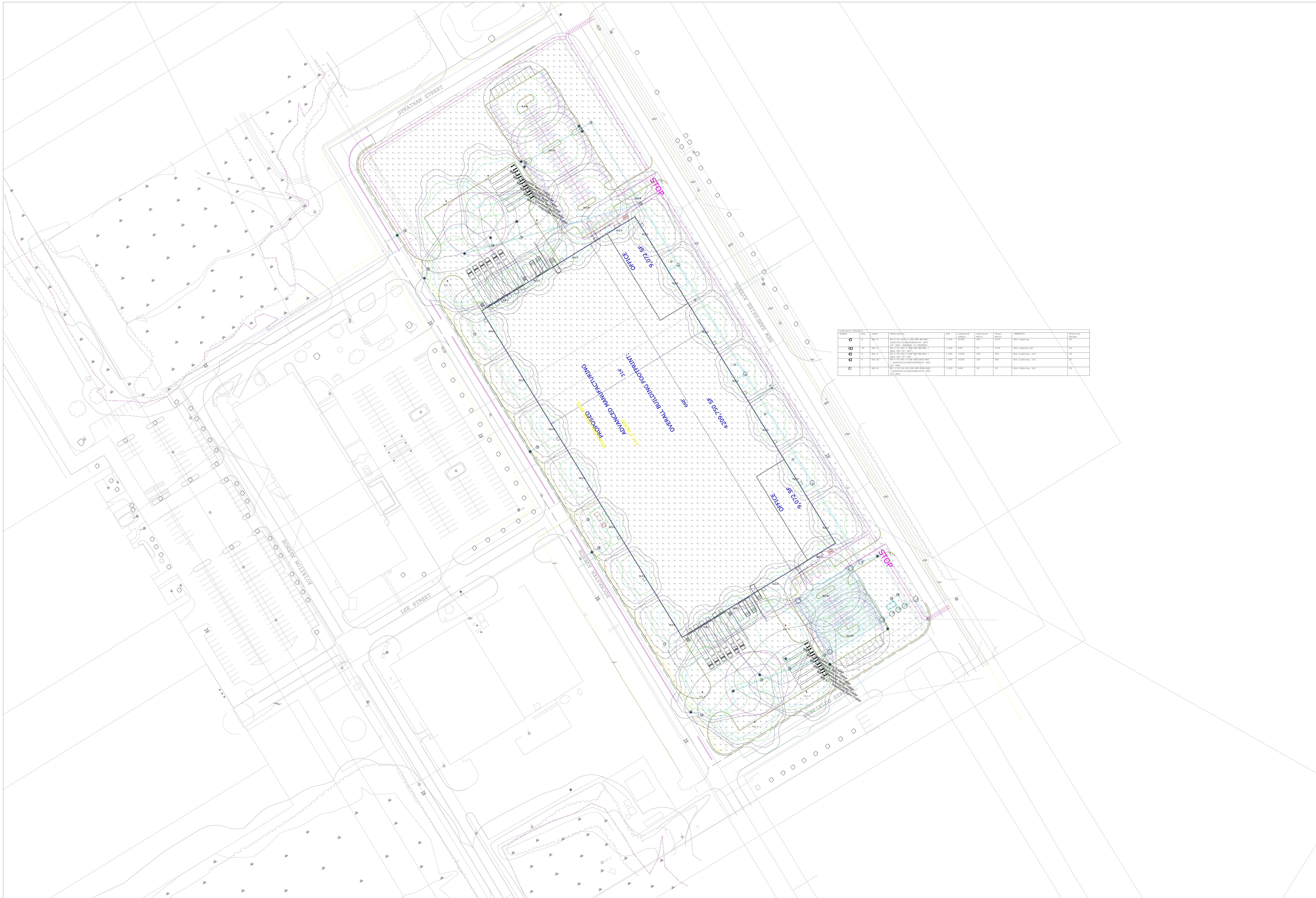
Scale: 3/64" = 1'-0"

PROPOSED EXTERIOR ELEVATIONS

Project
ADVANCED MANUFACTURING
100 NEW HAMPSHIRE AVE
PORTSMOUTH, NH

Date
12/12/2022

Dwg. No.
A1



Luminaire Schedule

Symbol	Qty	Label	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts	[MANUFAC]	Mounting Height
	8	NLS A	NV-2-T4-128L-1-40K-UNV-KM-BRZ / SSSP18411G12BCSGLBRZ3430 (MTD 20' AFG) (ANGELED 12 DEGREES)	1.000	45399	409	3272	NLS Lighting	20
	18	NLS D	NV-1-T4-32L-7-40K-UNV-WM-BRZ / WALL MTD 20' AFG	1.000	8307	71	1278	NLS Lighing LLC	20
	4	NLS C	NV-1-T3-32L-1-40K-UNV-WM-BRZ / WALL MTD 25' AFG	1.000	13038	106	424	NLS Lighting, LLC	25
	5	NLS B1	NV-1-T5-64L-7-40K-UNV-DPS6-BRZ / SSSP18411G12BCSGLBRZ3430 (MTD 20' AFG)	1.000	16320	136	680	NLS Lighting, LLC	20
	1	NLS B	NV-1-T3-16L-35-40K-UNV-DPS6-BRZ / SSSP18411G12BCSGLBRZ3430 (MTD 20' AFG)	1.000	2286	18	18	NLS Lighting, LLC	20

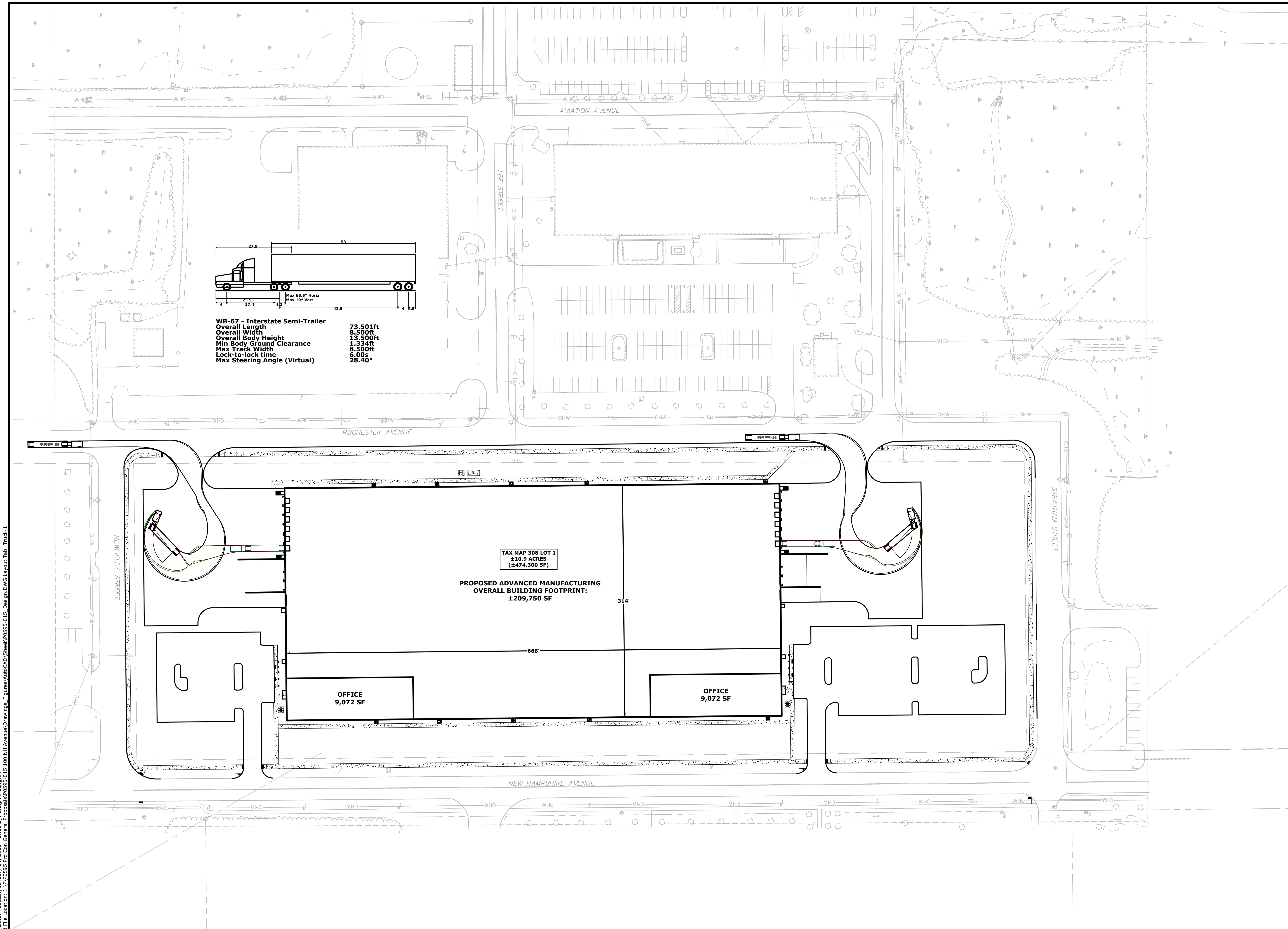
CHARRON
Post Office Box 4550
Manchester, NH 03108
t.603.624.4827 f.603.624.9765
www.charroninc.com

#	Date	Comments

Revisions

Drawn By: Daniel Hebert
Checked By:
Date:12/16/2022
Scale:

100 NH Ave Portsmouth
Photometrics Alt 2



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Tighe&Bond

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

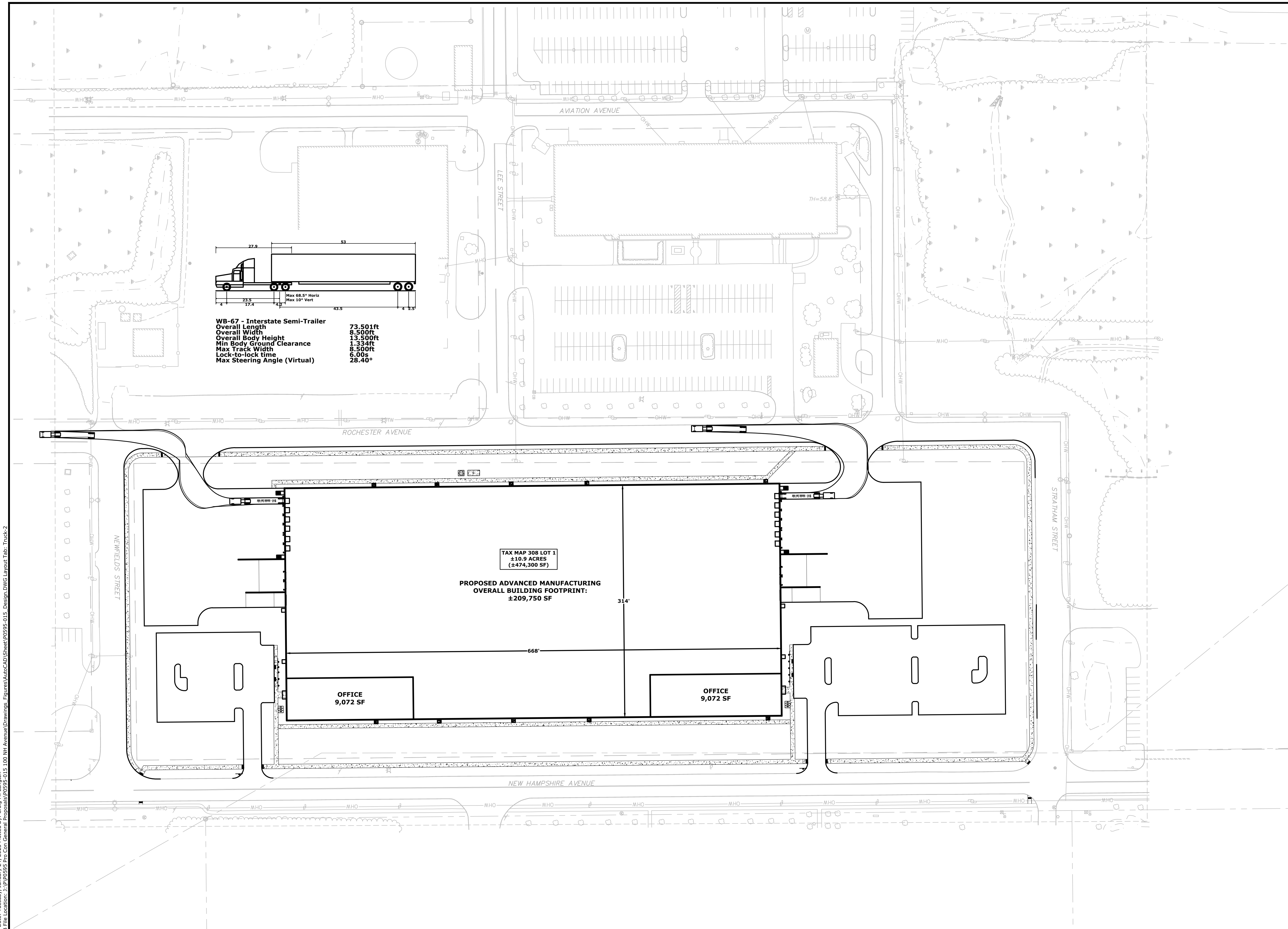
MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

WB-67 TRUCK ENTERING TURNING EXHIBIT

SCALE: AS SHOWN

1 OF 2



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Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

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APPROVED:	PMC

WB-67 TRUCK EXITING TURNING EXHIBIT

SCALE: AS SHOWN

2 OF 2

Last Save Date: January 24, 2023 4:37 PM By: CML
Plot Date: Tuesday, January 24, 2023 Plotted By: Craig M. Langton
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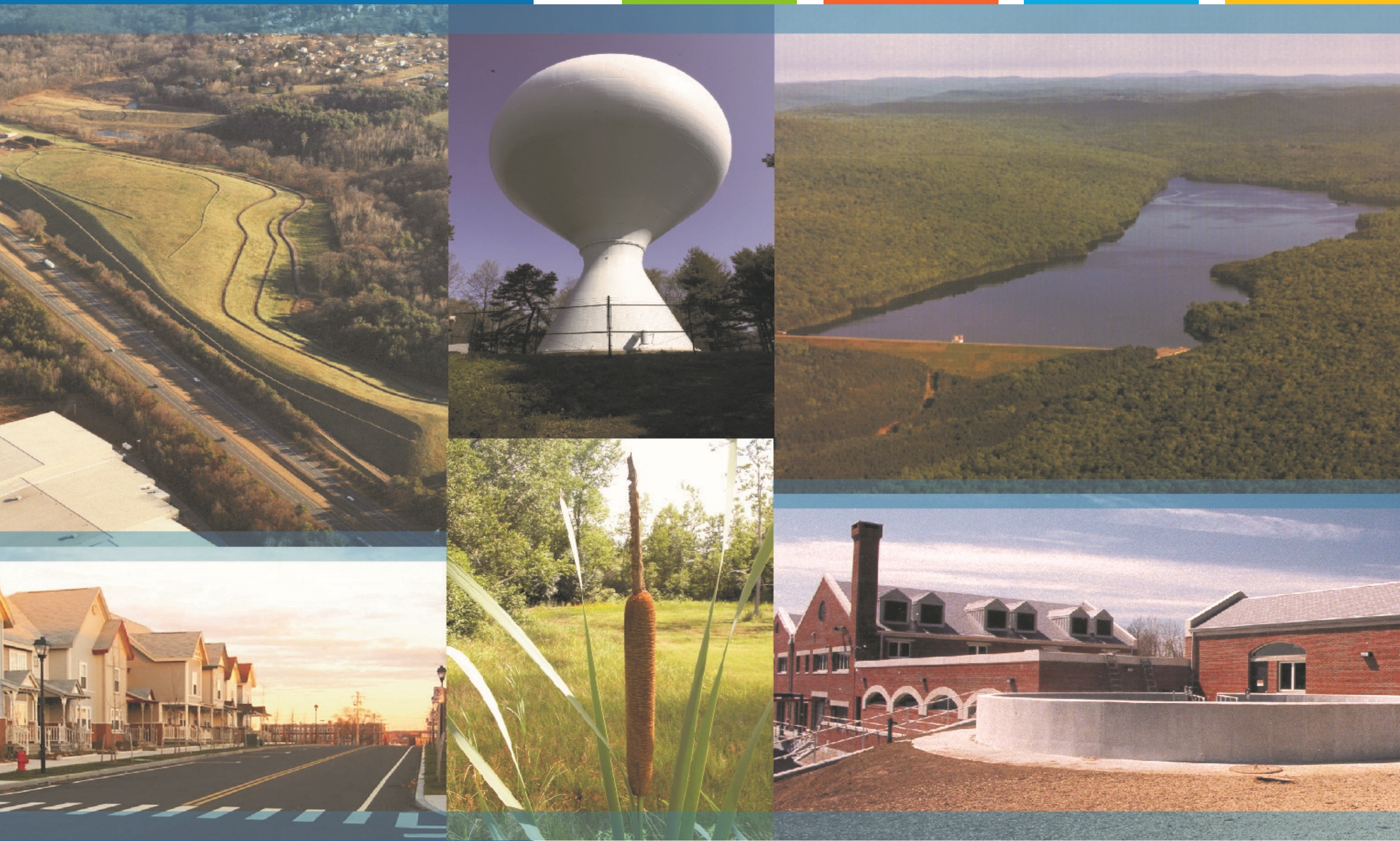


Proposed Advanced Manufacturing Facility

Portsmouth, NH

Drainage Analysis

Prepared For:

Aviation Avenue Group, LLC
210 Commerce Way Suite 300
Portsmouth, NH 03801

December 19, 2022

Last Revised: January 25, 2023

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER
NEIL A. HANSEN No. 15227 LICENSED

1/25/23

Section 1 Drainage Analysis

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Drainage Report\P0595-015_Drainage Analysis.docx

Section 1
Drainage Analysis

The project site is identified as Map 308 Lot 1 on the City of Portsmouth Tax Maps. The site is located on a piece of land that is bound by Stratham Street to the north, New Hampshire Avenue to the east, Newfields Street to the south, and Rochester Avenue to the west. The proposed project is for the construction of a ±209,750 SF advanced manufacturing facility including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system. There is approximately 196,665 SF of existing impervious area that is currently untreated before entering the municipal drainage system. The proposed stormwater management system has been designed to provide treatment for the existing impervious surface that are currently untreated and for ±161,130 SF of additional impervious that results from the proposed project. In addition to the on-site stormwater treatment the proposed project decreases the impervious area within the Rochester Avenue Right of Way by ±15,900 SF, while also adding seven (7) new offline catch basins to provide additional stormwater treatment within the Right of Way.

The Stormwater Management System was designed in accordance with the requirements of the New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AoT) rules and regulations (Env-Wq 1500). The system includes deep sump catch basins with oil water separator hoods, an underground detention system and a proprietary Jellyfish Filter Treatment Unit. The use of a proprietary treatment unit is proposed due to the site being located within multiple remediation areas as well a Groundwater Management Zone (GMZ), and per the requirements of Env-Wq 1507.02 (c) no infiltration, filtering, or groundwater recharge practices are permitted in these areas.

1.1 Calculation Methods

The design storms analyzed in this study are the 1-year, 2-year, 10-year, 25-year and 50-year 24-hour Type III duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. A Type III storm pattern was used in the model. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center (NRCC) at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l) and shown in Table 1.1.

TABLE 1.1 – EXTREME PRECIPITATION ESTIMATES (NRCC)

YEAR	24-hr Estimate (inches)	+ 15% (inches)
1	2.66	3.06
2	3.21	3.69
10	4.87	5.60
25	6.17	7.10
50	7.40	8.51

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow, and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.

2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.

3. “Extreme Precipitation in New York & New England.” Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

1.2 Pre-Development Conditions

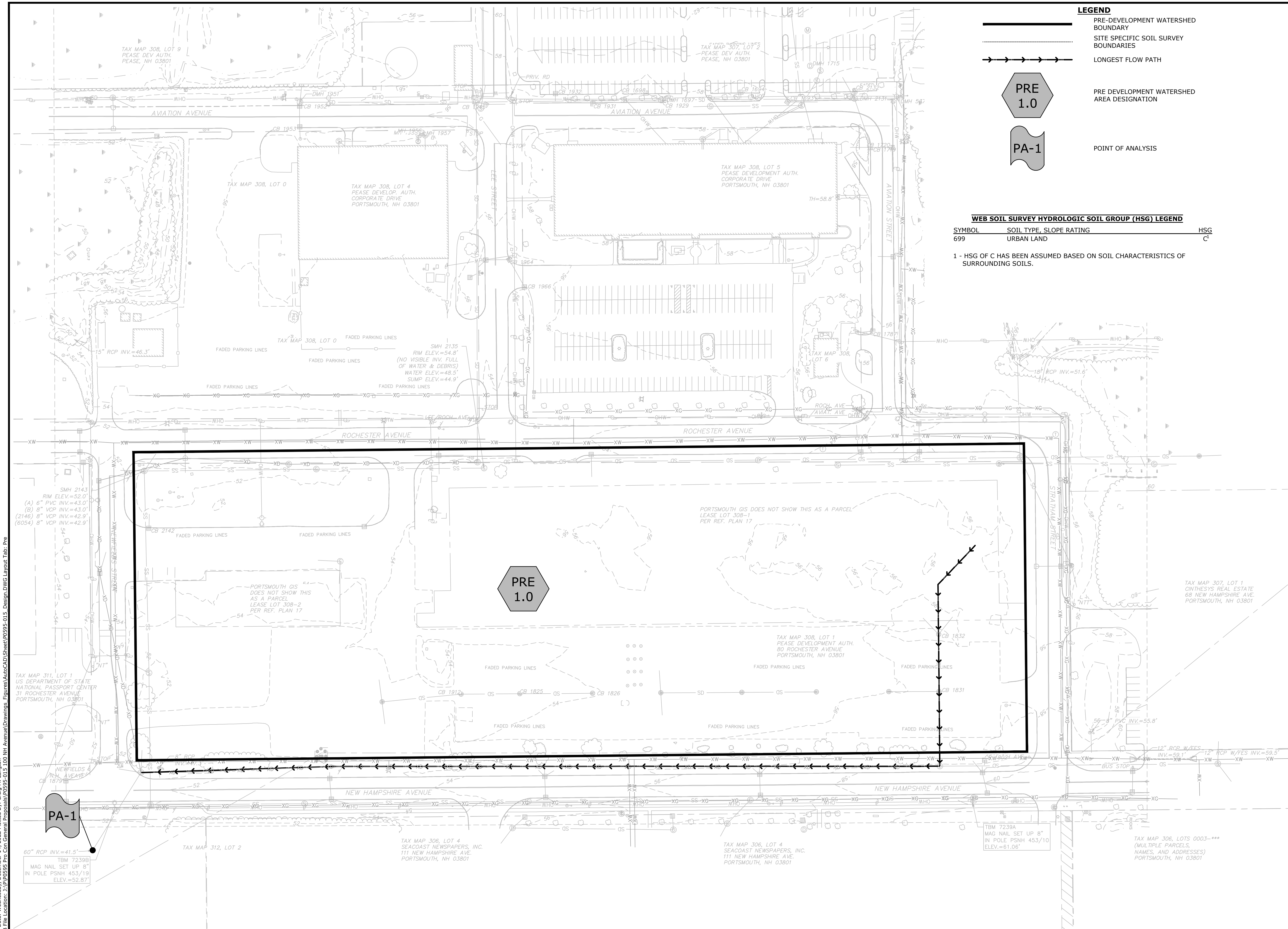
To analyze the Pre-Development condition, the site has been modeled utilizing one (1) sub-catchment area (PRE-1.0) with the distinct point of analysis (PA-1). This point of analysis and watershed are depicted on the plan entitled “Pre-Development Watershed Plan”, Sheet C-801.

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

Point of Analysis One (PA-1)

Point of analysis PA-1 is comprised of one (1) watershed area (PRE-1.0). This area includes the land that is currently utilized as an abandoned parking lot along with a grassed area. Runoff from this area travels southwest to northeast across the site via overland flow which is then collected in a closed drainage system then flowing through Point of Analysis 1 (PA-1).

1.2.1 Pre-Development Watershed Plan



Tighe&Bond

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

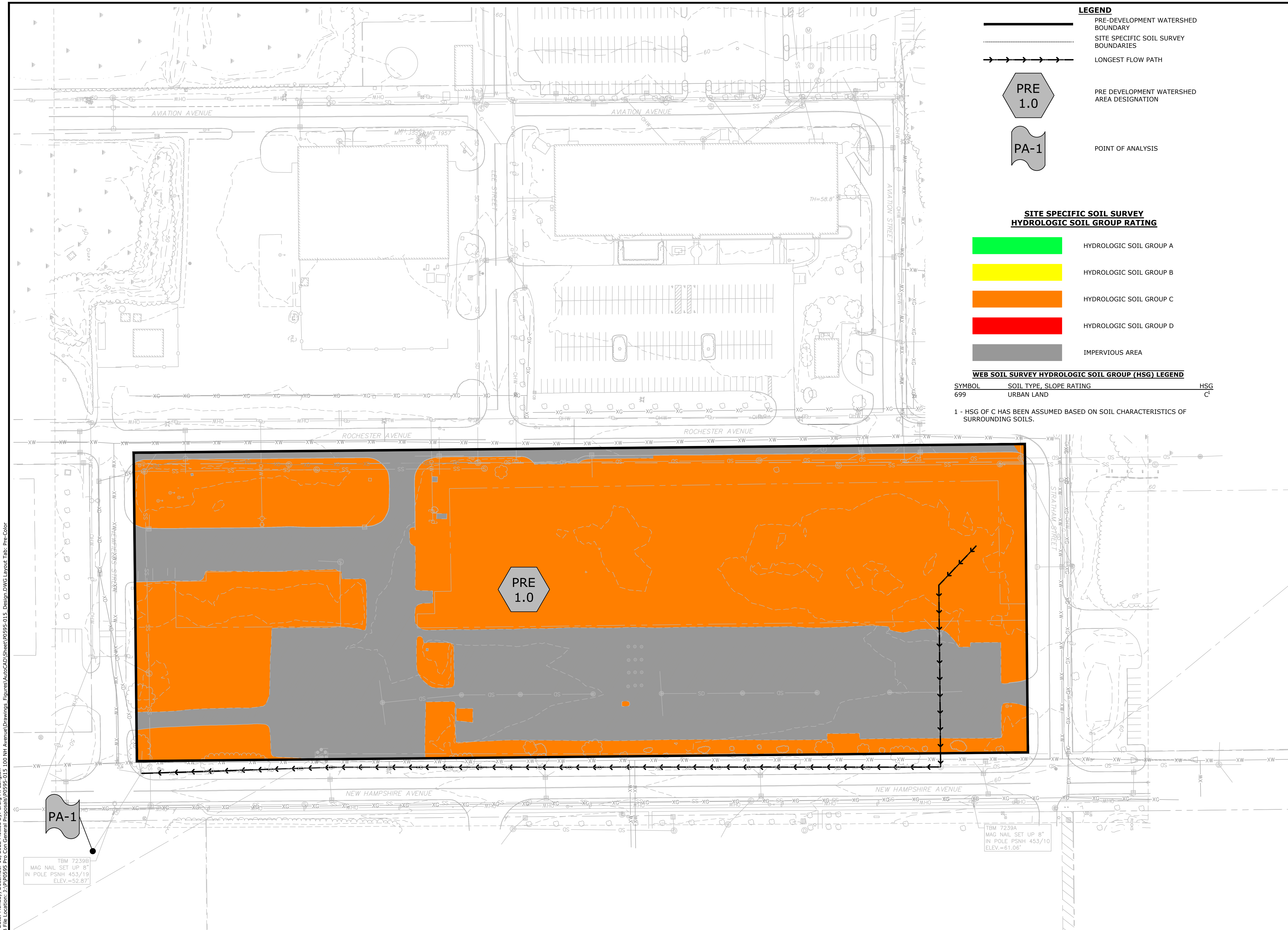
PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Save Date: December 14, 2022 11:43 AM By: CML
Plot Date: Wednesday, December 14, 2022 Plotted By: Craig M. Langton
T&B File Location: J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Drawings_Figures\AutoCAD\Sheet\P0595-015_Design.DWG Layout Tab: Pre

1.2.2 Pre-Development Soil Plan



LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

SITE SPECIFIC SOIL SURVEY BOUNDARIES

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS

SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP RATING

HYDROLOGIC SOIL GROUP A

HYDROLOGIC SOIL GROUP B

HYDROLOGIC SOIL GROUP C

HYDROLOGIC SOIL GROUP D

IMPERVIOUS AREA

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
699	URBAN LAND	C[1]

1 - HSG OF C HAS BEEN ASSUMED BASED ON SOIL CHARACTERISTICS OF SURROUNDING SOILS.

Tighe&Bond

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
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CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT SOIL COVERAGE COLOR PLAN

SCALE: AS SHOWN

C-803

Last Save Date: December 12, 2022 4:02 PM By: CML
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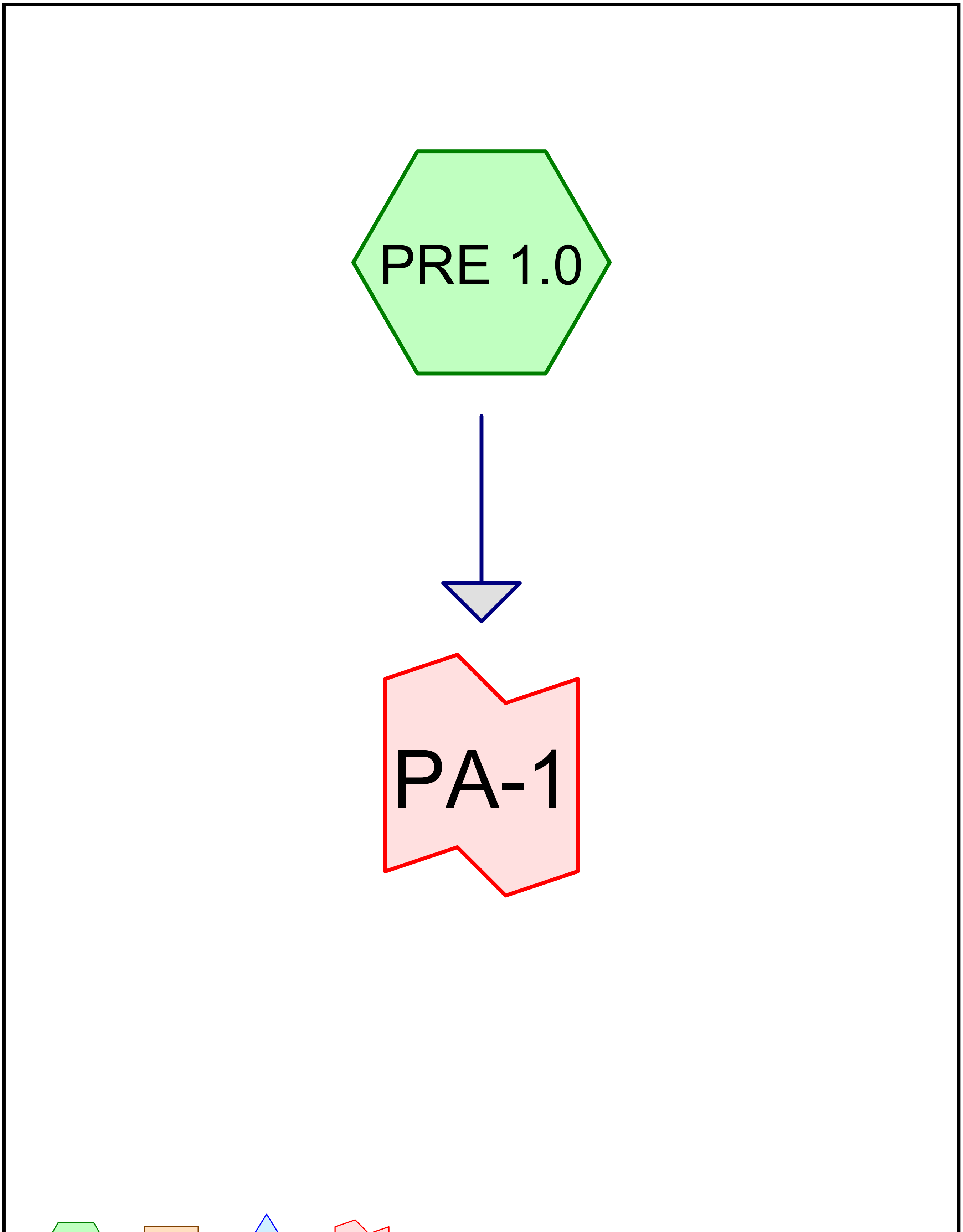
1.2.3 Pre-Development Calculation



Routing Diagram for P0595-015_Pre
Prepared by Tighe & Bond, Printed 12/14/2022
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.914	74	>75% Grass cover, Good, HSG C (PRE 1.0)
4.515	98	Paved parking, HSG C (PRE 1.0)
11.429	**83**	**TOTAL AREA**

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>1.49"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=20.01 cfs 1.423 af

Link PA-1: Inflow=20.01 cfs 1.423 af
Primary=20.01 cfs 1.423 af

Total Runoff Area = 11.429 ac Runoff Volume = 1.423 af Average Runoff Depth = 1.49"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>2.02"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=27.08 cfs 1.922 af

Link PA-1: Inflow=27.08 cfs 1.922 af
Primary=27.08 cfs 1.922 af

Total Runoff Area = 11.429 ac Runoff Volume = 1.922 af Average Runoff Depth = 2.02"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

Summary for Subcatchment PRE 1.0:

Runoff = 49.71 cfs @ 12.07 hrs, Volume= 3.542 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.60"

Area (sf)	CN	Description
301,177	74	>75% Grass cover, Good, HSG C
196,664	98	Paved parking, HSG C
497,841	83	Weighted Average
301,177		60.50% Pervious Area
196,664		39.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0150	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	38	0.0050	3.47	2.73	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
2.3	595	0.0030	4.27	13.42	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012 Concrete pipe, finished
2.3	869	0.0030	6.20	59.70	**Pipe Channel,** 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.012 Concrete pipe, finished
5.0	1,512	Total			

Summary for Link PA-1:

Inflow Area = 11.429 ac, 39.50% Impervious, Inflow Depth > 3.72" for 10-Year event
Inflow = 49.71 cfs @ 12.07 hrs, Volume= 3.542 af
Primary = 49.71 cfs @ 12.07 hrs, Volume= 3.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>5.12"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=67.64 cfs 4.876 af

Link PA-1: Inflow=67.64 cfs 4.876 af
Primary=67.64 cfs 4.876 af

Total Runoff Area = 11.429 ac Runoff Volume = 4.876 af Average Runoff Depth = 5.12"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

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

SubcatchmentPRE 1.0: Runoff Area=497,841 sf 39.50% Impervious Runoff Depth>6.46"
Flow Length=1,512' Tc=5.0 min CN=83 Runoff=84.49 cfs 6.154 af

Link PA-1: Inflow=84.49 cfs 6.154 af
Primary=84.49 cfs 6.154 af

Total Runoff Area = 11.429 ac Runoff Volume = 6.154 af Average Runoff Depth = 6.46"
60.50% Pervious = 6.914 ac 39.50% Impervious = 4.515 ac

1.3 Post-Development Conditions

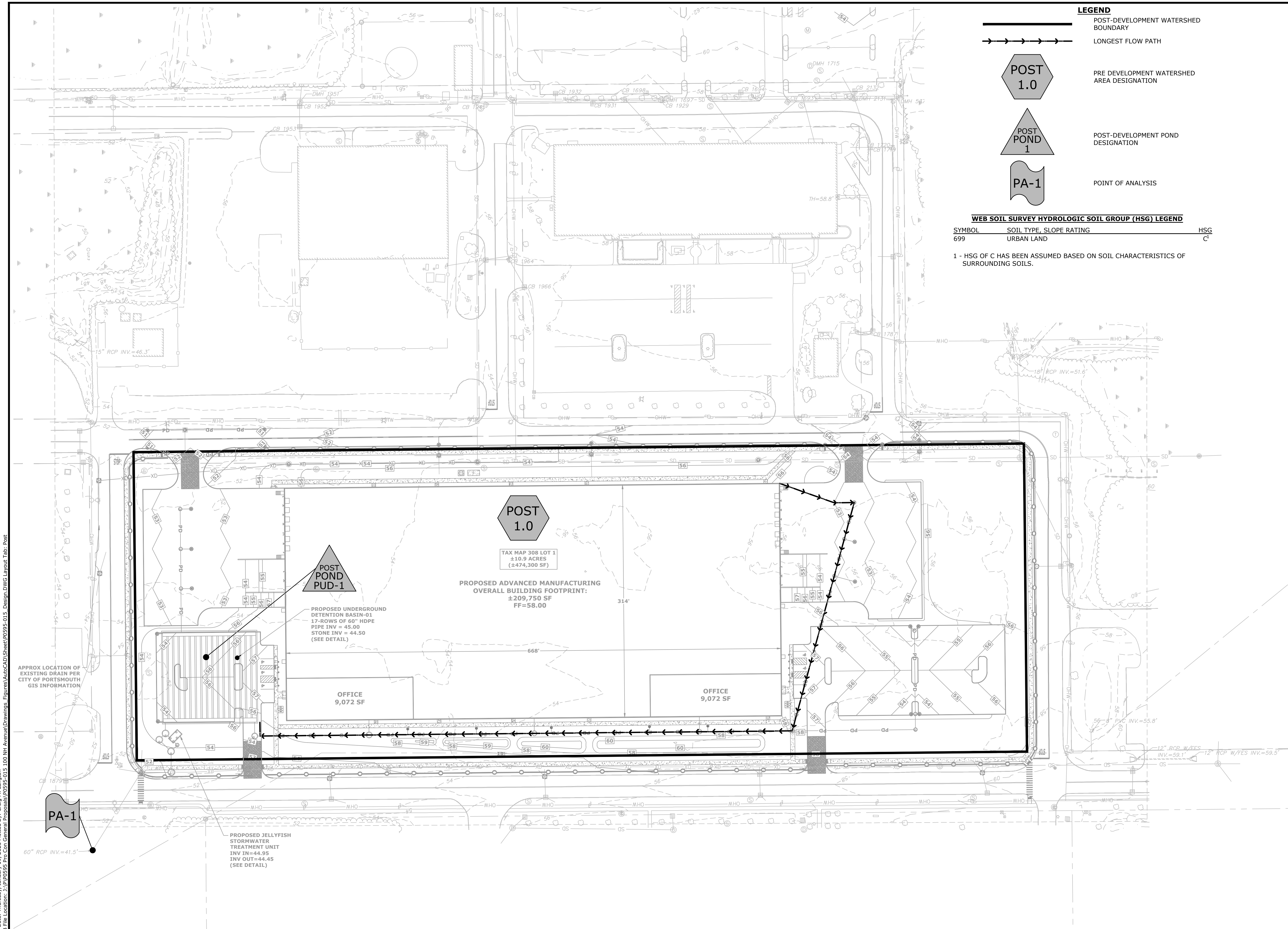
The post-development drainage condition is characterized by one (1) watershed area (POST-1.0) modeled at the same point of analysis as the pre-development condition. This point of analysis and watersheds are depicted on the plan entitled "Post Development Watershed Plan", Sheets C-802.

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

Point of Analysis One (PA-1)

Point of analysis PA-1 is comprised of one (1) watershed area (POST-1.0). This area includes all additional proposed impervious area on site as well the proposed green / landscaped areas on site. The proposed impervious areas generating runoff on site include roofs, parking lots, concrete sidewalks, and loading dock areas. Runoff from site is captured via overland flow then captured in the proposed onsite drainage system where it is detained and treated prior to being discharged through Point of Analysis 1 (PA-1).

1.3.1 Post-Development Watershed Plan



LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE, SLOPE RATING	HSG
699	URBAN LAND	C[1]

1 - HSG OF C HAS BEEN ASSUMED BASED ON SOIL CHARACTERISTICS OF SURROUNDING SOILS.

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Last Save Date: January 19, 2023 12:43 PM By: CML
Plot Date: Thursday, January 19, 2023 Plotted By: Craig M. Langton
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Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

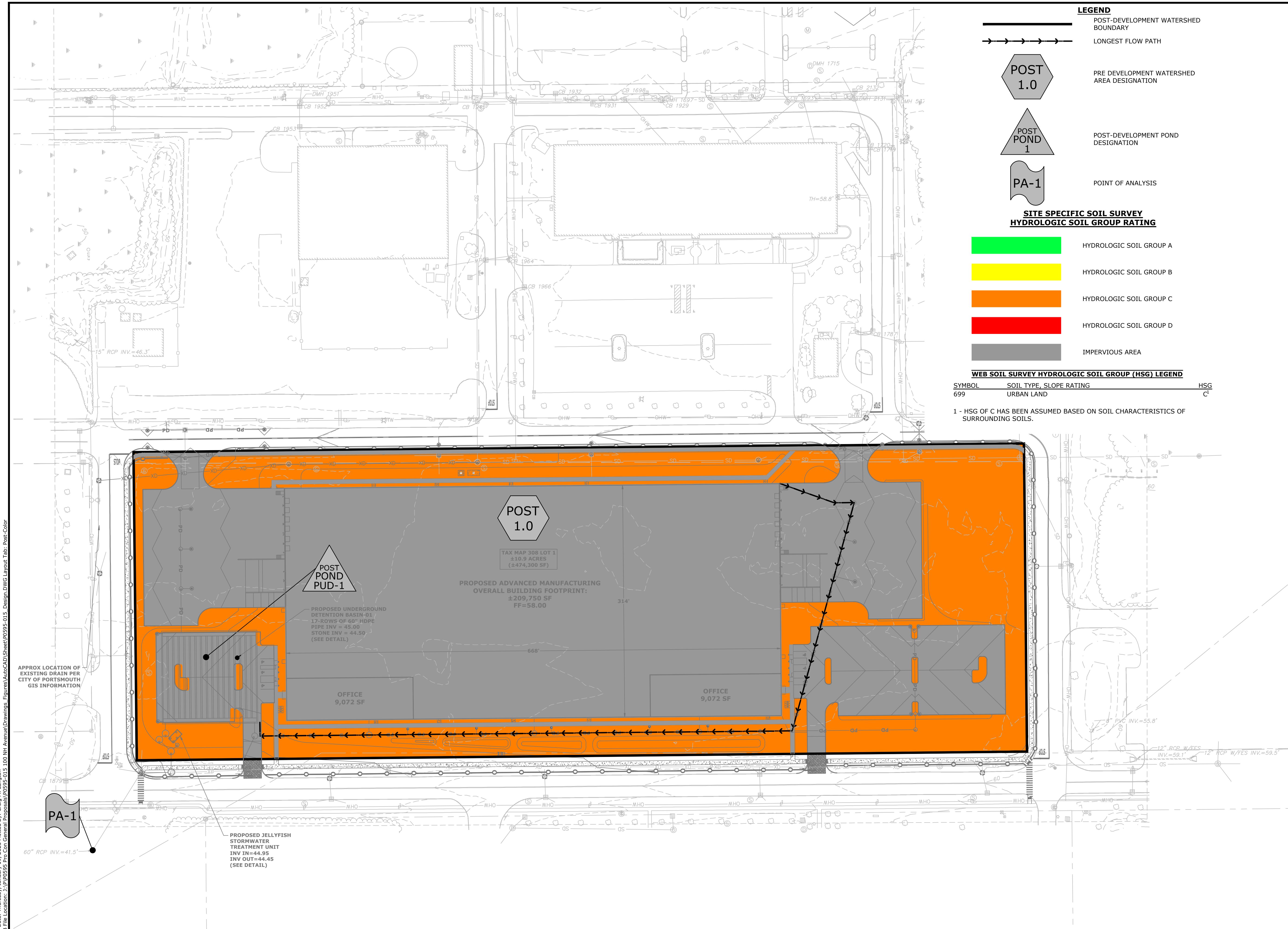
PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

1.3.2 Post-Development Soil Plan



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Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT SOIL COVERAGE COLOR PLAN

SCALE: AS SHOWN

C-804

Last Save Date: January 19, 2023 12:43 PM By: CML
Plot Date: Thursday, January 19, 2023 Plotted By: Craig M. Langton
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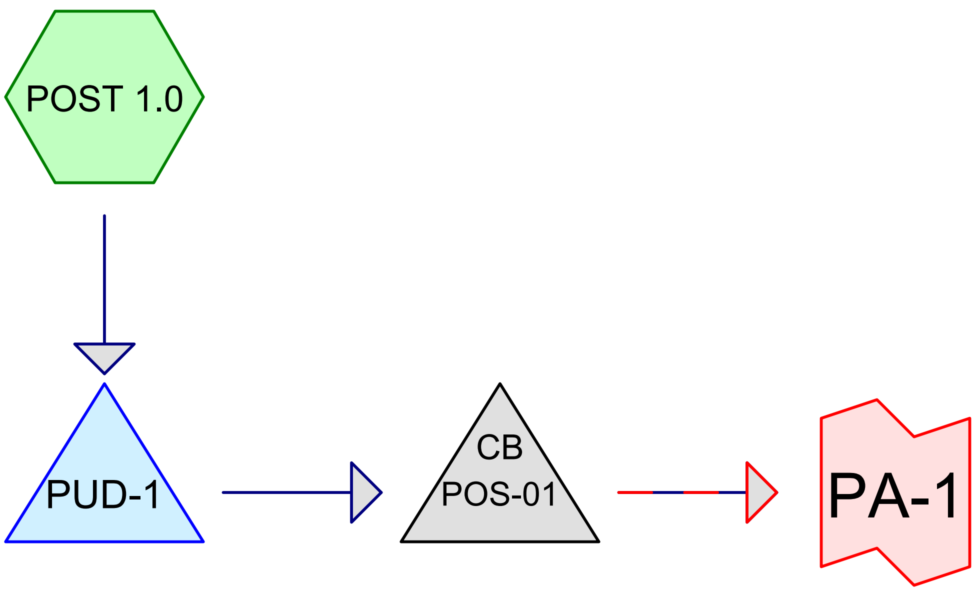
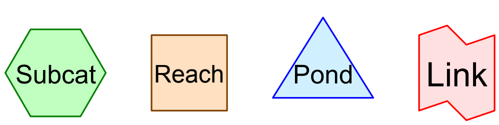
1.3.3 Post-Development Calculation





Routing Diagram for P0595-015_Post
Prepared by Tighe & Bond, Printed 12/14/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.215	74	>75% Grass cover, Good, HSG C (POST 1.0)
2.469	98	Paved parking, HSG C (POST 1.0)
5.745	98	Roofs, HSG C (POST 1.0)
11.429	**91**	**TOTAL AREA**

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

SubcatchmentPOST 1.0: Runoff Area=497,842 sf 71.87% Impervious Runoff Depth>2.13"
Flow Length=934' Tc=5.0 min CN=91 Runoff=28.25 cfs 2.025 af

Pond POS-01: Peak Elev=46.40' Inflow=14.24 cfs 2.025 af
Primary=9.45 cfs 1.769 af Secondary=4.79 cfs 0.255 af Outflow=14.24 cfs 2.025 af

Pond PUD-1: Peak Elev=47.28' Storage=15,242 cf Inflow=28.25 cfs 2.025 af
Outflow=14.24 cfs 2.025 af

Link PA-1: Inflow=14.24 cfs 2.025 af
Primary=14.24 cfs 2.025 af

Total Runoff Area = 11.429 ac Runoff Volume = 2.025 af Average Runoff Depth = 2.13"
28.13% Pervious = 3.215 ac 71.87% Impervious = 8.214 ac

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

SubcatchmentPOST 1.0: Runoff Area=497,842 sf 71.87% Impervious Runoff Depth>2.72"
Flow Length=934' Tc=5.0 min CN=91 Runoff=35.79 cfs 2.590 af

Pond POS-01: Peak Elev=46.58' Inflow=18.71 cfs 2.590 af
Primary=11.41 cfs 2.198 af Secondary=7.30 cfs 0.392 af Outflow=18.71 cfs 2.590 af

Pond PUD-1: Peak Elev=47.71' Storage=19,767 cf Inflow=35.79 cfs 2.590 af
Outflow=18.71 cfs 2.590 af

Link PA-1: Inflow=18.71 cfs 2.590 af
Primary=18.71 cfs 2.590 af

Total Runoff Area = 11.429 ac Runoff Volume = 2.590 af Average Runoff Depth = 2.72"
28.13% Pervious = 3.215 ac 71.87% Impervious = 8.214 ac

Summary for Subcatchment POST 1.0:

Runoff = 58.48 cfs @ 12.07 hrs, Volume= 4.347 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.60"

Area (sf)	CN	Description
250,258	98	Roofs, HSG C
140,048	74	>75% Grass cover, Good, HSG C
107,536	98	Paved parking, HSG C
497,842	91	Weighted Average
140,048		28.13% Pervious Area
357,794		71.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	77	0.0125	1.16		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.69"
0.2	27	0.0125	2.27		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	102	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.9	216	0.0050	4.20	7.43	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.4	125	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
0.8	223	0.0025	4.72	33.35	**Pipe Channel,** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013 Corrugated PE, smooth interior
0.6	164	0.0015	4.43	55.63	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.013 Corrugated PE, smooth interior
4.5	934	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond POS-01:

Inflow Area = 11.429 ac, 71.87% Impervious, Inflow Depth > 4.56" for 10-Year event
Inflow = 42.20 cfs @ 12.15 hrs, Volume= 4.344 af
Outflow = 42.20 cfs @ 12.15 hrs, Volume= 4.344 af, Atten= 0%, Lag= 0.0 min
Primary = 18.00 cfs @ 12.14 hrs, Volume= 3.391 af
Secondary = 24.20 cfs @ 12.15 hrs, Volume= 0.954 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 47.42' @ 12.14 hrs
Flood Elev= 54.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. To JellyFish Treatment Unit** C= 0.600
#2	Secondary	45.65'	**48.0" Vert. To PDMH-13** C= 0.600

Primary OutFlow Max=17.93 cfs @ 12.14 hrs HW=47.41' TW=0.00' (Dynamic Tailwater)
└─**1=To JellyFish Treatment Unit** (Orifice Controls 17.93 cfs @ 5.71 fps)

Secondary OutFlow Max=23.95 cfs @ 12.15 hrs HW=47.41' TW=0.00' (Dynamic Tailwater)
└─**2=To PDMH-13** (Orifice Controls 23.95 cfs @ 4.51 fps)

Summary for Pond PUD-1:

Inflow Area = 11.429 ac, 71.87% Impervious, Inflow Depth > 4.56" for 10-Year event
Inflow = 58.48 cfs @ 12.07 hrs, Volume= 4.347 af
Outflow = 42.20 cfs @ 12.15 hrs, Volume= 4.344 af, Atten= 28%, Lag= 4.4 min
Primary = 42.20 cfs @ 12.15 hrs, Volume= 4.344 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 45.00' Surf.Area= 16,096 sf Storage= 0 cf
Peak Elev= 48.51' @ 12.16 hrs Surf.Area= 16,096 sf Storage= 28,105 cf
Flood Elev= 50.00' Surf.Area= 16,096 sf Storage= 40,389 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.6 min (795.5 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.50'	0 cf	**128.59'W x 125.17'L x 6.08'H Field A**
			97,923 cf Overall - 48,988 cf Embedded = 48,934 cf x 0.0% Voids
#2A	45.00'	41,267 cf	**ADS N-12 60"** x 85 Inside #1
			Inside= 59.5"W x 59.5"H => 19.30 sf x 20.00'L = 386.0 cf
			Outside= 67.0"W x 67.0"H => 22.91 sf x 20.00'L = 458.2 cf
			Row Length Adjustment= +11.00' x 19.30 sf x 17 rows
			125.59' Header x 19.30 sf x 2 = 4,847.8 cf Inside
		41,267 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**24.0" Vert. Orifice** C= 0.600
#2	Primary	47.50'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=40.99 cfs @ 12.15 hrs HW=48.49' TW=47.41' (Dynamic Tailwater)
├─**1=Orifice** (Orifice Controls 15.77 cfs @ 5.02 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 25.22 cfs @ 3.26 fps)

Summary for Link PA-1:

Inflow Area = 11.429 ac, 71.87% Impervious, Inflow Depth > 4.56" for 10-Year event
Inflow = 42.20 cfs @ 12.15 hrs, Volume= 4.344 af
Primary = 42.20 cfs @ 12.15 hrs, Volume= 4.344 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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

SubcatchmentPOST 1.0: Runoff Area=497,842 sf 71.87% Impervious Runoff Depth>6.03"
Flow Length=934' Tc=5.0 min CN=91 Runoff=76.11 cfs 5.747 af

Pond POS-01: Peak Elev=47.98' Inflow=60.59 cfs 5.741 af
Primary=21.29 cfs 4.239 af Secondary=39.31 cfs 1.502 af Outflow=60.59 cfs 5.741 af

Pond PUD-1: Peak Elev=48.97' Storage=32,678 cf Inflow=76.11 cfs 5.747 af
Outflow=60.59 cfs 5.741 af

Link PA-1: Inflow=60.59 cfs 5.741 af
Primary=60.59 cfs 5.741 af

Total Runoff Area = 11.429 ac Runoff Volume = 5.747 af Average Runoff Depth = 6.03"
28.13% Pervious = 3.215 ac 71.87% Impervious = 8.214 ac

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

SubcatchmentPOST 1.0: Runoff Area=497,842 sf 71.87% Impervious Runoff Depth>7.42"
Flow Length=934' Tc=5.0 min CN=91 Runoff=92.55 cfs 7.071 af

Pond POS-01: Peak Elev=48.42' Inflow=76.08 cfs 7.062 af
Primary=23.53 cfs 4.988 af Secondary=52.55 cfs 2.073 af Outflow=76.08 cfs 7.062 af

Pond PUD-1: Peak Elev=49.39' Storage=36,337 cf Inflow=92.55 cfs 7.071 af
Outflow=76.08 cfs 7.062 af

Link PA-1: Inflow=76.08 cfs 7.062 af
Primary=76.08 cfs 7.062 af

Total Runoff Area = 11.429 ac Runoff Volume = 7.071 af Average Runoff Depth = 7.42"
28.13% Pervious = 3.215 ac 71.87% Impervious = 8.214 ac

1.4 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates from the 1-year, 2-year, 10-year, 25-year and 50-year storm events at each point of analysis.

Table 1.4 – Comparison of Pre- and Post-Development Flows (CFS)

Point of Analysis	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed (PA-1)	20.01	27.08	49.71	67.64	84.49
Post-Development Watershed (PA-1)	14.24	18.71	42.20	60.59	76.08

The Peak Runoff Control Requirements of Env-Wq 1507.06 are required to be met for the point of analysis. As shown in Table 1.4 the Post-Development flows are decreased from the Pre-Development flows at PA-1.

The Channel Protection requirements of Env-Wq 1507.05 are met for the point of analysis as the 2-year, 24-hour Post-Development peak flowrate (18.71 cfs) is less than or equal to the 1-year, 24-hour pre-development peak flowrate (20.01 cfs).

1.5 Mitigation Description

1.5.1 Mitigation Calculations

The proposed project area has been evaluated to treat the required water quality flow (WQF) per the requirements of Env-Wq 1500. These calculations have been provided in appendix E of this report.

1.5.2 Pre-Treatment Methods for Protecting Water Quality

Pretreatment methods for protecting water quality on this site include offline deep sump catch basins with oil water separator hoods.

Table 1.5 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Phosphorus
Deep Sump Catch Basin w/Hood[1]	15%	5%

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

1.5.3 Treatment Methods for Protecting Water Quality

The runoff from proposed impervious areas will be captured in the proposed closed drainage system directed to an underground detention system and then treated by an ADS Water Quality Unit. The water quality unit has been sized to treat the Water Quality Flow from the contributing subcatchment areas. The system has been designed with an internal bypass structure that diverts peak flows greater than the 1-inch storm event.

Table 1.6 below, shows design pollutant removal efficient for the proposed Jellyfish Filter Treatment Unit which meets the requirements of Env-Wq 1508.10. Additional reference information on the proposed Jellyfish Filter Treatment Unit can be found in Appendix C.

Table 1.6 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Phosphorus
Jellyfish Filter Treatment Unit [1]	89%	59%

1. Pollutant removal efficiencies per Contech Engineered Solutions Jellyfish Filter Performance testing results.

Table 1.7 – Pollutant Removal Calculations

Total Suspended Solids Removal				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catch Basin w/Hood[1]	0.15	1.00	0.15	0.85
Jellyfish Filter Treatment Unit [2]	0.89	0.85	0.76	0.09
			Total Suspended Solids Removed:	**91%**

Total Phosphorus Removal				
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catch Basin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter Treatment Unit [2]	0.59	0.95	0.56	0.39
			Total Phosphorus Removed:	**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.
2. Pollutant removal efficiencies per Contech Engineered Solutions Jellyfish Filter Performance testing results.

APPENDIX A
(Bound Separately)

APPENDIX B

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.808 degrees West
Latitude	43.075 degrees North
Elevation	0 feet
Date/Time	Tue, 29 Jun 2021 09:16:17 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.92	**1yr**	2.35	2.81	3.21	3.94	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.94	2.49	3.21	3.57	**2yr**	2.84	3.43	3.93	4.67	5.32	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.43	3.14	4.07	4.57	**5yr**	3.60	4.40	5.03	5.93	6.70	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.25	1.72	2.22	2.88	3.74	4.87	5.53	**10yr**	4.31	5.31	6.07	7.10	7.98	**10yr**
25yr	0.47	0.75	0.96	1.32	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.73	6.17	7.10	**25yr**	5.46	6.82	7.78	9.02	10.06	**25yr**
50yr	0.53	0.85	1.09	1.52	2.05	2.74	**50yr**	1.77	2.51	3.27	4.30	5.65	7.40	8.58	**50yr**	6.55	8.25	9.40	10.81	11.99	**50yr**
100yr	0.60	0.97	1.25	1.76	2.39	3.22	**100yr**	2.06	2.96	3.86	5.11	6.74	8.86	10.38	**100yr**	7.84	9.98	11.35	12.96	14.30	**100yr**
200yr	0.67	1.09	1.41	2.02	2.79	3.80	**200yr**	2.41	3.49	4.58	6.09	8.06	10.62	12.55	**200yr**	9.40	12.07	13.71	15.54	17.05	**200yr**
500yr	0.79	1.30	1.69	2.45	3.43	4.71	**500yr**	2.96	4.34	5.71	7.65	10.19	13.50	16.15	**500yr**	11.95	15.53	17.61	19.77	21.55	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.66	2.23	2.53	**1yr**	1.97	2.43	2.85	3.16	3.88	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.46	**2yr**	2.70	3.32	3.82	4.55	5.07	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.13	2.74	3.80	4.21	**5yr**	3.36	4.05	4.71	5.54	6.26	**5yr**
10yr	0.39	0.59	0.73	1.03	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.38	4.89	**10yr**	3.88	4.70	5.46	6.43	7.22	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.78	3.56	4.70	5.94	**25yr**	4.16	5.72	6.69	7.84	8.73	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.10	3.97	5.31	6.88	**50yr**	4.70	6.61	7.80	9.11	10.08	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.42	2.63	3.45	4.40	5.96	7.96	**100yr**	5.27	7.65	9.09	10.60	11.64	**100yr**
200yr	0.59	0.89	1.13	1.64	2.29	2.82	**200yr**	1.98	2.76	2.94	3.83	4.86	6.67	9.21	**200yr**	5.91	8.85	10.59	12.34	13.46	**200yr**
500yr	0.69	1.03	1.32	1.92	2.73	3.38	**500yr**	2.36	3.30	3.41	4.39	5.56	7.76	11.16	**500yr**	6.87	10.73	12.98	15.12	16.29	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.75	2.21	3.00	3.14	**1yr**	2.66	3.02	3.58	4.37	5.05	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.26	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.69	**2yr**	3.03	3.54	4.07	4.82	5.64	**2yr**
5yr	0.40	0.61	0.76	1.05	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.33	4.93	**5yr**	3.84	4.74	5.36	6.34	7.13	**5yr**
10yr	0.47	0.71	0.89	1.24	1.60	1.96	**10yr**	1.38	1.92	2.27	3.09	3.93	5.33	6.16	**10yr**	4.72	5.92	6.75	7.80	8.71	**10yr**
25yr	0.57	0.87	1.08	1.54	2.03	2.55	**25yr**	1.75	2.49	2.93	4.05	5.10	7.79	8.26	**25yr**	6.90	7.95	9.02	10.27	11.35	**25yr**
50yr	0.66	1.01	1.26	1.81	2.43	3.10	**50yr**	2.10	3.03	3.57	4.96	6.24	9.76	10.34	**50yr**	8.64	9.94	11.25	12.63	13.88	**50yr**
100yr	0.78	1.18	1.47	2.13	2.92	3.77	**100yr**	2.52	3.68	4.34	6.10	7.64	12.21	12.94	**100yr**	10.81	12.44	14.02	15.57	16.99	**100yr**
200yr	0.91	1.37	1.73	2.51	3.50	4.59	**200yr**	3.02	4.49	5.29	7.51	9.36	15.32	16.21	**200yr**	13.56	15.59	17.49	19.17	20.80	**200yr**
500yr	1.12	1.67	2.15	3.13	4.44	5.95	**500yr**	3.84	5.81	6.86	9.90	12.27	20.70	21.84	**500yr**	18.32	21.00	23.45	25.25	27.19	**500yr**

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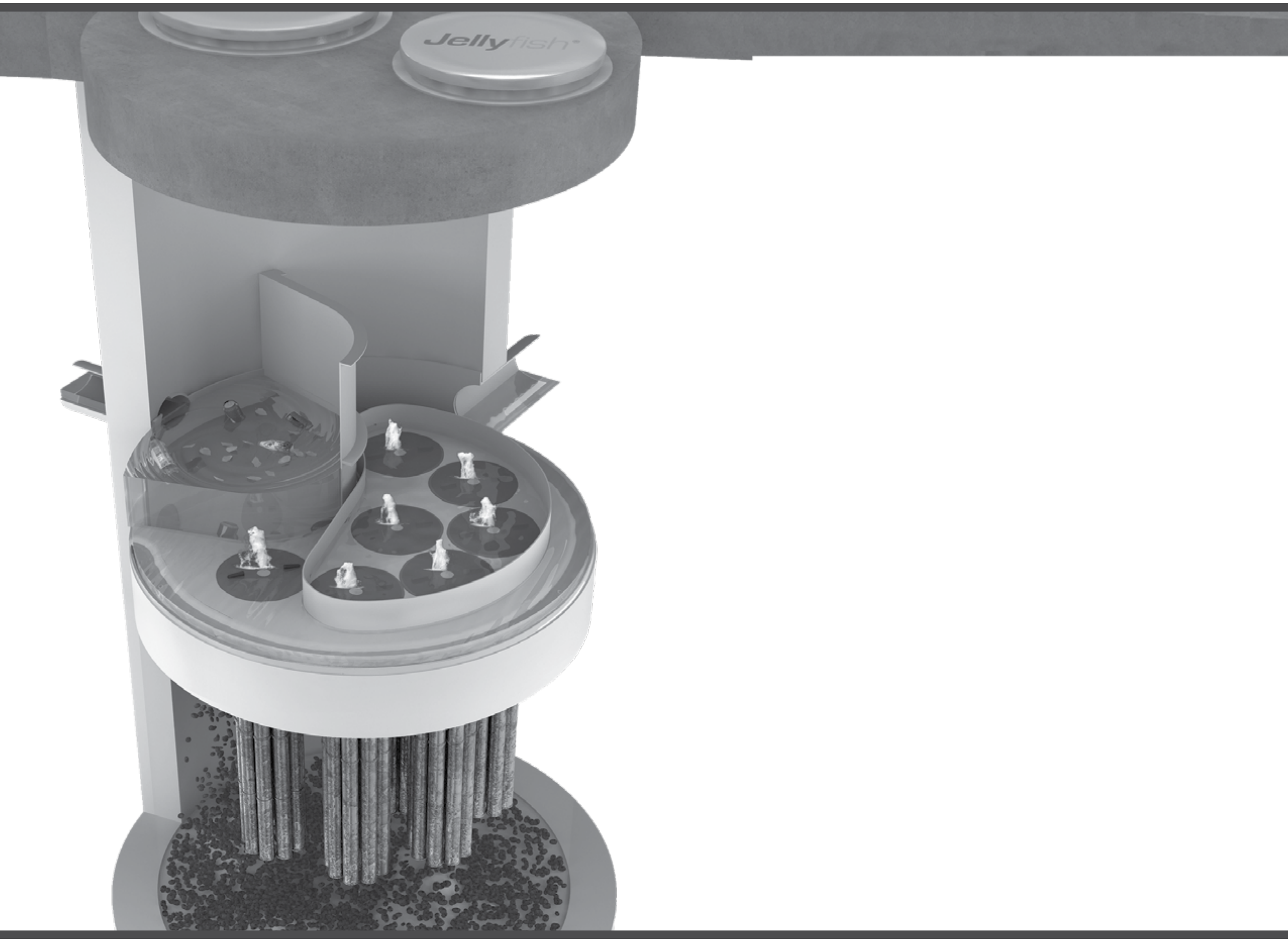
APPENDIX C

CONTECH® ENGINEERED SOLUTIONS

Jellyfish® Filter Maintenance Guide



Jellyfish®

Jellyfish®

JELLYFISH® FILTER
INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

TABLE OF CONTENTS

1.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

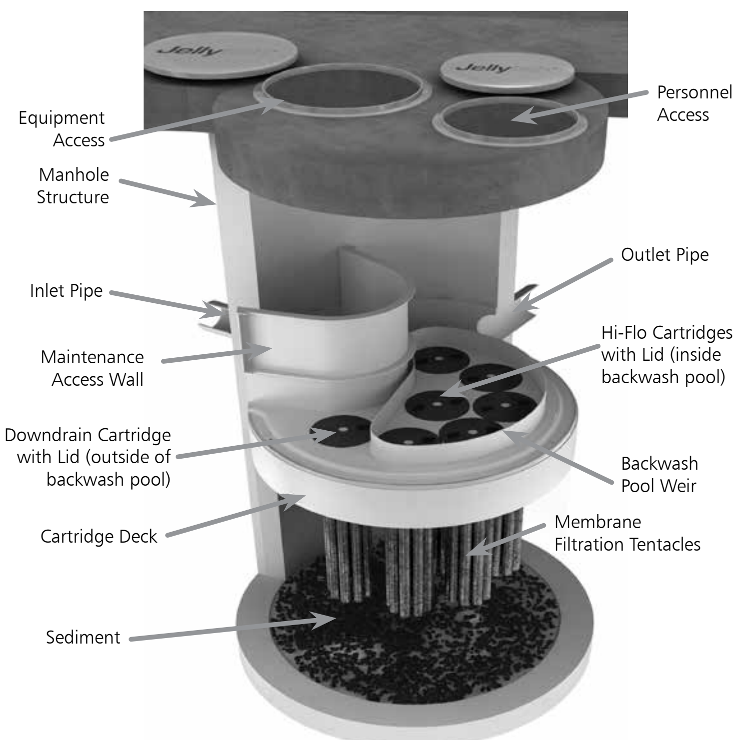
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

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

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed



Note: Separator Skirt not shown

2.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

3.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

3.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.

Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

3.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

4.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

5.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. ***Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs***.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

5.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.


Cartridge Removal & Lifting Device

2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.
3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. ***Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane***.

4. Collected rinse water is typically removed by vacuum hose.
5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

5.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.

Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.
4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.

Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

5.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. ***Caution: Do not force the cartridge downward; damage may occur.***
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

5.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

5.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

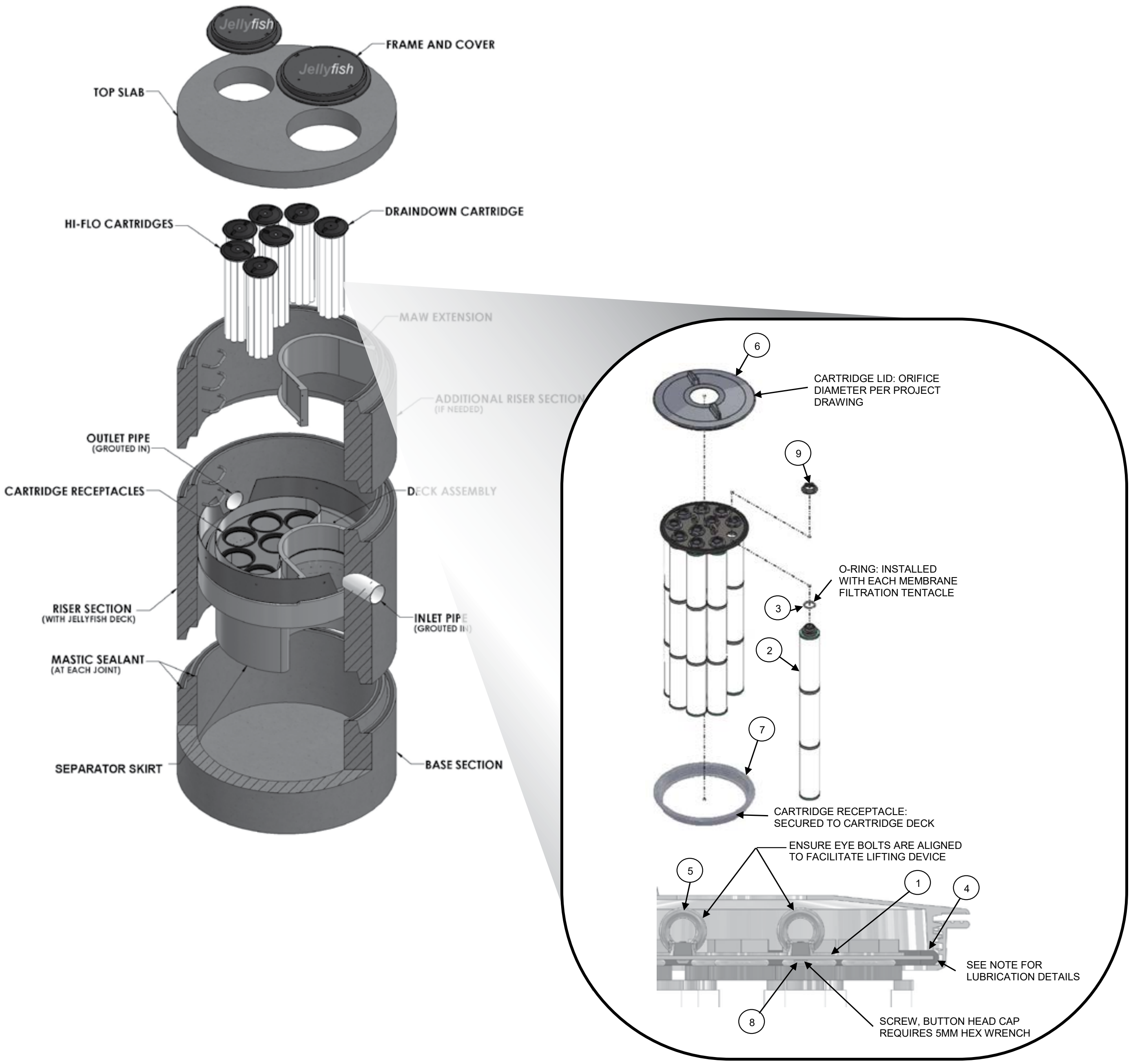


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lide (ITem 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner:				Jellyfish Model No:		
Location:				GPS Coordinates:		
Land Use:	Commercial:		Industrial:		Service Station:	
	Roadway/Highway:		Airport:		Residential:	

Date/Time:						
Inspector:						
Maintenance Contractor:						
Visible Oil Present: (Y/N)						
Oil Quantity Removed:						
Floatable Debris Present: (Y/N)						
Floatable Debris Removed: (Y/N)						
Water Depth in Backwash Pool						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Draindown Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo Cartridges: (Y/N)						
Sediment Depth Measured: (Y/N)						
Sediment Depth (inches or mm):						
Sediment Removed: (Y/N)						
Cartridge Lids intact: (Y/N)						
Observed Damage:						
Comments:						

Jellyfish®

CONTECH®
ENGINEERED SOLUTIONS

800.338.1122
www.ContechES.com

Support

- Drawings and specifications are available at www.conteches.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.
- Find a Certified Maintenance Provider at www.conteches.com/ccmp

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, wastewater treatment and earth stabilization products. For information on other Contech segment offerings, visit ContechES.com or call 800.338.1122

APPENDIX D

APPENDIX E

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

11.43	ac	A = Area draining to the practice
8.21	ac	A_I = Impervious area draining to the practice
0.72	decimal	I = Percent impervious area draining to the practice, in decimal form
0.70	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
7.96	ac-in	WQV= 1" x Rv x A
28,909	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.70	inches	Q = Water quality depth. Q = WQV/A
97	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P]$^{0.5}$)
0.3	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.064	inches	Ia = Initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
600.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
7.466	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes:

This calculation represents the treatment train directed to Contech Jellyfish Treatment Unit.

Full Treatment in compliance with Env-Wq 1508.10 shall be achieved by use of a proprietary flow-through device. The proposed Contech Jellyfish Treatment Unit - Model#: JFPD0816 will be used to treat the WQF as calculated in the above spreadsheet. The specified device is designed to treat up to 7.84 cfs of flow.

APPENDIX F

Underground Injection Control Project Report

Site Number: **100330336**

Project Number: **0036693**

Name and Address: **BUILDING 119 (SITE 36) 5B6**
PEASE AIR FORCE BASE
PORTSMOUTH

Mapit

Responsible Party: **BUILDING 119 (SITE 36) 5B6**
PORTSMOUTH

Wellhead Protection Area: **No**

Risk Level: **DW SUPPLY WITHIN 1000' OR SITE IN SWPA**

Assigned To: **REGISTRATION**

Discovery Date: **04/12/2016**

Eligibile:

Eligibilty Determined on:

MTBE: **N**

Brownfield: **N**

Activities (1)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
04/12/2016	UIC Application Received	LOCKER	04/26/2016	UIC Registration Issued	REGISTERED

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4601803	REGISTRATION	SITE #36 INJECTION REGISTRATION (5B6) ISSUED	04/26/2016	.08 MB

Underground Injection Control Project Report

Site Number:	**100330336**	Project Number:	**0036693**
Name and Address:	**BUILDING 119 (SITE 36) 5B6** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**BUILDING 119 (SITE 36) 5B6** **PORTSMOUTH**
Mapit			
Wellhead Protection Area:	**No**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**REGISTRATION**	Discovery Date:	**04/12/2016**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

No Vapor Recovery Information

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2022	Non-Permit GW Monitoring Result Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
5001486	REPORT TO DES	SITE 36 FALL 2021 SAMPLING EVENT DATA TRANSMITTAL 7-APR-2022	06/09/2022	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/19/2021	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4958065	REPORT TO DES	FINAL SS036 FAALL 2021 REMEDIAL ACTION-OPERATIONS FIELD WORK NOTIFICATION	10/19/2021	4.61 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/23/2020	Annual Report Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4884500	REPORT	DRAFT 2019 GROUNDWATER MONITORING REPORT	10/23/2020	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/22/2019	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4755436	REPORT TO DES	FINAL IN SITU CHEMICAL OXIDATION PILOT STUDY COMPLETION REPORT	01/22/2019	5.00 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/14/2018	Additional Information Received	SANDIN	12/14/2018	TECHNICAL INFORMATION PROVIDED	REPORT INCOMPLETE

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4749416	CORRESPONDENCE	DES COMMENTS 12.14.18	12/14/2018	.08 MB
4746936	REPORT TO DES	DRAFT IN-SITU CHEMICAL OXIDATION PILOT STUDY COMPLETION REPORT	11/14/2018	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/07/2018	Additional Information Received	OTHER	11/13/2018	No Action Necessary (Report filed)	WETLANDS VIOLATIONS CASE CLOSED

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4747011	CORRESPONDENCE-FROM	WETLANDS CASE CLOSED	11/13/2018	.20 MB
4746460	REPORT TO DES	2018 WETLAND MONITORING REPORT	11/07/2018	2.90 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/31/2018	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4696966	REPORT TO DES	FINAL IN SITU CHEMICAL OXIDATION PILOT STUDY	01/31/2018	5.00 MB

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
01/30/2018	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4696071	REPORT TO DES	DRAFT IN SITU CHEMICAL OXIDATION PILOT STUDY IMPLEMENTATION REPORT	01/30/2018	5.00 MB

12/20/2017	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4688637	REPORT TO DES	2017 WETLAND MONITORING REPORT	12/20/2017	5.00 MB

08/24/2017	Additional Information Received	UNASSIGNED			
01/27/2017	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4640648	CORRESPONDENCE-TO	RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION	01/27/2017	1.20 MB

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/21/2016	Additional Information Received	OTHER			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4635429	REPORT TO DES	2016 WETLAND MONITORING REPORT	12/21/2016	3.81 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/15/2016	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4632437	REPORT TO DES	2015 ANNUAL REPORT	11/15/2016	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/02/2016	Additional Information Received	OTHER	11/16/2016	TECHNICAL INFORMATION PROVIDED	RESTORATION PLAN APPROVED BY D. PRICE

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4637567	CORRESPONDENCE	WETLANDS RESTORATION PLAN APPROVAL	11/16/2016	.22 MB
4630201	REPORT TO DES	WETLAND RESTORATION PLAN LEE STREET SITE 36	11/01/2016	5.00 MB

Site Number:	100330336	Project Number:	0004283
Name and Address:	BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH	Responsible Party:	U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420
Mapit			
Wellhead Protection Area:	Unknown	Risk Level:	DW SUPPLY WITHIN 1000' OR SITE IN SWPA
Assigned To:	SANDIN	Discovery Date:	05/14/1993
Eligibile:		Eligibilty Determined on:	
MTBE:	N	Brownfield:	N

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/27/2016	Additional Information Received	HILTON	11/04/2016	Not Approved	ISCO FAILURE NOT EVALUATED. DES DID NOT APPROVE ORIGINALLY, CANNOT CONCUR NOW

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4630401	CORRESPONDENCE	DES COMMENTS 11.4.16 TO ISCO RESTART PLAN 10.27.16	11/04/2016	.08 MB
4629781	REPORT TO DES	IN SITU CHEMICAL OXIDATION (ISCO) INJECTIONS RESTART PLAN	10/27/2016	1.75 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
10/27/2016	Additional Information Received	OTHER	11/01/2016	No Action Necessary (Report filed)	WETLANDS BUREAU TO OVERSEE VIOLATIONS

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4629780	CORRESPONDENCE-TO	RESPONSE TO NHDES LRM REGARDING ISCO	10/25/2016	.13 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/10/2016	Additional Information Received	UNASSIGNED			

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4616481	REPORT TO DES	DRAFT LONG-TERM MONITORING PLAN REVISION 5	08/10/2016	5.00 MB

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
07/27/2016	Additional Information Received	HILTON	09/14/2016	TECHNICAL INFORMATION PROVIDED	AF PROCEEDING WITHOUT REGULATOR CONCURRENCE. IMPLEMENTATION RESULTED IN WETLANDS VIOLATIONS

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4624264	CORRESPONDENCE	DES EMAIL 9.22.16	09/22/2016	.07 MB
4614946	REPORT TO DES	FINAL ADDITIONAL INVESTIGATION AND PILOT STUDY WORK PLAN 01-JUL-2016	07/27/2016	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2016	Additional Information Received	HILTON	06/30/2016	No Action Necessary (Report filed)	EPA TO ADDRESS

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4606629	CORRESPONDENCE-TO	RESPONSE TO COMMENTS (EPA) ON DRAFT SUPPLEMENTAL SITE INVEST STATUS REPORT 22-APR-2016	06/09/2016	.17 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2016	Additional Information Received	HILTON	06/30/2016	Not Approved	SEE 6.30.16 PBC LETTER ATTACHED TO DRAFT PSWP

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4606630	CORRESPONDENCE-TO	RESPONSE TO COMMENTS ON THE DRAFT SUPPPLEMENTAL SITE INVESTIGATION STATUS REPORT 22-APR-2016	06/09/2016	.19 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH**	Responsible Party:	**U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/09/2016	Work Plan Received	HILTON	06/30/2016	Not Approved	PREVIOUS COMMENTS UNRESOLVED, DES DOES NOT CONCUR WITH APPROACH AS PROPOSED. PROGRAM-WIDE LETTTER OF 6.30.16 APPLIES

Activity Documents (3)

	Document Type	Document Title	Document Date	File Size
4624250	CORRESPONDENCE	EMAIL TRANSMITING DES 6.30.16 LETTER	06/30/2016	.04 MB
4624249	CORRESPONDENCE	DES LETTER 6.30.16	06/30/2016	.04 MB
4606631	REPORT TO DES	DRAFT ADDITIONAL INVESTIGATION AND PILOT STUDY WORK PLAN 01-JUN-2016	06/09/2016	5.00 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/05/2015	Additional Information Received	UNASSIGNED			
01/27/2015	Additional Information Received	HILTON	03/31/2015	TECHNICAL INFORMATION PROVIDED	DES EMAIL DETAILING REPORT AND CONCEPTUAL SITE MODEL DEFICIENCIES

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4541861	CORRESPONDENCE	DES EMAIL COMMENTS 3.31.15 TO 1.26.15 SSI STATUS REPORT	03/31/2015	.06 MB
4535965	REPORT TO DES	SUPPLEMENTAL SITE INVESTIGATION STATUS REPORT SITE 36 SS036 BUILDING 119 26-JAN-2015	01/27/2015	5.00 MB

Site Number:	100330336	Project Number:	0004283
Name and Address: Mapit	BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH	Responsible Party:	U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420
Wellhead Protection Area:	Unknown	Risk Level:	DW SUPPLY WITHIN 1000' OR SITE IN SWPA
Assigned To:	SANDIN	Discovery Date:	05/14/1993
Eligibile:		Eligibilty Determined on:	
MTBE:	N	Brownfield:	N

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
02/10/2014	Additional Information Received	HILTON	10/02/2014	TECHNICAL INFORMATION PROVIDED	DES EMAIL COMMENTS TO SITE STATUS AND WORK THROUGH SUMMER 2014

Activity Documents (4)

	Document Type	Document Title	Document Date	File Size
4520591	CORRESPONDENCE	SITE 36 ADDITIONAL COMMENTS-CONCERNS	11/03/2014	.08 MB
4521795	CORRESPONDENCE	10-2-14 DES EMAIL	10/02/2014	.07 MB
4487323	CORRESPONDENCE	SITE 36 STATUS REPORT AND WORK PLAN; DES COMMENTS	03/17/2014	.05 MB
4484102	REPORT TO DES	STATUS REPORT AND SUPPLEMENTAL SITE INVESTIGATION WORK PLAN ADDENDUM 10-FEB-2014	02/10/2014	3.72 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/13/2012	Additional Information Received	HILTON	12/13/2012	TECHNICAL INFORMATION PROVIDED	S HILTON HELD CONF CALL WITH SHAW TO DISCUSS HYDROPUNCH DRILL & SAMPLE DEPTHS.

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4424839	CORRESPONDENCE-FROM	SITE 36 S HILTON DEC 13 2012 EMAIL TO SHAW ENV	12/13/2012	.03 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36) PEASE AIR FORCE BASE PORTSMOUTH**	Responsible Party:	**U S AIR FORCE 2261 HUGHES AVE, STE 155 JBSA LACKLAND TX 78236-9853 PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/09/2012	Additional Information Received	HILTON	12/13/2012	TECHNICAL INFORMATION PROVIDED	SEE DES TELE CONFERENCE E-MAIL DATED 13-DEC-2012

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4422065	REPORT TO DES	RESPONSE TO COMMENTS TABLE SUPPLEMENTAL SITE INVESTIGATION WORK PLAN 01-NOV-2012	11/09/2012	.14 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
11/09/2012	Additional Information Received	HILTON	12/13/2012	TECHNICAL INFORMATION PROVIDED	SEE DES TELE CONFERENCE E-MAIL 13 DEC 2012

Activity Documents (1)

	Document Type	Document Title	Document Date	File Size
4422064	REPORT TO DES	DRAFT FINAL SUPPLEMENTAL SITE INVESTIGATION WORK PLAN 01-NOV-2012	11/09/2012	2.48 MB

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
08/03/2012	Additional Information Received	HILTON	09/13/2012	TECHNICAL INFORMATION PROVIDED	

Activity Documents (3)

	Document Type	Document Title	Document Date	File Size
4487465	CORRESPONDENCE	SITE 36 COMMENTS TO AUG 2012 DRAFT SOIL GW CONF SAM.	09/13/2012	.05 MB
4487464	CORRESPONDENCE	SITE 36 COVER TO COMMENTS SI WORK PLAN AUGUST 2012.	09/13/2012	.06 MB
4402604	REPORT TO DES	DRAFT SUPPLEMENTAL SITE INVESTIGATION WORK PLAN 01-AUG-2012	08/03/2012	1.43 MB

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

Activities (31)

Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
12/12/2011	Additional Information Received	UNASSIGNED			

Activity Documents (2)

	Document Type	Document Title	Document Date	File Size
4543394	CORRESPONDENCE	PEASE AFB; DES REVIEW OF WHITE PAPER FOR SITE 36	12/12/2011	.02 MB
4543395	CORRESPONDENCE	CDES REVIEW WHITE PAPER FOR SITE 36	12/12/2011	.02 MB

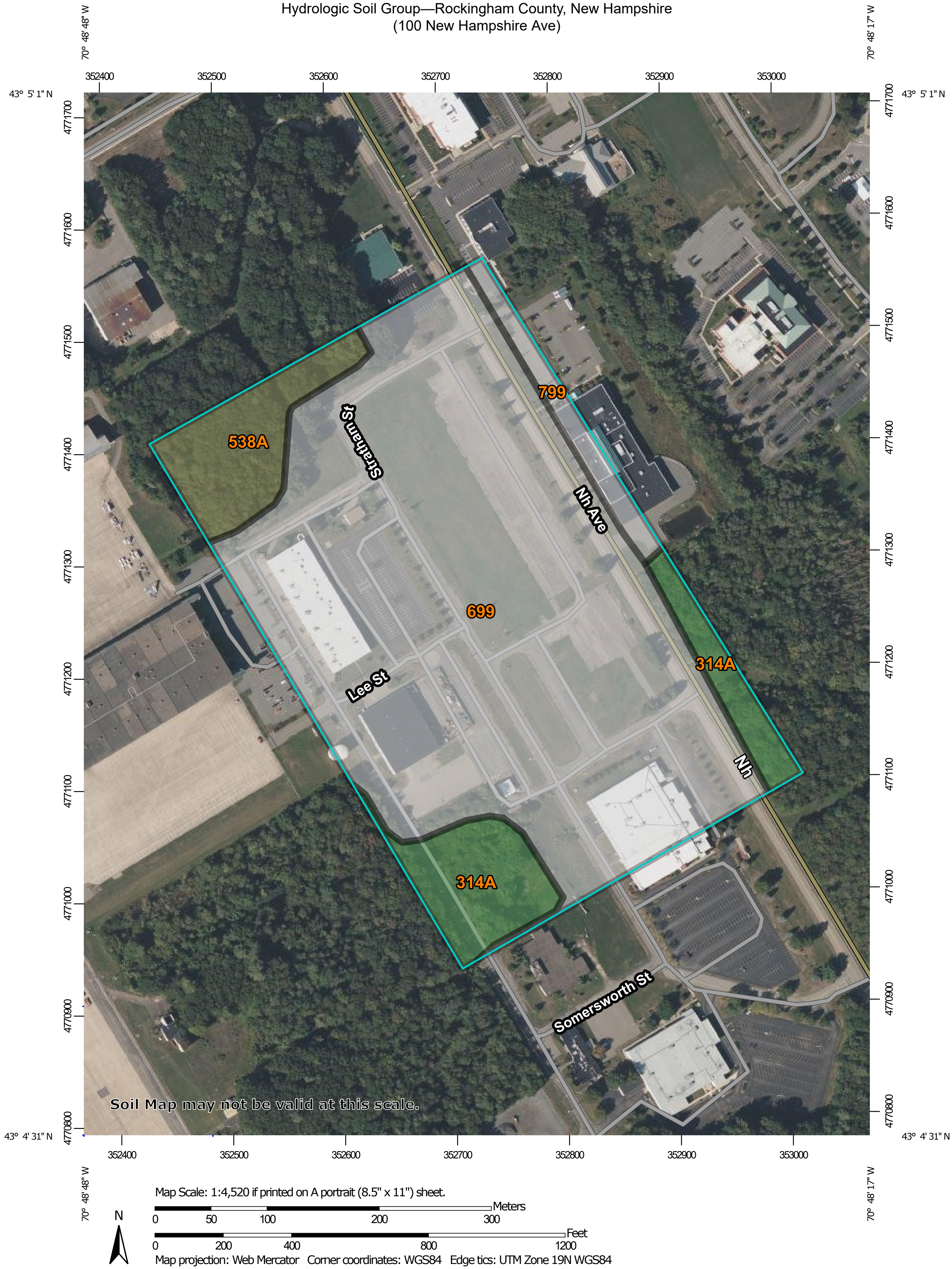
Submittal Date	Submittal Description	Staff Assigned	Action Date	Action Description	Comments
06/29/1993	Additional Information Received	SMITH	07/02/1993	Technical Report Approved	
04/07/1993	Additional Information Received	SMITH	05/14/1993	Comments to Waste Management Division	

Superfund Site Project Report

Site Number:	**100330336**	Project Number:	**0004283**
Name and Address:	**BUILDING 119 (SITE 36)** **PEASE AIR FORCE BASE** **PORTSMOUTH**	Responsible Party:	**U S AIR FORCE** **2261 HUGHES AVE, STE 155** **JBSA LACKLAND TX 78236-9853** **PHONE: 210-395-9420**
Mapit			
Wellhead Protection Area:	**Unknown**	Risk Level:	**DW SUPPLY WITHIN 1000' OR SITE IN SWPA**
Assigned To:	**SANDIN**	Discovery Date:	**05/14/1993**
Eligibile:		Eligibilty Determined on:	
MTBE:	**N**	Brownfield:	**N**

No Vapor Recovery Information

Hydrologic Soil Group—Rockingham County, New Hampshire
(100 New Hampshire Ave)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
314A	Pipestone sand, 0 to 5 percent slopes	A/D	4.7	10.0%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	C/D	3.4	7.4%
699	Urban land		36.8	79.3%
799	Urban land-Canton complex, 3 to 15 percent slopes		1.5	3.3%
Totals for Area of Interest			**46.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

EVERSOURCE
ENERGY

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

December 6, 2022

Craig Langton
Tighe & Bond, Inc.
177 Corporate Drive
Portsmouth, NH 03801

Dear Mr. Langton:

I am responding to your request to confirm the availability of electric service for the proposed 80 Rochester Avenue project being constructed for/by Aviation Avenue Group, LLC.

The proposed project consists of a 1-story ±191,600 SF Manufacturing and approximately 18,144 s/f of office space with at grade parking. The proposed development will be constructed along New Hampshire Avenue.

The developer will be responsible for the installation of all underground/overhead facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan C-104, dated 12/6/2022. The proposed building service will be fed from new transforms adjacent to the building as determined by Eversource Engineering as depicted on utility plan C-104, dated 12/6/2022. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground/overhead facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawing titled "Overall Utility Plan" sheet C-104 dated 12/6/2022, shows proposed transformer locations to service your proposed project.

Eversource approves the location shown; assuming the final installed location meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Portsmouth Office, 603-436-7708 Ext. 555-5678

Respectfully.

Michael J. Busby, PE
NH Eastern Regional Engineering and Design Manager, Eversource

cc: (via e-mail)
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource

Craig M. Langton

From: MacLean, David <macleand@unitil.com>
Sent: Thursday, January 5, 2023 1:54 PM
To: Craig M. Langton; Olson, Jeffery; Beaulieu, David
Cc: Kickham, Charlie; Kenny, Gary
Subject: RE: 100 New Hampshire Ave - Portsmouth, NH (Pease)

[Caution - External Sender]

Hi Craig,

This location has high pressure gas on several sides of the property- I stopped in to gas engineering and they agree you are in a great place for gas. The service location looks good. Once you have an estimated gas load please let me know and I will have engineering run an analysis and size your service.

Dave

Dave MacLean
Senior Business Development Rep

Unitil

325 West Rd
Portsmouth, NH 03801
T 603.294.5261
M 603.534.2379
F 603.294.5264
Email macleand@unitil.com
www.unitil.com

From: Craig M. Langton <CMLangton@tigheBond.com>
Sent: Thursday, January 5, 2023 12:48 PM
To: Olson, Jeffery <olsonj@unitil.com>; Beaulieu, David <beaulieu@unitil.com>
Cc: MacLean, David <macleand@unitil.com>; Kickham, Charlie <kickham@unitil.com>; Kenny, Gary <kennyg@unitil.com>
Subject: RE: 100 New Hampshire Ave - Portsmouth, NH (Pease)

Jeff / David,

We are going through the local permitting process for this project now there was a comment that the City brought ups and wanted us to confirm with you, is the status of the existing gas mains around the site and if any upgrades would be required. As you will see on the attached draft utilities plan for the site we are proposing to tap into the main as it crosses Lee street. Is this an acceptable place to tap into the gas main?

Thanks,
Craig

Craig Langton, PE
Project Engineer

Tighe&Bond

o. 603.433.8818 | d. 603.294.9231

177 Corporate Drive, Portsmouth, NH, 03801
w: tighebond.com | halvorsondesign.com

From: Olson, Jeffery <olsonj@unitil.com>
Sent: Friday, October 14, 2022 5:58 PM
To: Craig M. Langton <CMLangton@tigheBond.com>
Cc: Beaulieu, David <beaulieu@unitil.com>; Neil A. Hansen <NAHansen@tighebond.com>; MacLean, David <macleand@unitil.com>; Kickham, Charlie <kickham@unitil.com>; Kenny, Gary <kennyg@unitil.com>
Subject: RE: 100 New Hampshire Ave - Portsmouth, NH (Pease)

[Caution - External Sender]

Craig,

As requested in your correspondence, we have reviewed the location of our gas mains in the subject project area. Please be advised that any information provided in this response referencing the location of Unitil gas mains and any attributes describing these facilities in the subject project area is to be considered SUE-LEVEL D data – "REFERENCE ONLY" if used to help facilitate graphic representation on your project plans.

Attached to this email is a pdf showing Unitil owned gas mains around 100 New Hampshire Ave. In your project area pdf, the highlighted gas pipe that your survey found turned is most likely an abandoned service line to the building formerly stadning on the 100 New Hampshire Ave property. That being said, a digsafe ticket is still the best method to determine exact locations of active gas pipes before any construction.

It is understood between Unitil Corp. and any other parties who may be provided these map drawings, that this information is "reference only" and that prior to any construction commencing on this project appropriate DigSafe ticket must be executed.

Let me know if you need anything else or have any questions.

Thanks,

Jeff Olson, GISP
GIS Analyst

Unitil

30 Energy Way
Exeter, NH 03833
T 603.379.3837

these files, and assumes no responsibility or liability for their accuracy or completeness, or for any changes made to them. If you have received this e-mail in error, please reply to the sender so that we may redirect this information.

From: Craig M. Langton [mailto:CMLangton@tigheBond.com]
Sent: Wednesday, October 5, 2022 10:18 AM
To: MacLean, David <macleand@unitil.com>
Cc: Beaulieu, David <beaulieu@unitil.com>; Neil A. Hansen <NAHansen@tighebond.com>
Subject: 100 New Hampshire Ave - Portsmouth, NH (Pease)

Your attachments have been security checked by Mimecast Attachment Protection. Files where no threat or malware was detected are attached.

David,

We are working on a potential development on the Pease Tradeport at a site on the corner of Rochester Ave, Stratham St, and New Hampshire Ave. We have survey for the site, but as you'll see in the attached gas was only picked up in one location around the site. I was hoping you could provide us with any GIS or other information you have for gas service in the area se we can include in our conceptual design plans?

Thanks,
Craig

Craig Langton, PE
Project Engineer

Tighe&Bond
o. 603.433.8818 | d. 603.294.9231

177 Corporate Drive, Portsmouth, NH, 03801
w: tighebond.com | halvorsondesign.com

Tighe&Bond

P0595-015
January 25, 2023

Mr. Peter Britz, Director of Planning and Sustainability
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit & Subdivision Applications**
Proposed Advanced Manufacturing Facility

Dear Peter:

On behalf of Aviation Avenue Group, LLC, we are pleased to submit the following information to support a request to the Planning Board for a recommendation for approval to the Pease Development Authority (PDA) for Site Plan Review and Subdivision for a proposed Advanced Manufacturing Facility on a previously developed site located at 80 Rochester Avenue:

- One (1) copy of TAC Comment Response Report, dated January 25, 2023;
- One (1) copy of the PDA Application for Subdivision, dated January 25, 2023;
- One (1) full size & one (1) half size copy of the Site Plan Set, dated January 25, 2023;
- Three (3) full size & one (1) half size copy of the Subdivision Plan, dated January 25, 2023;
- One (1) copy of the Truck Turning Exhibits, dated January 25, 2023;
- One (1) copy of the Drainage Analysis, dated January 25, 2023;
- One (1) copy of the Signed Eversource Will Serve Letter, dated December 6, 2022;
- One (1) copy of correspondence with Unitil; January 5, 2023

The proposed project is located at 80 Rochester Avenue which is identified as Map 308 Lot 1 on the City of Portsmouth Tax Maps. The proposed project is for the construction of a ±209,750 SF advanced manufacturing building including ±18,145 SF of office space, two (2) parking areas, two (2) loading dock areas, minor realignment of a portion of Rochester Avenue, and associated site improvements consisting of underground utilities, landscaping, lighting, and a stormwater management system.

There is approximately 196,665 SF of existing impervious area that is currently untreated before entering the municipal drainage system. The proposed stormwater management system has been designed to provide treatment for the existing impervious surface that is currently untreated and for ±161,130 SF of additional impervious that results from the proposed project as required by the PDA Site Plan Regulations.

On October 20, 2022, the PDA Board granted conceptual approval for the proposed project. The project was granted a variance from the Zoning Board of Adjustment for the front yard setback requirements at their meeting on November 15, 2022.

We respectfully request to be placed on the Technical Advisory Committee (TAC) meeting agenda for the February 7, 2023, meeting. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President

Neil A. Hansen, PE
Project Manager

Copy: Aviation Avenue Group, LLC (via email)
Pease Development Authority

J:\P\P0595 Pro Con General Proposals\P0595-015 100 NH Avenue\Report_Evaluation\Applications\City of Portsmouth\TAC\20230125_TAC Resubmission\TAC-Resubmission Cover Letter.docx

PROPOSED ADVANCED MANUFACTURING FACILITY - TAC COMMENTS (12/30/2022) RESPONSE
80 Rochester Avenue (100 New Hampshire Avenue)
Portsmouth, New Hampshire
January 25, 2023

Prepared by: CML
Project # P0595-015

	Comment	Response	Corresponding Plan Sheet #
1	Please confirm this project includes a lot line adjustment and not the creation of a new parcel.	The project is no longer proposing the relocation of the ROW line on Rochester Avenue. However, a subdivision application will still be required in order to create a new lease area over the parcel with the PDA.	PROPOSED SUBDIVISION PLAN (1 OF 1) & Enclosed Subdivision Application
2	Rochester Ave pavement is too far deteriorated for the mill and pave process. The road needs reclamation, fortified and new pavement. Stratham and Newfields Streets need to be reconstructed as well.	The plans have been updated to call for Rochester Avenue to be reclaimed and re-paved, and to mill and overlay Newfields & Stratham Street.	C-102
3	The new lease line may extend over the street drainage system and sidewalk. A license may be required.	See comment 1. Also a note has been added to the plans stating "Location of existing drain line to be confirmed and drainage license area within the project site to be determined prior to construction."	PROPOSED SUBDIVISION PLAN (1 OF 1)
4	PCB 18 should tie into the street drainage, not the site drainage	The proposed grading in Rochester Avenue the entrances to each of the loading areas have been revised to make highpoints at the center of the drives and provide six (6) new catch basins within Rochester Avenue. In addition, the drainage analysis was updated to identify the overall reduction of impervious area within the Rochester Avenue Right of Way.	C-104 & Drainage Analysis
5	DMH 1925 is likely not large enough to accept such a large new core. Please confirm this design will work by investigating the structure with Stormwater division from DPW.	Based on Tighe & Bonds inspection of DMH 1925, which is a vault structure and not a typical circular manhole, the structure should be capable of accepting the increased opening for a new 48" HDPE vs. the existing 36" RCP pipe at this location.	C-103.2
6	Proposed sidewalk should be at least 5.5’ wide, preferably 6’ wide.	Sidewalk widths have been increased to 5.5'	C-102
7	Third party review of stormwater design. Is location of pretreatment outlet structure after detention basin appropriate? Is treatment prior to detention basin more appropriate?	The applicant has executed a thrid party review agreement. The Jellyfish treatment unit post detention is the same configuration we have used numerous times in Portsmouth on projects that have also received City and NHDES approval. Per our prior approvals with NHDES using this configuration, the WQF is calculated to determine the sizing of the treatment unit rather than the 1" WQ Storm as would be done upstream.	
8	State sizes of domestic water and fire services.	The sizes for the domestic water and fire services have been called out on the plans.	C-104
9	Provide flow tests to show the existing water main can supply adequate water to proposed building.	Flow testing is scheduled to be completed prior to construction.	
10	Provide vehicle speed data for New Hampshire Avenue to confirm adequacy of sight lines at driveways and to determine need for additional safety measures at proposed crosswalks.	The project location on NH Ave is located near the center of a mile long stretch of road the is very flat and straight. Proposed crosswalks were requested by the PDA and have the same extended sight distance as the driveways. PDA is also currently having the traffic study reviewed by a third party who will likely also look at this aspect.	
11	Provide pedestrian counts and vehicle turning movement counts at intersections of New Hampshire Avenue with Newfields and Stratham, to document need for crosswalks across New Hampshire Ave.	Crosswalks were requested by the PDA to connect the site to the existing pedestrian infrastructure already in place	
12	A third party peer review of the traffic study should be done.	PDA is currently having the traffic study reviewed by a third party.	

Pease Development Authority

55 International Drive, Portsmouth, NH 03801, (603) 433-6088

PEASE INTERNATIONAL TRADEPORT PORTSMOUTH, NH

Subdivision Application

For PDA Use Only			
Date Submitted: ________	Municipal Review: ________	Fee: ________	
Application Complete: ________	Date Forwarded: ________	Paid: ________	Check #: ________

Applicant Information

Applicant: **Aviation Avenue Group, LLC**	Agent: **Tighe & Bond**
Address: **210 Commerce Way, Suite 300, Portsmouth, NH**	Address: **177 Corporate Drive Portsmouth, NH**
Business Phone: **603-430-4000**	Business Phone: **603-433-8818**
Mobile Phone:	Mobile Phone:
Fax: **603-430-8940**	Fax:

Site Information

Address / Location of Original Lot: **80 Rochester Ave (100 New Hampshire Ave)**

Portsmouth Tax Map: **308** **Lot #:** **1** **Zone:** **Pease Industrial (PI)**

Proposed Activity (check one) **Subdivision** **X** **Lot Line Adjustment** ______

Existing Lot

Total # of Existing Lot(s) **1**

Existing Lot Area **±10.9**

Created Lot

Total # of Proposed Lot(s) **1**

Area of Proposed Lot(s) **±10.9**

All above information shall be shown on a site plan submitted with this application. Provide 3 Full size hard copies and 1 PDF copy of all application materials as well as 1 half size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 500 of PDA Land Use Controls for additional information

Checklist: Application fee (as required) **(X)** Abbutters List **(X)** Drawings **(X)**

Copies of approvals for any Required State/Federal permits (See Ch 500 of PDA LUC) ( )

Certification

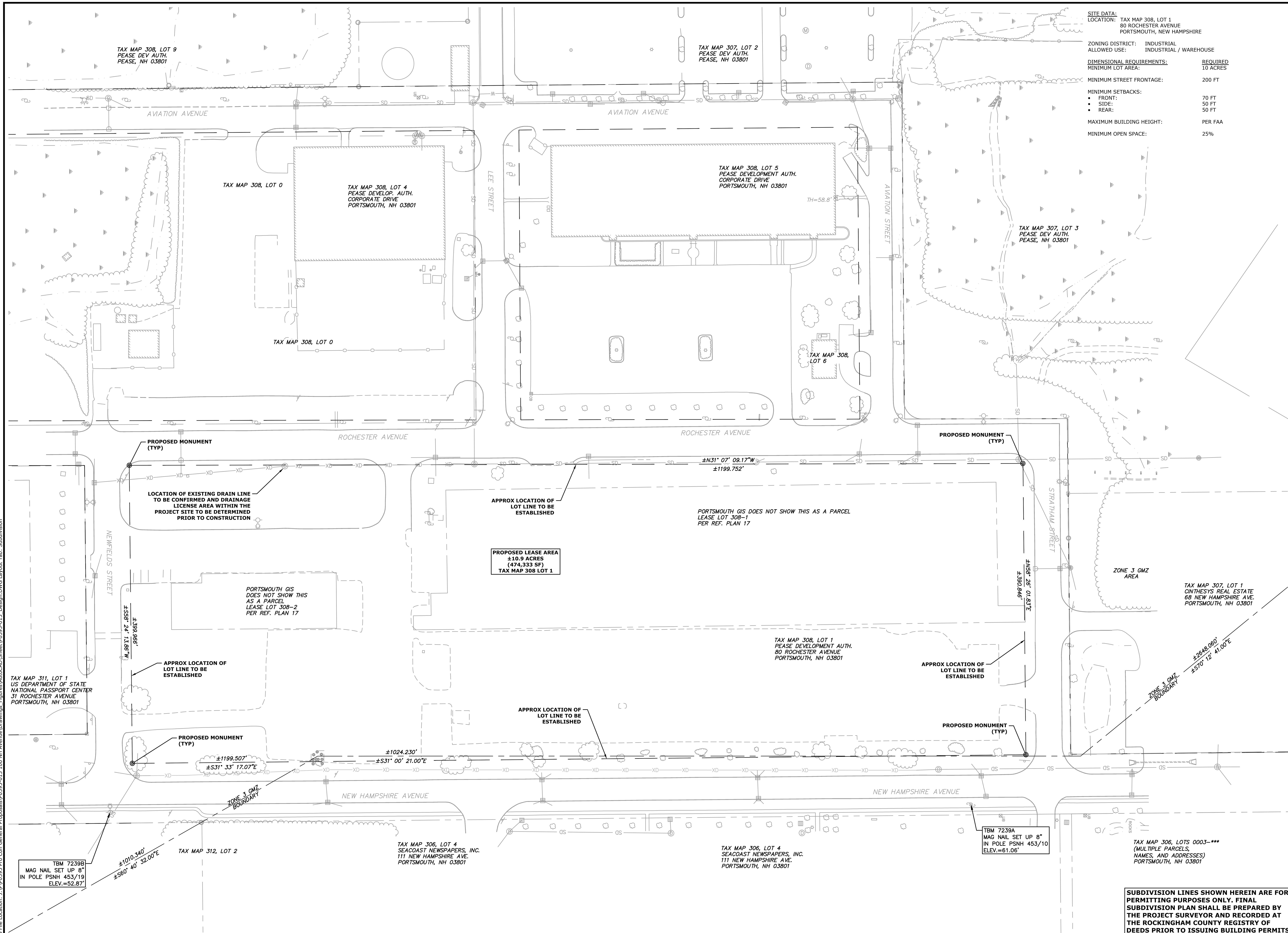
I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Subdivision and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and the PDA Board of Directors in the development and construction of this

Neil Hansen
Signature of Applicant

1/25/23
Date

Neil A. Hansen
Printed Name

N:\Engineer\Subdivision Application.xlsx



SUBDIVISION LINES SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL SUBDIVISION PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS PRIOR TO ISSUING BUILDING PERMITS.

Tighe&Bond

STATE OF NEW HAMPSHIRE PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 1/25/23

STATE OF NEW HAMPSHIRE NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER 1/25/23

Proposed Advanced Manufacturing Facility

Aviation Avenue Group, LLC

100 New Hampshire Avenue
Portsmouth, NH

MARK	DATE	DESCRIPTION
B	1/25/2023	TAC Resubmission
A	12/19/2022	TAC Submission

PROJECT NO:	P0595-015
DATE:	12/19/2022
FILE:	P0595-015_DESIGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

PROPOSED SUBDIVISION PLAN

SCALE: AS SHOWN

1 OF 1

Last Save Date: January 24, 2023 5:03 PM By: CML
Plot Date: Wednesday, January 25, 2023 Plotted By: Craig M. Langton

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

January 23, 2023

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

Re: Application for Site Plan Review
Assessor's Map 126, Lot 4
147 Congress Street
Altus Project No. 5392

Dear Peter,

On behalf of the Owner, Luckly Thirteen Property, LLC, and Michael and Peter Labrie, Altus Engineering respectfully submits an application for Site Plan Review. Lucky Thirteen proposes to renovate and expand the former health food store property at the corner of Congress Street and Maplewood Avenue. Market Square Architects prepared architectural plans and renderings for the improvements and has received approval for the project from the HDC. Attorney Durbin has filed an application to the Zoning Board of Adjustment to seeking relief from the open space requirements. The application is expected to be heard at the January 24th Board of Adjustment meeting.

Enclosed please find the following items for consideration at the February 7, 2023 TAC Meeting:

- Letter of Authorization (Applicant to Altus)
- "Green" Statement
- Sitework Cost Estimate
- Site Review Checklist
- Full sized sets of Site Plans

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

Sincerely,

wde/5397.00 tac cvr ltr.docx

Enclosures

eCopy: Sarah Howard, MSA
Derek Durbin, Esq.
Mike Labrie, Lucky Thirteen Properties, LLC

Letter of Authorization

I, Michael Labrie and Lucky thirteen Properties, LLC, hereby authorize Altus Engineering, Inc. of Portsmouth, NH to represent us in all matters concerning the engineering and related permitting of improvements to the property located at 147 Congress Street in Portsmouth, NH on Assessors Map 126, Lot 4. This authorization shall include any signatures required for Federal, State and Municipal permit applications.

Paula Harrington	[signature]	10-26-22
Signature	Michael Labrie	Date
Paula Harrington		
Witness	Print Name	Date

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

“Green” Statement
147 Congress Street
Assessor’s Map 126, Lot 4
Altus Project 5392
January 2023

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. respectfully submits the following list of the project’s “green” components for the re-development of the site of the former health food store building at 147 Congress Street.

- The proposed renovation and expansion utilizes and captures a small pocket of under-utilized open space along Maplewood Avenue.
- There are no wetlands or wetland buffers on the property that will be impacted by the development.
- The antiquated building with good structural components will remain.
- The upgraded building components will meet and or exceed the current energy codes and more efficient MEP equipment being installed.
- LED, dark sky friendly building mounted exterior site lighting will be installed.
- Restroom and kitchen plumbing will include low flow water closets and high efficiency dishwashing units for efficient water usage and wastewater generation.

wde/5392 green statement.docx

Tel: (603) 433-2335 E-mail: Altus@altus-eng.com

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
(603) 433-2335

147 Congress Street
Portsmouth, NH

Engineer's Opinion of Cost

(January 23, 2023 Plan Set)

PROJECT: 5392

Est. Qty	Unit	ITEM DESCRIPTION &	Cost/Unit	Total
1	LS	Site Demolition	$ 5,000.00	$ 5,000.00
160	SY	Brick sidewalk	$ 50.00	$ 8,000.00
1	LS	Misc. Temp. Erosion and Sediment Control	$ 3,000.00	$ 3,000.00
1	LS	Planted Landscape	$ 2,000.00	$ 2,000.00
			****SUBTOTAL:**	**$ 18,000.00**

THIS ESTIMATE IS FOR PERMIT APPLICATION PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION, CONSTRUCTION BIDDING, CONTRACTING OR SUBCONTRACTING.

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: Lucky Thirteen Properties, LLC Date Submitted: 1/23/23

Application # (in City's online permitting): 22-192

Site Address: 147 Congress Street Map: 126 Lot: 4

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Viewpoint - submission materials	
☒	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 floor plans/ Plan Package	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Cover sheet, all sheets in title block	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Cover sheet, bottom left signature in LOA	N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Lot line revision plan	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover sheet	N/A
☒	List of reference plans. **(2.5.3.1H)**	Lot line revision plan, right middle	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Site Plan - no new utility services are proposed	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**		N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	NA - no wetlands on-site	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Cover sheet, all plan sheets title block	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Cover sheet, all plan sheets, middle right	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	Lot line Revision Plan	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Lot line revision plan Site Plan NA NA	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architectural elevations site plan	
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	NA Site Plan & Grading Plan NA Site Plan NA NA	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Parking - NA Landscaping - Site Plan No parking provided	
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	No new services provided Grading Plan	
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	no new services provided	

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	No new services provided	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	Site Plan	
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Not applicable	
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Architectural drawings	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Site plan	
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	No undisturbed areas No vegetation to be retained Planting bed to be irrigated	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading Plan	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	NA	
☒	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	Architectural drawings	
☒	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	NA site is not in a flood hazard zone	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	NA	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Green statement	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	Project is not within a wellhead protection or aquifer protection area	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Notes on grading plan	
☒	Inspection and Maintenance Plan **(7.6.5)**	NA - no drainage infrastructure proposed	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Site Plan	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	NA NA NA NA NA NA NA	
☒	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)**	NA no new utility services are proposed	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Site Plan	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan	N/A
☒	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	NA - not in a flood harard zone	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Waiver requested Site Plan	N/A

Applicant's Signature: Eric D. Weinrieb, PE **Date:** 1/23/23

THIS DRAWING SET HAS NOT BEEN RELEASED FOR CONSTRUCTION

Proposed Redevelopment

147 Congress Street
Portsmouth, New Hampshire

Assessor's Parcel 126, Lot 4

ISSUED FOR TAC

Plan Issue Date:

JANUARY 23, 2023

Owner/Applicant:

Lucky Thirteen Properties, LLC

P.O. Box 300
Rye, NH 03870-0300
(603) 661-6633

Architect:

MARKET SQUARE ARCHITECTS

104 Congress Street
Suite 203
Portsmouth, NH 03801
(603) 501-0202

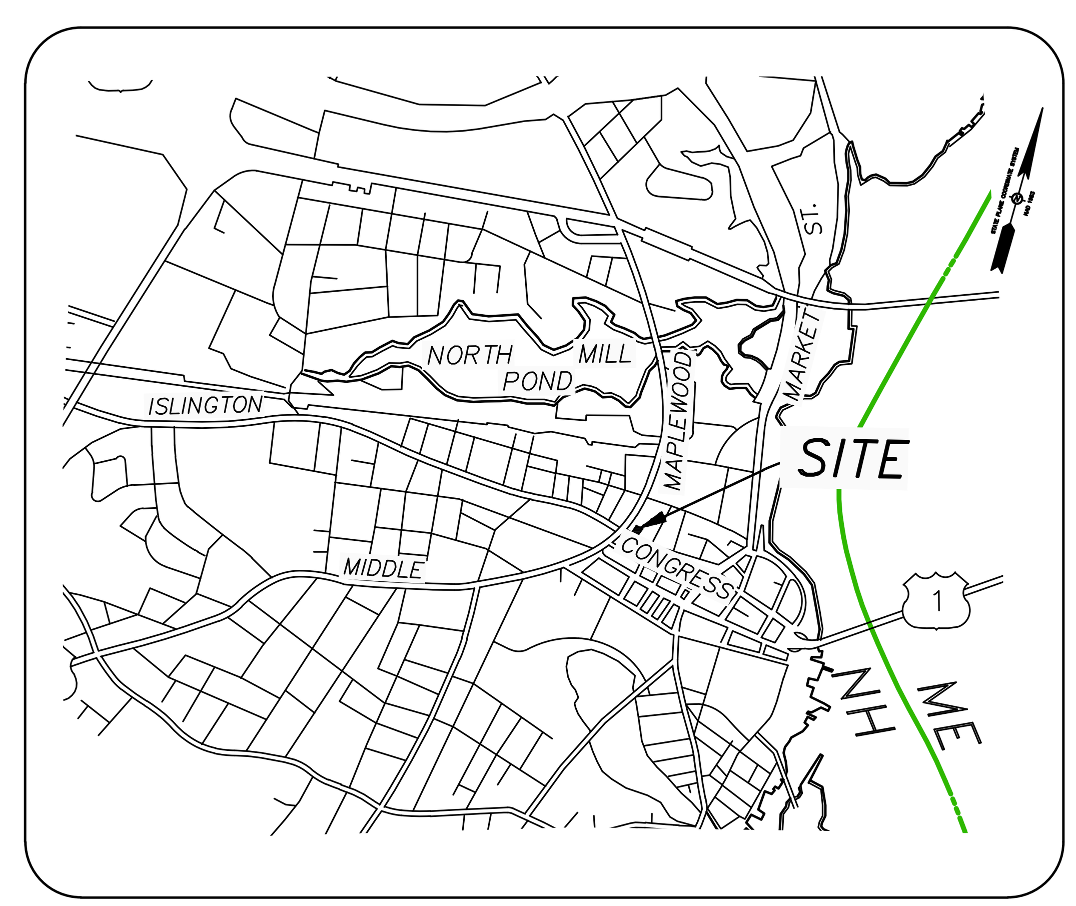
Civil Engineer:

ALTUS ENGINEERING

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

Surveyor:

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



LOCUS NOT TO SCALE

Sheet Index

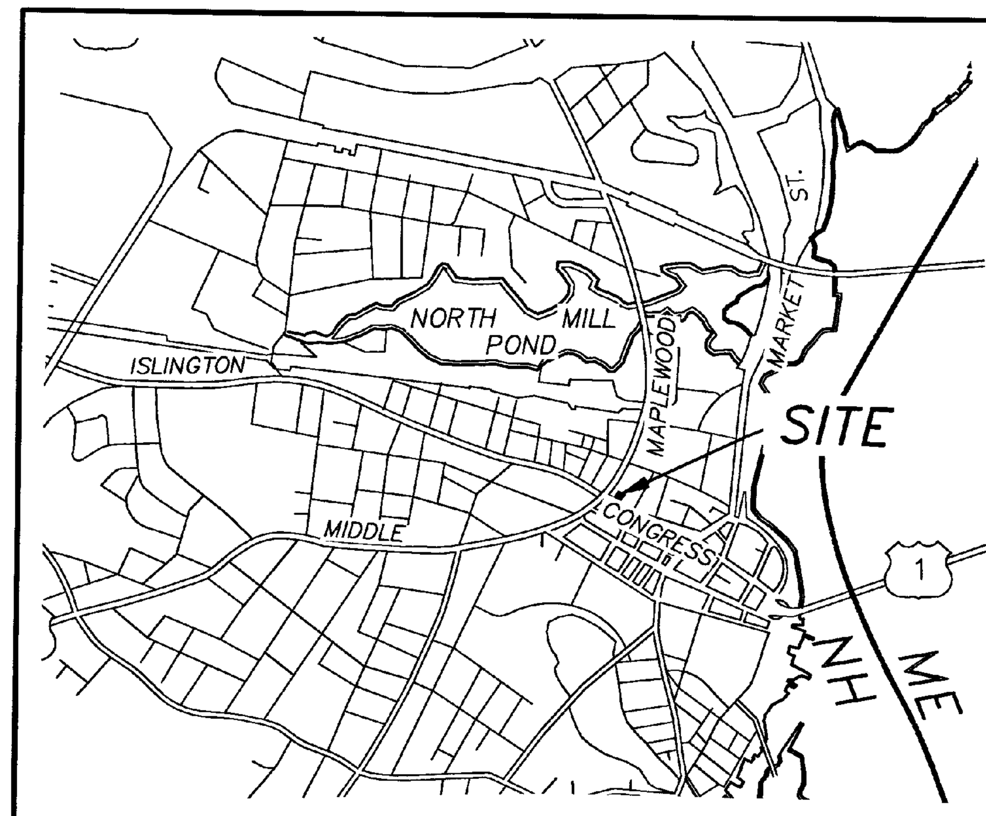
Title	Sheet No.:	Rev.	Date
Lot Line Revision	1 of 1	2	06/13/17
Site Plan	C-1	2	01/23/23
Open Space Plan & Grading Plans	C-2	2	01/23/23
Proposed Context (by Market Square)	10	0	11/18/22
Proposed Context (by Market Square)	11	0	11/18/22
Proposed Plan (by Market Square)	12	0	11/18/22
Proposed Elevations (by Market Square)	16	0	11/18/22
Proposed Elevations (by Market Square)	17	0	11/18/22

Permit Summary	Received
City of Portsmouth HDC Approval	12/14/22
City of Portsmouth ZBA Approval	Pending
City of Portsmouth PB Approval	-

P5392

2017 AUG 15 PM 2:22 035067

C/H L-CHIP ROA379137



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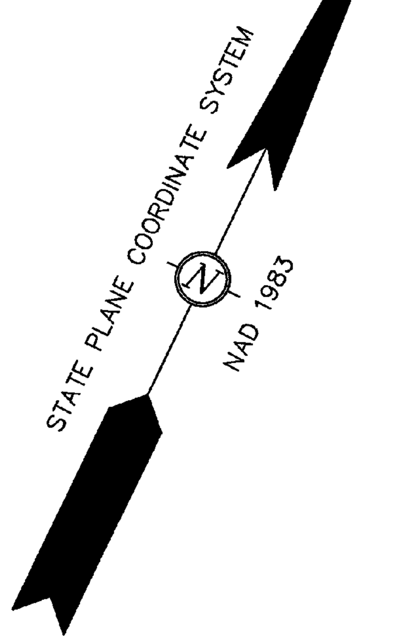
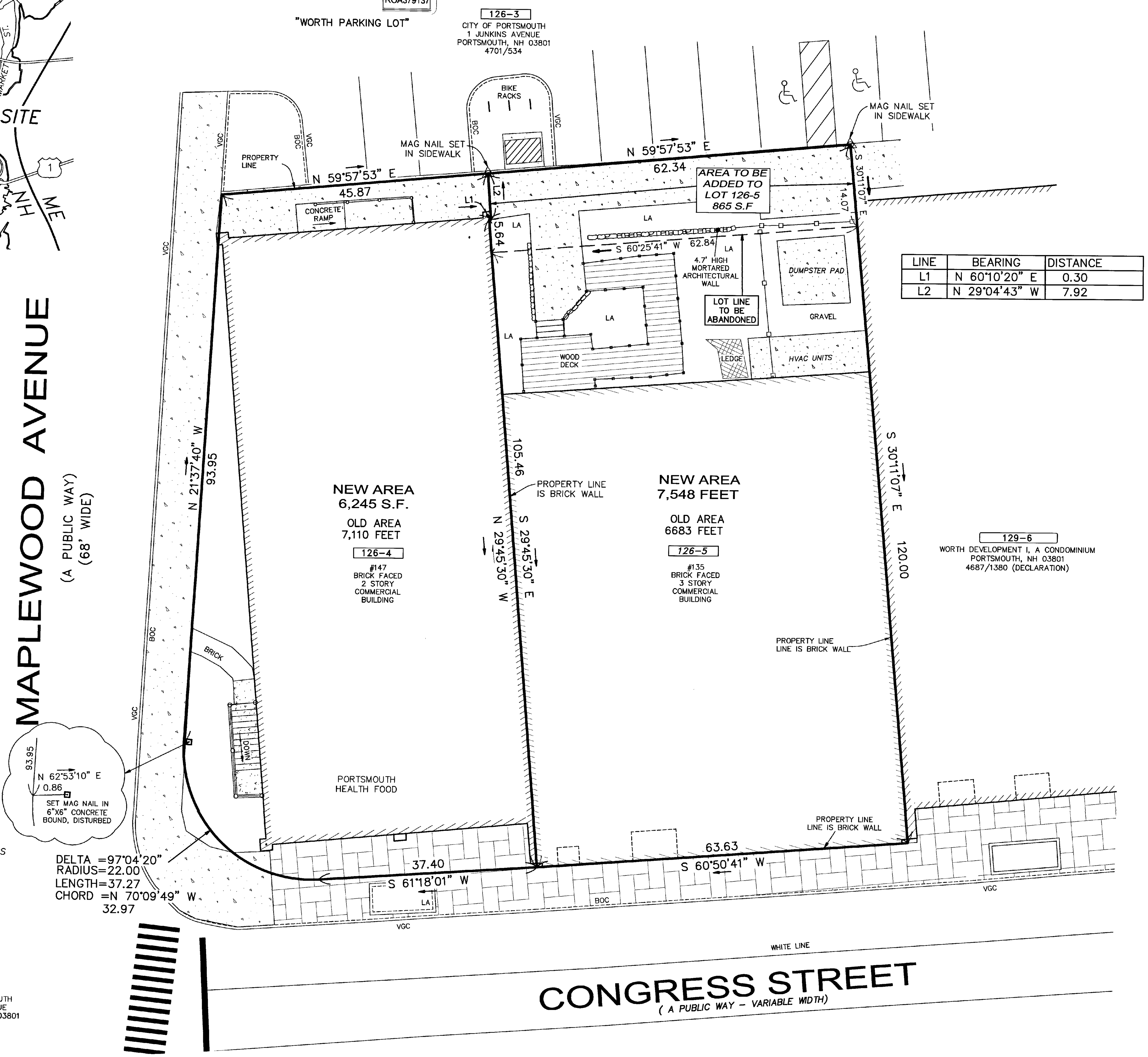




LINE	BEARING	DISTANCE
L1	N 60°10'20" E	0.30
L2	N 29°04'43" W	7.92

LEGEND:

- BOUND as DESCRIBED
- SEWER MANHOLE
- CEMENT CONCRETE PAD
- ELECTRICAL BOX
- TELEPHONE RISER
- TRANSFORMER & PAD
- SEWER MANHOLE
- — S — SEWER LINE
- SIGN
- VGC ...... VERTICAL FACED GRANITE CURB
- HANDICAP SPACE
- RCRD ...... ROCKINGHAM COUNTY REGISTRY OF DEEDS
- CONIFEROUS TREE
- DECIDUOUS TREE
- BRICK WALK
- LA ...... LANDSCAPED AREA
- BOC ...... BACK OF CURB

NOTES:

1. OWNER OF RECORD................BLUESTONE PROPERTIES OF RYE, LLC
   ADDRESS................PO BOX 4780, PORTSMOUTH, NH 03802
   DEED REFERENCE................5761/1289
   TAX SHEET / LOT................126-5

   OWNER OF RECORD................ROMAN AND NELSON, LLC
   ADDRESS................151 CONGRESS STREET, PORTSMOUTH, NH 03801
   DEED REFERENCE................4731/730
   TAX SHEET / LOT................126-4
2. ZONED:
   DOD (DOWNTOWN OVERLAY DISTRICT)
   HD (HISTORIC DISTRICT)
   CD5 (CHARTER DISTRICT 5)
   MINIMUM OPEN SPACE 5%
   PROVIDED:
   NEW LOT 126-5
   1031 SF OPEN / 7548 =13.7 % OPEN SPACE
   NEW LOT 126-4
   644 SF OPEN / 6245 =10.1 % OPEN SPACE
3. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-800-225-4977.
5. THE PARCEL SHOWN HEREON LIES IN ZONE X, AREA OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER MAP 33015C0259E, DATED MAY 17, 2005 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

REFERENCE PLANS:

1. ALTA/ACSM LAND TITLE SURVEY, # 141 CONGRESS STREET, PORTSMOUTH, NEW HAMPSHIRE, FOR K.S.C., LLC, DATED 4/1/1996, BY DURGIN, VERRA AND ASSOCIATES, INC., PLAN NO 20633
2. VAUGHAN STREET URBAN RENEWAL PROJECT, N.H. R-10, PORTSMOUTH, NEW HAMPSHIRE CONDEMNATION MAP, DATED FEB. 1971, RCRD #D-2425 SHEET 2 OF 3.
3. VAUGHAN STREET URBAN RENEWAL, PROJECT NO. N.H. R-10, PORTSMOUTH, NEW HAMPSHIRE, SUBDIVISION, PARCELS 9, 9-A, 9-B, 9-C, DATED OCT. 7, 1970, REV. AUGUST 26, 1971, RCRD # B-2572.

APPROVED FOR THE RECORD:

Dexter R. Legg 6/14/2017

CHAIRMAN PORTSMOUTH PLANNING BOARD DATE

STATE OF NEW HAMPSHIRE LAND SURVEYOR NO. 625 JAMES VERRA LICENSED

REV. NO.	DATE	DESCRIPTION	APPR'D
2	2017-06-13	REVISE PER RCRD COMMENTS	JV
1	2017-05-31	SET LOT CORNERS	JV

LOT LINE REVISION
135 & 147 CONGRESS STREET
PORTSMOUTH, NEW HAMPSHIRE
ASSESSOR'S PARCELS: 126-5 & 126-4

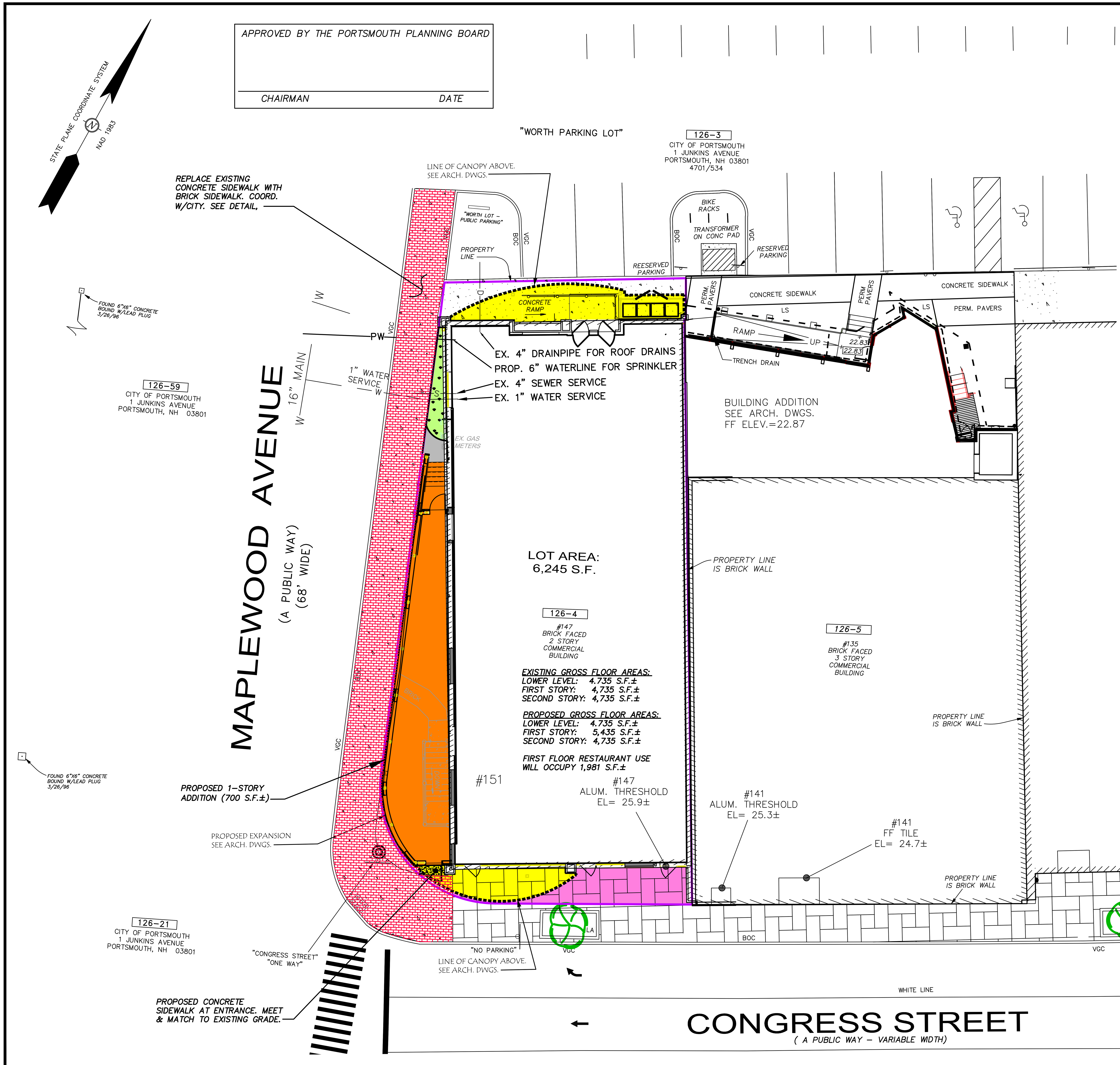
OWNERS: BLUESTONE PROPERTIES OF RYE LLC & ROMAN AND NELSON, LLC

JAMES VERRA AND ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8
NEWINGTON, NEW HAMPSHIRE 03801-7876
603-436-3557

DATE:	3-27-2017
JOB NO:	20633-A
SCALE: 1" =	10'
DWG NAME:	20633-A1
PLAN NO:	20633-A1
SHEET:	1 of 1

JV PROJECT MGR — HRM DRAWN BY

D-40317



SITE NOTES

1. DESIGN INTENT – THIS PLAN SET IS INTENDED TO DEPICT THE EXPANSIONS & IMPROVEMENTS OF THE SITE FOR A MIXED USE.
2. APPROXIMATE LOT AREA: 6,245 S.F.±
3. ZONE: HISTORIC DISTRICT CD5, DOWNTOWN OVERLAY DISTRICT
4. DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:	NR	
MAX. BLDG BLOCK LENGTH:	225'	
FRONT SETBACK:	5' MAX. (±2.9' EXISTING)	0' PROPOSED
SECONDARY FR. SETBACK:	0' EXISTING	0' PROPOSED
SIDE SETBACK:	NR (EX. LEFT: 0')	0' PROPOSED
SIDE SETBACK:	NR (EX. RIGHT 0')	0' PROPOSED
REAR SETBACK:	5' MIN. (±6.8' EXISTING)	±0.8' PROPOSED
MAX. BUILDING HEIGHT:	2–3 STORIES, 40' ALLOWED	< 40' PROPOSED (EX.)
MIN. GROUND STORY HT:	12'-0" (±11' EXISTING)	±11' PROPOSED (EX.)
REQUIRED FACADE TYPE:	SHOPFRONT	PROVIDED
MAX. BLDG. COVERAGE:	95% (±78% EXISTING)	94.6% PROPOSED (5,910 SF)
MIN. OPEN SPACE:	5% (±18.5% EXISTING)	2.3% PROPOSED (146 SF)
IMPERVIOUS LOT AREA:	NR (±71.5% EXISTING)	97.7%± PROPOSED
OPEN TO SKY:	NR (±22% EXISTING)	4.5% PROPOSED (282 SF)
MAX. BLDG. FOOTPRINT:	20,000 S.F.	
MAX. ENTRANCE SPACING:	50'	SEE ARCH. DWGS.
MIN. FRONT LOT LINE B.O.:	80% (±88% EXISTING)	92%± PROPOSED

PARKING REQUIREMENTS (SECTION 10.1115):
RESTAURANT: NO REQUIREMENT
RETAIL: NO REQUIREMENT

5. THERE ARE NO WETLANDS ON OR WITHIN THE VICINITY OF THE PARCEL.
6. PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
7. ALL CONSTRUCTION SHALL MEET THE MINIMUM STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATION FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITIONS. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
8. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINES WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
9. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
10. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
11. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
12. BUILDING AREA SHOWN IS BASED ON FOOTPRINT MEASURED TO THE EDGE OF FOUNDATIONS AND/OR SLABS. ACTUAL INTERIOR SPACE WILL DIFFER.
13. ALL SITE LIGHTING WILL BE BUILDING MOUNTED & POSITIONED TO MEET DARK SKY FRIENDLY REQUIREMENTS.
14. NO NEW UTILITY SERVICES ARE PROPOSED.
15. EXISTING PLANTING BED MAY BE AUGMENTED WITH ANNUAL PLANTS & IRRIGATION MAY BE INSTALLED.
16. PROJECT IS NOT LOCATED WITHIN A WELLHEAD PROTECTION OR AQUIFER PROTECTION AREA.
17. NO STATE OR FEDERAL PERMITS ARE REQUIRED FOR THIS PROJECT.
18. DURING CONSTRUCTION NO MATERIALS SHALL BE STOCKPILED OUTSIDE ON THE SITE.
19. A WAIVER IS REQUESTED FROM THE REQUIREMENT THAT THE SITE PLAN BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
20. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
21. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

- PROPERTY LINE
- PROPOSED ADDITION – SEE ARCH. DWGS.
- PROPOSED CANOPY – SEE ARCH. DWGS. (OPEN BELOW)
- EXISTING BRICK SIDEWALK (OPEN TO SKY)
- EXISTING CONCRETE SIDEWALK (OPEN TO SKY)
- PROPOSED CONCRETE SIDEWALK (CANOPY ABOVE)
- PROPOSED LANDSCAPING – SEE ARCH. DWGS. (CANOPY ABOVE)

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)

P5392

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

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC SUBMISSION

ISSUE DATE:
JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	11/01/22
1	INITIAL BOA SUBMISSION	EDW	12/21/22
2	TAC SUBMISSION	EDW	01/23/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5392.dwg

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

OWNER/APPLICANT:
LUCKY THIRTEEN PROPERTIES, LLC
P.O.BOX 300
RYE, NH 03870-0300

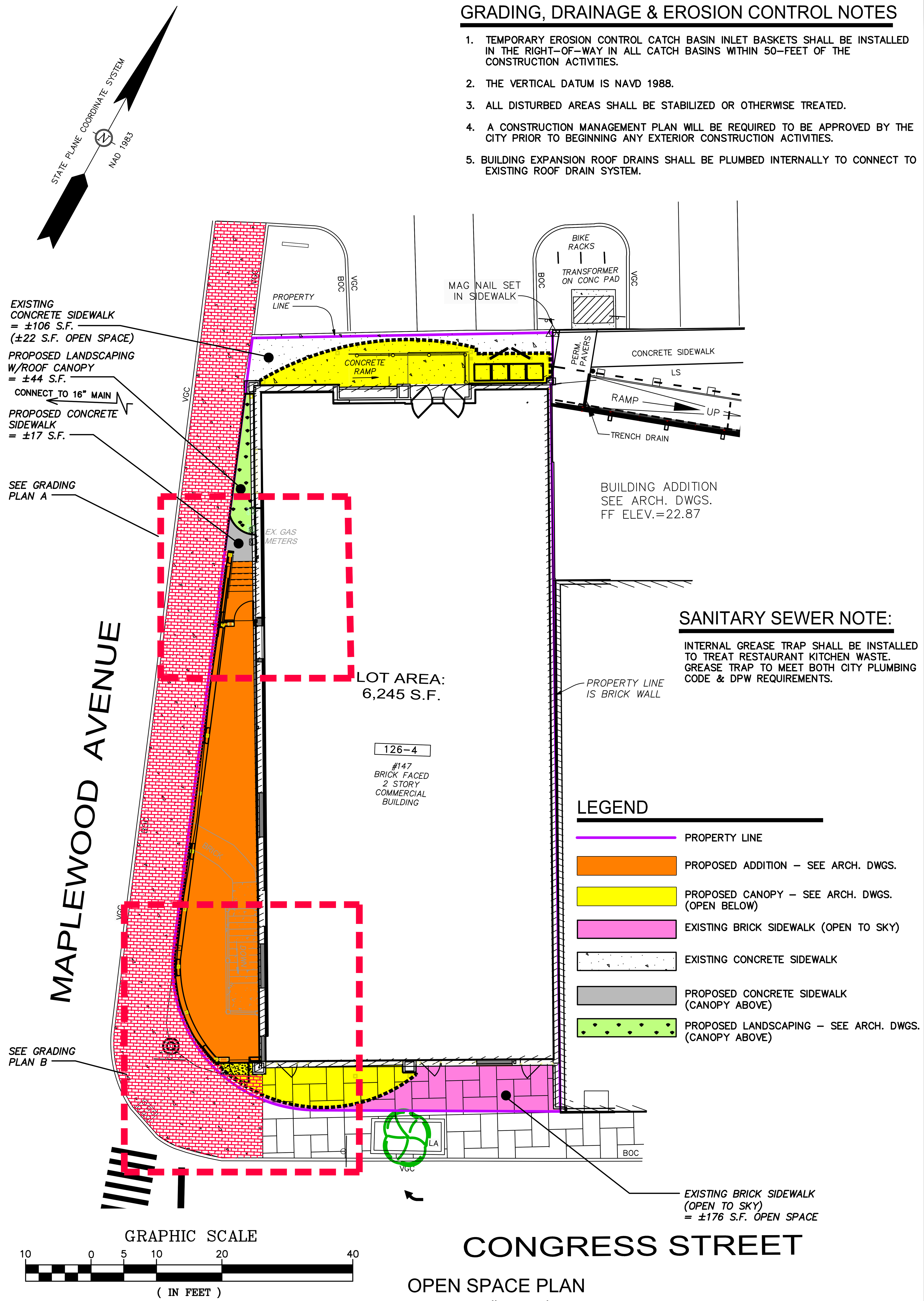
PROJECT:
PROPOSED REDEVELOPMENT
TAX MAP 126, LOT 4
147 CONGRESS STREET
PORTSMOUTH, NH

TITLE:
SITE PLAN

SHEET NUMBER:
C-1

GRADING, DRAINAGE & EROSION CONTROL NOTES

1. TEMPORARY EROSION CONTROL CATCH BASIN INLET BASKETS SHALL BE INSTALLED IN THE RIGHT-OF-WAY IN ALL CATCH BASINS WITHIN 50-FEET OF THE CONSTRUCTION ACTIVITIES.
2. THE VERTICAL DATUM IS NAVD 1988.
3. ALL DISTURBED AREAS SHALL BE STABILIZED OR OTHERWISE TREATED.
4. A CONSTRUCTION MANAGEMENT PLAN WILL BE REQUIRED TO BE APPROVED BY THE CITY PRIOR TO BEGINNING ANY EXTERIOR CONSTRUCTION ACTIVITIES.
5. BUILDING EXPANSION ROOF DRAINS SHALL BE PLUMBED INTERNALLY TO CONNECT TO EXISTING ROOF DRAIN SYSTEM.



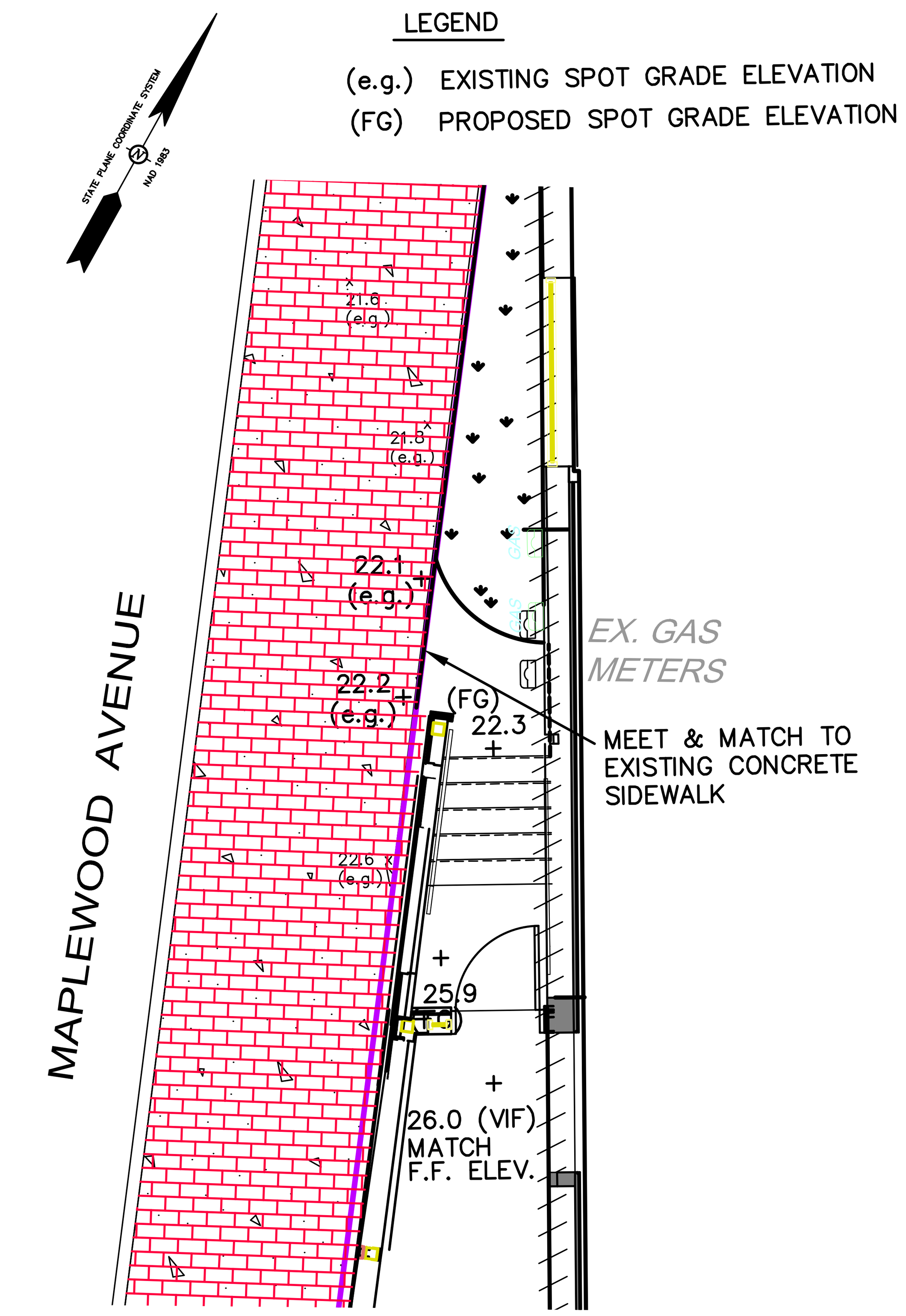
SANITARY SEWER NOTE:

INTERNAL GREASE TRAP SHALL BE INSTALLED TO TREAT RESTAURANT KITCHEN WASTE. GREASE TRAP TO MEET BOTH CITY PLUMBING CODE & DPW REQUIREMENTS.

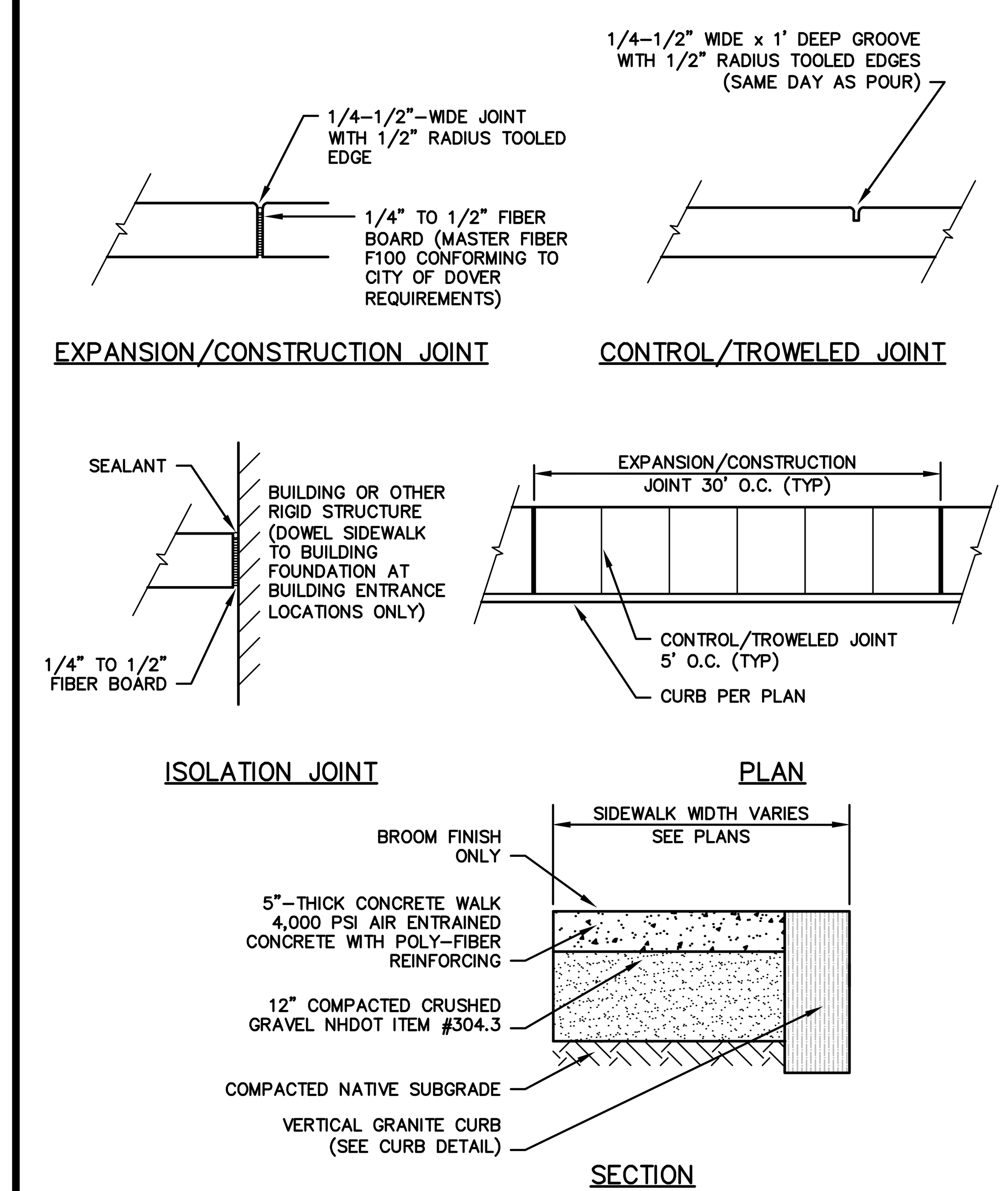
LEGEND

- PROPERTY LINE
- PROPOSED ADDITION – SEE ARCH. DWGS.
- PROPOSED CANOPY – SEE ARCH. DWGS. (OPEN BELOW)
- EXISTING BRICK SIDEWALK (OPEN TO SKY)
- EXISTING CONCRETE SIDEWALK
- PROPOSED CONCRETE SIDEWALK (CANOPY ABOVE)
- PROPOSED LANDSCAPING – SEE ARCH. DWGS. (CANOPY ABOVE)

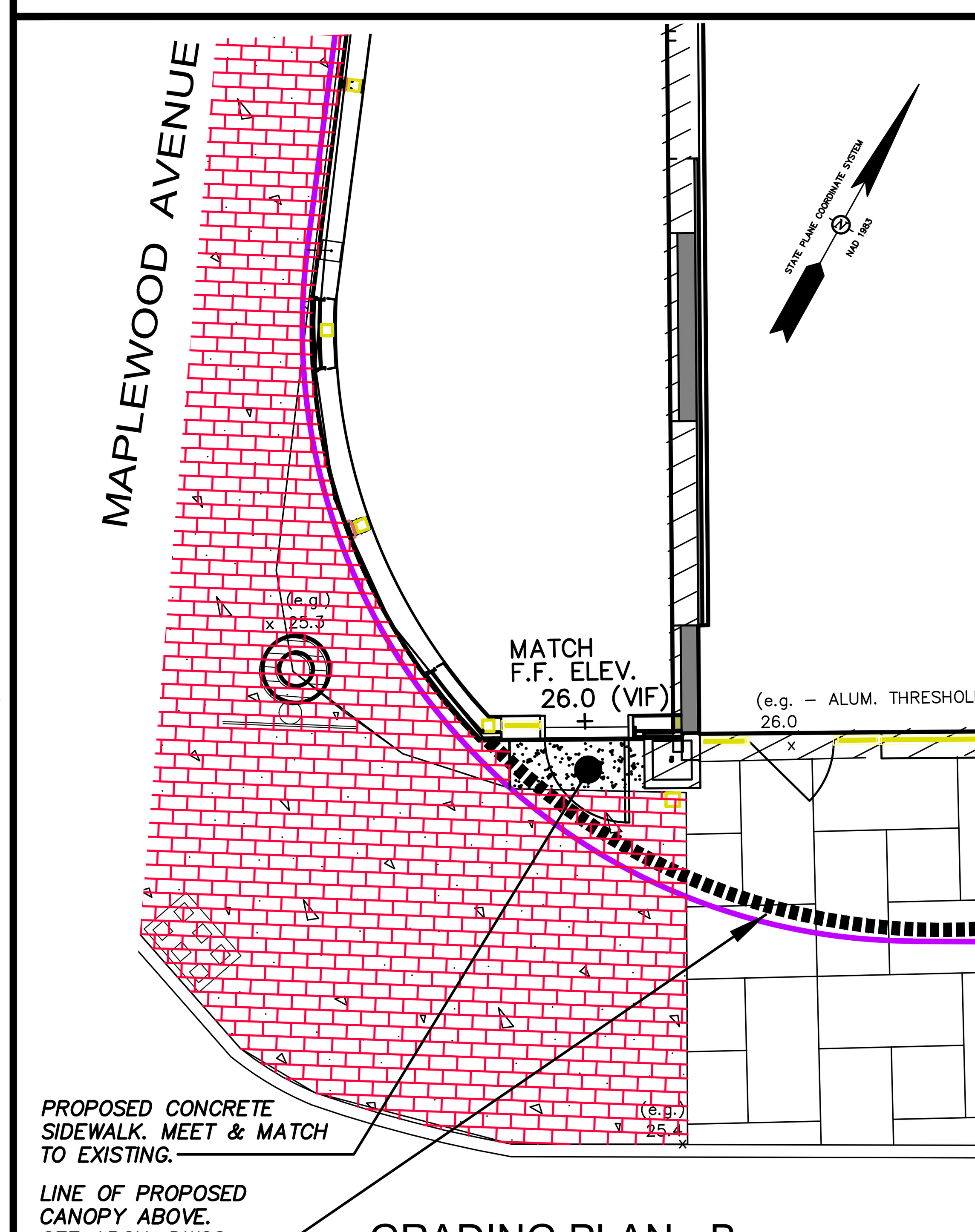
OPEN SPACE PLAN
SCALE: 1" = 10'



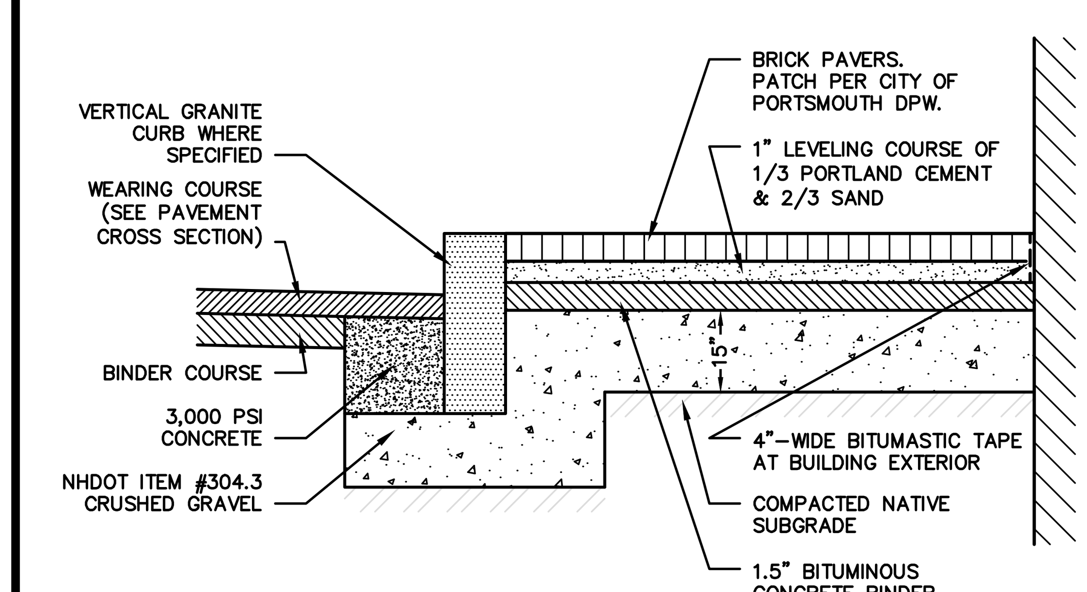
GRADING PLAN - A
SCALE: 1" = 5'



CONCRETE SIDEWALK DETAIL
NOT TO SCALE



GRADING PLAN - B
SCALE: 1" = 5'



BRICK SIDEWALK DETAIL
NOT TO SCALE

P5392

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

STATE OF NEW HAMPSHIRE ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC SUBMISSION

ISSUE DATE:
JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	11/01/22
1	BOA SUBMISSION	EDW	12/21/22
2	TAC SUBMISSION	EDW	01/23/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5392.dwg

SCALE:
22" x 34" – AS SHOWN
11" x 17" – AS SHOWN

OWNER/APPLICANT:
LUCKY THIRTEEN PROPERTIES, LLC
P.O.BOX 300
RYE, NH 03870-0300

PROJECT:
PROPOSED REDEVELOPMENT
TAX MAP 126, LOT 4
147 CONGRESS STREET
PORTSMOUTH, NH

TITLE:
OPEN SPACE PLAN & GRADING PLANS

SHEET NUMBER:
C-2

PROPOSED

MARKET SQUARE ARCHITECTS
104 Congress St., STE 203
Portsmouth, NH 03801
PH: 603.501.0202

HISTORIC DISTRIC COMMISSION
ADMINISTRATIVE APPROVAL
DECEMBER 2022

147 CONGRESS

147 Congress St
Portsmouth, NH 03801

Revisions: #	Description	Date

SCALE:
DRAWN BY: Author
CHECKED BY: Checker
PROJECT NO.: 202209
DATE: 11/18/22

TITLE: PROPOSED CONTEXT

10

1/19/2023 1:34:29 PM

PROPOSED

MARKET SQUARE ARCHITECTS
104 Congress St, STE 203
Portsmouth, NH 03801
PH: 603.501.0202

HISTORIC DISTRIC COMMISSION
ADMINISTRATIVE APPROVAL
DECEMBER 2022

147 CONGRESS

147 Congress St
Portsmouth, NH 03801

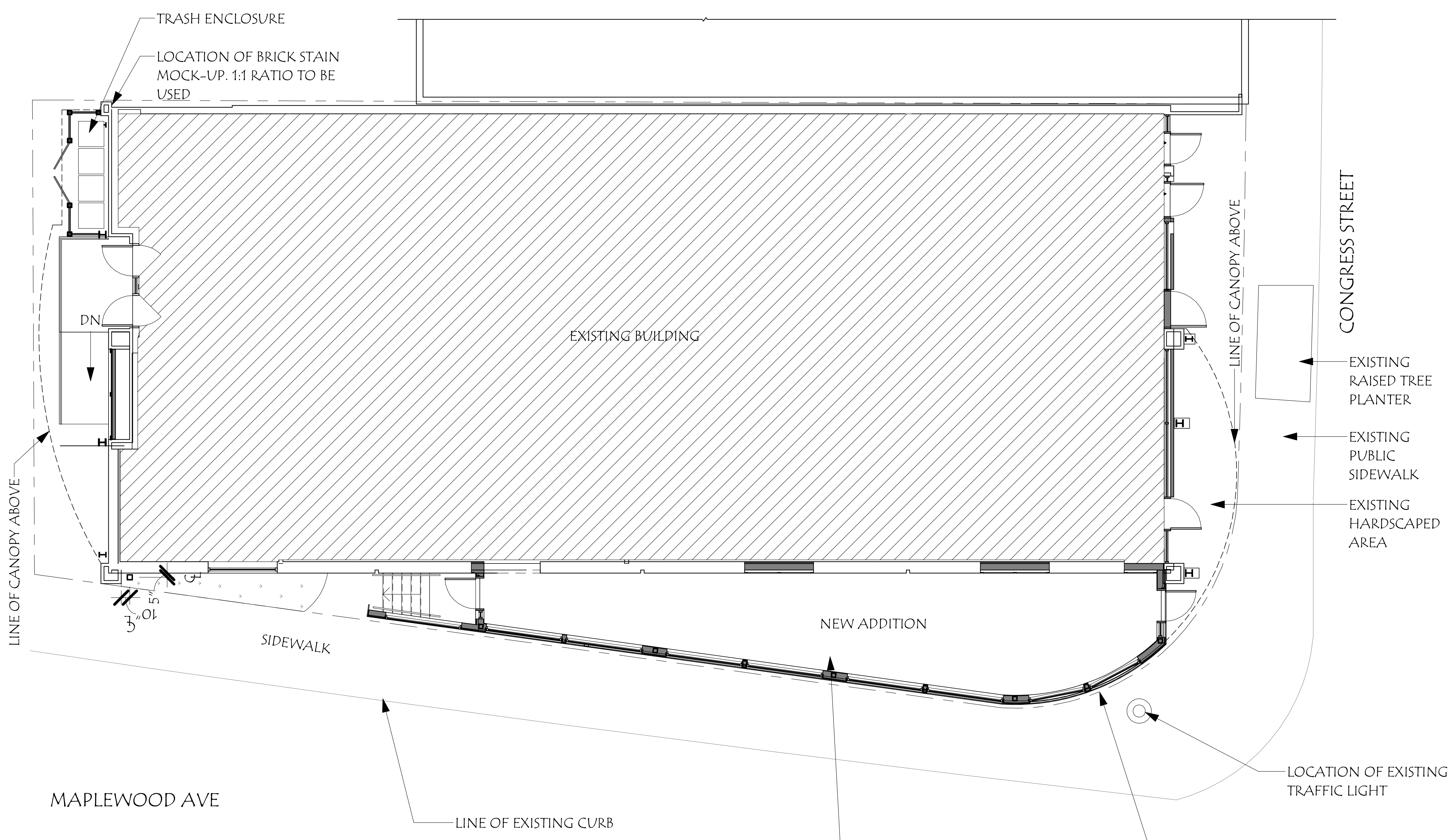
Revisions: #	Description	Date

SCALE:	
DRAWN BY:	Author
CHECKED BY:	Checker
PROJECT NO.:	202209
DATE:	11/18/22

1/19/2023 1:34:31 PM

TITLE: PROPOSED CONTEXT

11



FLOOR PLAN

PROPOSED

MARKET SQUARE ARCHITECTS
104 Congress St, STE 203
Portsmouth, NH 03801
PH: 603.501.0202

HISTORIC DISTRIC COMMISSION
ADMINISTRATIVE APPROVAL
DECEMBER 2022

147 CONGRESS

147 Congress St
Portsmouth, NH 03801

Revisions: #	Description	Date

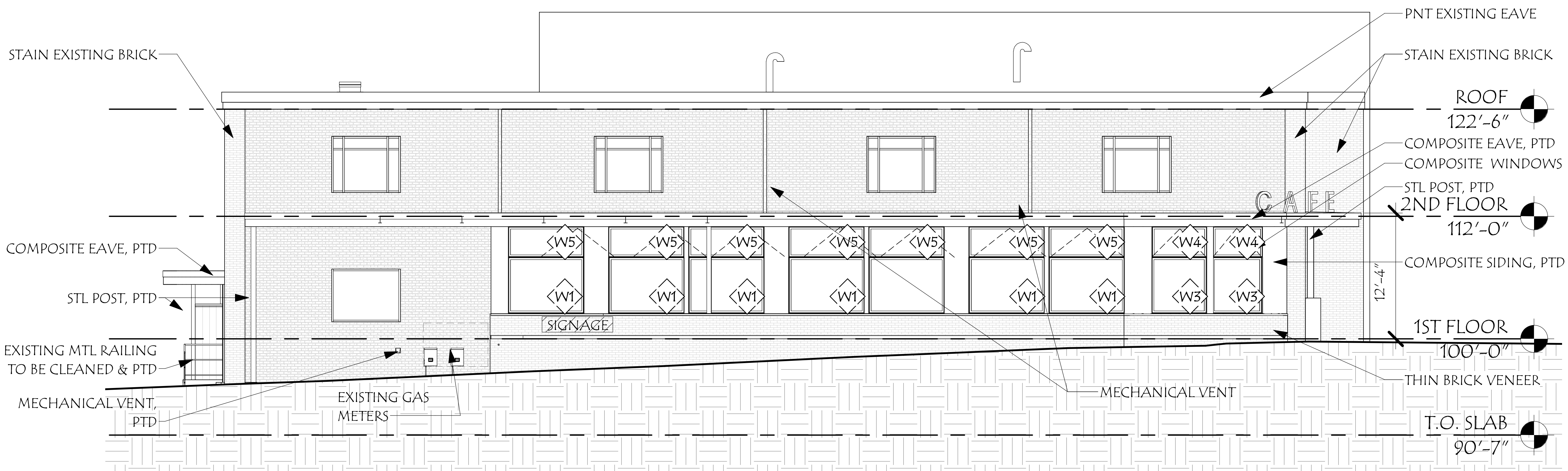
SCALE: 3/32" = 1'-0"
DRAWN BY: SNH
CHECKED BY: RJH
PROJECT NO.: 202209
DATE: 11/18/22

1/19/2023 1:14:55 PM

TITLE:
PROPOSED PLAN

12

INSPIRATION IMAGES AND MATERIALS



WEST ELEVATION

PROPOSED

MARKET SQUARE ARCHITECTS
104 Congress St, STE 203
Portsmouth, NH 03801
PH: 603.501.0202

HISTORIC DISTRIC COMMISSION
ADMINISTRATIVE APPROVAL
DECEMBER 2022

147 CONGRESS

147 Congress St
Portsmouth, NH 03801

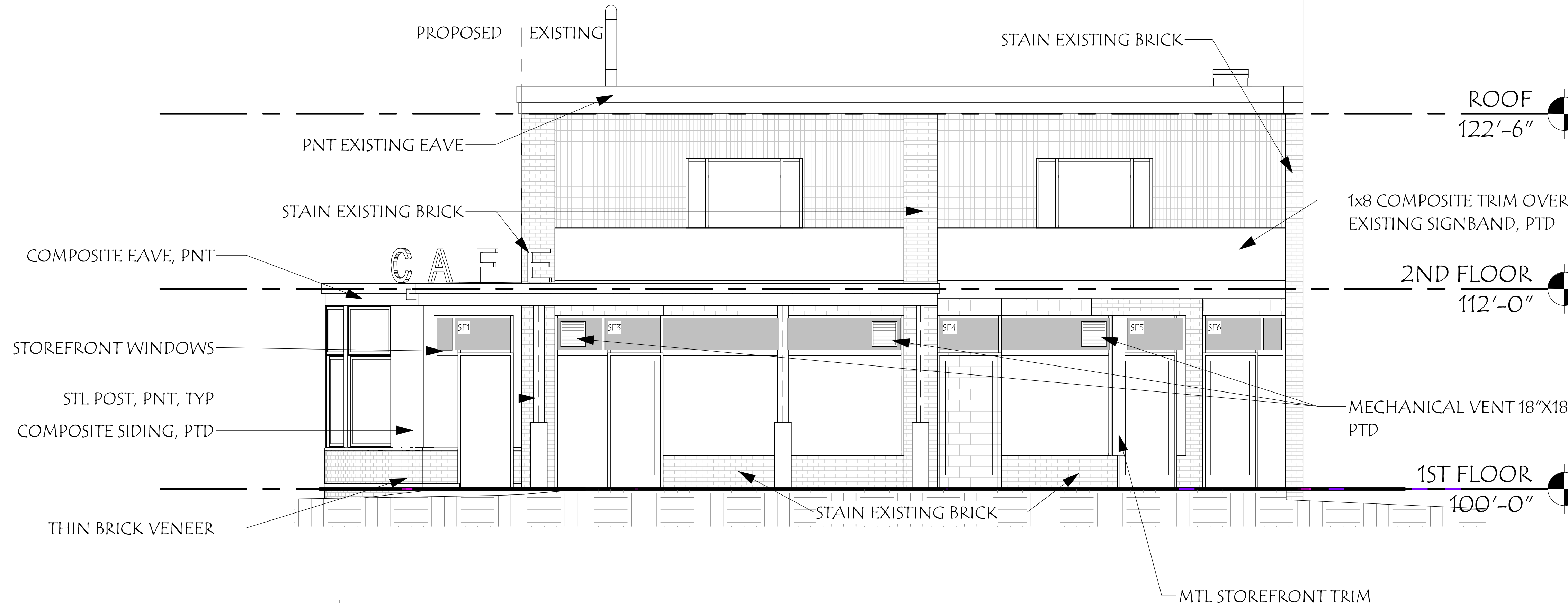
Revisions: #	Description	Date

SCALE:	3/32" = 1'-0"
DRAWN BY:	SNH
CHECKED BY:	RJH
PROJECT NO.:	202209
DATE:	11/18/22

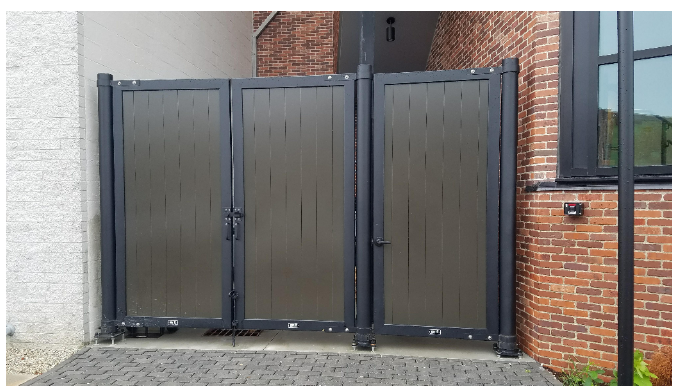
1/19/2023 1:14:57 PM

TITLE: PROPOSED ELEVATIONS

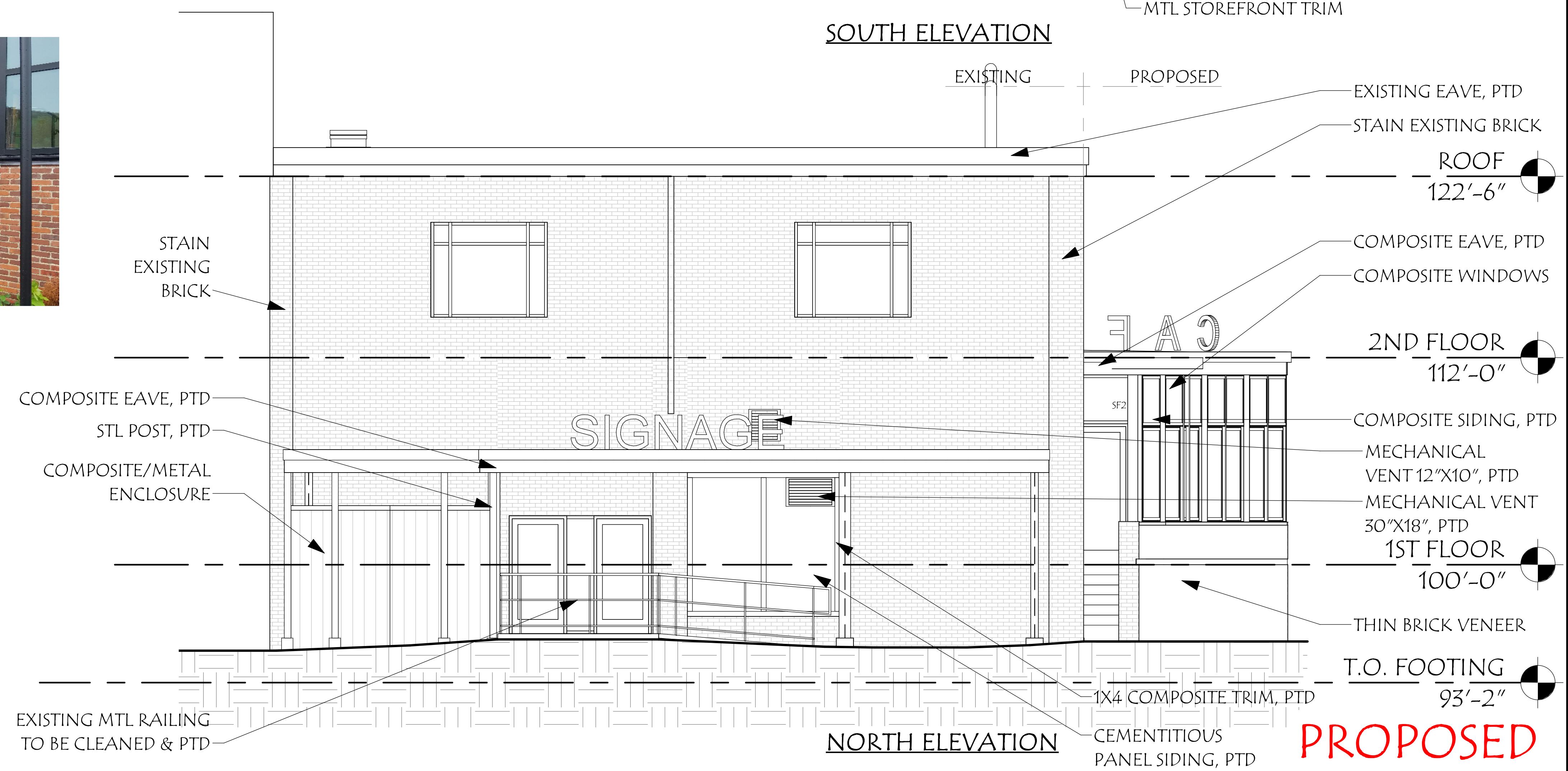
16



SOUTH ELEVATION



ENCLOSURE INSPIRATION



NORTH ELEVATION

PROPOSED

MARKET SQUARE ARCHITECTS
104 Congress St, STE 203
Portsmouth, NH 03801
PH: 603.501.0202

HISTORIC DISTRIC COMMISSION
ADMINISTRATIVE APPROVAL
DECEMBER 2022

147 CONGRESS
147 Congress St
Portsmouth, NH 03801

Revisions:
#	Description	Date

SCALE:	1/8" = 1'-0"
DRAWN BY:	SNH
CHECKED BY:	RJH
PROJECT NO.:	202209
DATE:	11/18/22

1/19/2023 1:14:59 PM

TITLE:
PROPOSED ELEVATIONS

17

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

January 23, 2023

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

Re: Application for Site Plan Review
Assessor's Map 144, Lot 23
361 Islington Street
Altus Project No. 5356

Dear Peter,

On behalf of the Owner, Luckly Thirteen Property, LLC, and the Applicant, It's Good to be Kneaded, LLC and Sean Creely, Altus Engineering respectfully submits an application for Site Plan Review. Good to be Kneaded proposes to renovate and expand the former gas service station. The existing building and canopy façade will be retained. Parking and site access will be improved by eliminating egress onto Islington Street. Landscape and drainage improvements will reduce runoff and improve stormwater quality and enhance the aesthetics of the property.

In October 2022, the Board of Adjustment granted variances to allow the project to proceed to the Site Plan Review level.

Enclosed please find the following items for consideration at the February 7, 2023 TAC Meeting:

- Letter of Authorization (Applicant to Altus)
- "Green" Statement
- Drainage Summary
  - Stormwater Inspection and Maintenance Manual
- Sitework Cost Estimate
- Site Review Checklist
- Phase I Environmental Assessment Findings and Conclusions (full report can be provided if requested)
- Parking Demand Analysis
- Full sized sets of Site Plans

Please call or email me directly should you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.

wde/5356.00 tac cvr ltr

Enclosures

eCopy: Robert Whiteamire, Winter Holben Architecture
Terrence Parker, Terrafirma
Derek Durbin, Esq.
Jeff Dyer, It’s Good to be Kneaded, LLC
Sean Creely, It’s Good to be Kneaded, LLC
Mike Labrie, Lucky Thirteen Properties, LLC

Letter of Authorization

We, Jeffrey N. Dyer and Sean Creeley, Option Holders, hereby authorize Altus Engineering, Inc. of Portsmouth, NH to represent us in all matters concerning the engineering and related permitting of improvements to the property located at 361 Islington Street in Portsmouth, NH on Assessors Map 144, Lot 23. This authorization shall include any signatures required for Federal, State and Municipal permit applications.

	Sean Creeley	10/25/22
Signature	Sean Creeley	Date
Liz Dyer	Elizabeth Dyer	10/28/22
Witness	Print Name	Date

	Jeffrey Dyer	10/27/22
Signature	Jeffrey N. Dyer	Date
Liz Dyer	Elizabeth Dyer	10/27/22
Witness	Print Name	Date

MEMORANDUM –Green Building Statement

Date:	January 18, 2023
To:	Portsmouth Technical Advisory Committee
Subject:	The Getty – 361 Islington Street
CC to:	

The former Getty service station is currently unoccupied, and the proposed adaptive reuse project will help to revitalize the property by transforming it into a bagel focused restaurant. The proposed enhancements to the station will allow this neglected site to once again contribute to the vitality of the neighborhood. The following list of features & green improvements are proposed to comply with Section 2.5.3.1(a) of the Site Plan Review Regulations:

1. The proposed bagel restaurant will adapt and reuse the existing site and structure while the renovation and additions will improve the building performance by meeting/exceeding the applicable energy code requirements.
2. Site lighting will be efficient LED type, and shall be 'Dark Sky' friendly meeting or exceeding the minimum City requirements.
3. The site development includes a landscape plan that will improve existing conditions by:
    a. providing shade trees to help reduce the heat island effect and improve the environment
    b. proposed lawns and planting beds will reduce the current impervious surfaces on site reducing runoff, promoting infiltration, and reducing the heat island effect
4. The site has been developed to allow an existing mature oak tree at the rear of the site to remain.
5. A closed drainage system with deep sump catch basins has been added to provide preliminary treatment of the runoff prior to discharge into the City's closed drainage system.
6. Site development provides parking for motorcycles, motor scooters, and bicycles encouraging promoting alternative means of transportation to reduce the carbon impact.
7. Site access to the building shall be improved by promoting pedestrian access directly from the sidewalk. Again, this will encourage accessing the business without utilizing a car.
8. The building additions and renovation work will utilize durable materials with a long lifespan that can be recycled upon the end of use.
9. Restroom plumbing fixtures will include low flow / dual flow water closets for efficient water use.
10. Equipment intended for the building heating and cooling will be high efficiency lowering the energy used to operate.

We trust this list addresses any questions regarding the environmental impact of the proposed renovation/additions. Please let us know if you need any additional information or have any concerns.

Thank You,

Robert Whiteamire
Architect
WINTER HOLBEN

ALTUS ENGINEERING

Civil
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Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

Drainage Summary

It's Good To Be Kneaded, LLC is proposing to redevelop the lot located at 361 Islington Street in Portsmouth, NH. The property is identified as Assessor's Map 144, Lot 23, is approximately ±15,114 square feet in size and is in the City's Character District 4 – L2 (CD4-L2) district. The site currently has a vacant building that was previously used as the Getty Service Station and more recently used as a site for a food truck. The lot is serviced by municipal water and sewer.

Site Soils

The NRCS indicates that the subject property consists of several primary soil classifications:
699 – Urban-Land, HSG C

Pre-Development (Existing Conditions)

The pre-development site is approximately 94.9% impervious. There are no stormwater BMPs on the site; therefore runoff leaves the site untreated. Runoff sheet flows from the lot into the streets closed drainage system that eventually drains into North Mill Pond.

Post-Development (Proposed Site Design)

The proposed project will refurbish the existing structure, propose building additions, and convert the closed business into an eatery. The post-development site will reduce the impervious area by 1,889 square feet resulting in a net impervious area of 83.4 % of the site. The proposed stormwater system includes hooded catch basins with deep sumps which capture much of the runoff onsite where it is pre-treated before entering the municipal closed drainage system.

Calculations Method

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). All rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Point of Analysis identified on the plans for the 2, 10, 25, and 50-year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

*Rainfall Intensities Reflect 15% Increase	**2-Yr Storm (3.69 inch)**	**10-Yr Storm (5.60 inch)**	**25-Yr Storm (7.10 inch)**	**50-Yr Storm (8.50 inch)**
Pre	1.20	1.85	2.35	2.82
Post	1.14	1.80	2.31	2.78
Change	**-0.06**	**-0.05**	**-0.04**	**-0.04**

Conclusion

As the above table demonstrates, the proposed peak rates of runoff will be decreased from the existing conditions for all analyzed storm events. This proposed site development will result in a decrease of site runoff, provide needed stormwater treatment, and resulting in betterment for the city and community. Altus believes that no down gradient abutters will be negatively impacted by the proposed development.

edw/5356.03 Drainage.memo

STORMWATER INSPECTION AND MAINTENANCE MANUAL

"It's Good to be Kneaded"

Assessor's Map144, Lot23

OWNER AT TIME OF SUBDIVISION APPROVAL:
It's Good To Be Kneaded, LLC
c/o Sean Creeley
337 Richards Avenue
Portsmouth, NH 03801

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

	Name	Company	Phone
Owner:	*It's Good To Be Kneaded, LLC*		*(603) 547-0509*
Inspection:	*It's Good To Be Kneaded, LLC*		*(603) 547-0509*
Maintenance:	*It's Good To Be Kneaded, LLC*		*(603) 547-0509*

NOTES:

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity.

CATCH BASINS

Function – Catch basins collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned annually and any removed sediment and debris shall be disposed of at a solid waste disposal facility.

LANDSCAPED AREAS – ORGANIC FERTILIZER MANAGEMENT

Function – All fertilizer used on site shall be certified organic. Organic fertilizer management involves controlling the rate, timing and method of organic fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Organic fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply organic fertilizer to frozen ground.
- Clean up any organic fertilizer spills.
- Do not allow organic fertilizer to be broadcast into water bodies.
- When organically fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

DE-ICING CHEMICAL USE AND STORAGE

Function – Sand and salt are used for de-icing of drives.

Maintenance

- Salt is highly water-soluble. Contamination of freshwater wetlands and other sensitive areas can occur when salt is stored in open areas. Salt piles shall be covered at all times if not stored in a shed. Runoff from stockpiles shall be contained to keep the runoff from entering the drainage system.
- When shared driveways and walks are free of snow and ice, they should be swept clean. Disposal shall be in a solid waste disposal facility.

- **Salt use shall be minimized.** Sand shall be used for de-icing activities when possible. Salt is highly water-soluble. Contamination of freshwater wetlands and other sensitive areas can occur when salt is stored in open areas. Owner shall not store salt piles on site.

GENERAL CLEAN UP

- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.
- Once in operation, all paved areas of the site should be swept at least once annually at the end of winter/early spring prior to significant spring rains.

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
(603) 433-2335

"It's Good To Be Kneaded" 361 Islington Street

Portsmouth, NH

Engineer's Opinion of Cost

(January 23, 2023 Plan Set)

PROJECT: 5161

Est. Qty	Unit	ITEM DESCRIPTION &	Cost/Unit	Total
1	LS	Site Demolition	$ 10,000.00	$ 10,000.00
180	TON	Hot Bituminous Pavement	$ 90.00	$ 16,200.00
656	SY	Concrete Sidewalk and Pads (incl. subgrade)	$ 25.00	$ 16,400.00
300	CY	Gravel (NHDOT 304.2)	$ 30.00	$ 9,000.00
150	CY	Crushed Gravel (NHDOT 304.3)	$ 34.00	$ 5,100.00
110	LF	6" & 8” PE Pipe (smooth interior)	$ 30.00	$ 3,300.00
180	LF	12” PE Pipe (smooth interior)	$ 70.00	$ 12,600.00
4	EA	4ft Dia. Catch Basin / Drain Manhole	$ 3,500.00	$ 14,000.00
1	EA	Drop Inlet Structure	$ 1,500.00	$ 1,500.00
1	EA	Grease Trap	$ 10,000.00	$ 10,000.00
5	EA	Manhole Cover and Frame	$ 700.00	$ 3,500.00
5	EA	Bollards	$ 250.00	$ 1,250.00
1	EA	Detectable Warning Devices, Cast Iron	$ 750.00	$ 750.00
154	LF	Vertical Granite Curb	$ 50.00	$ 7,700.00
363	LF	Sloped Granite Curb	$ 40.00	$ 14,520.00
125	LF	6" SDR 35 Sewer Pipe	$ 45.00	$ 5,625.00
80	LF	Domestic Water Service	$ 30.00	$ 2,400.00
80	LF	Fire Service	$ 50.00	$ 4,000.00
136	LF	SCH 40 Conduit (x4 per trench, incl. trenching and backfill)	$ 45.00	$ 6,120.00
1	LS	Signage	$ 500.00	$ 500.00
70	LF	Retaining Wall	$ 115.00	$ 8,050.00
3	EA	Light Pole	$ 4,000.00	$ 12,000.00
1	LS	Pavemnt Striping	$ 1,500.00	$ 1,500.00
1	LS	Misc. Temp. Erosion and Sediment Control	$ 3,000.00	$ 3,000.00
1	LS	Planted Landscape	$ 15,000.00	$ 15,000.00
			****SUBTOTAL:**	**$ 184,015.00**

EXCLUSIONS:

ITEMS EXCLUDED FROM THIS ESTIMATE INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
INSPECTION FEES, MONUMENTATION, HVAC PADS, TRANFORMER PADS, ELECTRICAL PULL BOXES, ELECTRIC AND COMMS CABLE, COMMS PEDESTALS, TEMPORARY FENCING AND BARRICADES, TRAFFIC CONTROL, POLICE DRETAILS, MATERIALS AND COMPACTION TESTING, BUILDING FOUNDATIONS, BUILDING FOUNDATION EXCAVATION, BUILDING MOUNTED EXTERIOR LIGHTING, BUILDINGS (INCLUDING MODIFICATIONS TO EXISTING BUILDINGS), TEMPORARY STABILIZATION, STAGING, MOBILIZATION, TEMPORARY CONSTRUCTION FACILITIES, SWPPP REQUIREMENTS, UNFORESEEN CONDITIONS, PRICE ESCALATION, LEGAL WORK, ETC.

THIS ESTIMATE IS FOR PERMIT APPLICATION PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION, CONSTRUCTION BIDDING, CONTRACTING OR SUBCONTRACTING.

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: It's Good to be Kneaded, LLC Date Submitted: 1/23/23

Application # (in City's online permitting): 22-195

Site Address: 361 Islington Street Map: 144 Lot: 23

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	Viewpoint	N/A
☒	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**	Viewpoint	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Viewpoint - submission materials	
☒	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 floor plans plan package	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Cover sheet, all sheets in title block	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Cover sheet, bottom left LOA	N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Condtions plan, sheet 1 of 1 and cover sheet	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover sheet	N/A
☒	List of reference plans. **(2.5.3.1H)**	Existing conditions survey plan, bottom center	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Site Preparation plan demolition notes, left & Utility Plan notes left, note 11	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Note 3 exisitng conditions plan bottom center	N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	No wetlands on site	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Cover sheet, all plan sheets title block, legend D-1	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Cover sheet, all plan sheets, right side middle	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	Existing conditions survey, 1 of 1	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing conditions survey 1 of 1 Site plan, C-2 No striped spaces Site plan, C-2 Site plan, C-2 Site plan, C-2 NA - no on-site wetlands Site plan, C-2	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Elevations, sheet A1 Site lighting plan Site plan, sheet C-2	
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site plan, C-2 Truck turning templates T-1 and T-2	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan, C-2	
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	No domestic wells. Monitoring wells - Site preparation plan. Water lines depicted on Utility Plan	
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Proposed sanitary sewer depicted on Utility plan	

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	See Utility plan	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	Site Plan	
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Storm drainage - Utility plan Site Plan Note Site Plan No exterior storage of materials proposed	
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Site lighting plan	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Note on Site plan	
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plan	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading Plan	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site plan	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions and Site plan	
☒	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	Site Plan, lower the left Architectural drawings	
☒	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	Not applicable	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Not applicable	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Green statement	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	Project is not within a wellhead protection or aquifer protection area	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Grading Plan, Erosion control details	
☒	Inspection and Maintenance Plan **(7.6.5)**	Application package	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Waivers - site plan no new driveways. Existing driveway relocated Variances noted on site plan, bottom center easement on existing conditions plan and site plan	
☐	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Drainage narrative provided Submittal package for water/wastewater generation Traffic generation if requested Noise - none expected Grading plan for stormwater managment and details no archaeological or wetland studies provided	
☒	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)**	Eversource will not provide design information until under applicant's ownership	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	None required	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site plan	N/A
☒	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	Not applicable	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Waiver requested Site Plan	N/A

Applicant's Signature: Eric D. Weinrieb, PE **Date:** 1/23/23

7 Findings and Conclusions

The goal of this Phase I ESA is to identify RECs as defined by the ASTM Standard. This section identifies known or suspected RECs, historical RECs, Controlled RECs, and de minimis conditions. During the Phase I ESA, BSC Group personnel identified one REC and identified several de minimis conditions associated with the Site. BSC Group's opinion is limited by the conditions prevailing at the time the work was performed and the applicable regulatory requirements in effect.

To meet the requirements of Section 12.8 of the Standard, the statement below has been included to preface the conclusions of this report.

> We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of 1 parcel, located at 361 Islington Street in Portsmouth, New Hampshire, the Site. Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. This assessment has revealed evidence of de minimis conditions in connection with the Site, as discussed below.

7.1 RECs

One REC has been identified for the Site. The Site has been subject to documented past releases of OHM. The Site is identified as NHDES Case #2284. A release of gasoline from an UST in 1989 was reported to NHDES. This release is part of ongoing remediation efforts actively managed by Getty under NHDES Site #198910068. The groundwater is actively being monitored under Groundwater Management Permit No. GWP-198910068-P-003. It is BSC Group's understanding that the liability for these ongoing remediation efforts are the sole responsibility of Getty Realty Corporation.

7.2 De Minimis Conditions

BSC Group personnel identified two de minimis conditions that could affect the Site during our records review and Site observations. BSC personnel were unable to determine the presence or condition of any floor drains under equipment or furniture in the former garage bay area due to the presence of the former commissary kitchen equipment and furniture. Upon removal of all equipment/furniture the floor area should be re-inspected for the presence/condition of floor drains. Two areas of miscellaneous debris were observed on-site, including miscellaneous metal wire shelves, and waste storage drums located behind the building and several carboys of car wash related fluids in the utility room. These materials should be removed and properly disposed of prior to taking ownership.

7.3 Vapor Encroachment Conditions

A VEC is the presence or likely presence of COC vapors in the subsurface of the Site caused by the release of vapors from contaminated soil or groundwater either on or near the target property. BSC Group personnel concluded that a VEC is likely to exist at the Site based on the review of onsite documented releases and the historical use of the property as a filling station.

8 Opinion and Recommendations

8.1 Opinion

According to the Phase I ESA Standard, the report shall include an opinion of the impact on the Site of the conditions identified in the Findings Section. BSC Group's opinion is limited by the conditions prevailing at the time the work was performed and the applicable regulatory requirements in effect. BSC Group personnel identified one REC and several de minimis conditions during the Phase I ESA.

In addition, BSC Group personnel concluded that a VEC is likely to exist based on the review of documented releases in proximity of the Site.

8.2 Recommendations

Based on the findings of this report, BSC Group recommends the following:

- The one REC identified during the Phase I ESA is the ongoing remediation efforts actively managed by Getty under NHDES Site #198910068, BSC does not recommend conducting a comprehensive Phase II ESA at the Site including sampling of subsurface media (soil and groundwater) based on the understanding from the Client that these ongoing remediation efforts are the sole responsibility of Getty Corporation.
- Based on the likely presence of a VEC, the Client may elect to perform or request the current Owner perform indoor air sampling for COCs that could migrate within soil vapor to the interior of the building to confirm the air quality within the building is safe for workers and customers.
- Several housekeeping issues should be completed prior to purchase of the property; these include removal of the miscellaneous wire shelving and unlabeled drums, as well as removal of any chemicals located within the utility room. Once this equipment/furniture is removed a follow-up visit should be conducted to observe the floor areas for the presence/condition of floor drains.

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

ON-SITE PARKING
CONDITIONAL USE PERMIT
REQUIREMENTS
361 ISLINGTON STREET
PORTSMOUTH, NH
"IT'S GOOD TO BE KNEADED"

January 26, 2023

In accordance with Section 10.1112.14 of the Zoning Ordinance, the Planning Board may grant a Conditional Use Permit (CUP) to allow a building or use to provide less than the minimum number of off-street parking spaces required by Section 10.1112.30 or Section 10.1115.20 provided the following is met:

Section 10.1112.141
A parking demand analysis has been submitted that demonstrates that the number of off-street parking spaces provided is sufficient. A parking demand analysis has been completed and is included in the submission package.

Section 10.1112.142
On behalf of it's Good to be Kneaded (Kneaded), we respectfully request that the application filed online is modified to include the Conditional Use Permit for off-street parking relief.

Section 10.1112.143
If the conditions are met, the Planning Board may issue a Conditional Use Permit. It is Altus' opinion that the Parking Demand Analysis, the location of the site, and physical characteristics of the site warrant the Board to grant the approval.

Section 10.1112.144
The Planning Board at their discretion may require more or less off-street parking than the minimum number requested. Altus believes that the number of spaces proposed are satisfactory and that the parking demand analysis fully supports the need for the board to grant the approval.

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133 Court Street
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03801-4413

PARKING DEMAND ANALYSIS
361 ISLINGTON STREET
PORTSMOUTH, NH
"IT'S GOOD TO BE KNEADED"

Revised January 26, 2023

It's Good to be Kneaded (Kneaded) is proposing to renovate the former Getty Service Station building at 361 Islington Street to create a bagel focused restaurant. They are proposing to construct two small building additions to create a total building area of 2,165 SF.

There will be a 1,183 SF seasonal patio area for dining under the canopy. It is understood that the exterior/seasonal patio use does not need to be included in the parking computations.

Retaining the existing building and canopy creates site design challenges. With the building sited in the middle of the property, an efficient and sufficiently sized parking field is not possible without compromising the canopy area for parking.

The City of Portsmouth Zoning Ordinance requires 1 parking space for every 100 SF of gross floor area for a restaurant. The gross floor area of the building (2,165 SF), 22 spaces are required.

12 legal, full-sized parking stalls are proposed with 5 ample sized moped/motorcycle spaces and two bike rack areas that can accommodate up to 14 bicycles, leaving the site deficient 10-full sized spaces.

Along Islington Street are two similar uses, The Kitchen Restaurant and White Heron. The Kitchen has 39-interior seats and 22-exterior seats (61-total). They do not have any on-site parking facilities for their customers. White Heron has 28-interior seats. They have 2-dedicated parking stalls and 4-optional parking stalls.

Kneaded is proposing 43-interior restaurant seats and 31-exterior, seasonal seating (74-total). The size is similar to the White Heron.

Interior seating comparison

The Kitchen	0 spaces per interior seating provided
White Heron	1 space per 14 interior seating provided
Kneaded	1 space per 3.6 interior seating provided

The process to make bagels is more space intensive than other types of restaurants as bagels need to proof for an extended period of time before they are baked. The kitchen addition also allows for them to fully utilize the existing building, showing off the historic gas station windows and garage overhead doors as a point of interest. Kneaded is offering the community a place to come and enjoy a quick meal with friends and neighbors. They are hoping that the community will see "The Getty" as a part of the neighborhood and will realize that the walk or bike ride is far more enjoyable than the short drive. They are hoping as well that the City's upgrade to the Islington Street corridor will help to promote this type of travel.

In the Zoning Ordinance, motorcycle and moped parking do not count towards the required parking. Arguably, the 5-spaces should count as the spaces are expected to be used year-round. The spaces are oversized for their intended use and can accommodate more than 5-mopeds.

Under section 10.1116.13, up to 5-percent of the required parking can be replaced with bicycle parking at a ratio of 1 automobile space being replaced by 6 bicycle spaces. The applicant has done this therefore, we are reducing the deficiency by one space.

The foundry garage is approximately 2,000-feet from the property. It is much closer to the site than many of the downtown businesses whose employees currently use it.

Providing a friendly environment that promotes pedestrian and alternative transportation will reduce the traffic demand for traditional parking.

Based on the high turnover business model, it is anticipated that on busy days that the maximum occupancy will be 75-percent of the interior seating capacity or approximately 32-people. Assuming that all parking spaces are used with 2-occupants, the parking spaces can accommodate 24 customers.

Promoting walking, bicycling and mopeds, Kneaded is confident that the remaining demand will be accommodated on-site.

Thus, it is Altus' opinion that 12 on-site parking stalls will be more than adequate for the expected demand.

APPROVED BY THE PORTSMOUTH PLANNING BOARD	
CHAIRMAN	DATE

PROPOSED SITE DEVELOPMENT PLANS
It's Good To Be Kneaded

361 Islington Street
Portsmouth, New Hampshire

Assessor's Parcel 144, Lot 23

Issued For: TAC Review

Plan Issue Date:

January 23, 2023 Initial TAC Submission

Owner:

LUCKY THIRTEEN PROPERTIES, LLC

P.O. BOX 300
RYE, NH 03870
TEL. (603) 661-6633

Applicant:

IT'S GOOD TO BE KNEADED, LLC

C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801
TEL. (603) 547-0509

Surveyor:

James Verra and Associates, Inc.
LAND SURVEYORS
101 Shattuck Way, Suite 8
Newington, NH 03801-7876
TEL. (603) 436-3557
Job No: 23455

Landscape Architect:

terra firma landscape architecture

163A COURT STREET, PORTSMOUTH, NH 03801
TEL. (603) 531-9109

Civil Engineer:

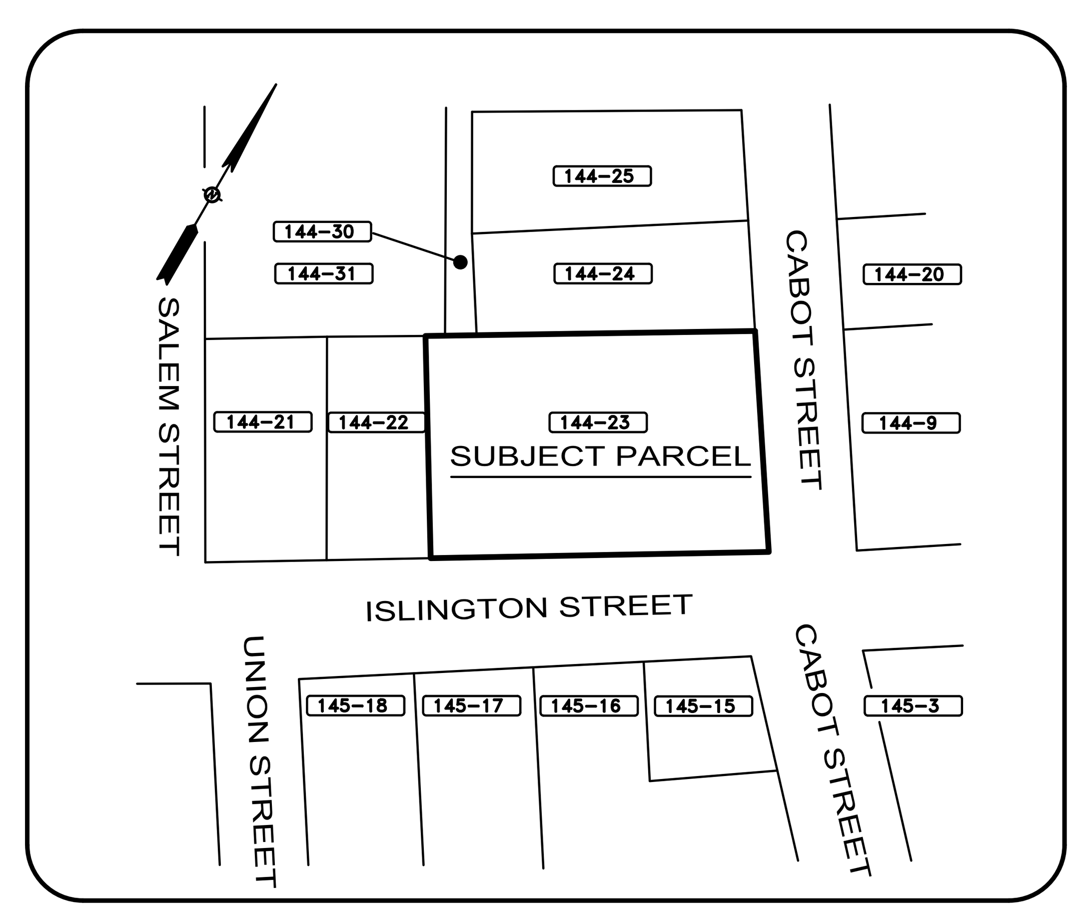
ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Architect:

WINTER HOLBEN
Architecture + Design

7 Wallingford Square Unit 209-9
KITTERY, ME 03904
O: 207.994.3104 | C: 419.569.6143

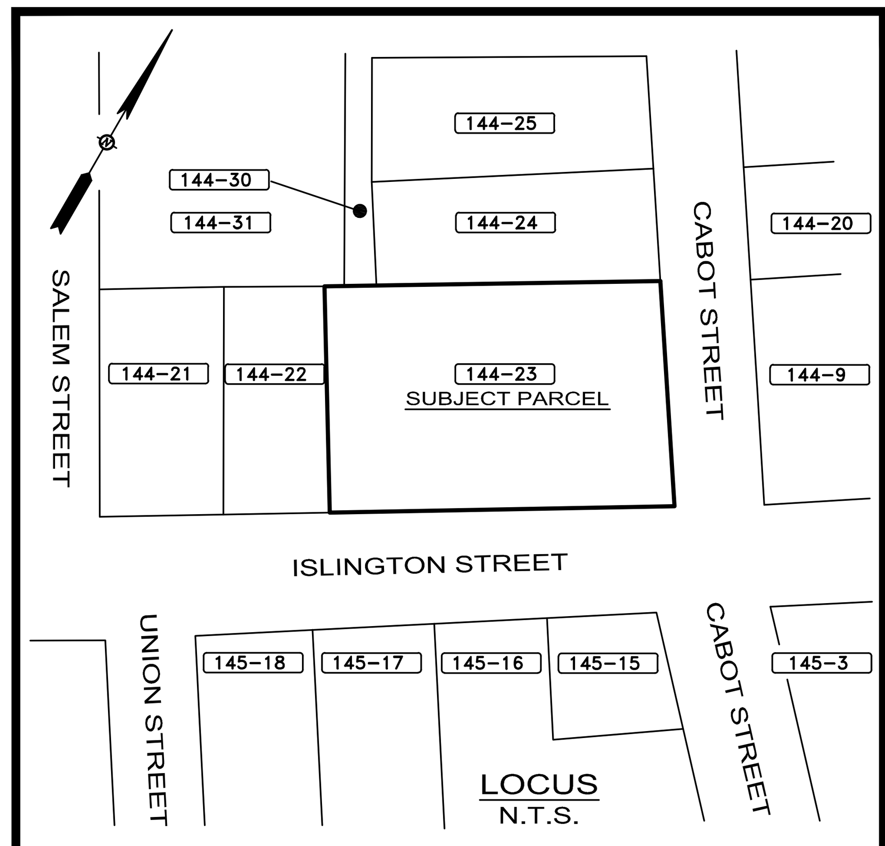


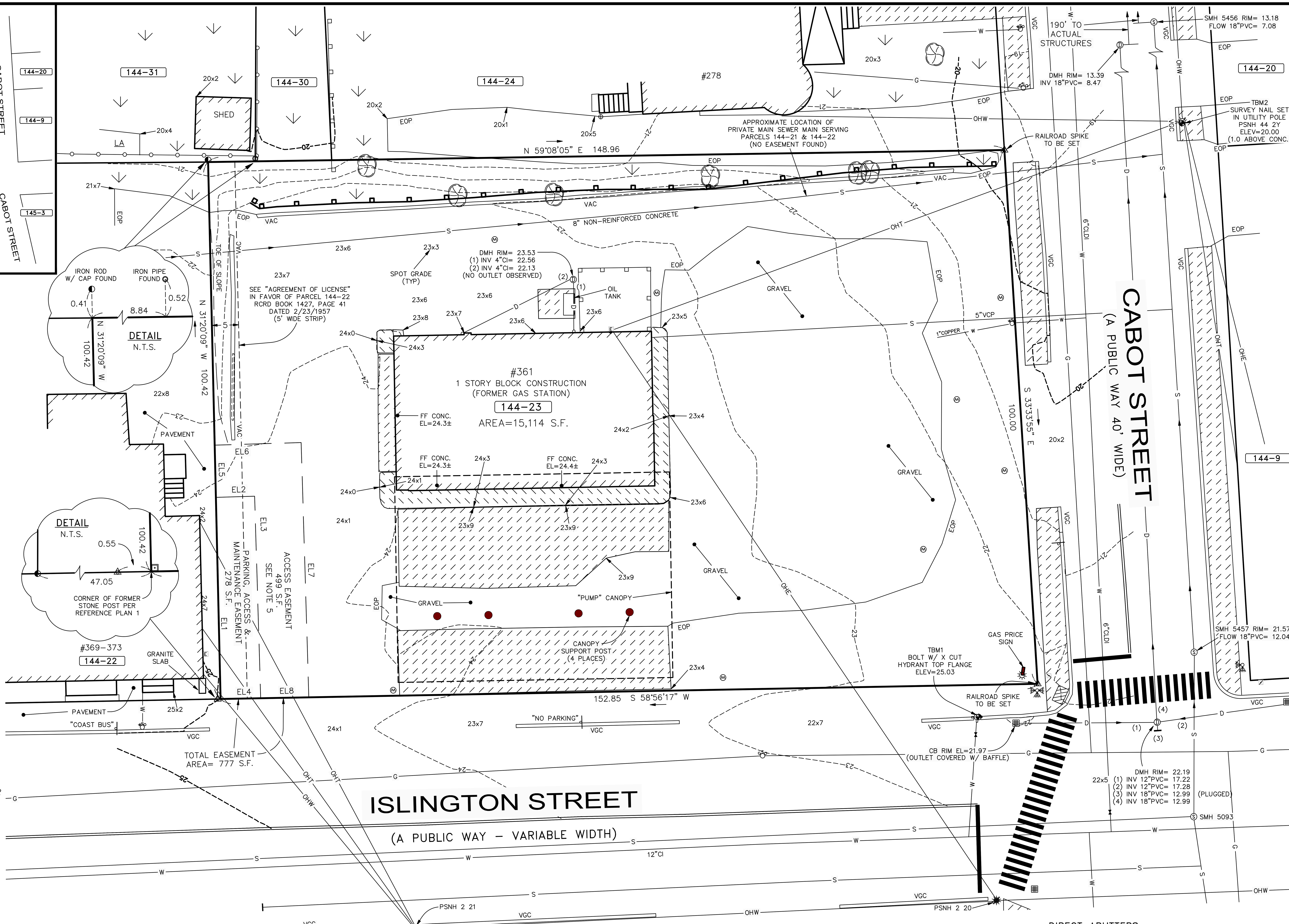
LOCUS NOT TO SCALE

Sheet Index Title	Sheet No.:	Rev.	Date
Existing Conditions Plan	1 of 1	0	10/18/21
Site Preparation Plan	C-1	0	01/23/23
Site Plan	C-2	0	01/23/23
Grading Plan	C-3	0	01/23/23
Utility Plan	C-4	0	01/23/23
Landscape Plan	L-1	0	01/23/23
Landscaping Details	L-2	0	01/23/23
Site Lighting Plan	1 of 1	0	01/23/23
Truck Turning Movements - Trash	T-1	0	01/23/23
Truck Turning Movements - Delivery	T-2	0	01/23/23
Detail Sheet	D-1	0	01/23/23
Detail Sheet	D-2	0	01/23/23
Detail Sheet	D-3	0	01/23/23
Detail Sheet	D-4	0	01/23/23
Detail Sheet	D-5	0	01/23/23
Floor Plan	A1.0	0	01/16/23
Exterior Elevations	A2.0	0	01/16/23
Exterior Elevations	A2.1	0	01/16/23

Permit Summary:	Approval:
Portsmouth Zoning Board of Adjustment	10/18/22
Portsmouth Site Plan Review	Pending

P5356





LINE	BEARING	DISTANCE
EL1	N 31°20'09" W	37.71
EL2	N 58°17'06" E	7.25
EL3	S 31°42'54" E	37.79
EL4	S 58°56'17" W	7.50
EL5	N 31°20'09" W	9.76
EL6	N 58°17'06" E	16.18
EL7	S 31°42'54" E	47.65
EL8	S 58°56'17" W	9.00

LEGEND:

- IRON ROD
- IRON PIPE
- CHAIN LINK FENCE
- WOOD FENCE
- SEWER MANHOLE
- CATCH BASIN
- CATCH BASIN
- MONITORING WELL
- BOLLARD
- UTILITY POLE
- LIGHT POLE
- UTILITY POLE W/TRANSFORMER
- GUY
- ELECTRIC METER
- GAS METER
- GAS SHUT OFF VALVE
- — S — SEWER LINE
- — W — WATER LINE
- — D — DRAIN LINE
- — G — GAS LINE
- —OHW— OVERHEAD WIRES
- —OHE— OVERHEAD ELECTRIC
- —OHT— OVERHEAD TELEPHONE
- —UGU— UNDERGROUND UTILITIES
- SIGN
- VGC VERTICAL FACED GRANITE CURB
- SAC SLOPED FACED ASPHALT CURB
- 9-8 TAX SHEET – LOT NUMBER
- GRASS COVER
- PSNH PUBLIC SERVICE CO. OF N.H.
- RCRD ROCKINGHAM COUNTY REGISTRY OF DEEDS
- DECIDUOUS TREE
- CONCRETE

10 0 10 20 30 40 FEET

5 0 5 10 METERS

REFERENCE PLANS:

1. PLAN OF LAND, NOS. 341 & 361 ISLINGTON ST., PORTSMOUTH, N.H., SURVEYED FOR GULF OIL CORP., DATED 4/1956, RCRD PLAN 02538.
2. EASEMENT PLAN OF LAND IN PORTSMOUTH, NH, GETTY, 361 ISLINGTON STREET, PORTSMOUTH, N.H., DATED 4/20/2004, RCRD PLAN C-31604.
3. CONDOMINIUM SITE PLAN, 369-373 ISLINGTON STREET CONDOMINIUM, FOR THE GHAMAMI REVOCABLE TRUST, DATED 10/2005, RCRD PLAN D-34059.
4. AMENDED CONDOMINIUM SITE PLAN, 383-385 ISLINGTON STREET CONDOMINIUM, PORTSMOUTH, N.H., GREENWAY MANAGEMENT NORTH, LLC, DATED 11/30/2005, RCRD PLAN D-33370.
5. PLAN OF LOT, NO'S 284-286 CABOT STREET, PORTSMOUTH, N.H., DATED 4/1966, FILE NO. 115, PLAN NO. 2228, BY JOHN W. DURGIN, CE, NOT RECORDED.

NOTES:

1. OWNER OF RECORD................. RYE ATLANTIC PROPERTIES, LLC
   ADDRESS................................. PO BOX 4780, PORTSMOUTH, NH 03802-4780
   DEED REFERENCE..................... 5360/1192
   TAX SHEET / LOT.................... 144-23
2. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
3. HORIZONTAL DATUM: NAD 1983; ESTABLISHED BY SURVEY GRADE GPS OBSERVATIONS AND NGS "OPUS" SOLUTION; REF FRAME: NAD 83 (2011)(EPOCH:2010.0000) VERTICAL DATUM: NAVD 1988 VERTICAL BM: NHDOT 379-0150
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
5. SEE RCRD BOOK 4313, PAGE 2577 FOR PARKING AND ACCESS EASEMENTS IN FAVOR OF PARCEL 144-22.

DIRECT ABUTTERS

MAP-LOT	OWNER OF RECORD	DEED REF.
144-22	ISLINGTON PLACE CONDOMINIUM ASSOCIATION C/O SHEILA GHAMAMI, 10 VALLEY VIEW WAY, METHUEN, MA 01844	4694/564
144-24	PAUL H. WHITE, TRUSTEE JANET L. WHITE-NAY, TRUSTEE C/O PAUL H. WHITE PO BOX 1325, PORTSMOUTH, NH 03802	4796/1339 2958/1878
144-30	CHARLES J. COCCHIARO 45 SALEM ST, PORTSMOUTH, NH 03801	2611/1195
144-31	ARTHUR H. HANSCOM, TRUSTEE BETTY J. HANSCOM, TRUSTEE 41 SALEM ST, PORTSMOUTH, NH 03801	3721/1082 3721/1082

P4466

SURVEYOR:

James Verra & Associates, Inc.
LAND SURVEYORS
101 SHATTUCK WAY – SUITE 8
NEWINGTON, N.H. 03801– 7876
603-436-3557
JOB NO: 23455

ENGINEER:

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335

ISSUED FOR: ENGINEERING DESIGN

ISSUE DATE: DECEMBER 10, 2012

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	ENGINEERING DESIGN	JV	12/10/12

DRAWN BY: JCS
APPROVED BY: JV
DRAWING FILE: 23455.DWG

SCALE:
22" x 34" – 1" = 10'
11" x 17" – 1" = 20'

OWNER/APPLICANT:

RYE ATLANTIC PROPERTIES, LLC
PO BOX 4780
PORTSMOUTH, NH 03802-4780
ASSESSOR'S PARCEL 144-23

PROJECT:

PROPOSED SITE DEVELOPMENT PLANS
361 ISLINGTON STREET & CABOT STREET
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 144-23

TITLE:

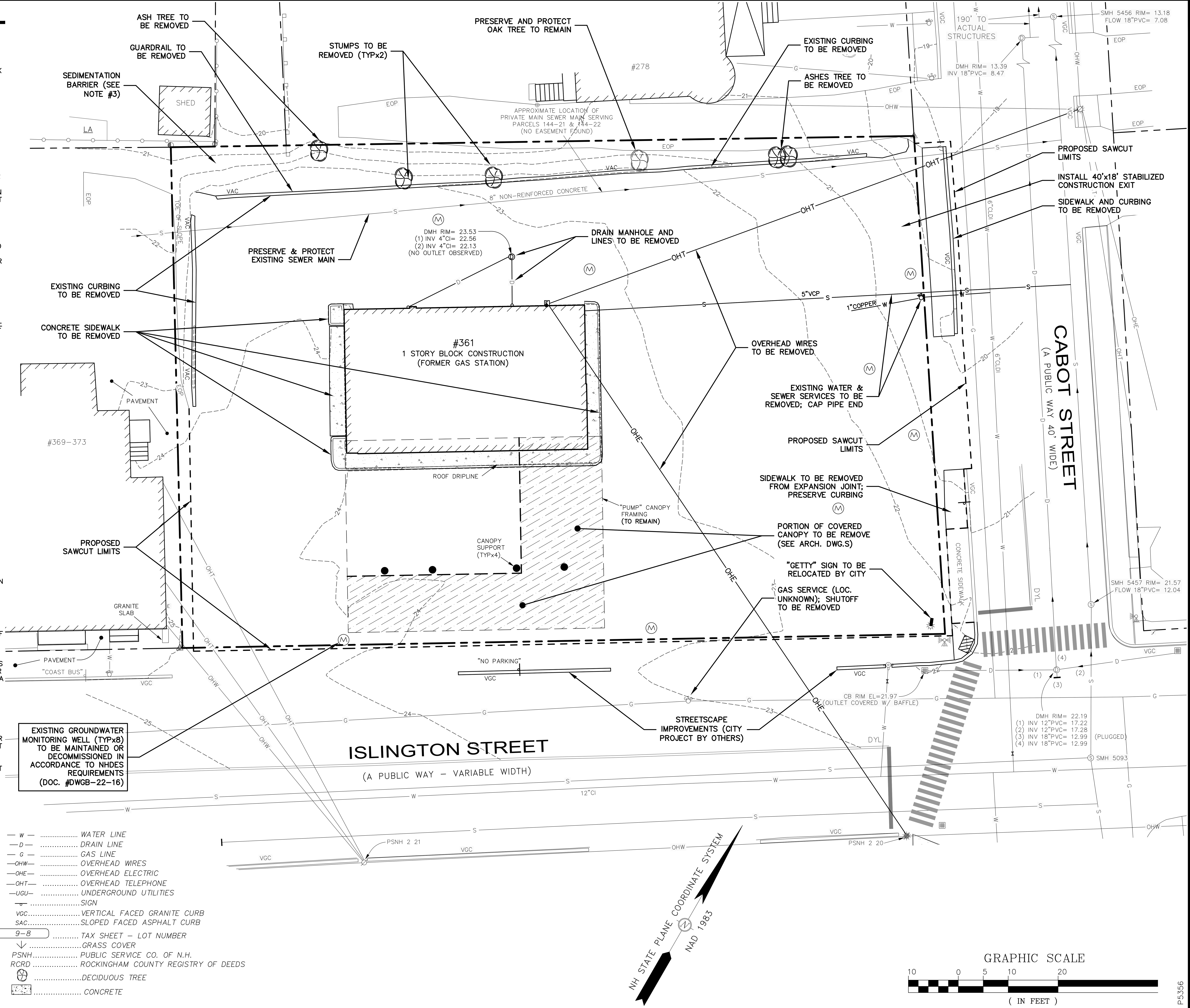
EXISTING CONDITIONS PLAN

SHEET NUMBER: 1 OF 1

Z:\Working\Shared Files\backup-dwgs\4400-4499\4466-Portsmouth-IslingtonSt-Labrie\ecd\VA\JVA-GETTY-EXIST-12-10-12.dwg, PLAN, 3/4/2013 9:36:55 AM

DEMOLITION NOTES

1. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY BUILDING DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30-DAY LEAD TIME.
2. CONTRACTOR SHALL SAFELY SECURE THE SITE AND WORK LIMITS WITH SECURITY FENCING WHICH SHALL BE LOCKED DURING NON-WORK HOURS.
3. CONTRACTOR SHALL INSTALL TUBULAR SEDIMENTATION BARRIER AROUND THE PARCEL PRIOR TO DEMOLITION ACTIVITIES.
4. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
6. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES, PORTSMOUTH DPW AND ABUTTING PROPERTY OWNERS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
7. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES, ETC. SHALL BE ADJUSTED TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
8. ALL MATERIALS SCHEDULED FOR DEMOLITION OR REMOVAL ON PRIVATE PROPERTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
9. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS/CODES.
10. SEWER AND WATER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
11. TELECOMMUNICATIONS: FAIRPOINT, JOE CONSIDINE, (603) 427-5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
15. CONTRACTOR TO CONTACT PORTSMOUTH DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY DEMOLITION TO COORDINATE ALL WORK CONCERNING DISCONNECTION/DEMOLITION OF ANY PROPOSED WATER AND SEWER LINE IMPROVEMENTS.
16. ALL WATER MAIN AND SERVICE DISCONNECTIONS SHALL CONFORM TO PORTSMOUTH DPW STANDARDS.
17. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
18. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL STATE AND LOCAL REGULATIONS.
19. EXISTING UTILITIES TO BE DISCONTINUED SHALL BE ABANDONED IN PLACE UNLESS OTHERWISE NOTED TO BE REMOVED OR ENCOUNTERED DURING THE INSTALLATION OF NEW WORK.
20. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, APPROPRIATE BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDIMENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM. A DISCHARGE PERMIT SHALL BE OBTAINED PRIOR TO DISCHARGING GROUNDWATER.
21. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL BUILDINGS, PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.
22. ALL CONSTRUCTION VEHICLES SHALL EXIT SITE VIA CABOT STREET.



EXISTING LEGEND:

Symbol	Description
◑	IRON ROD
○	IRON PIPE
—o—o—	CHAIN LINK FENCE
	WOOD FENCE
Ⓢ	SEWER MANHOLE
	CATCH BASIN
	CATCH BASIN
Ⓜ	MONITORING WELL
	BOLLARD
	UTILITY POLE
	LIGHT POLE
	UTILITY POLE W/TRANSFORMER
	GUY
E	ELECTRIC METER
	GAS METER
	GAS SHUT OFF VALVE
— S —	SEWER LINE
— W —	WATER LINE
— W —	WATER LINE
— D —	DRAIN LINE
— G —	GAS LINE
—OHW—	OVERHEAD WIRES
—OHE—	OVERHEAD ELECTRIC
—OHT—	OVERHEAD TELEPHONE
—UGU—	UNDERGROUND UTILITIES
	SIGN
VGC	VERTICAL FACED GRANITE CURB
SAC	SLOPED FACED ASPHALT CURB
9-8	TAX SHEET - LOT NUMBER
	GRASS COVER
PSNH	PUBLIC SERVICE CO. OF N.H.
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
	DECIDUOUS TREE
	CONCRETE

ENGINEER:

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR: TAC REVIEW

ISSUE DATE: JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
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DRAWN BY: RMB
APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

SCALE:
(22"x34") 1" = 10'
(11"x17") 1" = 20'

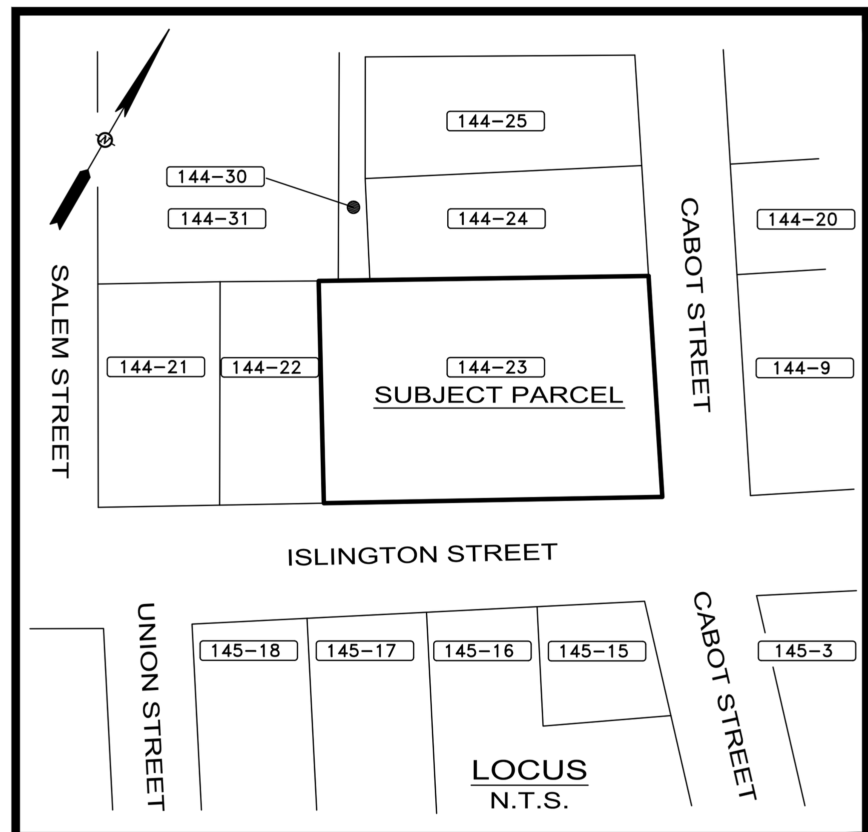
OWNER:
LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

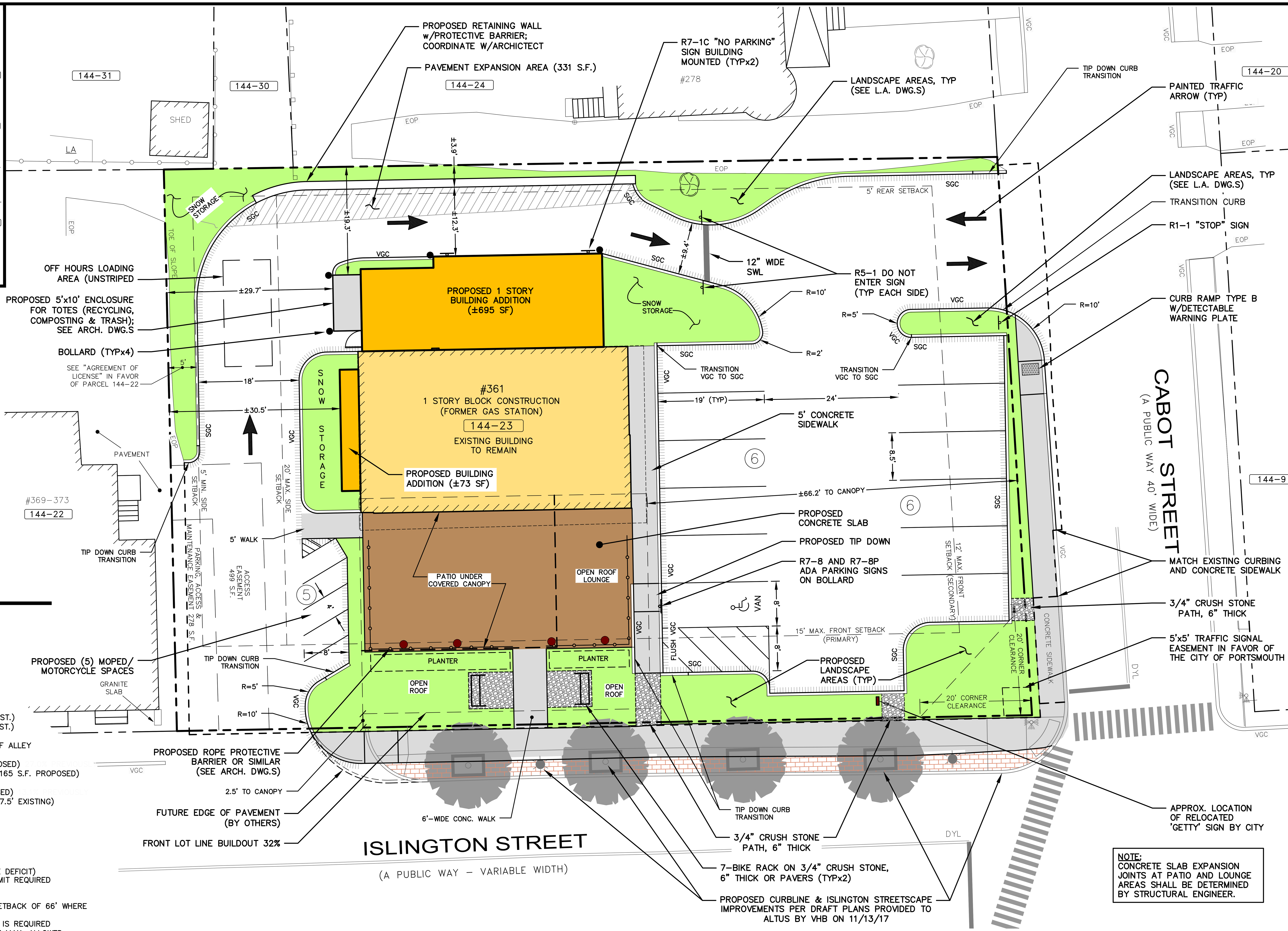
APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
SITE PREPARATION PLAN

SHEET NUMBER:
C - 1





NOTE:
CONCRETE SLAB EXPANSION JOINTS AT PATIO AND LOUNGE AREAS SHALL BE DETERMINED BY STRUCTURAL ENGINEER.

SITE NOTES

1. DESIGN INTENT – THIS PLAN SET IS INTENDED TO DEPICT THE REDEVELOPMENT OF THE SITE FOR A RESTAURANT USE.
2. PLAN REFERENCE: "EXISTING CONDITIONS PLAN", DATED DECEMBER 10, 2012, BY JAMES VERRA & ASSOCIATES, INC.
3. LOT AREA: ±15,114 S.F. (±0.35 ACRES)
4. ZONE: CHARACTER DISTRICT 4 – L2 (CD4–L2)
   HISTORIC DISTRICT
5. DIMENSIONAL REQUIREMENTS – CD4–L2:

FRONT YARD SETBACK:	15' (MAX.) – PRIMARY (ISLINGTON ST.) 12' (MAX.) – SECONDARY (CABOT ST.)
SIDE YARD SETBACK:	5' (MIN.) – 20' (MAX.)
REAR YARD SETBACK:	GREATER OF 5' OR 10' FROM CL OF ALLEY
FRONT LOT LINE BUILDOUT:	60% (MIN.) – 80% (MAX.)
MAX. BUILDING COVERAGE:	60% (22.0% EXISTING, 23.2% PROPOSED)
MAX. BUILDING FOOTPRINT:	2,500 S.F. (1,397 S.F. EXISTING, 2,165 S.F. PROPOSED)
MIN. LOT AREA:	3,000 S.F. (15,114 S.F. EXISTING)
MIN. OPEN SPACE:	25% (4.1% EXISTING, 16.8% PROPOSED)
BUILDING HEIGHT:	2 STORIES (SHORT 3RD) OR 35' (17.5' EXISTING)
TOTAL LOT GREEN SPACE:	2,539 S.F. OR 16.8%

6. PARKING REQUIREMENTS:
   RESTAURANT: 1 SPACE PER 100 S.F. GFA

2,165 S.F BUILDING + 1,183 S.F. PATIO	= 3,348 S.F.
3,348 S.F / 100	= 30 SPACES
TOTAL PARKING REQUIRED	= 33 SPACES
TOTAL PARKING PROVIDED	= 12 SPACES (21 SPACE DEFICIT) CONDITIONAL USE PERMIT REQUIRED

7. VARIANCES APPROVED ON OCTOBER 18, 2022:
   SECTION 10.5A41.10A TO ALLOW A SECONDARY FRONT YARD SETBACK OF 66' WHERE 12' MAX. IS ALLOWED;
   – TO ALLOW A FRONT LINE BUILDOUT OF 32% WHERE 60–80% IS REQUIRED
   – TO ALLOW A LEFT YARD SETBACK OF 30' WHERE 20' IS THE MAX. ALLOWED
   – TO ALLOW 14.5% OPEN SPACE WHERE 25% IS THE MIN. REQUIRED

   SECTION 10.5A44.31 TO ALLOW OFF–STREET PARKING SPACES TO BE LOCATED IN FRONT OF THE FACADE OF THE PRIMARY BUILDING

   SECTION 10.5A44.32 TO ALLOW PARKING TO BE UNSCREENED FROM THE STREET

   SECTION 10.575 TO ALLOW A DUMPSTER TO BE LOCATED 19 ' FROM A RESIDENTIAL ZONED LOT WHERE 20' IS REQUIRED

   SECTION 10.321 TO ALLOW A NONCONFORMING BUILDING OR STRUCTURE TO BE EXTENDED, RECONSTRUCTED OR ENLARGED WITHOUT CONFORMING TO THE REQUIREMENTS OF THE ORDINANCE

   IT WAS DETERMINED THAT A VARIANCE WAS NOT REQUIRED UNDER SECTION 10.440, USE #9.42 TO ALLOW A RESTAURANT WITH AN OCCUPANCY LOAD BETWEEN 50 AND 250.
8. SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN AREAS SHOWN HEREON, AND/OR TRUCKED OFF SITE AS APPROPRIATE.
9. NO SAND SHALL BE USED FOR WINTER PARKING AREA MAINTENANCE. WINTER MAINTENANCE CONTRACTOR SHALL BE NHDES GREEN SNOWPRO CERTIFIED.
10. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINES WITH RS–1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
11. PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE, YELLOW OR BLUE TRAFFIC PAINT (WHERE SPECIFIED) MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. PAINTED ISLANDS AND LOADING ZONES SHALL BE 4"–WIDE DIAGONAL WHITE LINES 3'–0" O.C. BORDERED BY 4"–WIDE WHITE LINES. PARKING STALLS SHALL BE SEPARATED BY 4"–WIDE WHITE LINES. SEE DETAILS FOR HANDICAP SYMBOLS, SIGNS AND SIGN DETAILS.
12. PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
13. ALL CONSTRUCTION SHALL MEET THE MINIMUM STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATION FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITIONS. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
14. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINES WITH RS–1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
15. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
16. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
17. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
18. ALL LIGHTS SHALL BE "DARK SKY" FREINDLY.
19. THE PARCEL IS NOT LOCATED IN THE 100–FLOOD ZONE PER FEMA #33015C0259F, DATED 01/29/21.
20. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
21. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRICTED 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 EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
22. WAIVER REQUEST FOR RECORDING OF SITE PLAN. AS BUILT PLAN WILL BE RECORDED RECORDED IN LIEU OF SITE PLAN.
23. SEE SHEET D–1 FOR LEGEND.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

GRAPHIC SCALE
10 0 5 10 20
(IN FEET)

P5356

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133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

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1/23/23

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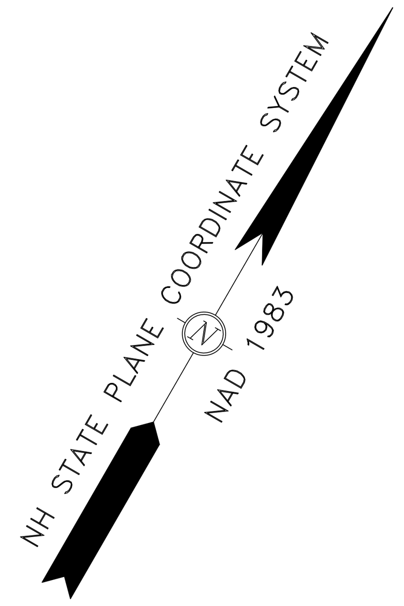
OWNER:
LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
SITE PLAN

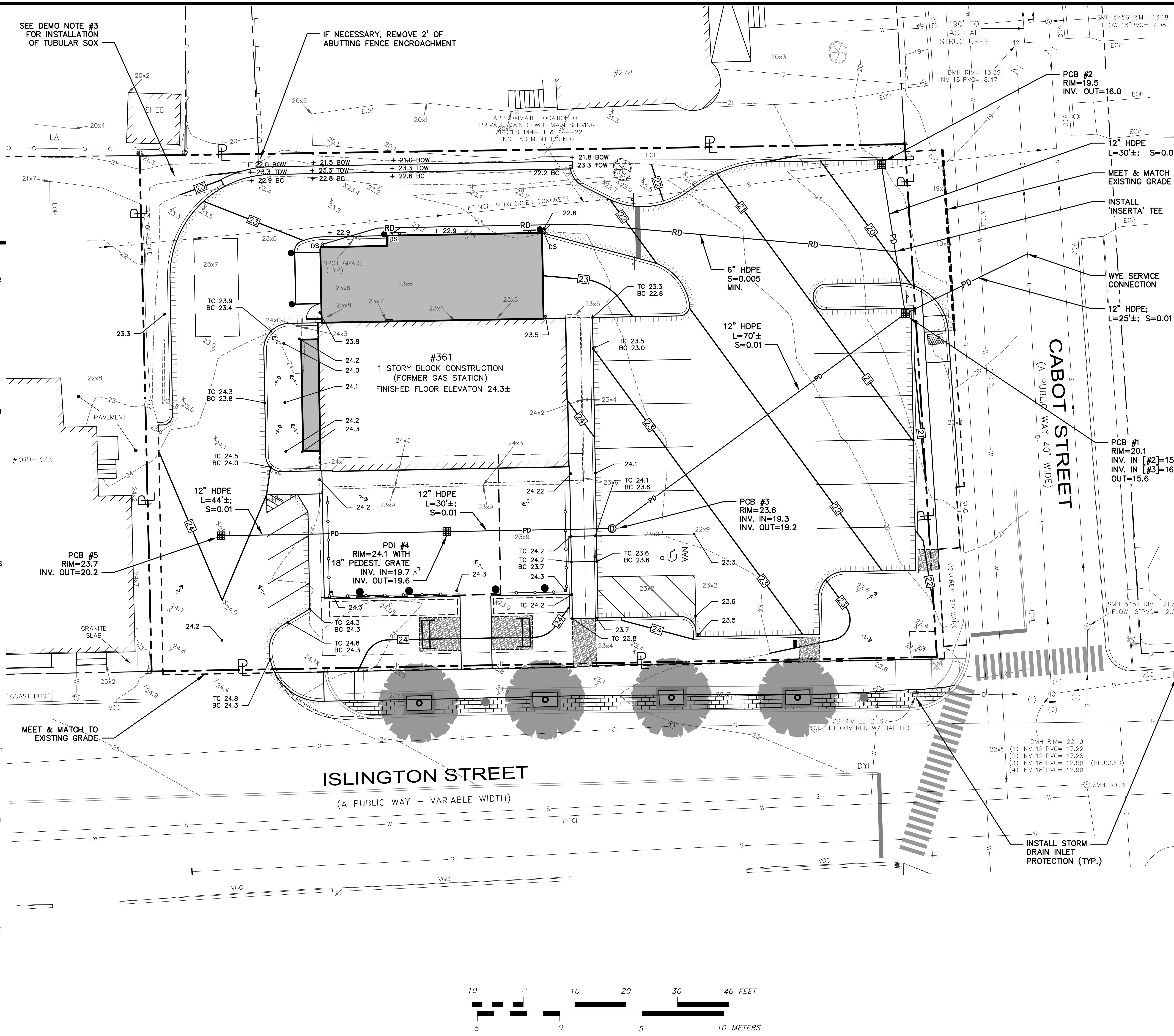
SHEET NUMBER:
C - 2



GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
8. NO EARTHWORK SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES.
10. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
11. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND ENSURE PERMANENT SOIL STABILIZATION.
12. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
13. ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.).
14. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
15. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
16. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
17. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
18. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. SYMBOLS MAY NOT BE INDICATIVE OF THE CENTER OF A STRUCTURE, PARTICULARLY WHEN SHOWN ADJACENT TO A CURB LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
19. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
20. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
21. AREA OF DISTURBANCE IS APPROXIMATELY ±13,600 S.F.
22. A STORMWATER INSPECTION AND MAINTENANCE REPORT SHALL BE COMPLETED ANNUALLY AND COPIED TO THE CITY PLANNING AND PUBLIC WORKS DEPARTMENTS.
23. SEE SHEET D-1 FOR LEGEND.

THE APPLICANT SHALL SUBMIT A COPY OF A COMPLETED LAND USE DEVELOPMENT TRACKING FORM USING THE POLLUTANT TRACKING AND ACCOUNTABILITY PROGRAM (PTAP) ONLINE PORTAL CURRENTLY MANAGED BY THE UNH STORMWATER CENTER OR SIMILAR FORM APPROVED BY THE CITY.



P5356

ENGINEER:

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APPLICANT:

IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:

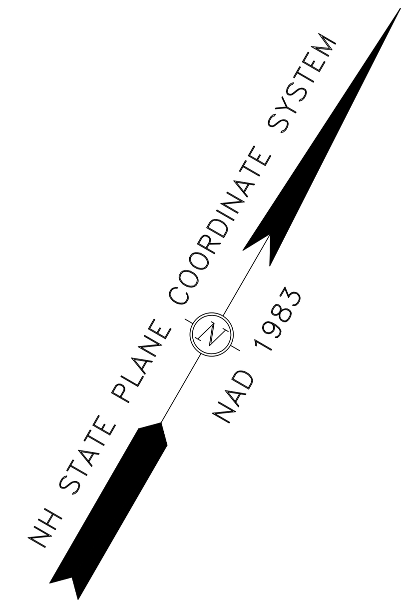
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:

GRADING PLAN

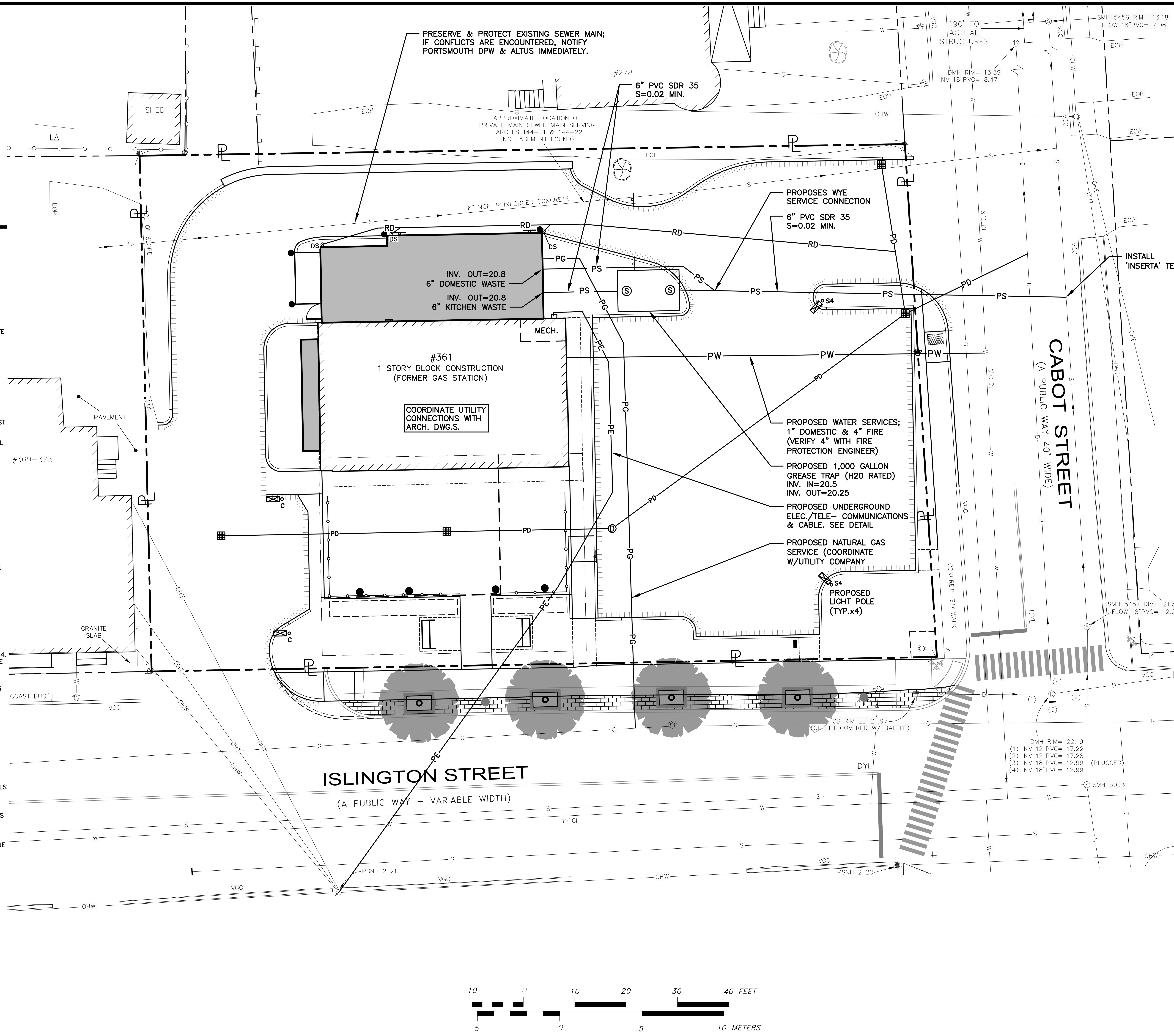
SHEET NUMBER:

C-3



UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE. CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, CITY OF PORTSMOUTH DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE-IN AND CONNECTION FEES.
4. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
6. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
7. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
8. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
9. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDING. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
10. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DPW.
11. UTILITY PROVIDERS AND CONTACTS:
    - WATER & SEWER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
    - GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
    - TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427-5525.
    - CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
    - ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48-HOUR MINIMUM NOTICE REQUIRED.
12. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
13. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW DUCTILE IRON WATERLINES SHALL BE WRAPPED WITH A SOIL-TIGHT POLYETHYLENE WRAPPING FOR THEIR FULL LENGTH, ALL DOMESTIC WATER SERVICES SHALL BE PROVIDED WITH BACKFLOW PREVENTERS AND ALL DUCTILE IRON PIPE JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
14. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
15. ALL MEANS, METHODS, MATERIALS AND INSTALLATION OF NEW SEWER LATERALS SHALL BE APPROVED AND WITNESSED BY PORTSMOUTH DPW PRIOR TO BACKFILLING.
16. THE CONTRACTOR SHALL CONFIRM ALL WATERLINE SIZES WITH THE MEP PLANS PRIOR TO INSTALLATION. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
17. ALL WATER VALVES AND SHUTOFFS SHALL BE PAINTED RED FOR FIRE OR BLUE DOMESTIC WITH PERMANENT RUST RESISTANT PAINT.
18. ALL SEWER INSTALLATIONS SHALL BE TESTED IN ACCORDANCE WITH NHDES REGULATIONS.
19. SEE SHEET D-1 FOR LEGEND.



P5356

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER

1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR: TAC REVIEW

ISSUE DATE: JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL TAC SUBMISSION	EDW	01/23/23

DRAWN BY: RMB
APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

SCALE:
(22"x34") 1" = 10'
(11"x17") 1" = 20'

OWNER:
LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
UTILITY PLAN

SHEET NUMBER:
C - 4

Plant List - TREES AND SHRUBS

ID	Qty	Botanical Name	Common Name	Scheduled Size
BDR	19	Buxus sempervirens 'Dee Runk'	Dee Runk Boxwood	5'
CBF	2	Carpinus betulus 'Fastigiata'	Fastigiata Hornbeam	2-2 1/2" Cal.
CP	4	Comptonia peregrina	Sweet Fern	2 QT
CSO	9	Chaenomeles s. 'Double Take Orange'	Double Take Orange Flowering Quince	10 Gal.
JBD	18	Juniperus communis depressa 'AmiDak'	Blueberry Delight Juniper	2 Gal.
MG	11	Myrica gale	Sweetgale	5 Gal.
NS	2	Nyssa sylvatica	Black Tupelo	2" Cal.
QGP	1	Quercus p. 'Green Pillar'	Green Pillar Oak	2-2 1/2"
RGL	69	Rhus aromatica 'Grow Low'	Grow Low Sumac	2 Gal.
SLP	17	Spiraea japonica 'Little Princess'	Little Princess Spirea	4'

Plant List - PERENNIALS

ID	Qty	Botanical Name	Common Name	Scheduled Size
AMT	5	Amsonia tabernaemontana	Blue Star Flower	1 Gal.
AOS	16	Aster oblongifolius 'October Skies'	Aromatic Aster	2 QT
BAP	18	Baptisia australis	Blue False Indigo	2 QT
CFC	7	Caryopteris x clandonensis 'First Choice'	First Choice Bluebeard	2 QT
EUP	14	Eupatorium maculatum 'Gateway'	Joe Pye Weed	2 QT
HLQ	3	Helianthus 'Lemon Queen'	Lemon Queen Sunflower	2 QT
HYP	8	Hypericum x 'Hidcote'	Hidcote St. John's Wort	2 QT
PV	6	Panicum virgatum 'Heavy Metal'	Heavy Metal Switch Grass	2 Gal.
PVR	9	Panicum virgatum 'Ruby Ribbons'	Ruby Ribbons Switch Grass	2 GAL
PVS	40	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 Gal.
TC	16	Thermopsis chinensis 'Sophia'	Sophia Thermopsis	2 QT

LICENSED LANDSCAPE ARCHITECT
TERRENCE P. PARKER
041
STATE OF NEW HAMPSHIRE

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

terra firma landscape architecture

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE.

No.	Date	By	Revision Notes

No.	Date	Issue Notes

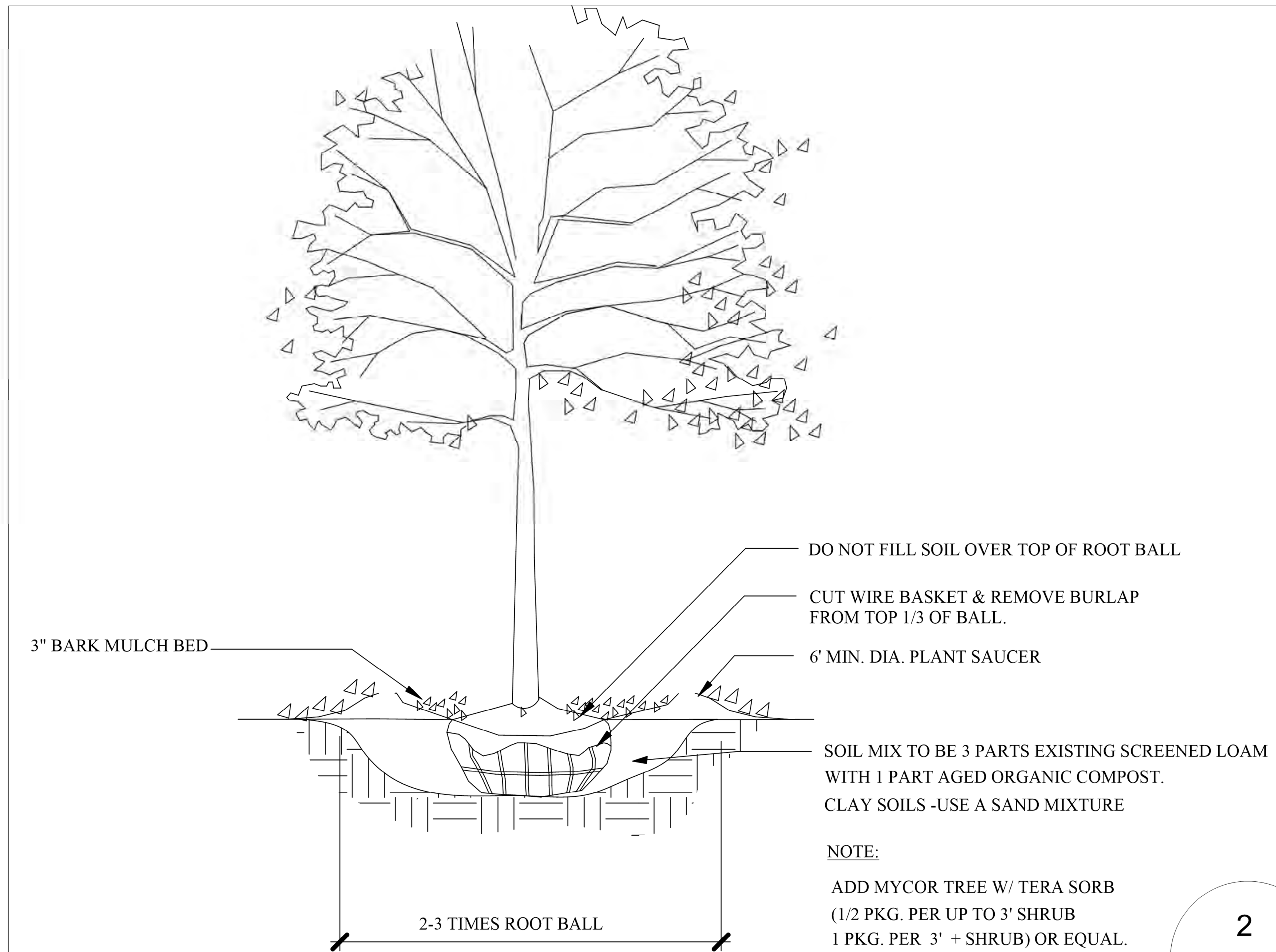
Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
The Getty

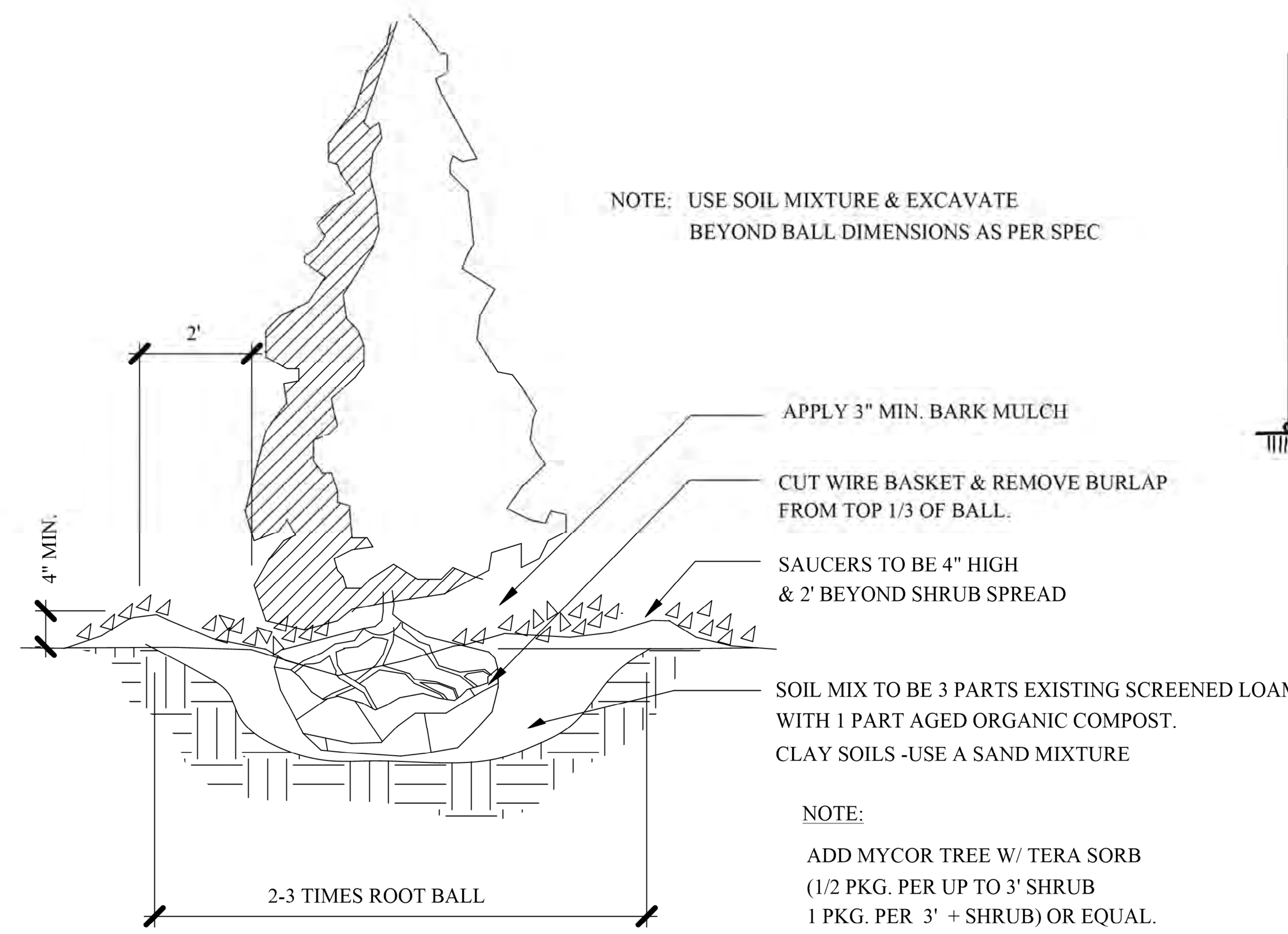
Sheet Title
Landscape Plan

Project Manager: Project Manager	Project ID: The Getty
Drawn By: TC	Scale: 1:120
Reviewed By: TP	Sheet No.: L-1 of 2
Date: 1/23/2023	
CAD File Name: getty_v2023.vwx	



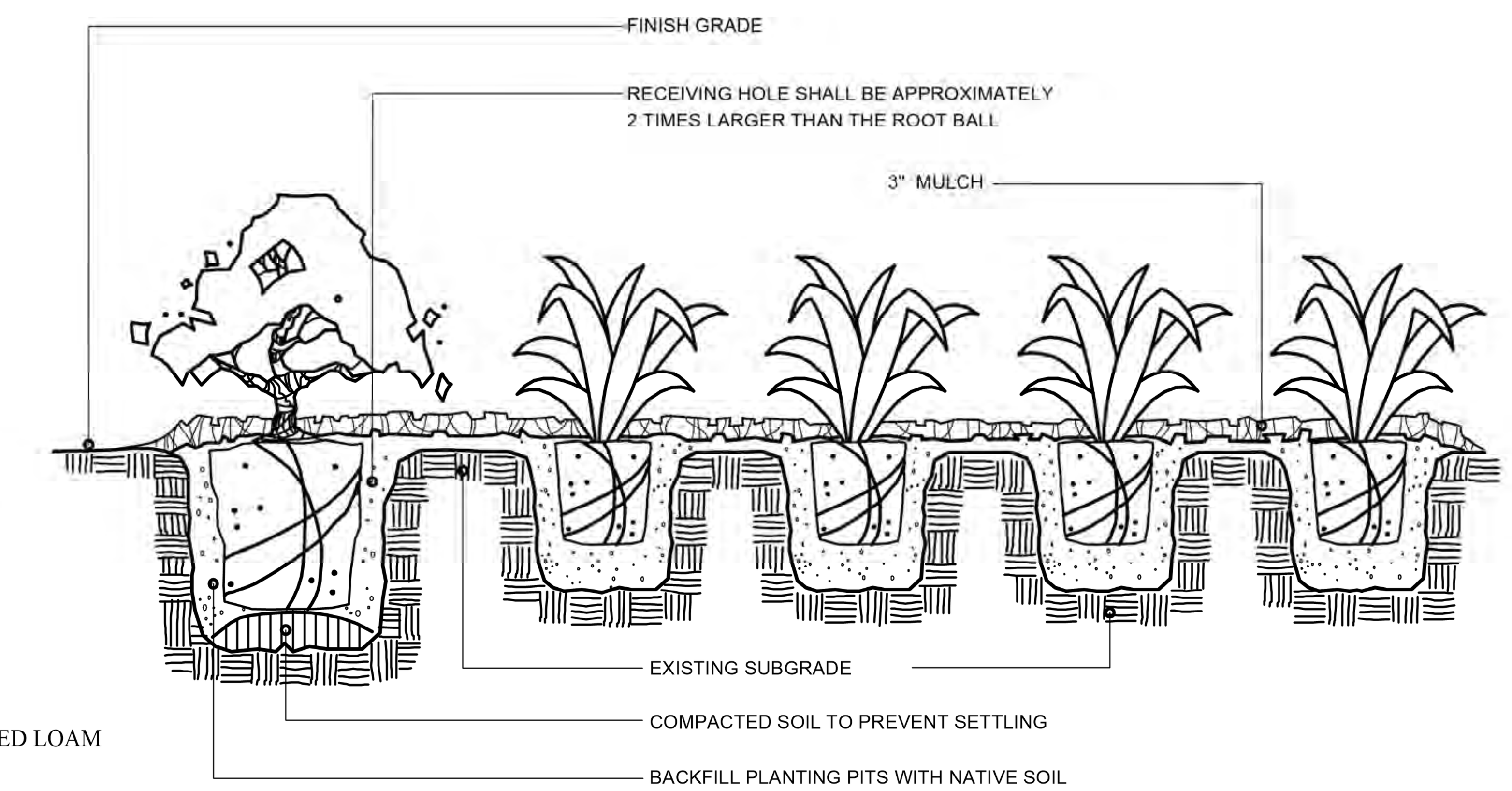
1 / L-5

TREE PLANTING - 2"+ CAL.
SCALE: NTS



2 / L-5

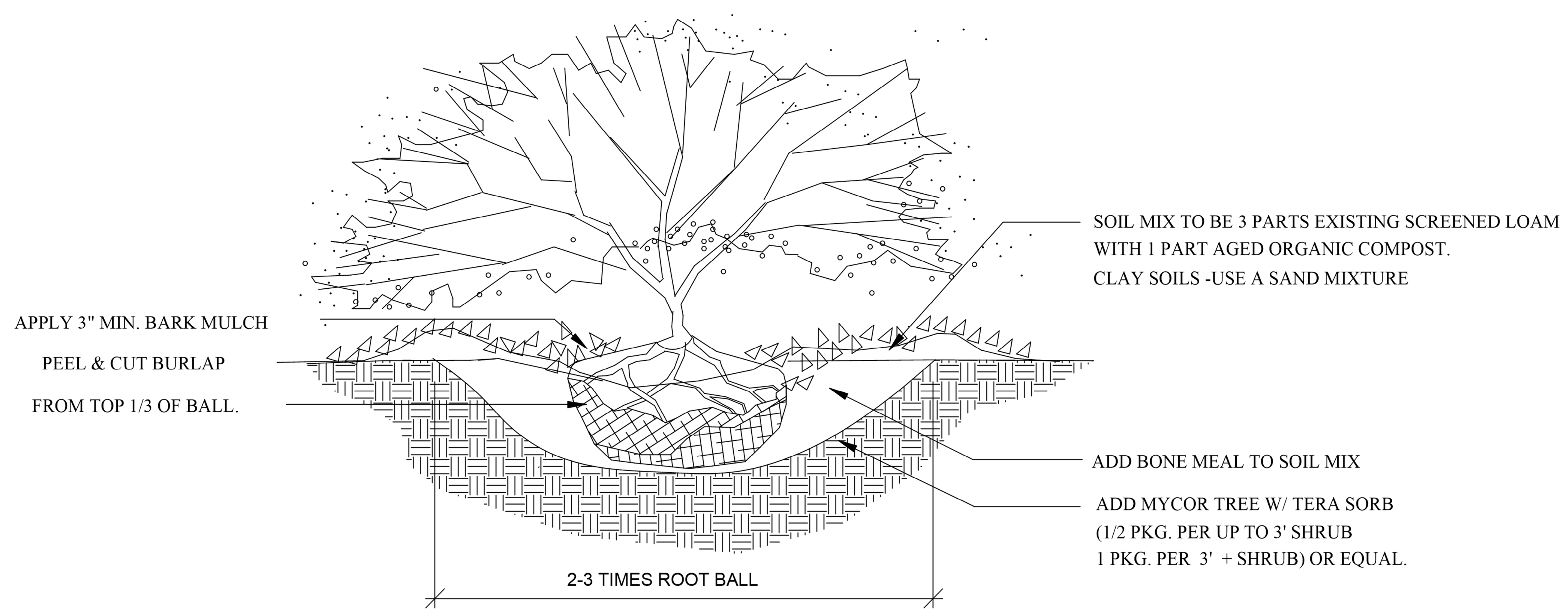
PYRAMIDAL EVERGREEN TREE PLANTING
SCALE: NTS



NOTE: SHRUBS SHALL BE PLANTED A MINIMUM OF 1" & NO MORE THAN 2" ABOVE FINISH GRADE, DEPENDING UPON SITE CONDITIONS.

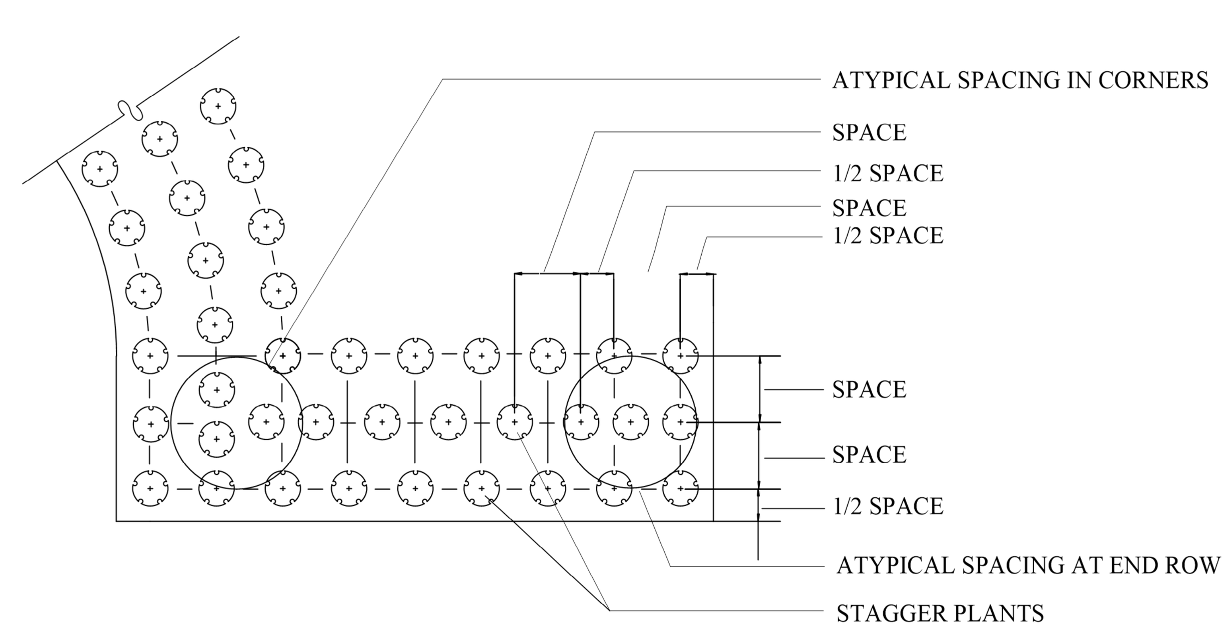
3 / L-5

SHRUB/GROUND COVER PLANTING DETAIL
SCALE: NTS



4 / L-5

B&B SHRUB PLANTING
SCALE: NTS

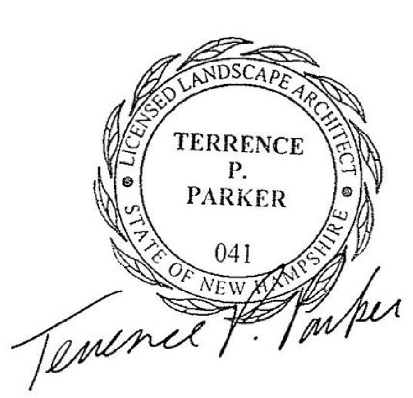


NOTES:

1. PLACE PLANTS IN BED AS SHOWN, SPACING AS SPECIFIED IN PLANT SCHEDULE.
2. GROUNDCOVER SHALL BE TRIANGULAR SPACED IN ROWS PARALLEL TO STRAIGHT EDGES AND SHALL BE EVENLY SPACED IN ROWS PARALLEL TO CURVE EDGES.

5 / L-5

GROUND COVER SPACING DETAIL
SCALE: NTS



LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT DELIVERED TO THE SITE FOR AESTHETIC REASONS BEFORE PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY FOR ALL THE PLANTS.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANTS SHALL BE INSTALLED AND DETAILED PER PROJECT SPECIFICATIONS.
10. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE ARCHITECT IN WRITING OR OTHERWISE FORFEIT HIS CLAIM. LANDSCAPE CONTRACTOR SHALL PRUNE PLANTINGS OF DEAD LIMBS OR TWIGS DURING THE FIRST YEAR OF GROWTH.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. LANDSCAPE CONTRACTOR SHOULD REPLACE DEAD PLANTINGS IMMEDIATELY UPON OWNER DIRECTION WITHIN THE WARRANTY PERIOD AND AGAIN AT THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAVE DIED, THAT HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT ARE, IN THE OPINION OF THE LANDSCAPE ARCHITECT, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS CALLED FOR.
15. ALL TREES AND SHRUBS TO BE PLANTED IN MULCH BEDS WITH DEFINED AND CUT EDGES TO SEPARATE TURF GRASS AREAS.
16. FOR ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE, REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC., THEN APPLY GRASS SEED OR PINE BARK MULCH AS DEPICTED ON PLANS.
17. LANDSCAPE CONTRACTOR SHALL FEED AND PRUNE EX. TREES, ON OR JUST OFF SITE, THAT HAVE EXPERIENCED ROOT BASE INTRUSION OR DAMAGE DURING CONSTRUCTION IMMEDIATELY AND FOR THE DURATION OF THE WARRANTY PERIOD AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
18. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE EDGE OF THE EX. TREE CANOPY THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. ALL MULCH AREAS SHALL RECEIVE A 2" LAYER OF SHREDDED PINE BARK MULCH.
20. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE. .

terra firma
landscape architecture
163.a court street portsmouth, nh 03801

No.	Date	By	Revision Notes

No.	Date	Issue Notes

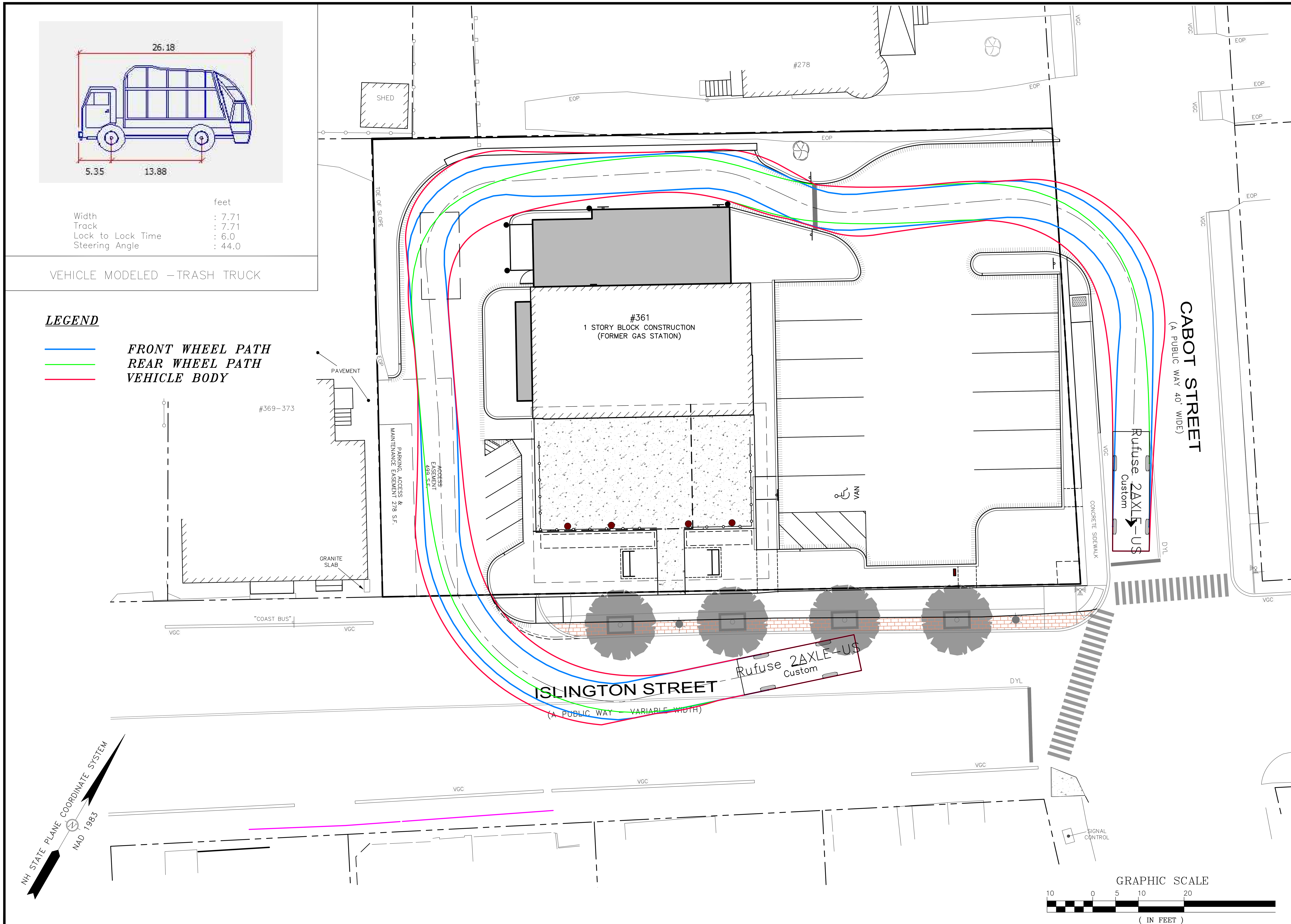
Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
The Getty

Sheet Title
Landscape Details

Project Manager: Project Manager	Project ID: The Getty
Drawn By: TC	Scale: NTS
Reviewed By: TP	Sheet No.: L-2 of 2
Date: 1/23/2023	
CAD File Name: getty_v2023.vwx	



ENGINEER:

ALTUS ENGINEERING

133 Court Street
Portsmouth, NH 03801
(603) 433-2335
www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED
PROFESSIONAL ENGINEER

1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC REVIEW

ISSUE DATE:
JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL TAC SUBMISSION	EDW	01/23/23

DRAWN BY: RMB
APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

SCALE:
(22"x34") 1" = 10'
(11"x17") 1" = 20'

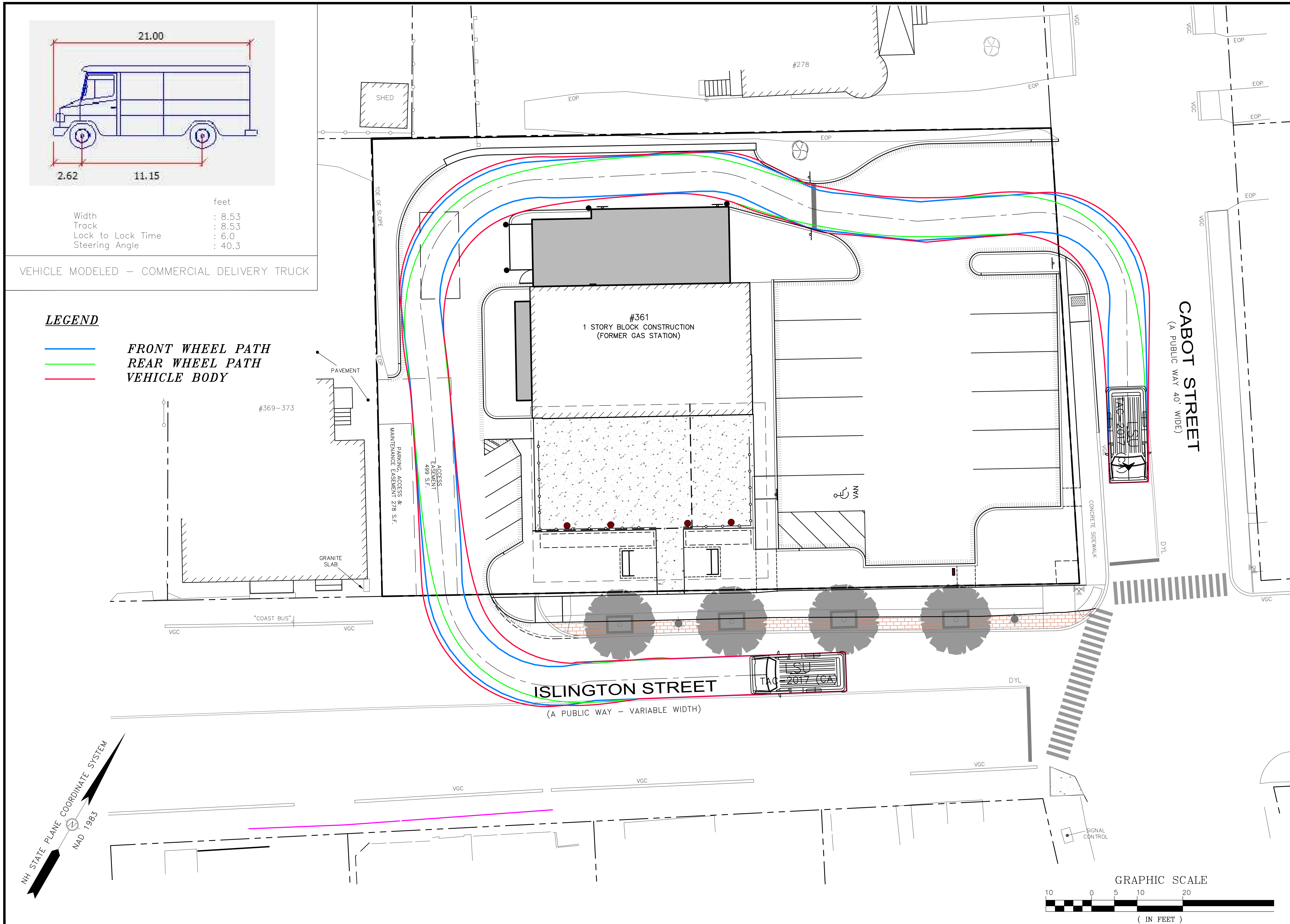
OWNER:
LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
TRUCK TURNING MOVEMENTS - TRASH

SHEET NUMBER:
T - 1



ENGINEER:

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Portsmouth, NH 03801 www.altus-eng.com

STATE OF NEW HAMPSHIRE ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER

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APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

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P.O. BOX 300
RYE, NH 03870

APPLICANT:
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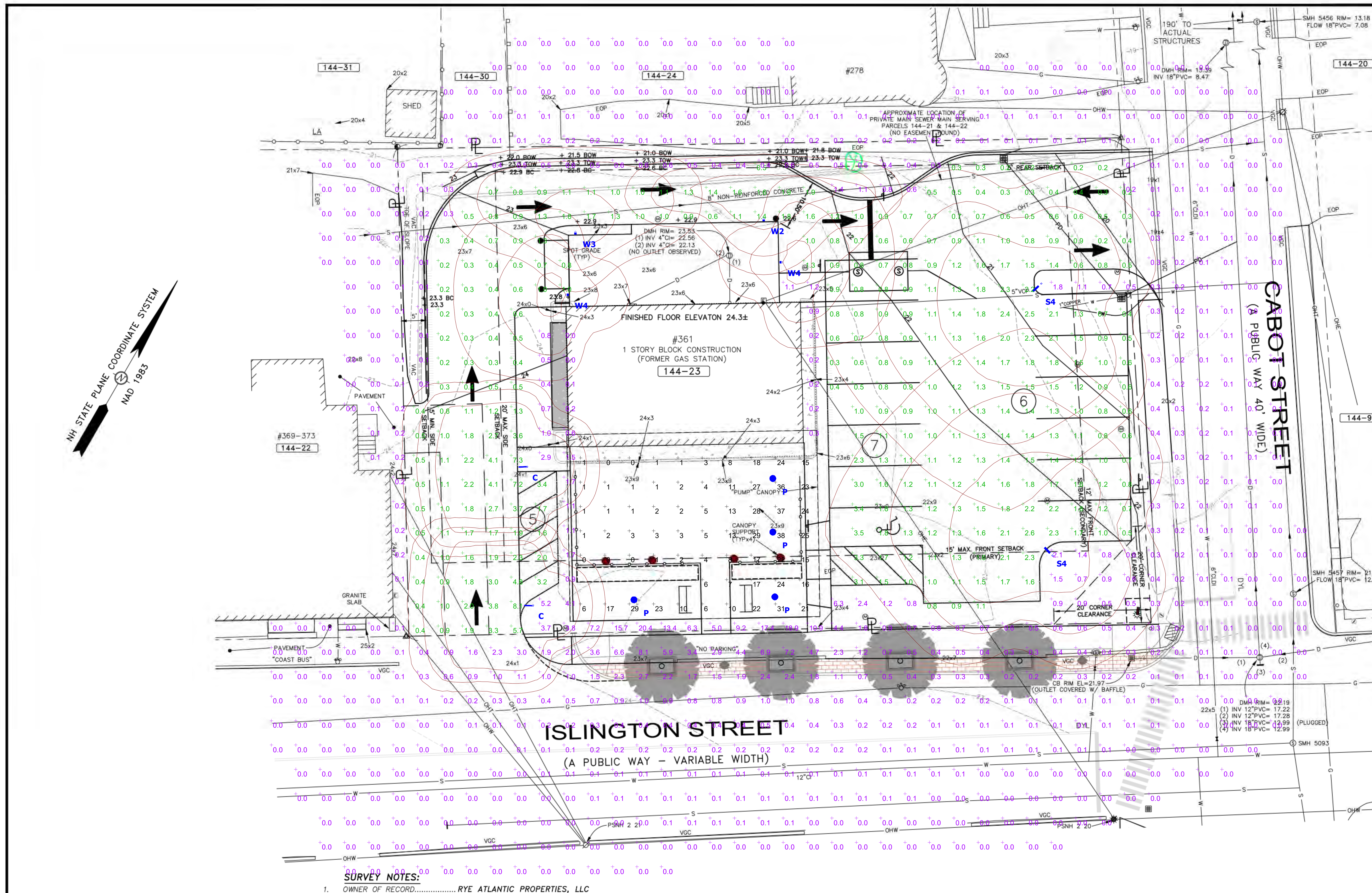
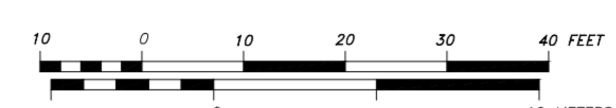
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
TRUCK TURNING MOVEMENTS - DELIVERY

SHEET NUMBER:
T - 2





Plan View
Scale - 1" = 16ft

ALTUS ENGINEERING, INC.
133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

NOT FOR CONSTRUCTION

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APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

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P.O. BOX 300
RYE, NH 03870

APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
GRADE FOR NOW ADJUSTMENT SITE PLAN

P5356

SHEET NUMBER:
1 OF 1

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Filename	Lumens per Lamp	LLF	Wattage	Distribution	Polar Plot	Wattage
	C	2	Lumenpulse	BLDS-SD-120/277--CSL-S40-30K-CRI 80-4	Lumenblade; mounted at 6ft	LED	BLDS-SD-120_277-CSL-S40-30K-CRI 80-4.ies	2253	0.9	36		Max: 1556cd	36
	P	4	METEOR Lighting	WS2 120 308 UNV STV WD BLK UP2 DF OUT	Whiz 2.0 LED Pendant; mounted at 11ft	LED	WS2-120-308-XXX-XXX-WD-XXX.IES	9890	0.8	120		Max: 4365cd	120
	S4	2	Lumenpulse	BLDM-SD-120/277--CSL-S60-30K-CRI 80-4	Lumenblade; mounted at 14ft	LED	BLDM-SD-120_277-CSL-S60-30K-CRI 80-4.ies	3693	0.9	55		Max: 2178cd	55
	W2	1	Lumenpulse	BLDN-SD-120/277--CSL-XS10-30K-CRI 80-2	Lumenblade Nano; mounted at 10ft	LED	BLDN-SD-120_277-CSL-XS10-30K-CRI 80-2.ies	962	0.9	10		Max: 966cd	10
	W3	1	Lumenpulse	BLDN-SD-120/277--CSL-XS10-30K-CRI 80-3	Lumenblade Nano; mounted at 10ft	LED	BLDN-SD-120_277-CSL-XS10-30K-CRI 80-3.ies	1014	0.9	10		Max: 788cd	10
	W4	2	Lumenpulse	BLDN-SD-120/277--CSL-XS10-30K-CRI 80-4	Lumenblade Nano; mounted at 10ft	LED	BLDN-SD-120_277-CSL-XS10-30K-CRI 80-4.ies	867	0.9	10		Max: 534cd	10

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Outside of Parking Lot	+	0.5 fc	20.4 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.3 fc	8.1 fc	0.2 fc	40.5:1	6.5:1
Under Patio Canopy	+	11 fc	38 fc	0 fc	N/A	N/A

VISUAL

Site Lighting Plan

Designer
Heidi G. Connors
Visible Light, Inc.
24 Stickney Terrace
Suite 6
Hampton, NH 03842

Date
1/23/2023

Scale
1"=16'

Drawing No.

Summary

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 144 LOT 23

LATITUDE: 043° 04' 22" N
LONGITUDE: 070° 45' 50" W

OWNER:

LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

APPLICANT:

IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

DESCRIPTION

The project consists of the redevelopment of the existing building for a commercial restaurant along with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the redevelopment is approximately ±13,600 S.F. (±0.31 acres). USEPA NPDES Phase II compliance not required.

PROJECT PHASING

The proposed project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains via an existing municipal closed drainage system and eventually to North Mill Pond.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including silt fences, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Demolish existing pavement areas and utilities as shown on Demolition Plan and reclaim pavement.
3. Rough grade site including placement of borrow materials.
4. Construct building additions and associated improvements.
5. Construct drainage structures, culverts, utilities, swales & pavement base course materials.
6. Install base course paving & curbing. Install landscaping.
7. Install top course paving.
8. Install pavement markings and signs.
9. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized.
10. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, & level spreaders prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from silt fence or other barriers when it has reached one–third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base coarse gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed;
   – or –
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6"screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. FILTERS

1. Silt Fence
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

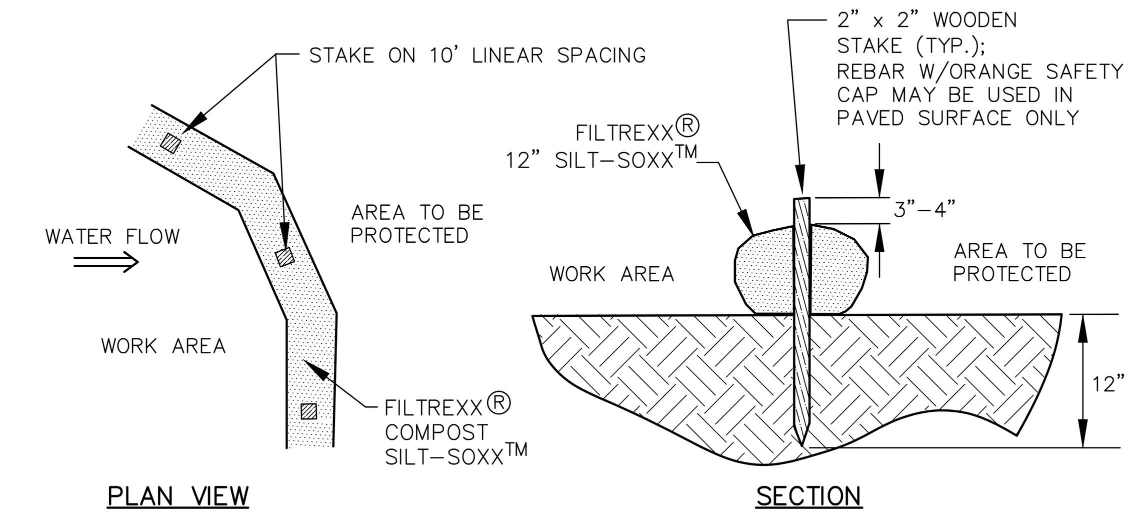
   * Requirements reduced by 50 percent after six (6) months of installation.

   Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

   b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).
   c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.
   d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
   e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
   f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.
   g. The trench shall be backfilled and the soil compacted over the filter fabric.
   h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.
2. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.
3. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.
   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
   c. Sediment deposits must be removed when deposits reach approximately one–third (1/3) the height of the barrier.
   d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.
   e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

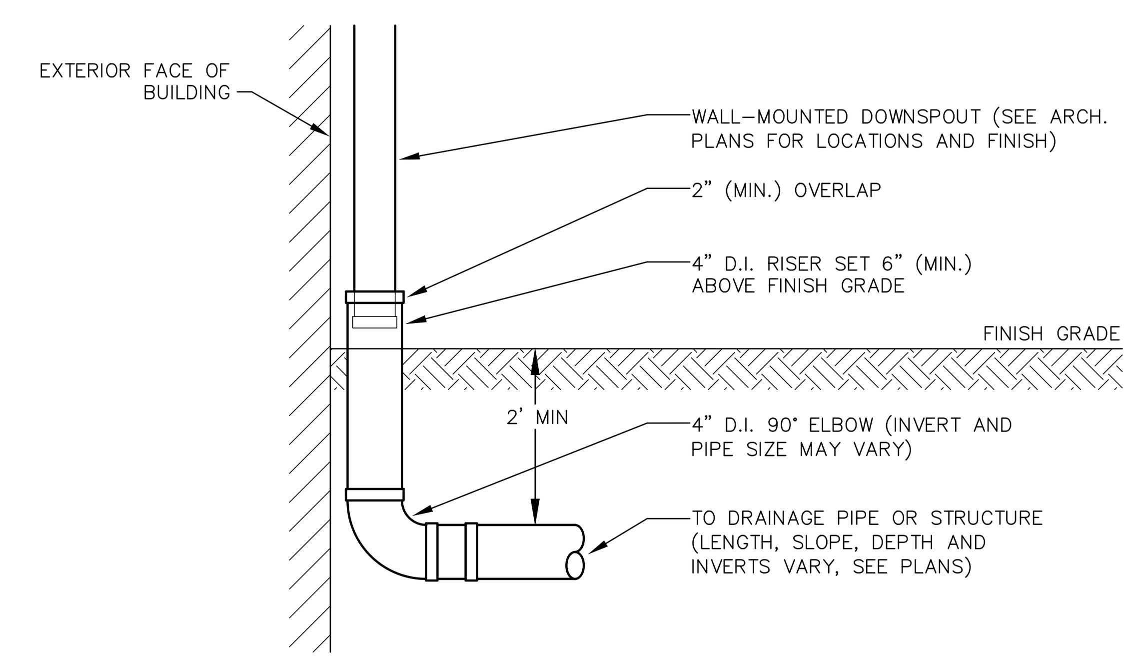
WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

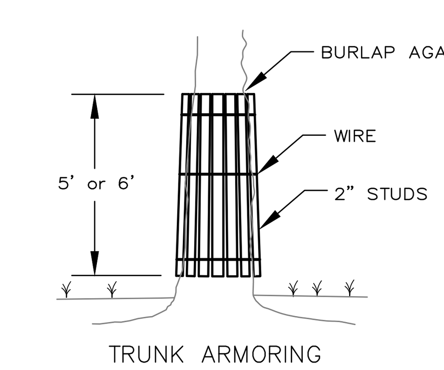


NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER — NOT TO SCALE



EXTERIOR ROOF DRAIN CONNECTION — NOT TO SCALE



NOTE:
IF SOIL BECOMES COMPATCED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHOULD BE AERATED BY PUNCHING SMALL HOLES IN IT WITH SUITABLE AERATING EQUIPMENT.

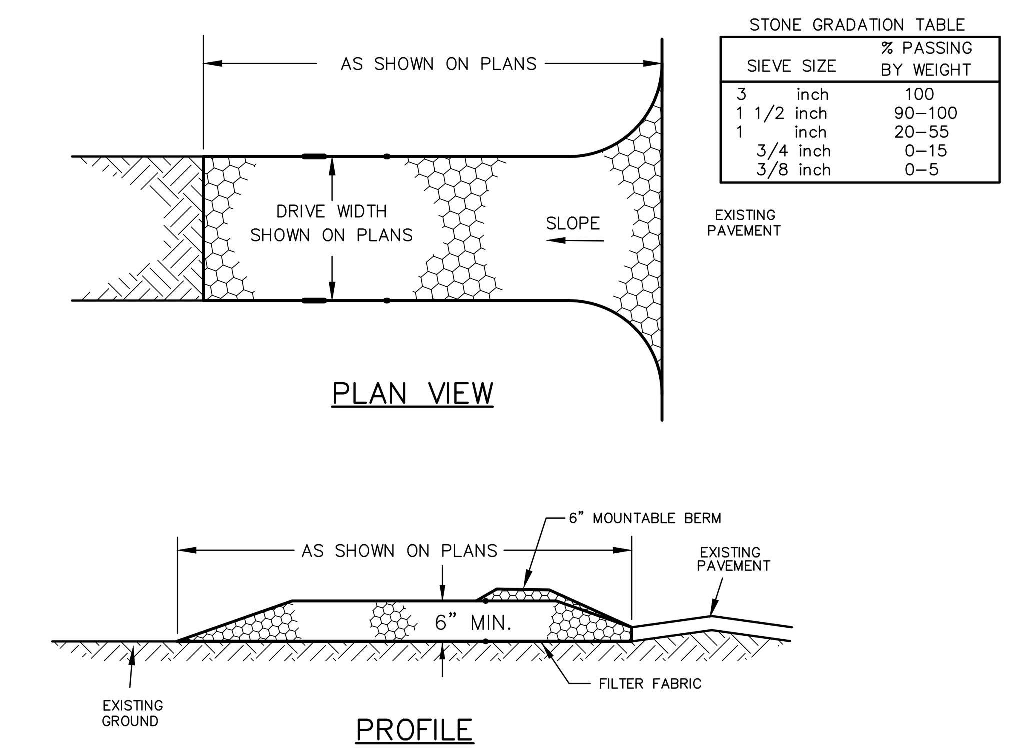
ANY DAMAGE TO THE CROWN, TRUNK OR ROOT SYSTEM OF ANY TREE RETAINED ON SITE SHOULD BE REPAIRED IMMEDIATELY. CONSULT A FORESTER OR TREE SPECIALIST FOR MORE SERIOUS DAMAGE OF TREES.

CONTRACTOR TO USE OPTION A OR B WHERE SUITABLE AND/OR AS DIRECTED BY THE ENGINEER.

TREE PROTECTION DETAILS — NOT TO SCALE

PROPOSED LEGEND:

Symbol	Description
– – – 22 – – –	EXISTING CONTOUR
22	PROPOSED CONTOUR
	PROPOSED SIGN
●	PROPOSED BOLLARD
VGC / SGC	PROPOSED VERTICAL OR SLOPED GRANITE CURB
	PROPOSED DRAINAGE FLOW ARROW
TC 23.6 / BC 23.6	PROPOSED SPOT GRADE (TOP/BOTTOM OF CURB)
PCB — PD — RD — PDMH	PROPOSED CATCH BASIN/DRAIN LINE/ROOF DRAIN/MANHOLE
PE	PROPOSED UNDERGROUND UTILITIES (ELECTRIC/PHONE/TV)
PG	PROPOSED GAS
PS	PROPOSED SEWER/MANHOLE
PW	PROPOSED WATER/GATE VALVE OR COOPERATION STOP
BOW	BOTTOM OF WALL
TOW	TOP OF WALL
PDI	PROPOSED DROP INLET STRUCTURE

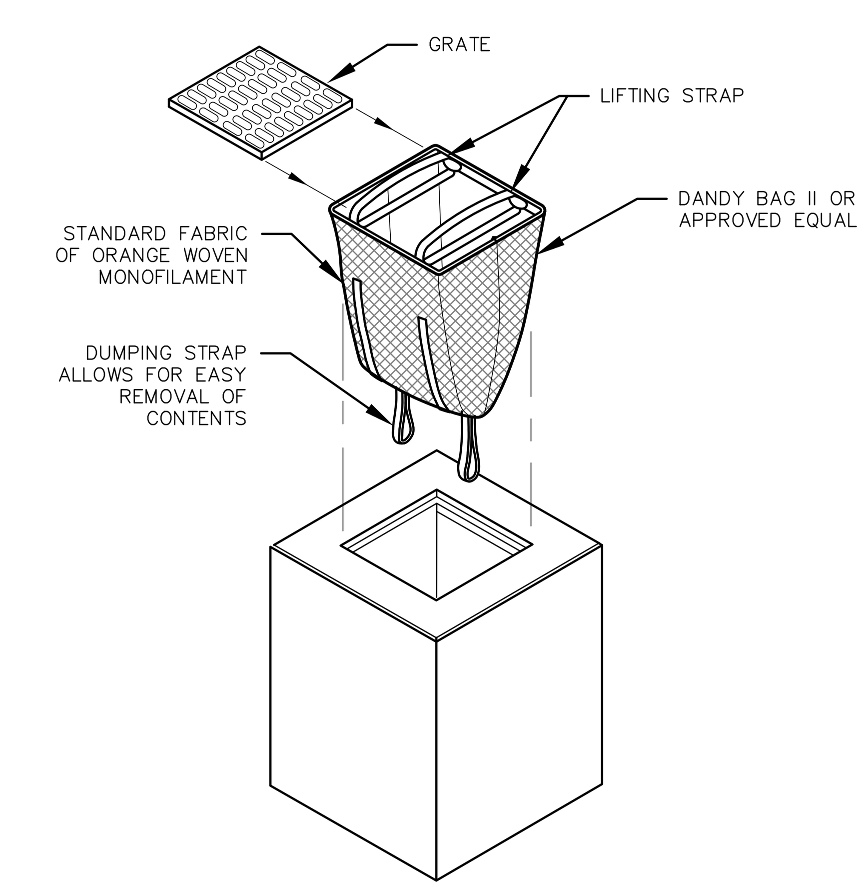


SIEVE SIZE	% PASSING BY WEIGHT
3 inch	100
1 1/2 inch	90–100
1 inch	20–55
3/4 inch	0–15
3/8 inch	0–5

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS–OF–WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT — NOT TO SCALE



INSTALLATION AND MAINTENANCE:

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION — NOT TO SCALE

P5042 / P5356

ENGINEER:
ALTUS ENGINEERING
133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: TAC REVIEW

ISSUE DATE: JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL TAC SUBMISSION	EDW	01/23/23

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

SCALE:
(22"x34") N.T.S.
(11"x17") N.T.S.

OWNER:
LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

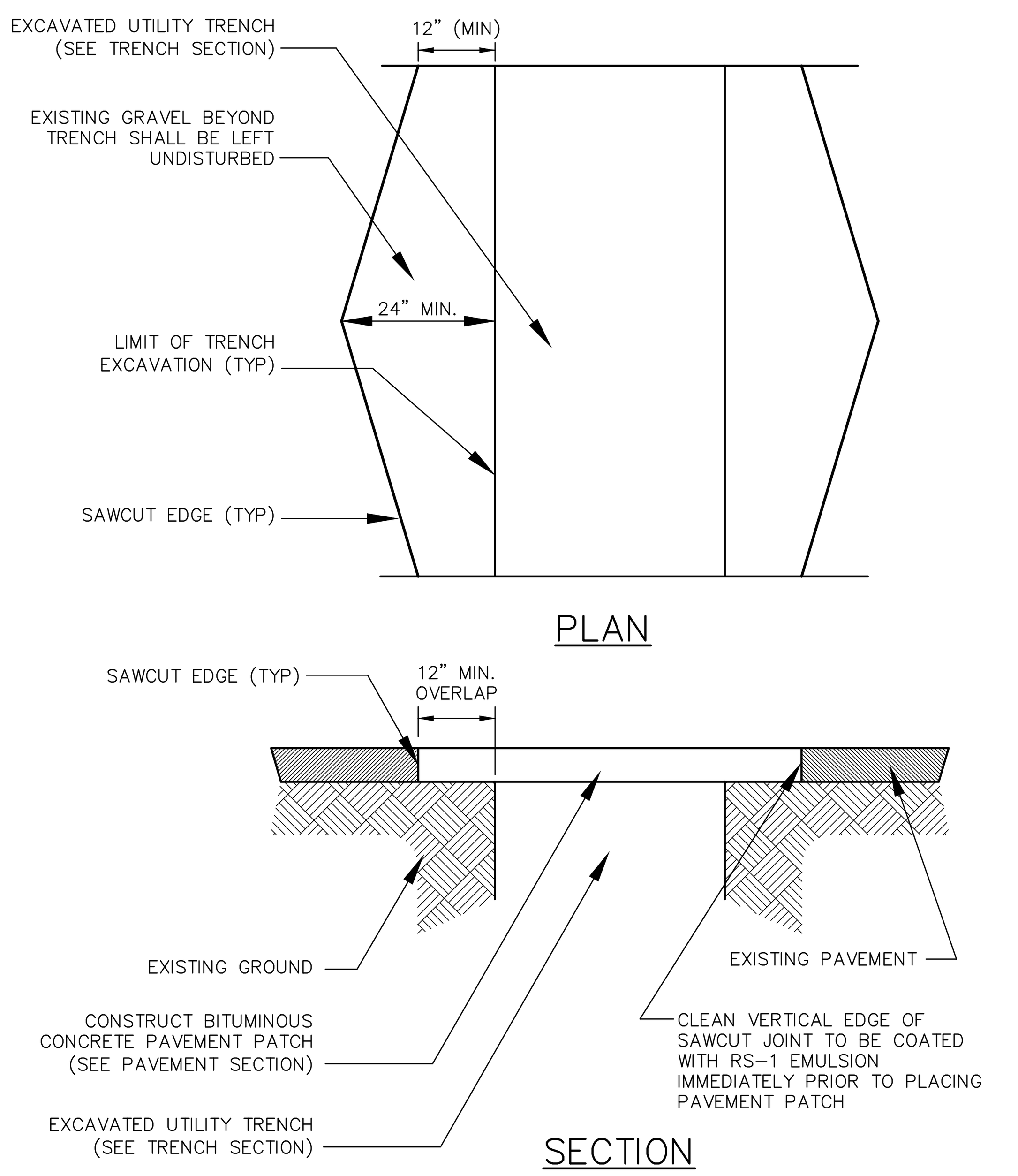
APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
SITE PLAN

SHEET NUMBER:
D - 1

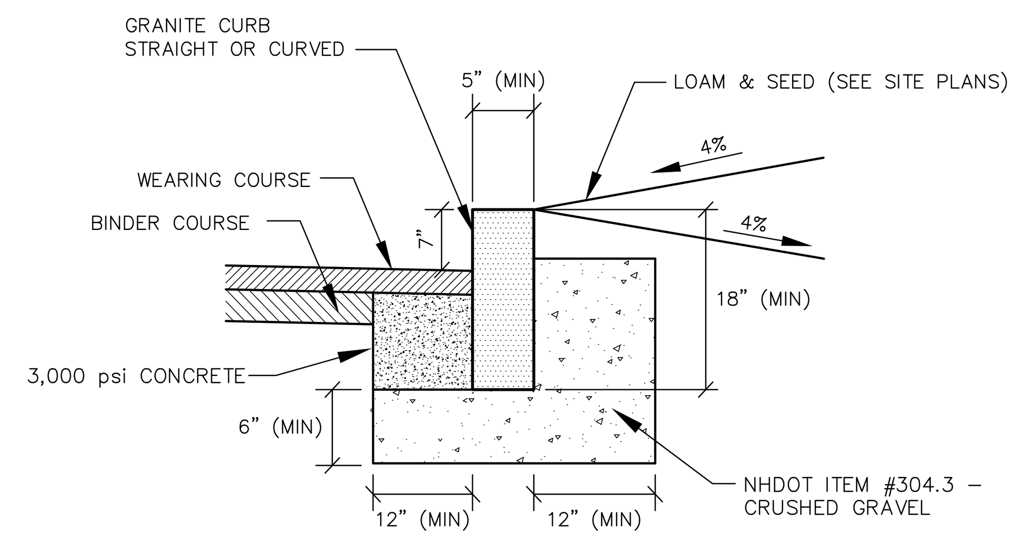
COLOR AT OWNERS DISCRETION



NOTES

1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

TYPICAL TRENCH PATCH — NOT TO SCALE

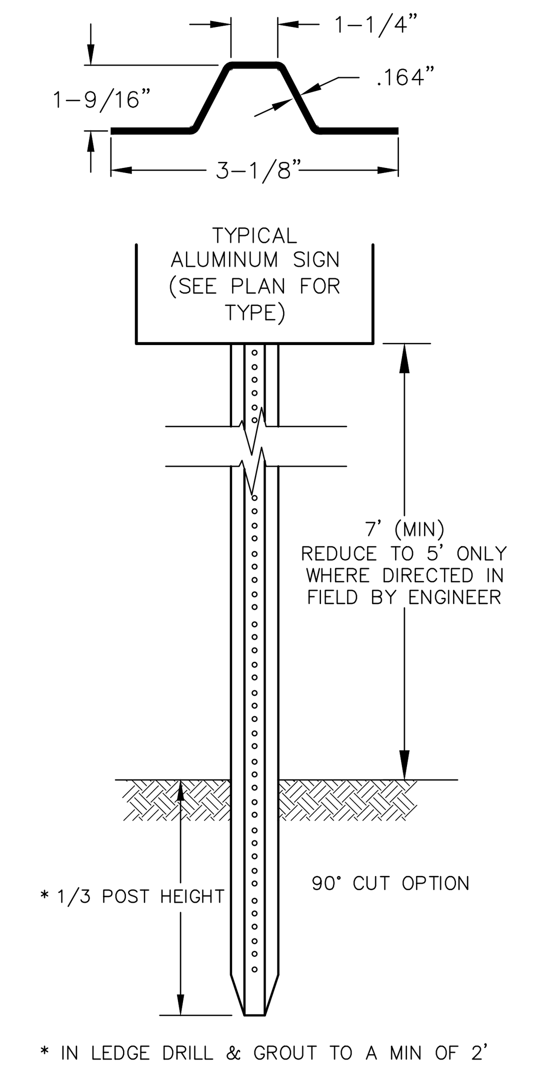


NOTES

1. SEE PLANS FOR CURB LOCATION.
2. SEE PLANS FOR PAVEMENT CROSS SECTION.
3. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
4. MINIMUM LENGTH OF CURB STONES = 4'.
5. MAXIMUM LENGTH OF CURB STONES = 10'.
6. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART.
7. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.
8. CURB SHALL BE INSTALLED PRIOR TO PLACEMENT OF TOP PAVEMENT COURSE.
9. JOINTS BETWEEN CURB STONES SHALL BE MORTARED.

RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'

VERTICAL GRANITE CURB — NOT TO SCALE



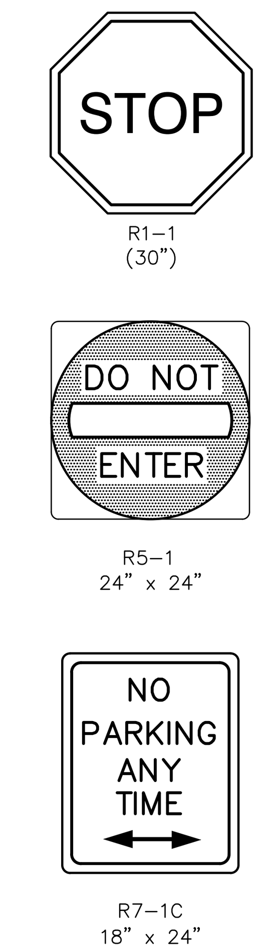
* IN LEDGE DRILL & GROUT TO A MIN OF 2'

LENGTH: AS REQUIRED

WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)

HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH

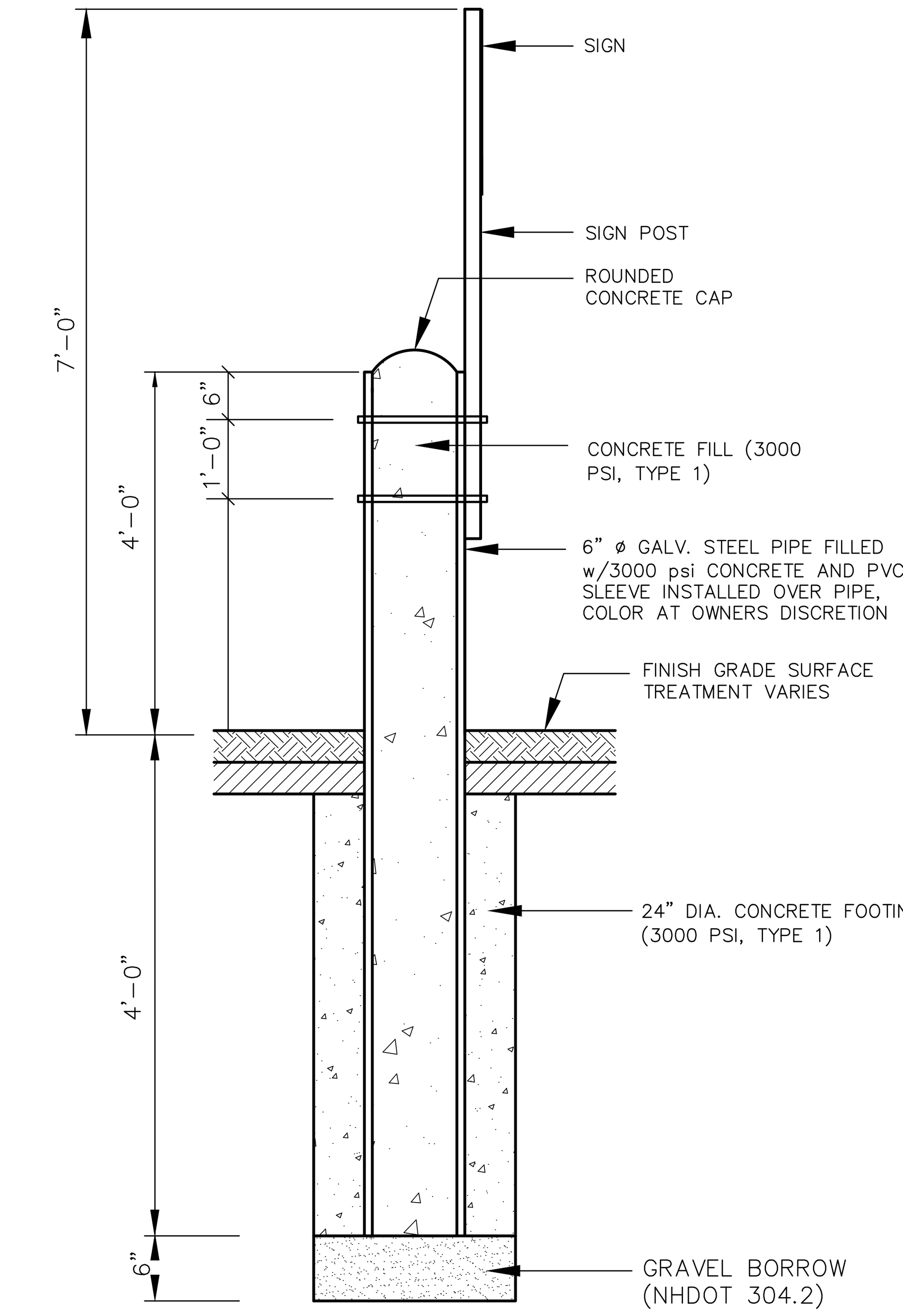
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 – 1080)

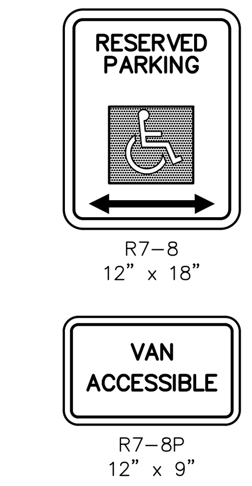


NOTES

1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

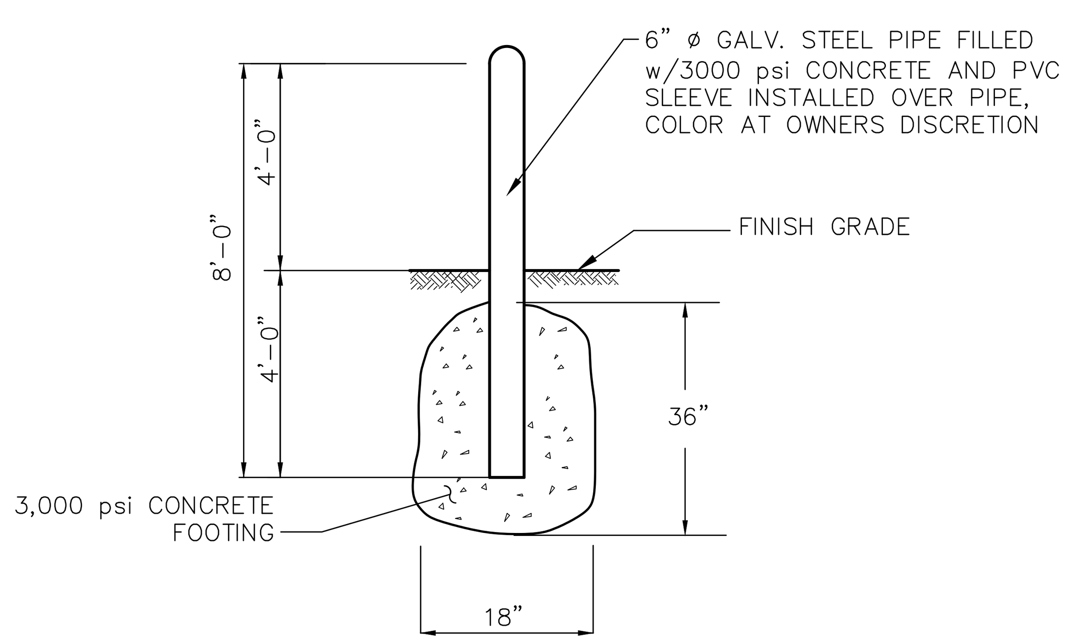
SIGN DETAILS — NOT TO SCALE



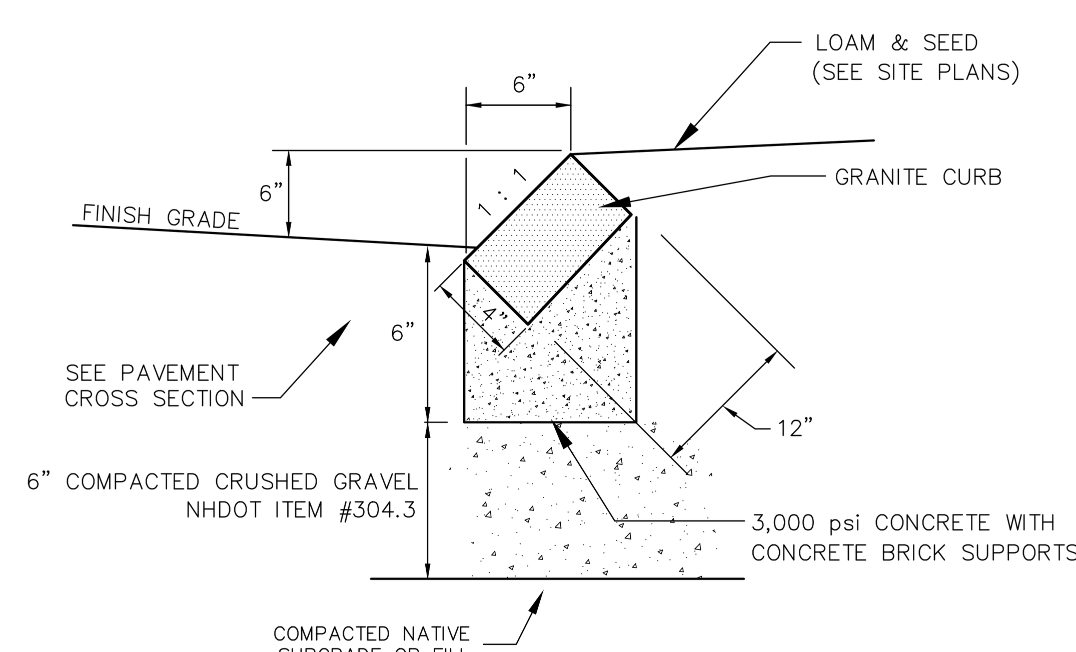


NOTE:
SEE PLANS FOR LOCATIONS OF TWIN BOLLARD MOUNTED HANDICAP SIGNS. WHERE TWO SIGNS ARE TO BE MOUNTED ON INDIVIDUAL SIGN POSTS ON OPPOSITE SIDES OF THE BOLLARD.

BOLLARD WITH MOUNTED SIGN — NOT TO SCALE



BOLLARD — NOT TO SCALE

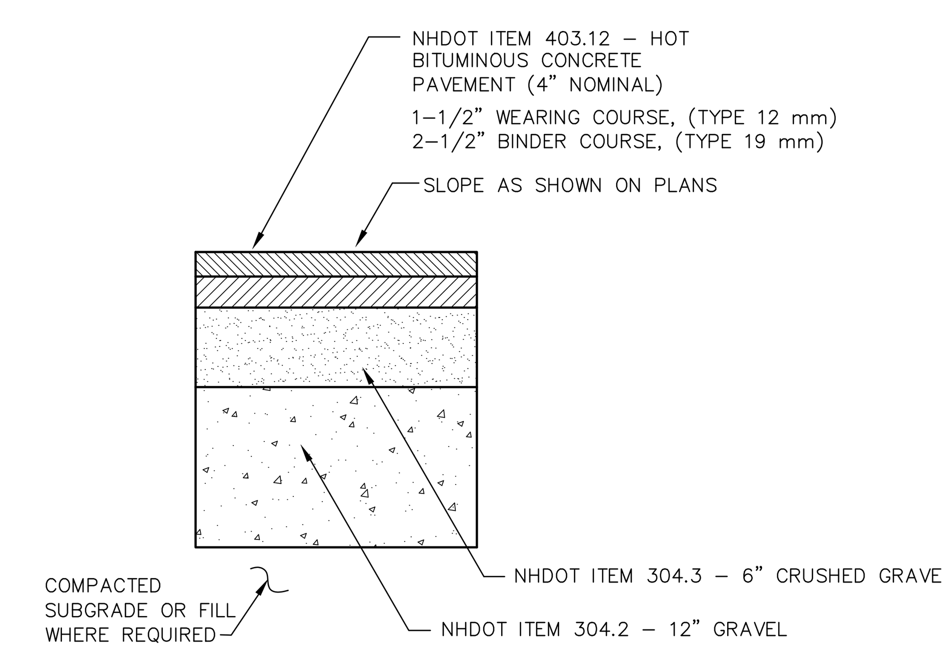


NOTES

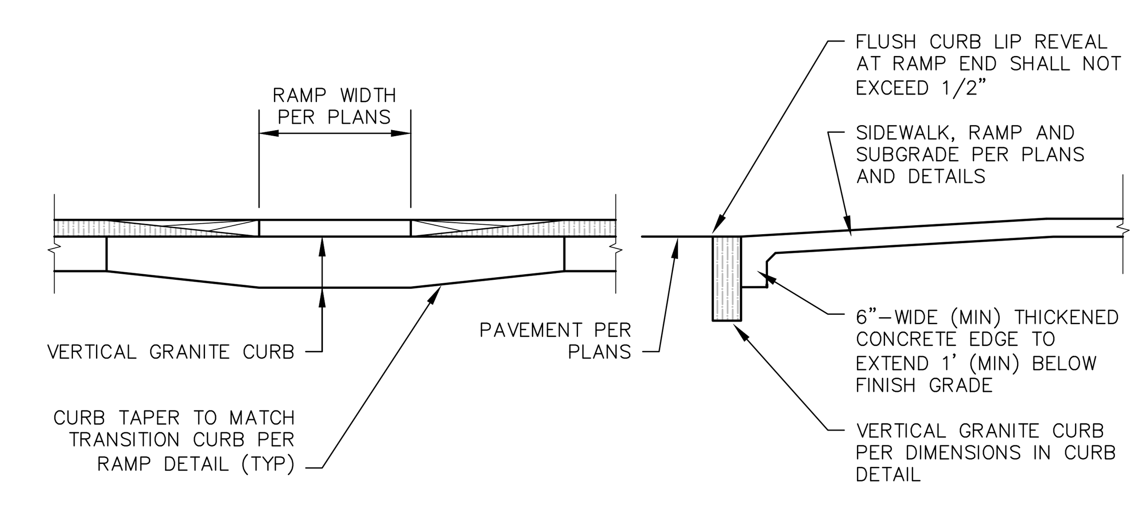
1. SEE SITE PLAN FOR LIMITS OF CURBING
2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

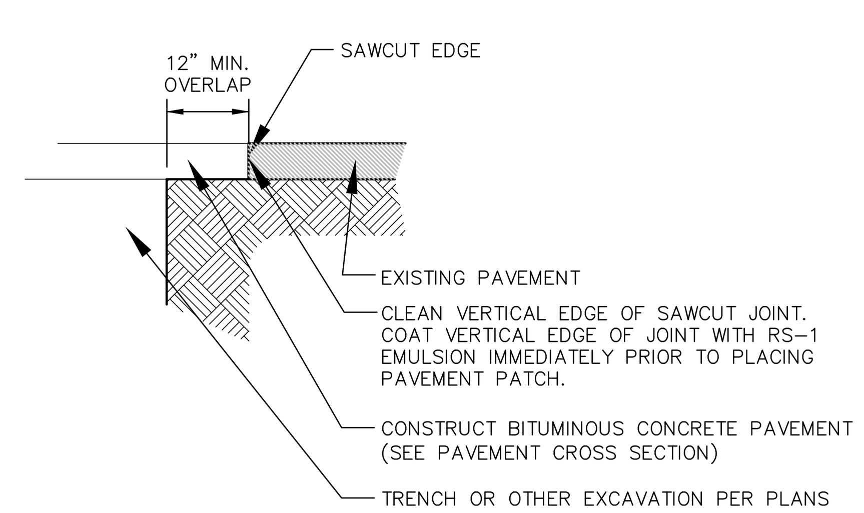
SLOPED GRANITE CURB — NOT TO SCALE



PAVEMENT CROSS SECTION — NOT TO SCALE



FLUSH CURB AT RAMP DETAIL — NOT TO SCALE

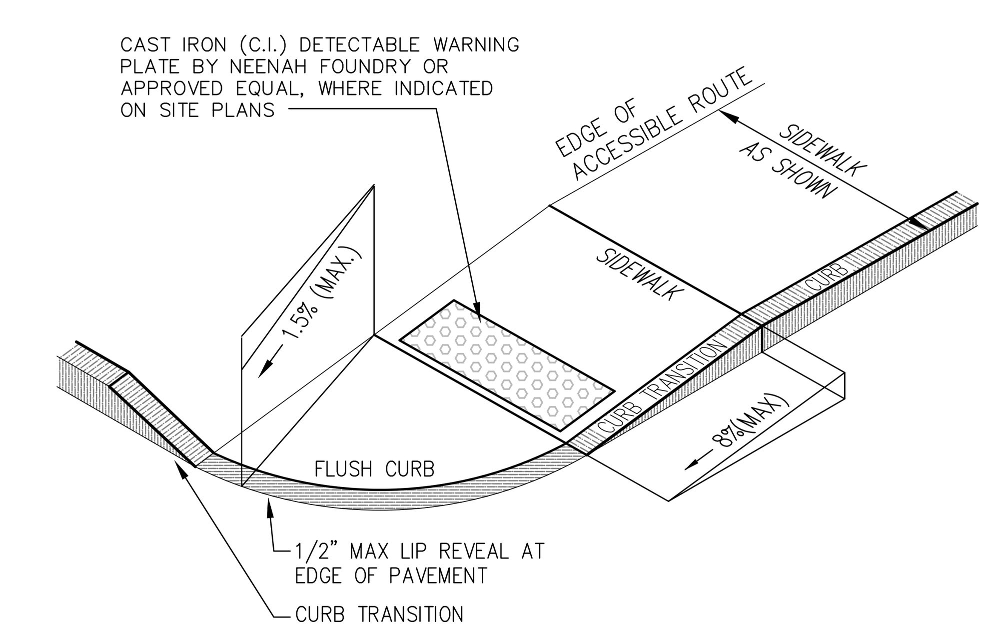


TYPICAL PAVEMENT SAWCUT — NOT TO SCALE

NOTES APPLICABLE TO ALL CURB RAMPS AND SIDEWALKS:

1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8%.
4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
6. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/2" AT THE EDGE OF PAVEMENT.
9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.

CURB RAMP & SIDEWALK NOTES — NOT TO SCALE



CURB RAMP (TYPE 'B') — NOT TO SCALE

P5356

ENGINEER:

ALTUS ENGINEERING

133 Court Street, Portsmouth, NH 03801
(603) 433-2335, www.altus-eng.com

STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB No. 7634 — LICENSED PROFESSIONAL ENGINEER

1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR: TAC REVIEW

ISSUE DATE: JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL TAC SUBMISSION	EDW	01/23/23

DRAWN BY: RLH

APPROVED BY: EDW

DRAWING FILE: 5356SITE.dwg

SCALE:
(22"x34") N.T.S.
(11"x17") N.T.S.

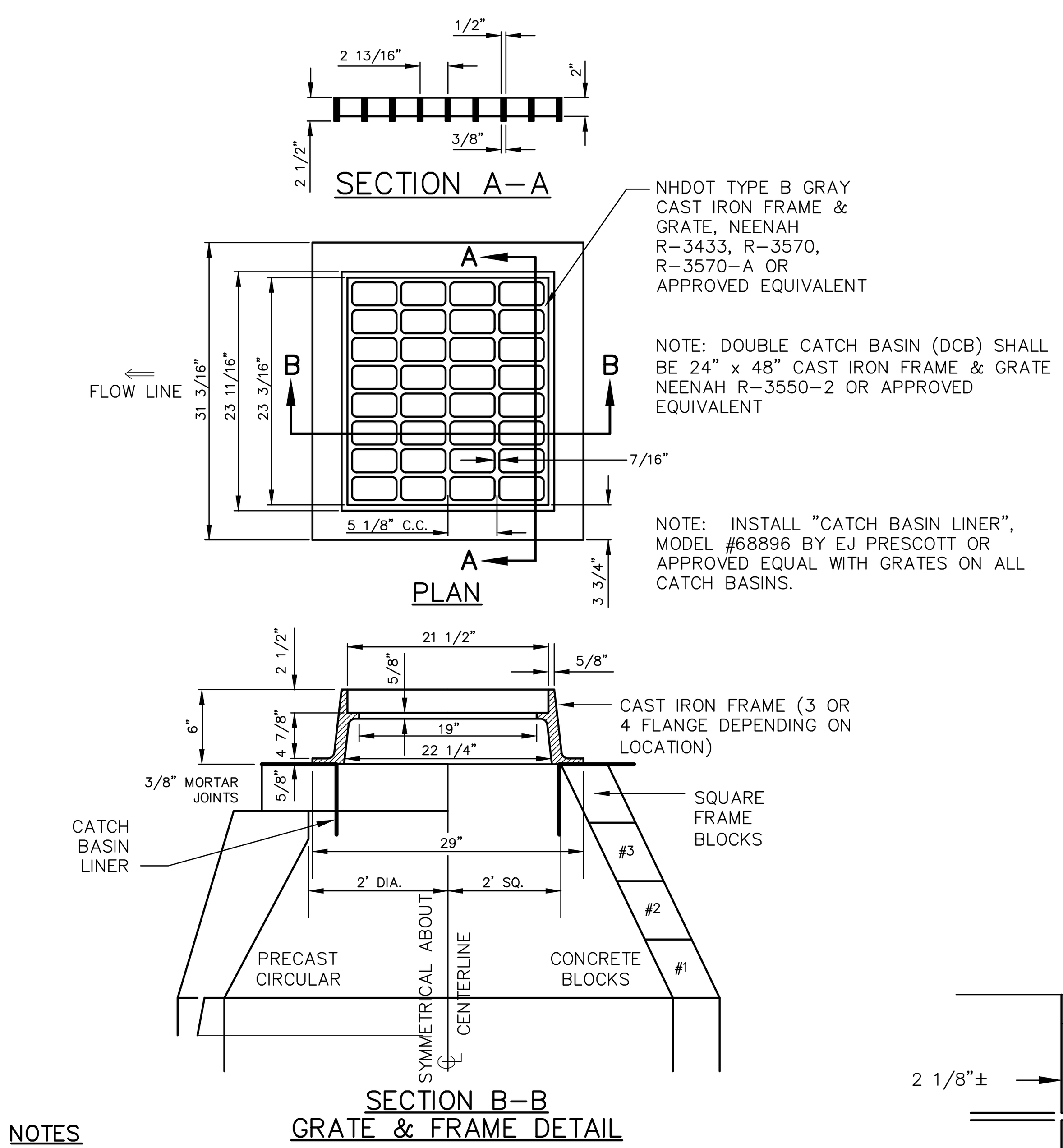
OWNER:
LUCKY THIRTEEN PROPERTIES, LLC
P.O. BOX 300
RYE, NH 03870

APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

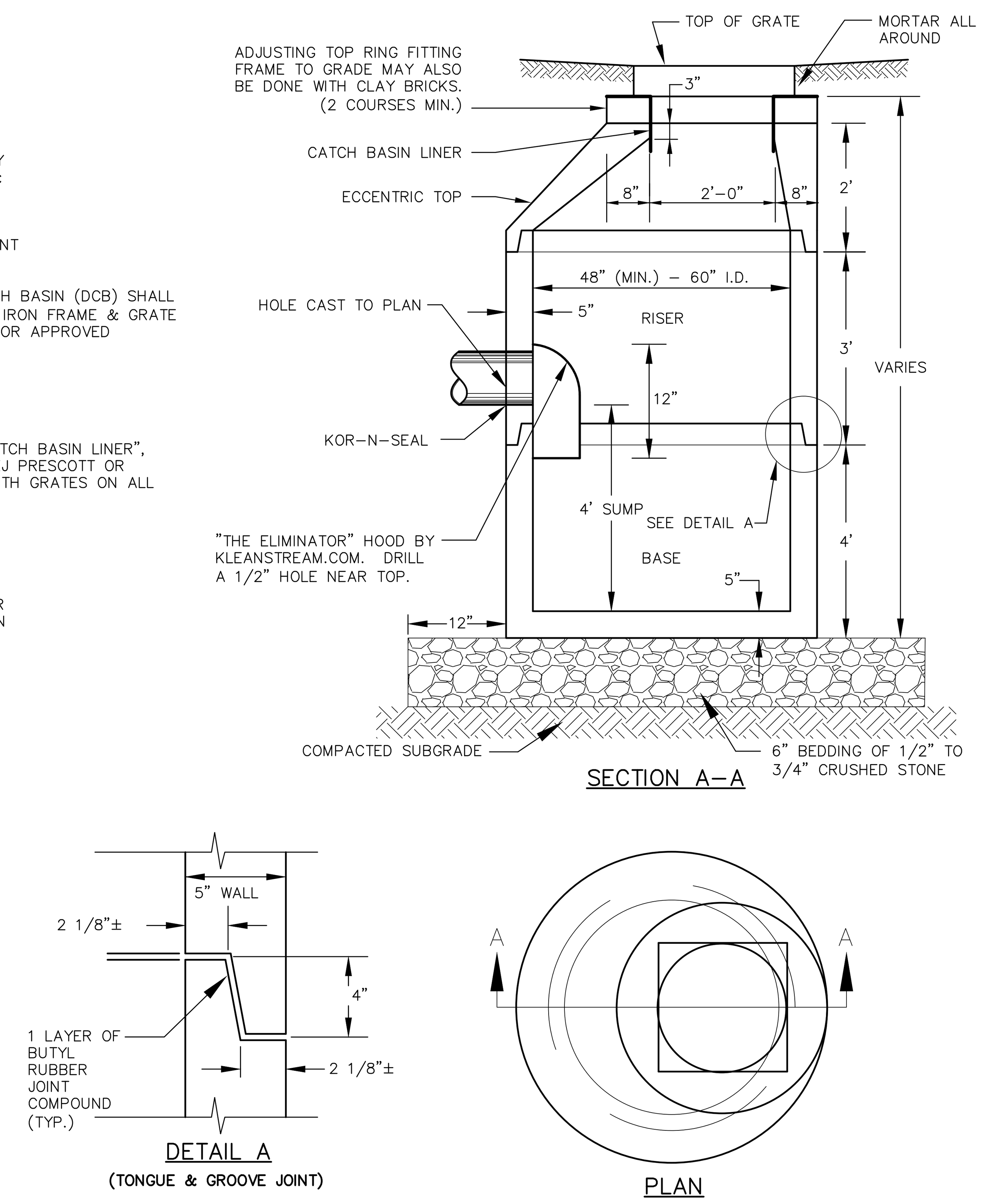
TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 2



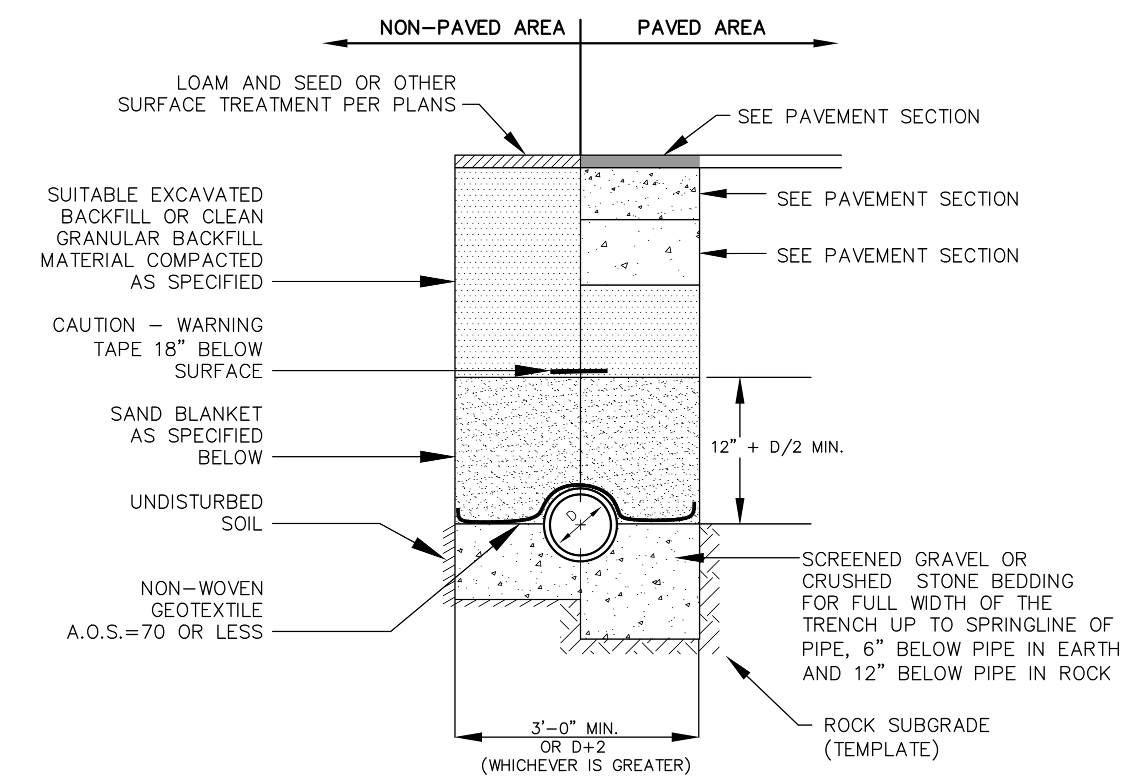
NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APPROVED BY THE ENGINEER.



DEEP SUMP CATCH BASIN

NOT TO SCALE



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

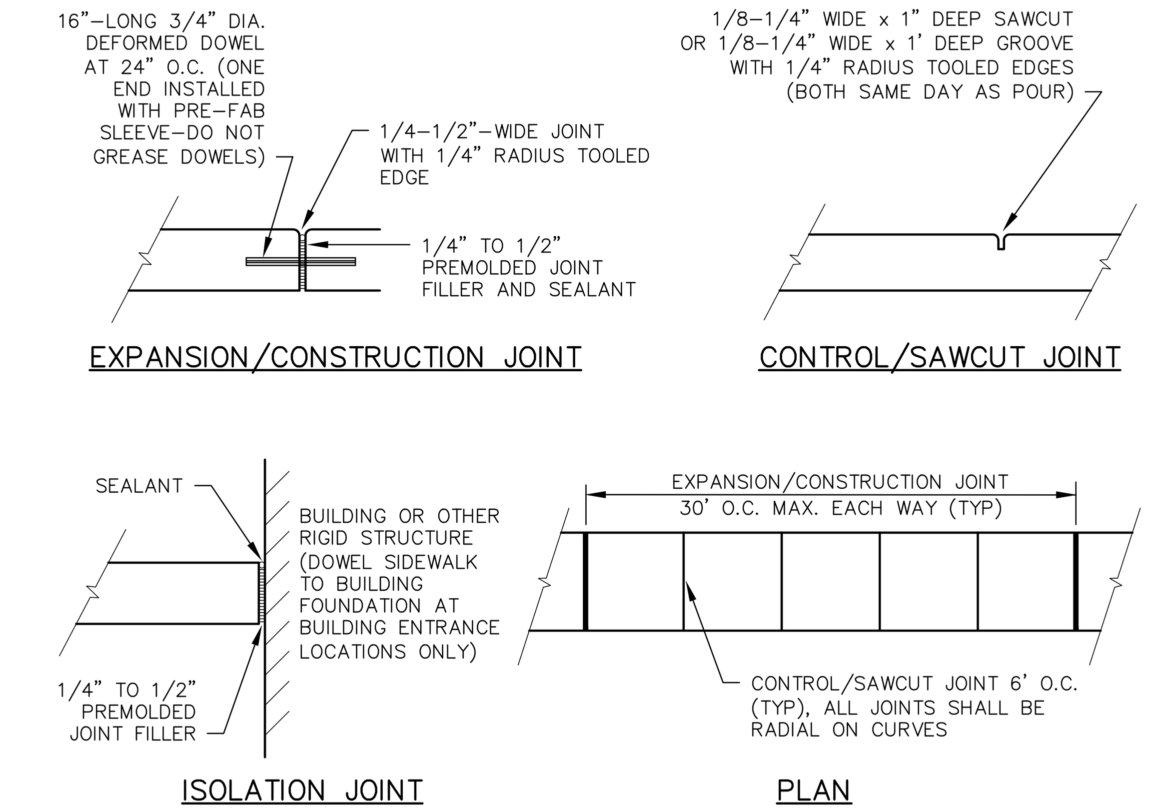
SCREENED GRAVEL OR CRUSHED STONE BEDDING*

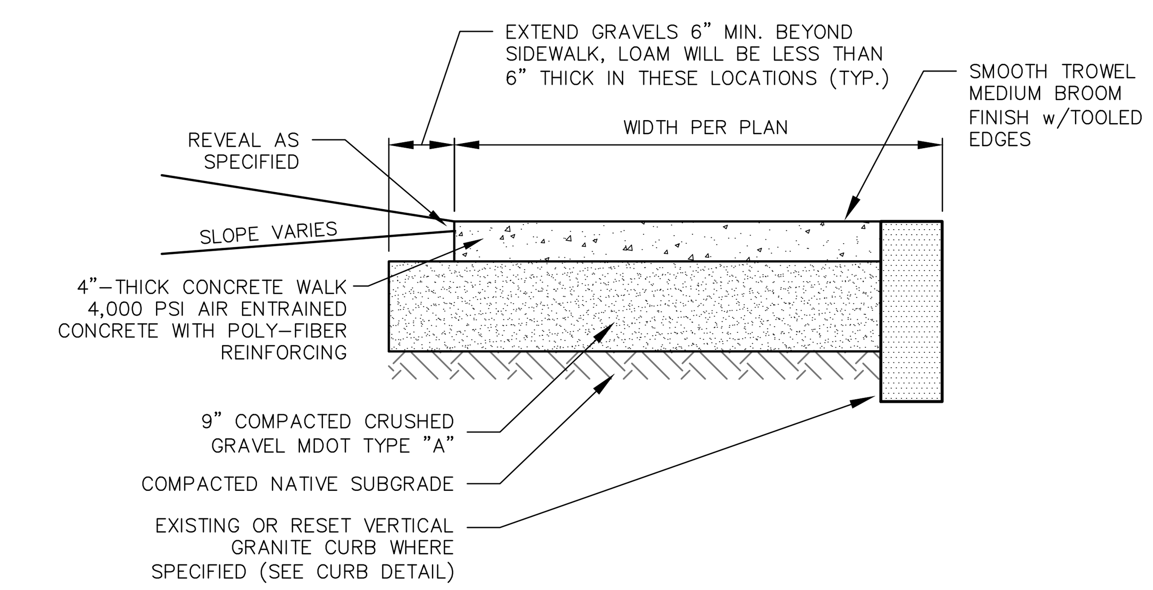
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAINAGE TRENCH SECTION

NOT TO SCALE



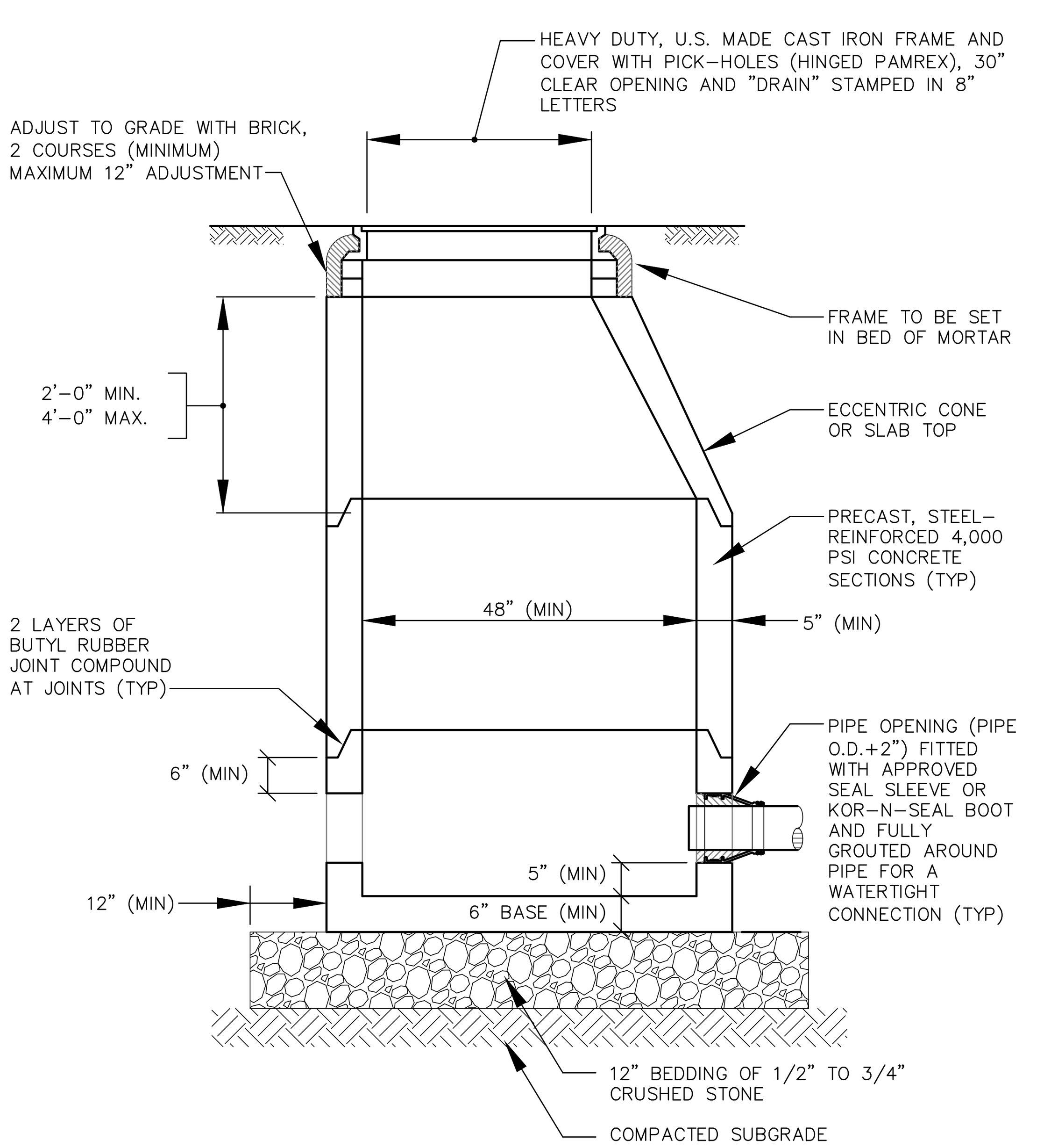


NOTE

1. JOINTS IN CONCRETE SIDEWALKS SHALL CONFORM TO THE TYPES AND LOCATIONS SHOWN IN THE HEAVY-DUTY CONCRETE PAVEMENT DETAIL

CONCRETE SIDEWALK

NOT TO SCALE



NOTES

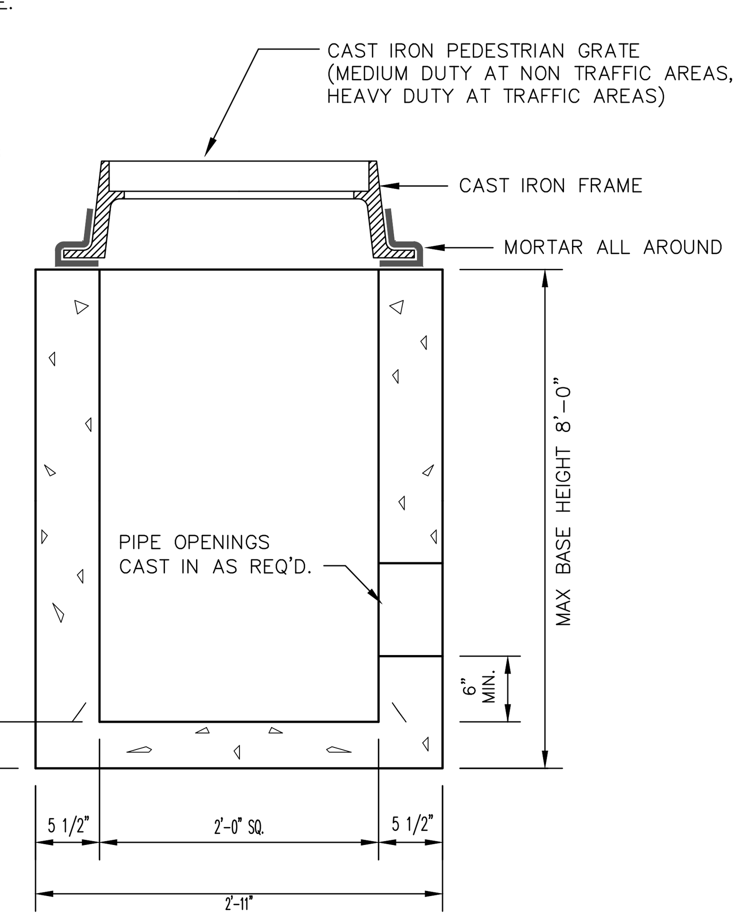
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. ALL MANHOLE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H-20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4 FT OF GRADE.
7. MANHOLE STEPS ARE NOT PERMITTED.

DRAIN MANHOLE DETAIL (PDMH)

NOT TO SCALE

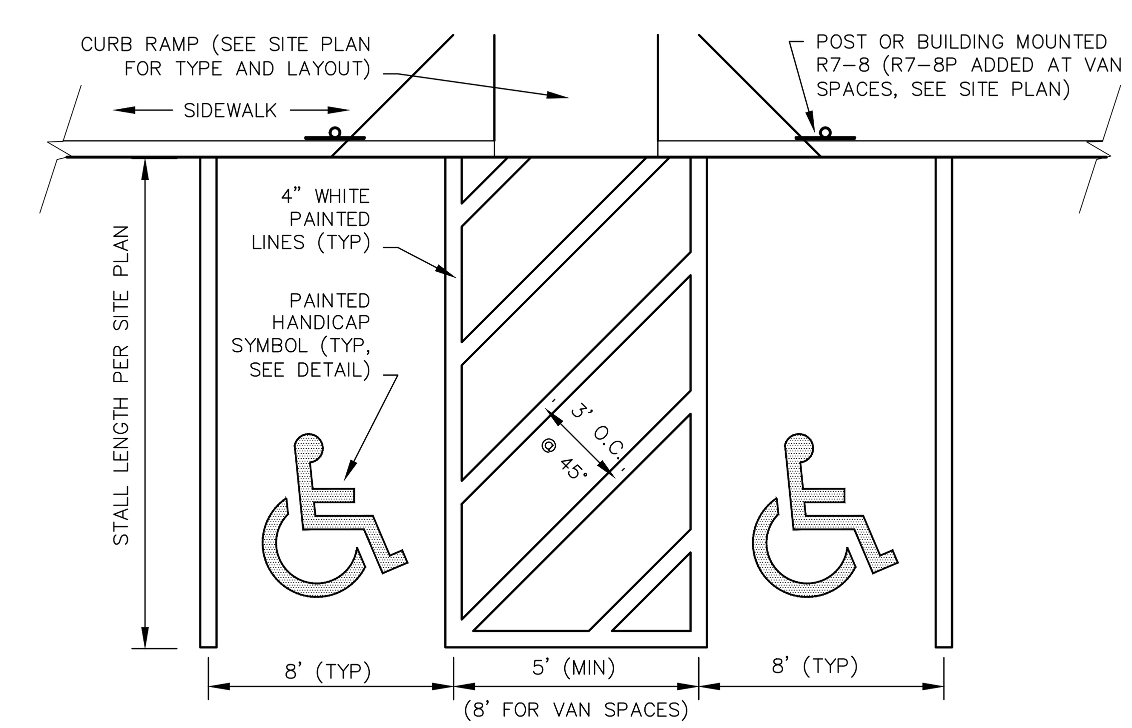
NOTES:

1. TO ACCOMMODATE A 24" SQ. C.I. FRAME AND GRATE.
2. SUPERIOR CONCRETE CO. (800-482-7417) OR APPROVED EQUAL
3. CONCRETE: 5,000 PSI AFTER 28 DAYS
4. MATERIALS SHALL WITHSTAND H-20 LOADING AT TRAFFIC AREAS



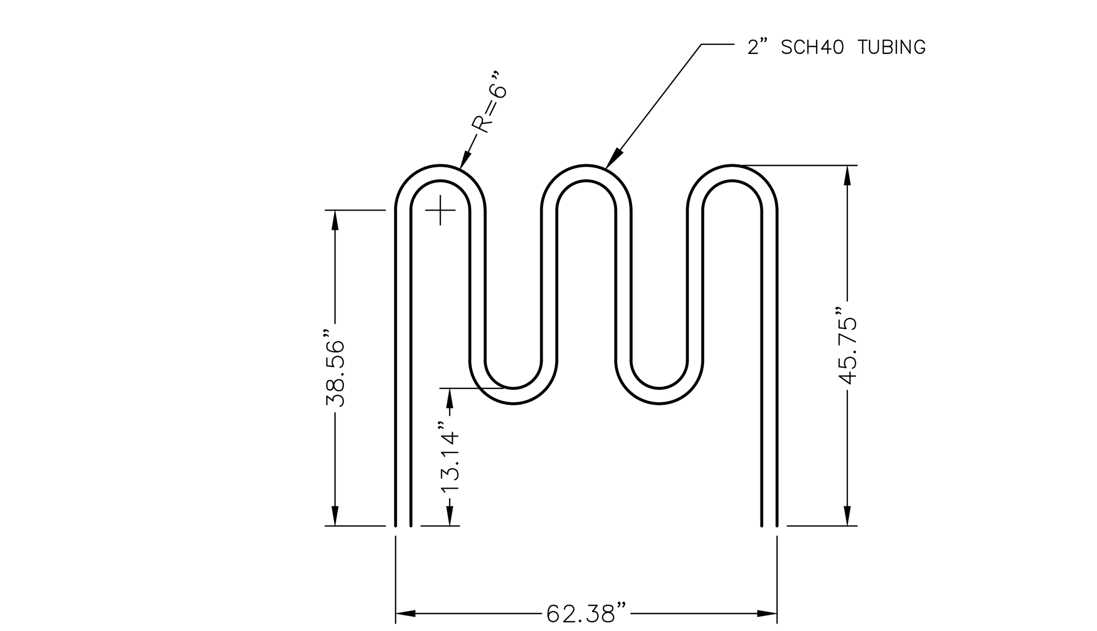
DROP INLET STRUCTURE

NOT TO SCALE



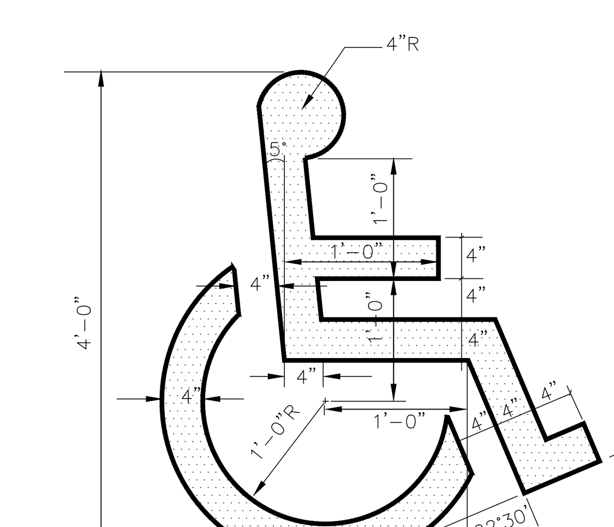
HANDICAP PARKING STALL LAYOUT

NOT TO SCALE



7-BIKE WAVE BIKE RACK (IN-GROUND)

NOT TO SCALE



NOTES

1. SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES IN WHITE PAINT (BLUE-PAINTED SQUARE BACKGROUND OPTIONAL).

PAINTED HANDICAP SYMBOL

NOT TO SCALE

P5356

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED
PROFESSIONAL ENGINEER
1/23/23

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC REVIEW

ISSUE DATE:
JANUARY 23, 2023

REVISIONS

NO.	DESCRIPTION	BY	DATE
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DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5356SITE.dwg

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(22"x34") N.T.S.
(11"x17") N.T.S.

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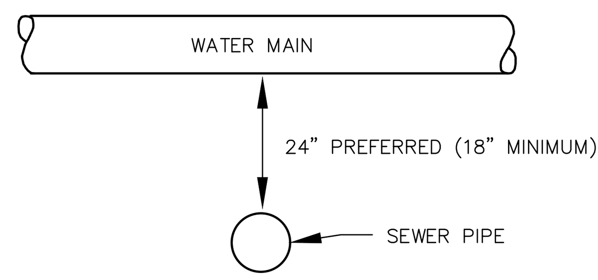
APPLICANT:
IT'S GOOD TO BE KNEADED, LLC
C/O SEAN CREELEY
337 RICHARDS AVENUE
PORTSMOUTH, NH 03801

PROJECT:
IT'S GOOD TO BE KNEADED
361 ISLINGTON STREET
PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:
DETAIL SHEET

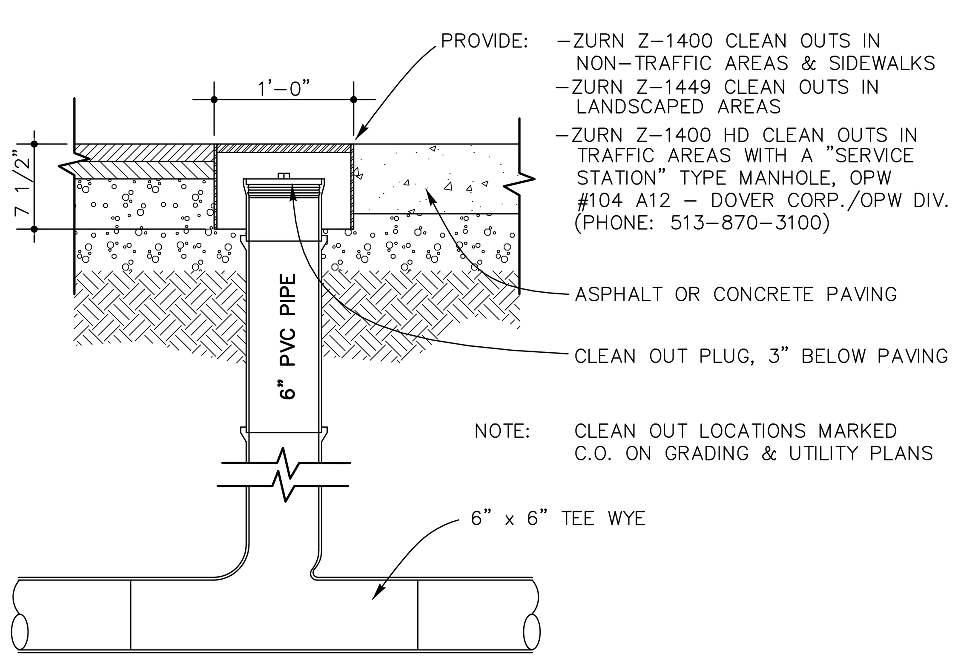
SHEET NUMBER:
D - 3



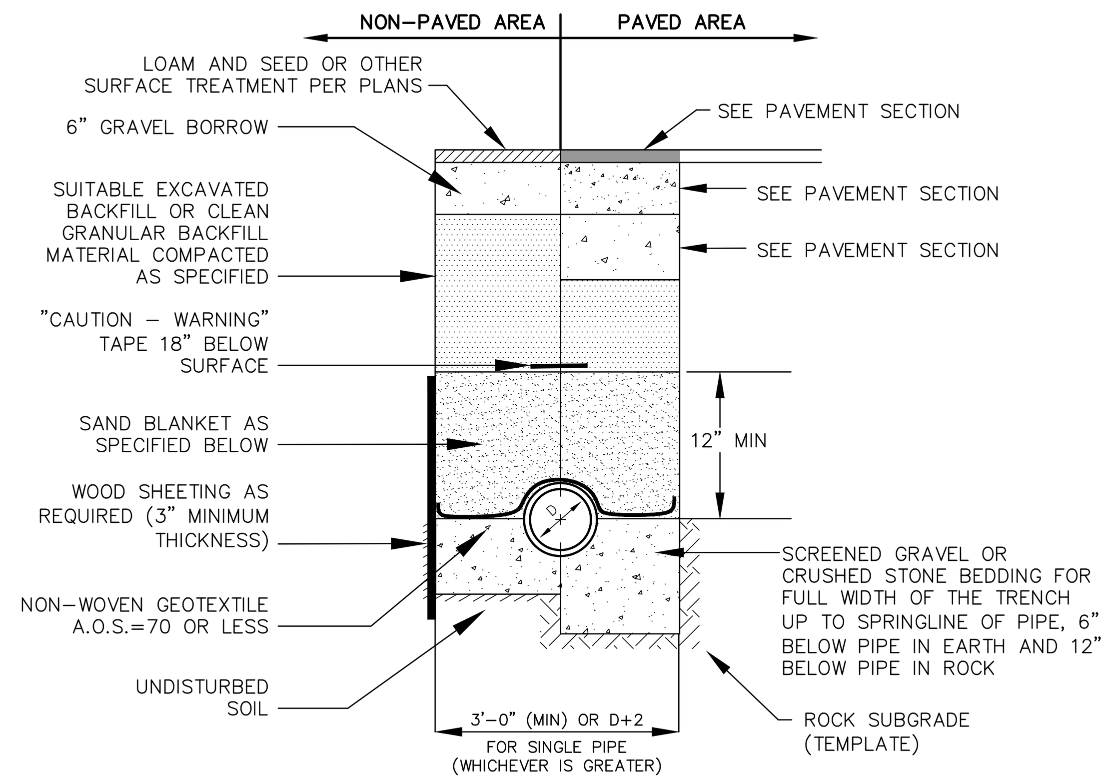
NOTES

1. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS. A MINIMUM VERTICAL DISTANCE WITH WATER ABOVE SEWER SHALL BE MAINTAINED.
2. SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
3. IF THE REQUIRED CONFIGURATION CANNOT BE MET, THE SEWER MAIN SHALL BE CONSTRUCTED TO MEET THE NHDES REQUIREMENTS FOR FORCE MAIN CONSTRUCTION.

WATER MAIN / SEWER CROSSING NOT TO SCALE



SEWER CLEANOUT NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'–0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

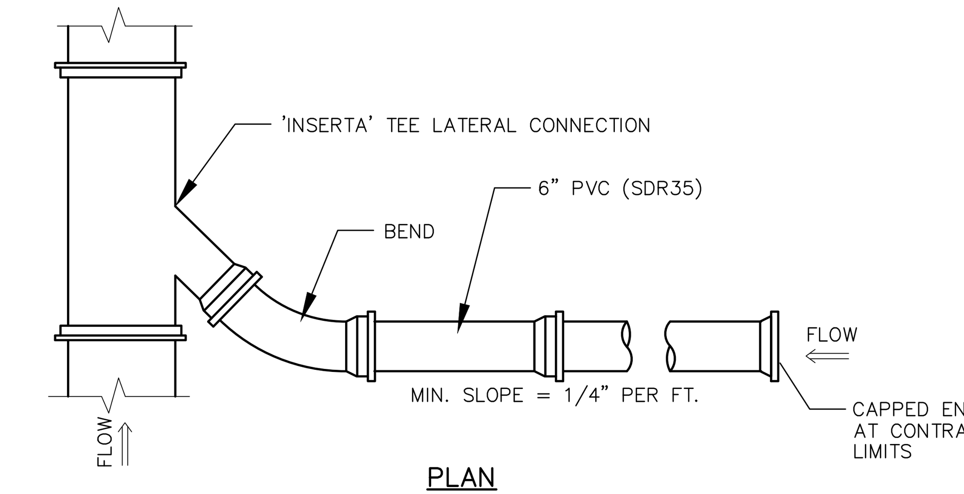
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

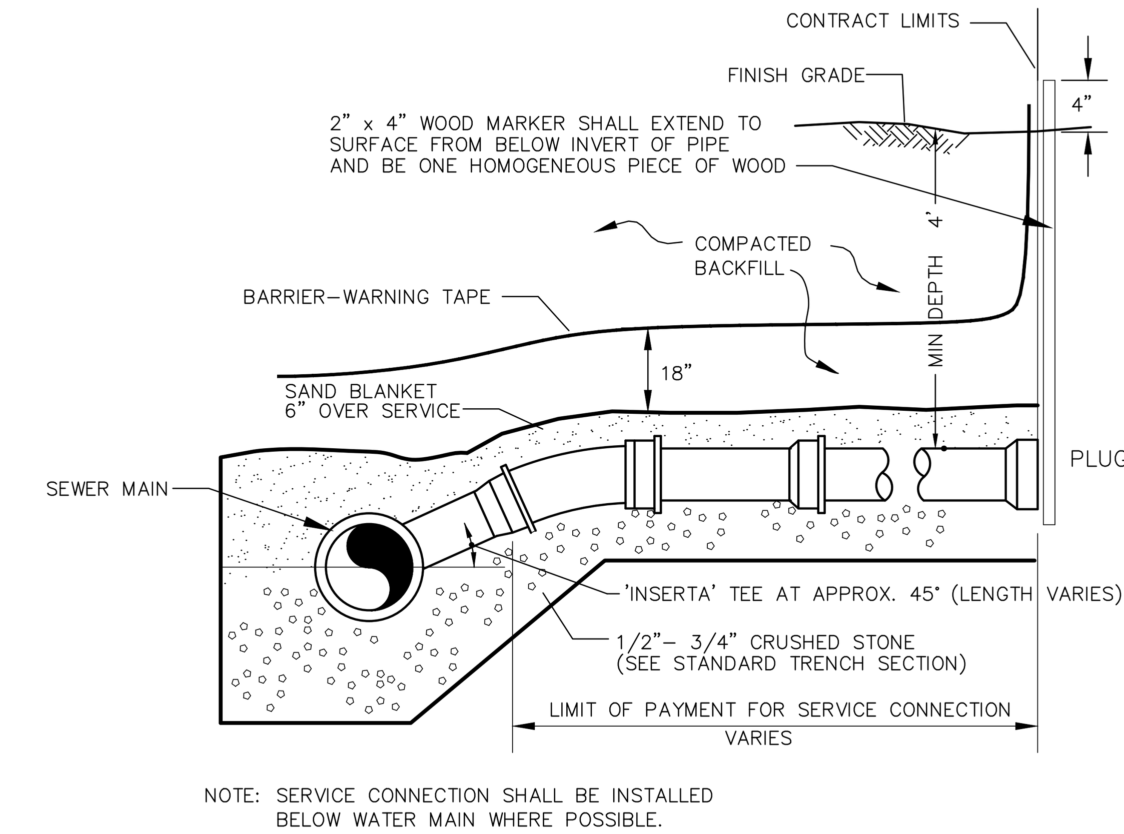
STANDARD TRENCH NOTES

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST–IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT, IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – DIVISIONS 300 AND 400 RESPECTIVELY.
6. SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG
   CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
10. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
11. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.

SEWER TRENCH NOT TO SCALE



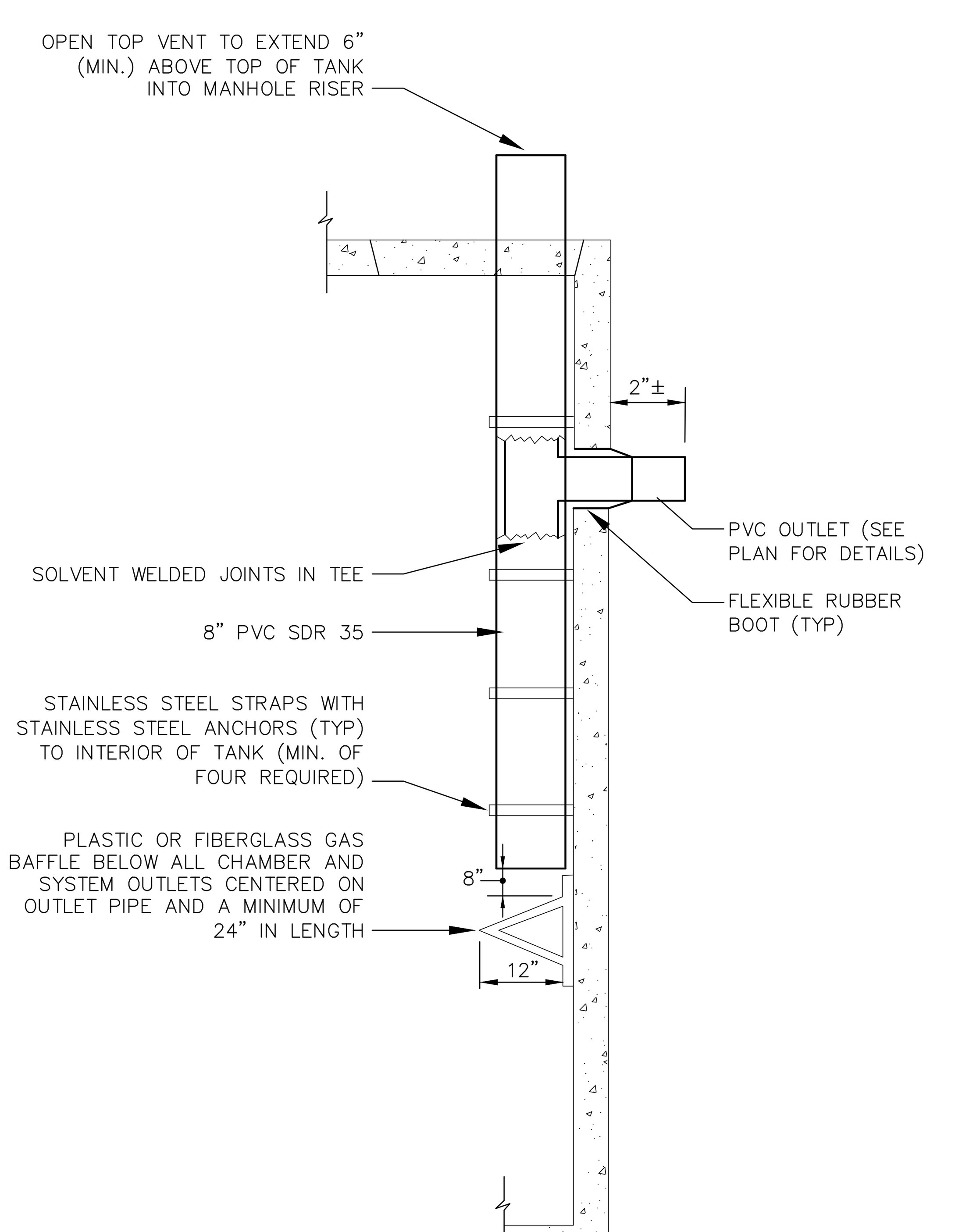
PLAN



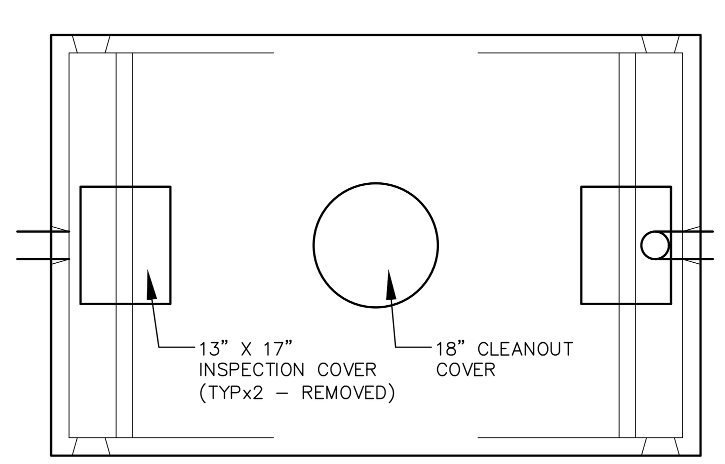
NOTE: SERVICE CONNECTION SHALL BE INSTALLED BELOW WATER MAIN WHERE POSSIBLE.

ELEVATION

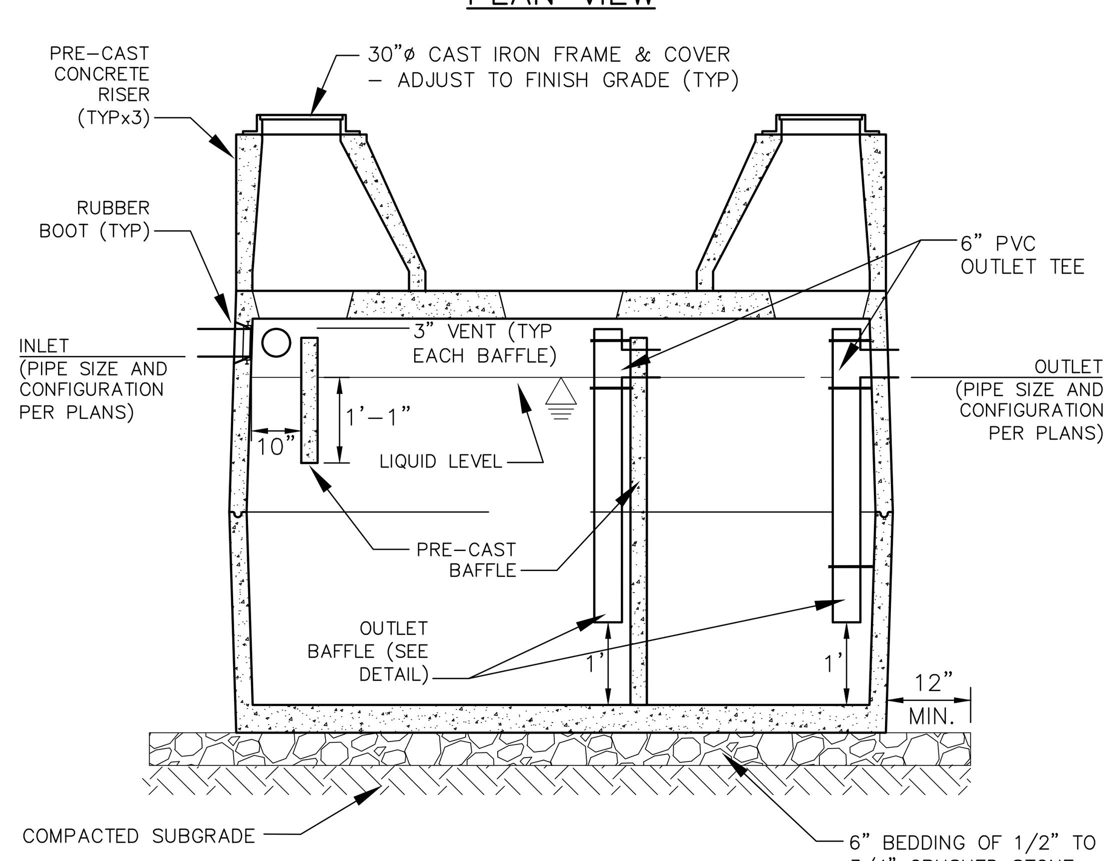
SEWER SERVICE CONNECTION NOT TO SCALE



GREASE TRAP OUTLET BAFFLE DETAIL NOT TO SCALE



PLAN VIEW

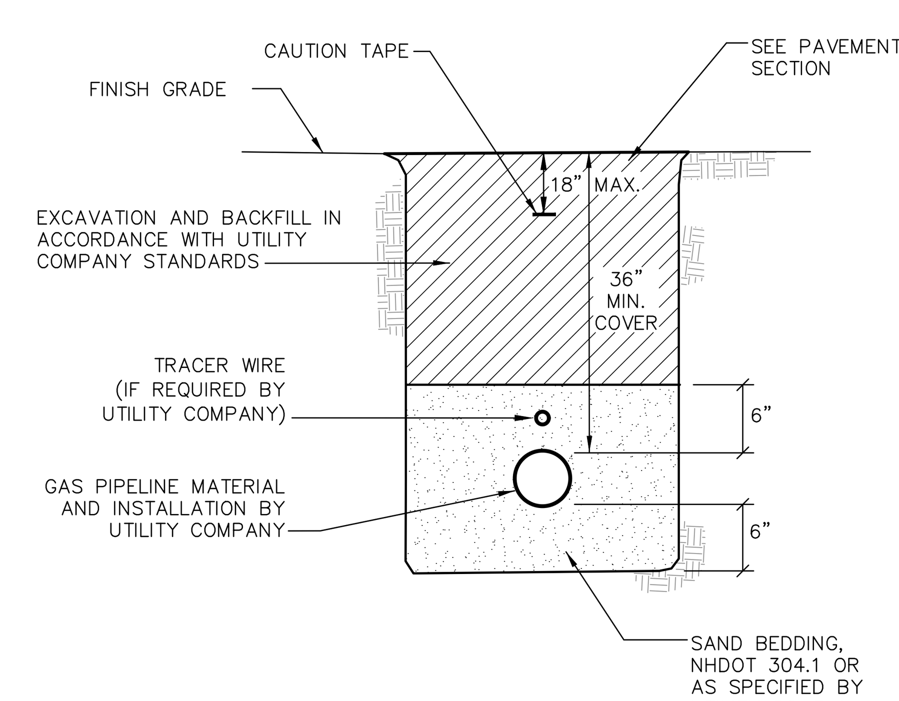


SECTION VIEW

NOTES:

1. TANK SHALL BE MULTI–COMPARTMENT 4,000 PSI (MIN.) STEEL REINFORCED CONCRETE.
2. KEYED TANK JOINTS SHALL BE SEALED WITH BUTYL RUBBER.
3. TANK SHALL BE MANUFACTURED BY E. F. SHEA OR APPROVED EQUAL TO THE CAPACITY SHOWN. TANK DIMENSIONS MAY VARY DEPENDING ON THE MANUFACTURER.
4. INLET AND OUTLET PIPE SIZES AND CONFIGURATION SHALL BE CONSTRUCTED PER THE PLANS.

1,000 GALLON GREASE TRAP NOT TO SCALE



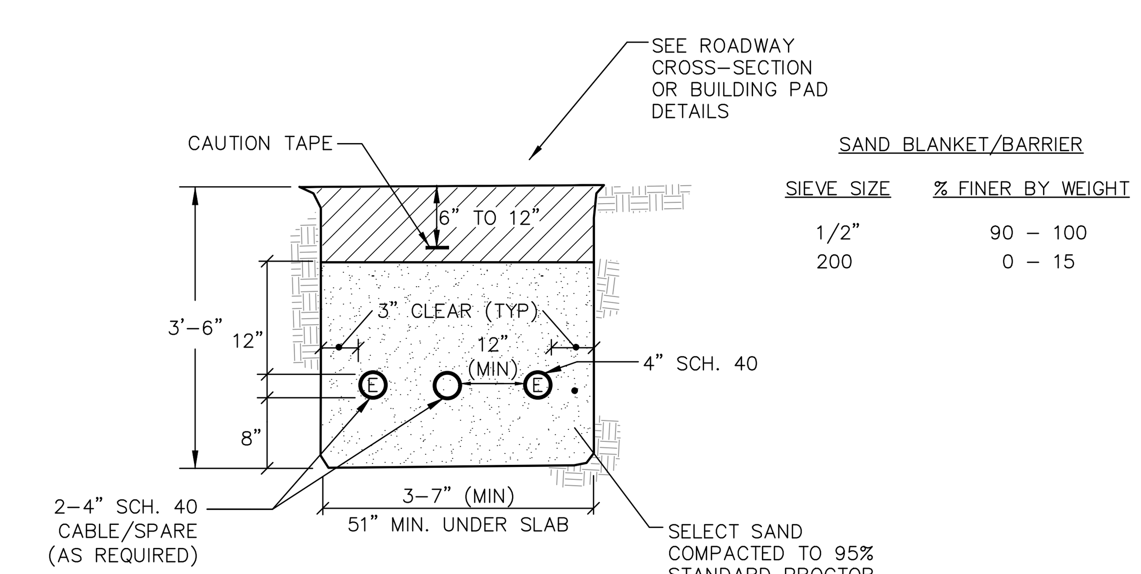
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL FOR PIPE INSTALLATION WITHIN THE PROJECT SITE.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

GAS TRENCH NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10–FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP–PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6–INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY–FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3–INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4–INCH FOR THREE PHASE SECONDARY, AND 5–INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

ELECTRIC / COMMUNICATION TRENCH NOT TO SCALE

P5356

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
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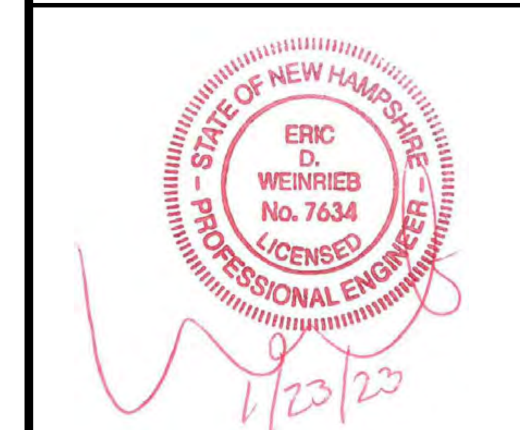

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PROJECT:
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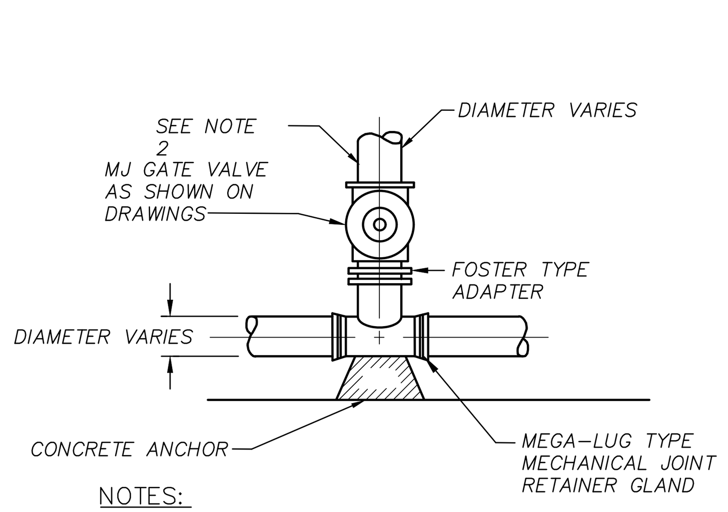
TITLE:
DETAIL SHEET

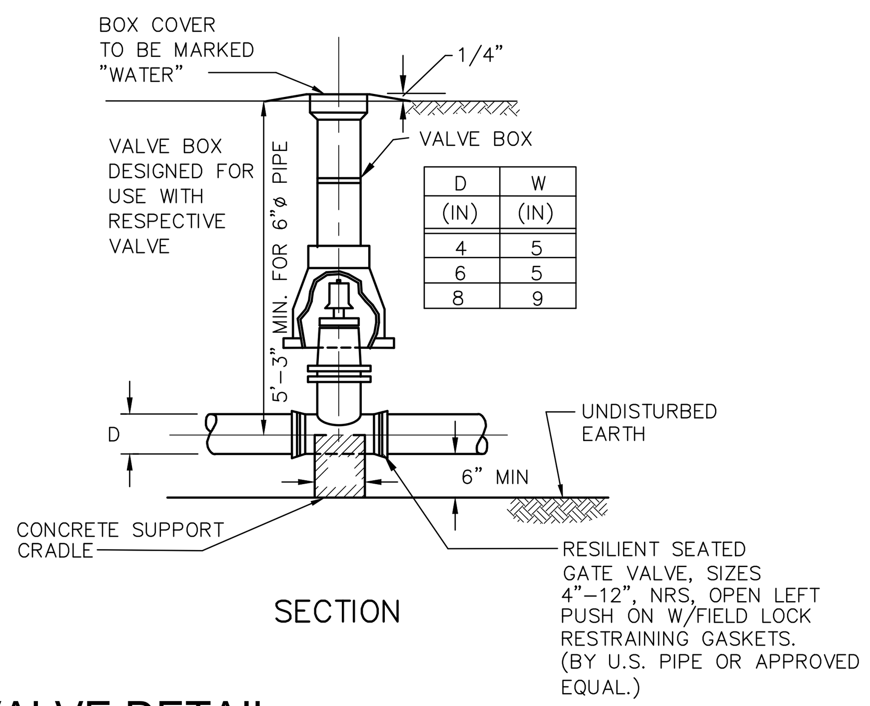
SHEET NUMBER:
D - 4



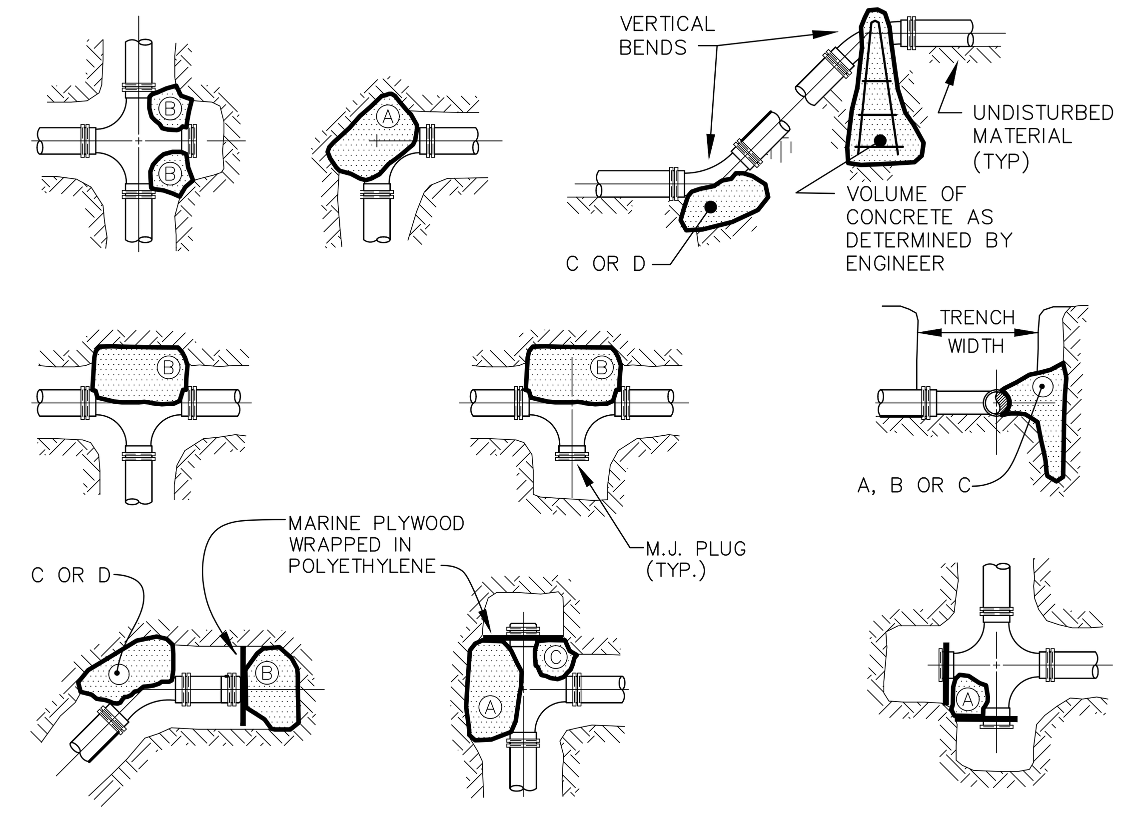
NOTES:

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

TEE & GATE VALVE ASSEMBLY DETAIL NOT TO SCALE



WATER VALVE DETAIL NOT TO SCALE

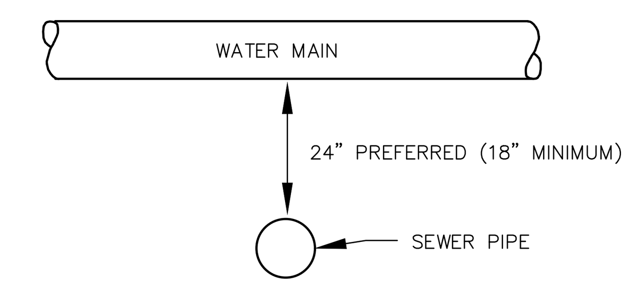


TEST PRESSURE = 150 psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. X
6. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND ALL FITTINGS PRIOR TO CONCRETE PLACEMENT.

THRUST BLOCKING NOT TO SCALE



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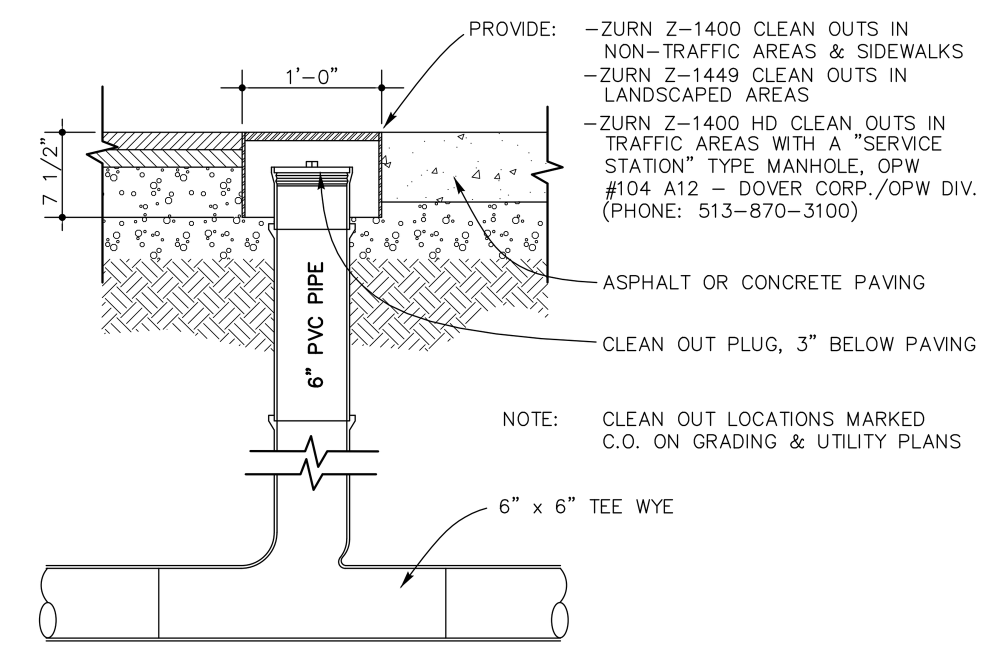
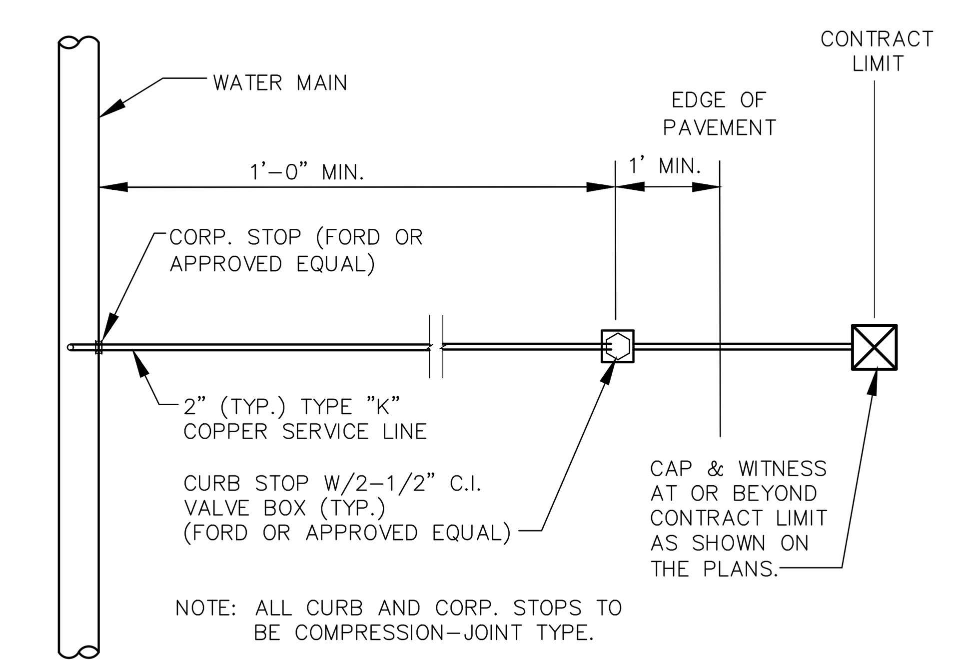
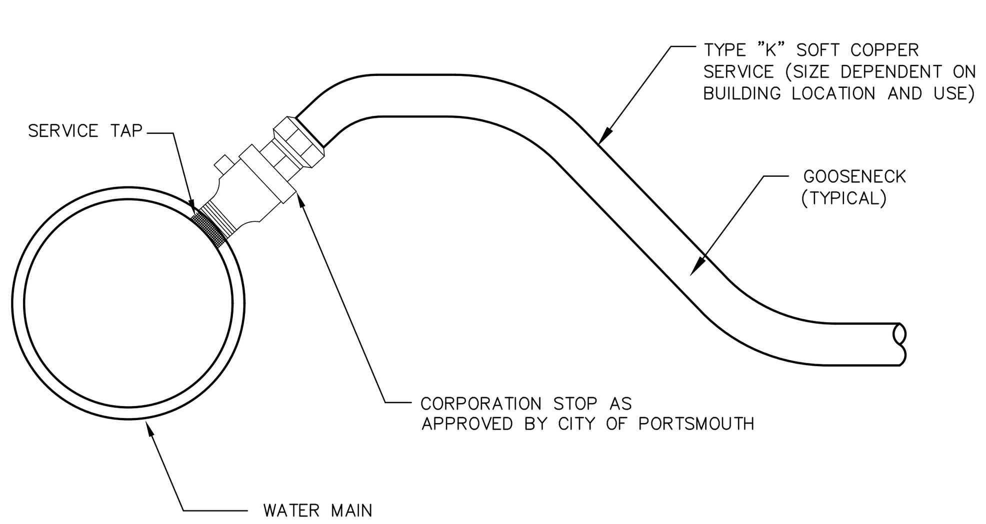


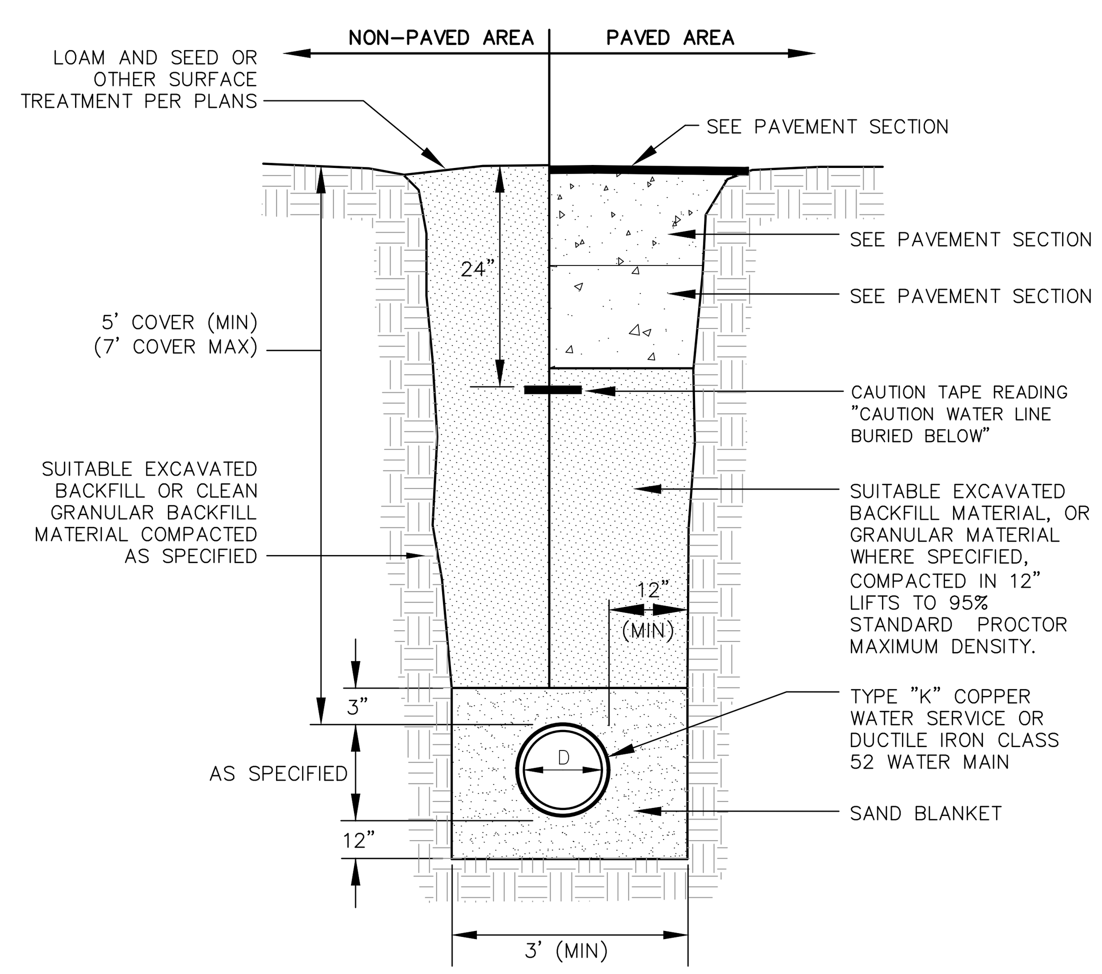
SEWER CLEANOUT NOT TO SCALE



NOTE: ALL MATERIALS AND SPECIFICATIONS SHALL CONFORM TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS AND REQUIREMENTS. VERIFY PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.



WATER SERVICE CONNECTION NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

WATER MAIN TRENCH NOT TO SCALE

P5356

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STATE OF NEW HAMPSHIRE ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER

1/23/23

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PORTSMOUTH, NH
MAP 144 LOT 23

TITLE:

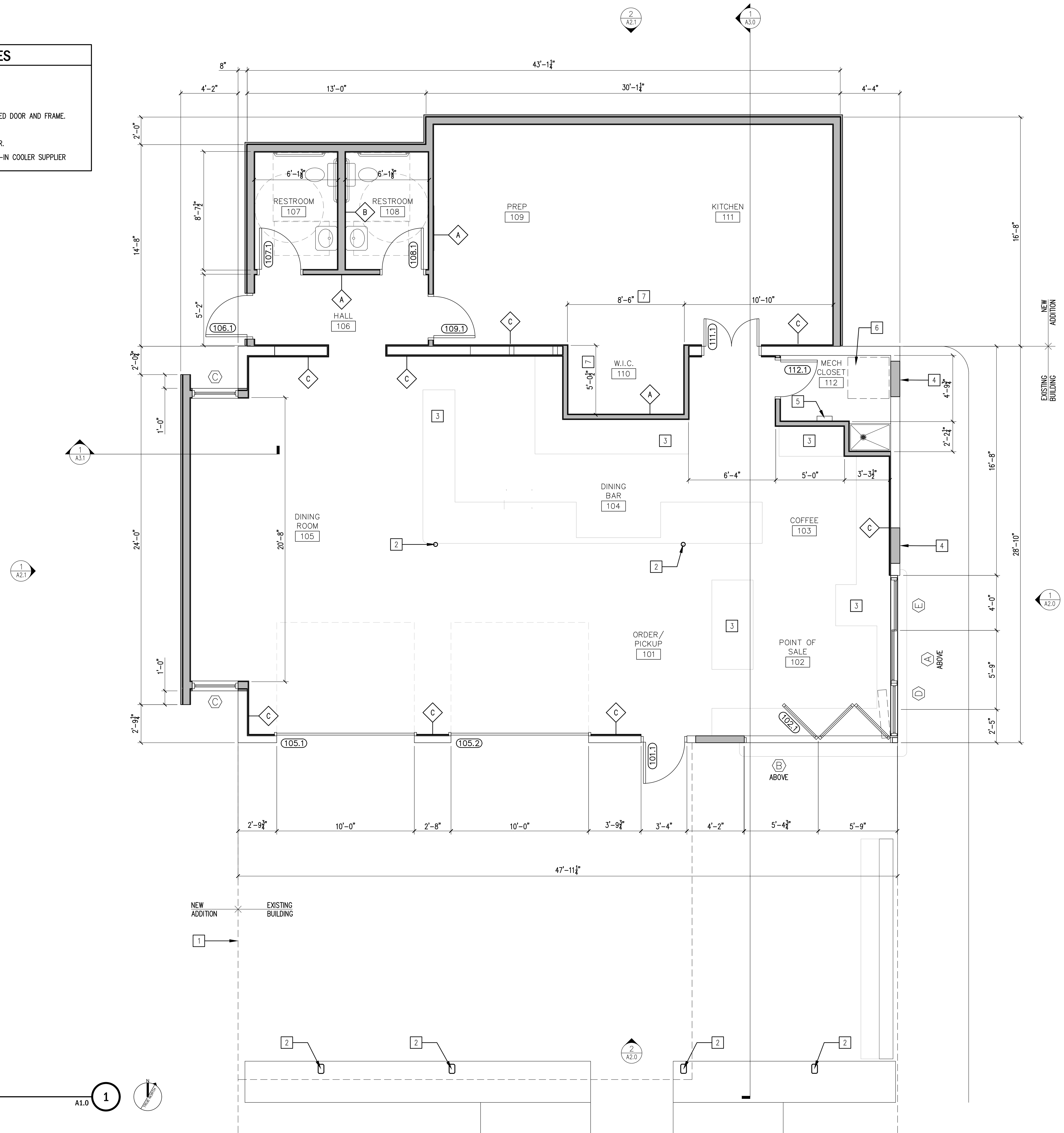
DETAIL SHEET

SHEET NUMBER:

D - 5

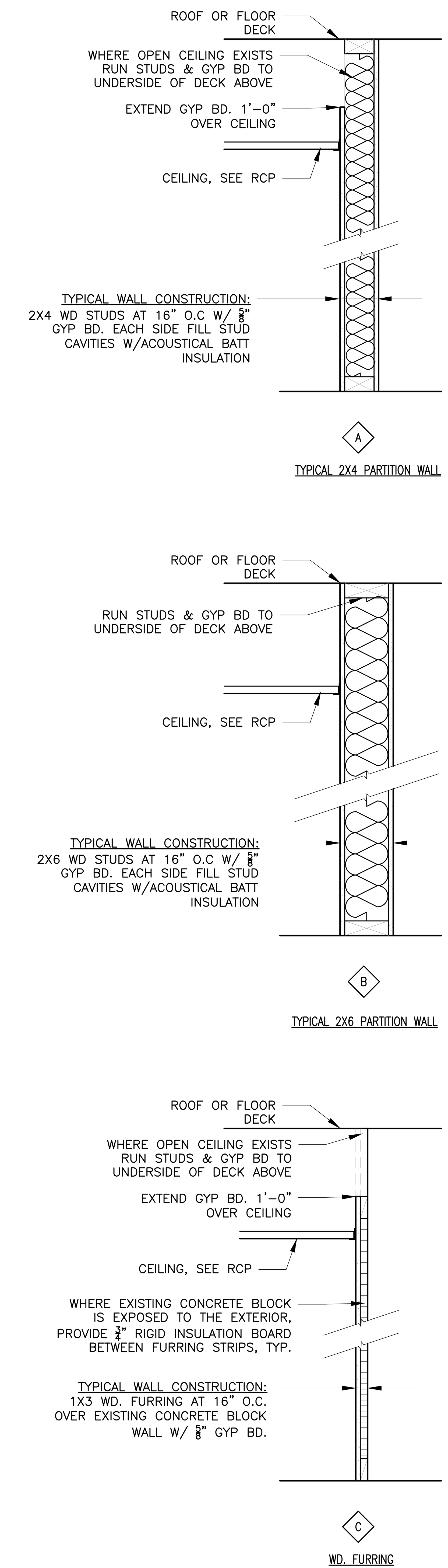
KEYNOTES

1	LINE OF CANOPY ABOVE.
2	EXISTING COLUMN TO REMAIN.
3	BUILT IN CASEWORK.
4	CONCRETE BLOCK TO INFILL REMOVED DOOR AND FRAME.
5	ELECTRICAL PANEL.
6	3' X 3' AREA FOR SPRINKLER RISER.
7	COORDINATE DIMENSION WITH WALK-IN COOLER SUPPLIER



FLOOR PLAN

SCALE: 1/4"=1'-0" A1.0 1



WALL TYPES

SCALE: 1"=1'-0" A1.0 2

GETTY BAGEL

361 ISLINGTON STREET
PORTSMOUTH, NEW HAMPSHIRE 03801

PROJECT:

STAMP:

PROGRESS PRINT ONLY (Not for Construction) January 16, 2023

WINTER HOLBEN
architecture + design

7 WALLINGFORD SQ
UNIT 209-9
KITTERY, MAINE 03904
207.994.3104

REVISIONS:

PROJECT NAME: GETTY BAGEL

361 ISLINGTON ST.
PORTSMOUTH, NH 03801

PROJECT NO.: 22063

DRAWN BY: ALU/RW

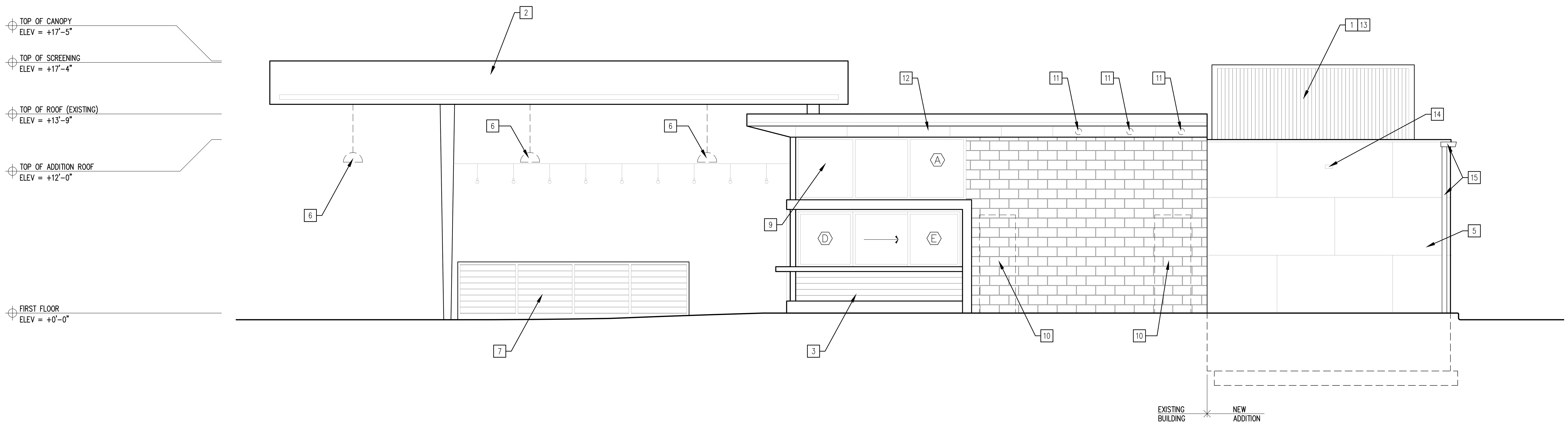
APPROVED BY: BH

ISSUE DATE:

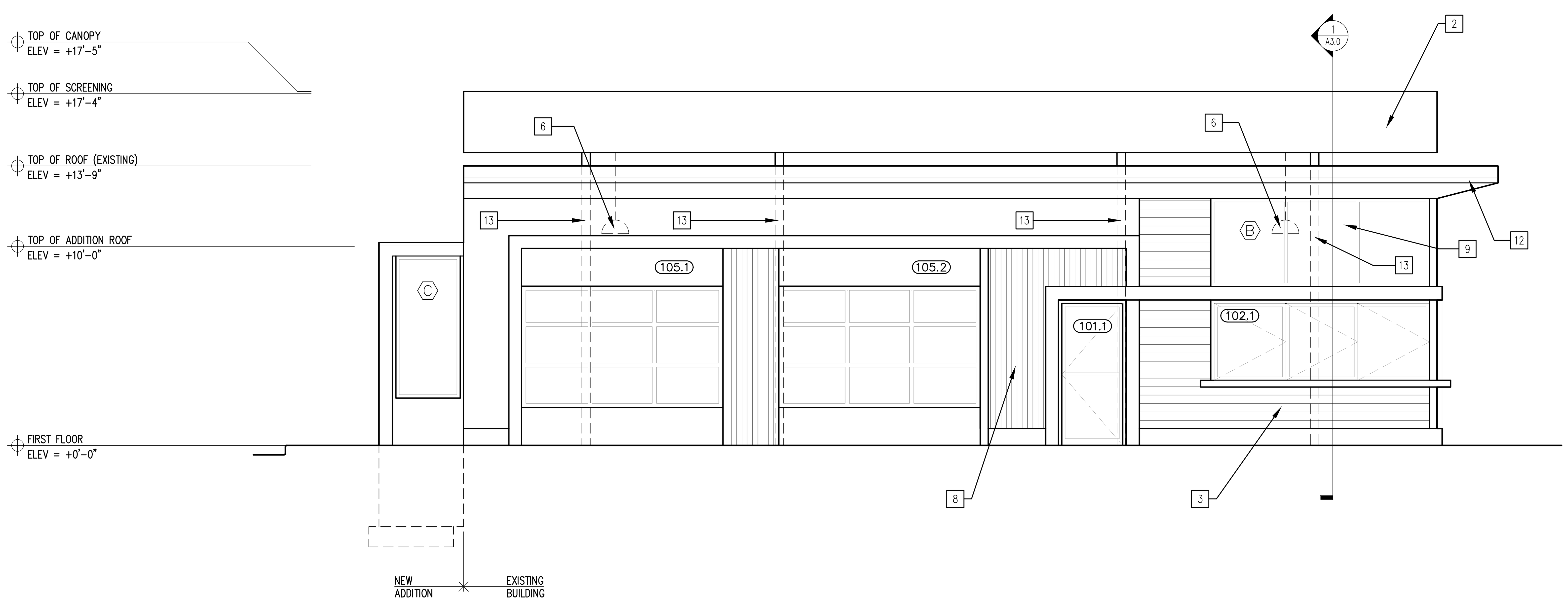
DRAWING NAME: FLOOR PLAN

SCALE:

DRAWING NO.: A1.0



NORTHEAST ELEVATION
SCALE: 1/8"=1'-0"
A2.0 1



SOUTHEAST ELEVATION
SCALE: 1/8"=1'-0"
A2.0 2

ELEVATION NOTES

1	MECHANICAL SCREEN FOR ROOFTOP EQUIPMENT.
2	EXISTING CANOPY FASCIA.
3	WOOD SIDING.
4	PAINTED EXISTING WALL.
5	PAINTED PANEL SIDING.
6	LIGHT FIXTURE.
7	PLANTER.
8	METAL SIDING.
9	ALUMINUM WINDOW SIDING.
10	PROVIDE BLOCK TO MATCH EXISTING ADJACENT. PAINT FINISH.
11	REMOVE LIGHT FIXTURE, PATCH SOFFIT.
12	PAINT EXISTING SOFFIT.
13	EXISTING CANOPY COLUMNS (SHOWN DASHED).
14	WALL MOUNTED LED LIGHT FIXTURE.
15	ALUMINUM GUTTER AND DOWNSPOUT.

PROJECT:
GETTY BAGEL
361 ISLINGTON STREET
PORTSMOUTH, NEW HAMPSHIRE 03801

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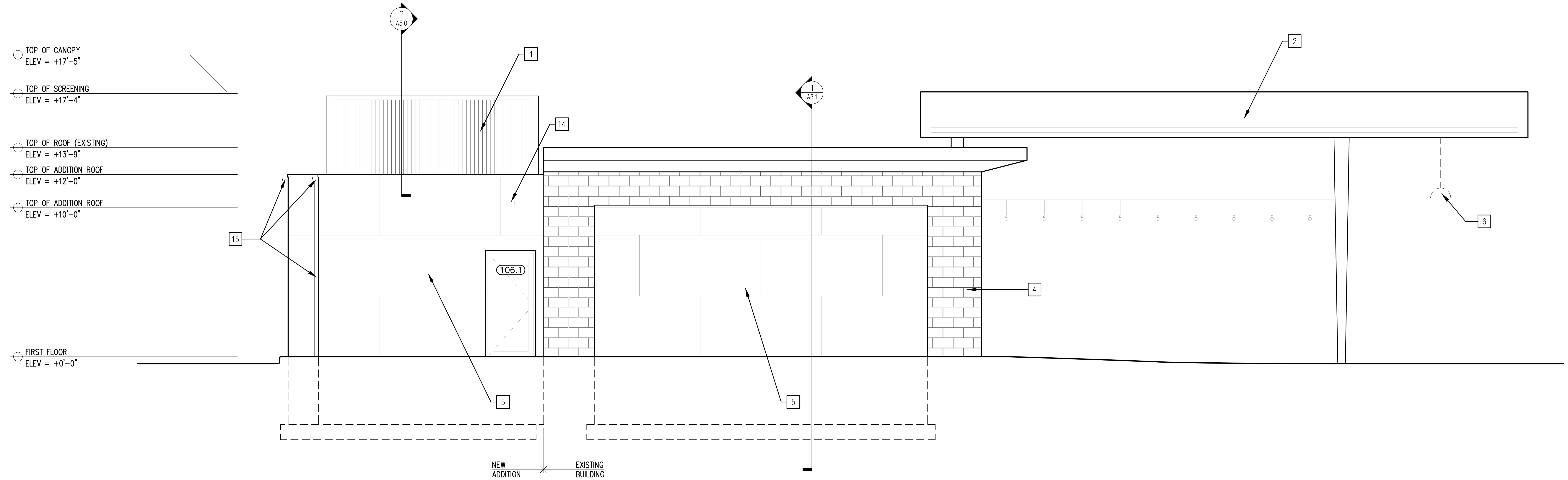
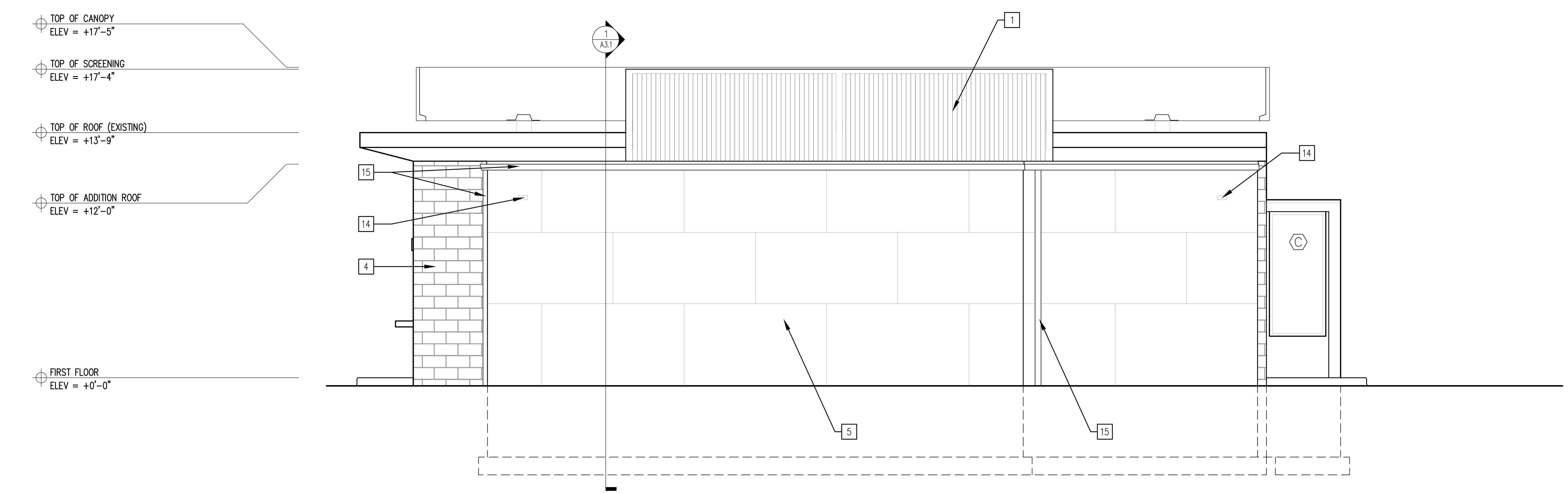
DRAWING NAME:
EXTERIOR ELEVATIONS
SCALE:
DRAWING NO.:
A2.0



SOUTHWEST ELEVATION
SCALE: 1/8"=1'-0"
A2.0 3



NORTHWEST ELEVATION
SCALE: 1/8"=1'-0"
A2.0 4

ELEVATION NOTES

1	MECHANICAL SCREEN FOR ROOFTOP EQUIPMENT.
2	EXISTING CANOPY FASCIA.
3	WOOD SIDING.
4	PAINTED EXISTING WALL.
5	PAINTED PANEL SIDING.
6	LIGHT FIXTURE.
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ISSUE DATE:
DRAWING NAME:
EXTERIOR
ELEVATIONS

SCALE:
DRAWING NO.:
A2.1

Weston & Sampson

85 Devonshire Street, 3rd Floor, Boston, MA 02109
Tel: 617.412.4480

LETTER OF TRANSMITTAL

TO	
City of Portsmouth New Hampshire Planning Department 1Junkins Avenue, 3rd Floor City of Portsmouth	

DATE	JOB NO.
January 23, 2023	Eng22-0627
ATTENTION	Mr. Peter Stith, Principal Planner
RE	City of Portsmouth Rt 33 Skate Park
Technical Advisory Committee – Site Plan Review Submission	

WE ARE SENDING YOU:

☐ Shop Drawing ☐ Attached ☑ Plans ☐ Samples
☐ Change Order ☑ Prints ☐ Copy of Letter ☐ Specifications
☐ Other ☐ Under Separate Cover Via: ____________

COPIES	DATE	NO.	DESCRIPTION
1	01.23.2023	1	Site Plan Application Checklist
1	01.23.2023	1	Letter of Authorization
1	01.23.2023	1	Stormwater Management Report
1	01.23.2023	1	Traffic Memorandum
1	01.23.2023	1	Site Plans

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For Approval ☐ Approved as Submitted ☐ Resubmit Copies for Approval
☐ For Your Use ☐ Approved as Noted ☐ Submit Copies for Distribution
☐ For Review and Comment ☑ As Requested ☐ Return Corrected Prints
☐ FOR BIDS DUE ☐ Prints Returned After Loan to Us ☐ Returned for Corrections
☐ Other

REMARKS:

COPY TO:	SIGNED: Brandon Kunkel

If enclosures are not as noted, kindly notify us at once.

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. <u>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.</u>

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. <u>Waiver requests must be submitted in writing with appropriate justification</u>.

Name of Applicant: Brandon Kunkel Date Submitted: January 23, 2023

Application # (in City's online permitting): TBD

Site Address: January 23, 2023 Map: 241 Lot: 18

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**		N/A
☒	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	N/A	
☐	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	N/A	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Sheet Sheet L000- Cover Page	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Sheet L000- Cover Page	N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Sheet L000- Cover Page	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Sheet L001- General Notes Page	N/A
☒	List of reference plans. **(2.5.3.1H)**	Sheet L000- Cover Page	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Sheet L001 - General Notes Page; Grading, utility and Drainage Note #14	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Sheet L100 - Existing Conditions Plan, Notes #6 and #7	N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Wetland Delineation Memo	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	All applicable plan sheets	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Today's date, first submission in the title block on all sheets.	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	All applicable plan sheets	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Sheet L100 - Existing Conditions Plan	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Add Alternate: Pre Engineered Steel 800 s.f., 20' x 40' open air barrel vault shade pavilion. Sheet L120 - Materials Plan	
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Sheet L130 - Layout Plan	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Sheet L130 - Layout Plan	
☐	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	N/A	
☐	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	N/A	

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Sheet L140 - Grading, Drainage, and Utility Plan	
☐	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	N/A	
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Sheet L140 - Grading, Drainage, and Utility Plan	
☐	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	N/A	
☐	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	N/A	
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Sheet L120 - Materials Plan	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet L140 - Grading, Drainage, and Utility Plan	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Sheet L120 - Materials Plan	
☐	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	
☐	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☐	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Traffic Memorandum	
☐	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	N/A	
☒	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)**	Stormwater Report	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Sheet L110 - Site Preparation and Demolition Plan	
☒	Inspection and Maintenance Plan **(7.6.5)**	Stormwater Report	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	N/A	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Stormwater Report	
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	N/A	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	State of NHDES Alternaton of Terrain Permit	
☒	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)**	Sheet L001- General Notes Page, Special Notes #1	N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Sheet L001- General Notes Page Special Notes #2 and #3	N/A

Applicant's Signature: ______________________ **Date:** January 23, 2023

PUBLIC WORKS DEPARTMENT

CITY OF PORTSMOUTH
680 Peverly Hill Road
Portsmouth N.H. 03801
(603) 427-1530 FAX (603) 427-1539

Letter of Authorization

I, Peter Rice, do herby authorize Weston & Sampson Engineers to act on the City of Portsmouth's behalf concerning the Portsmouth New Hampshire Skate Park Project submission to the Technical Advisory Committee. The property is located at 305 Greenland Road Portsmouth, NH and is owned by the city of Portsmouth.

X

Peter Rice
Director of Public Works

1/23/23

Stormwater Management Report

Portsmouth, New Hampshire

Route 33 Skate Park Project

December 22, 2022

JOB NO: ENG22-0627

Weston & Sampson
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
www.westonandsampson.com
Tel: 978-532-1900 Fax: 978-977-0100

Index

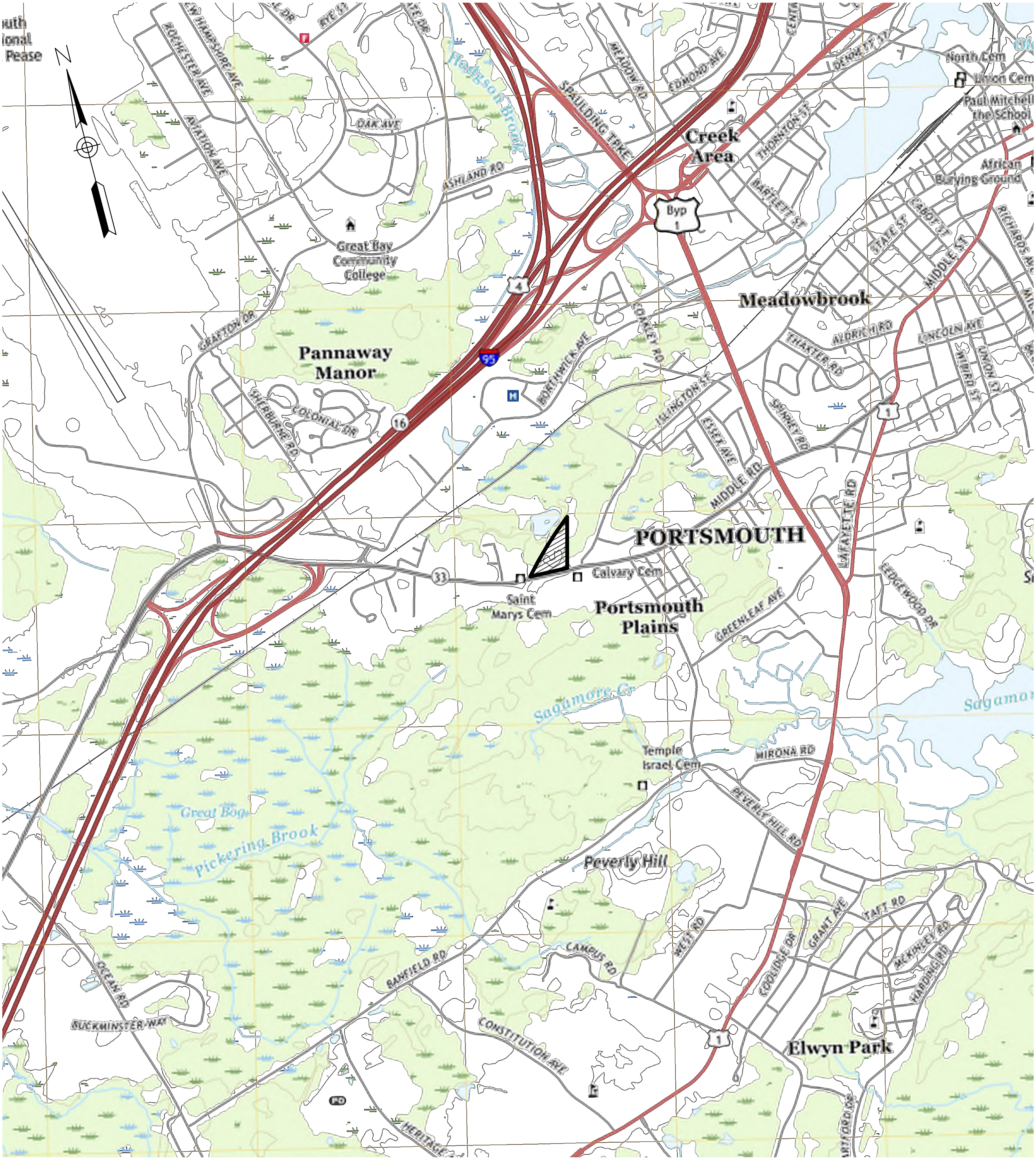


FIG-1 - USGS MAP

2000 1000 0 2000

SCALE 1"= 2000

Weston & Sampson

Weston & Sampson Engineers, Inc.

55 Walkers Brook Drive, Suite 100, Reading MA 01867

Project Narrative

Stormwater Report

December 22, 2022

Applicant/Project Name: City of Portsmouth
Route 33 Skate Park

Project Address: 305 Greenland Road, Portsmouth, NH

Application Prepared by:
Firm: Weston & Sampson, Inc.
Registered PE: James Pearson

Project Description and General Site History:

The project applicant, the City of Portsmouth, proposes to develop a parcel of land located at 305 Greenland Road (Map 24 / Lot 18) into a recreational facility consisting of a skateboarding park with a gravel parking lot, and sidewalks providing access through the site. Total site disturbance associated with this project is 90,618-SF, although the total proposed site disturbance is below 100,000-SF, the project applicant would like the ability to further develop the site in the future if they choose.

The site had historically been used as a gravel pit followed by a disposal location for stumps and excess soil generated from municipal construction projects. The site is known locally as “the stump dump”. The site at one time was also previously owned by the Portsmouth Gun Club and functioned as a shooting range. More recently, the site has been used as a construction staging/stockpile area for municipal infrastructure projects. In 2013, the City was approved for an Alteration of Terrain permit to develop the parcel into a soccer field and recreational facility. Work began in 2014, and the site was partially completed. Improvements to drainage infrastructure were made, and the site was roughly graded. Construction was not completed however, and afterwards, the site once again became used as a construction staging/stockpile area for municipal projects.

Existing Site Conditions

The subject parcel is 216,556-SF (4.97-AC) in size. It is located at 305 Greenland Road near the intersection of Islington Street and adjacent to the NH Seacoast Greenway Rail Trail. Grading of the site is generally very flat, with elevations predominantly ranging from 55 to 56-FT±, and a low point of 46-FT± at the bottom of a drainage swale in the southwestern most corner of the site. The ground cover of the site is in relatively poor condition, with 3.96-AC± of the site consisting of a gravel/bare earth surface in poor shape. Several large stockpiles of soil and construction debris are located throughout the site with areas of brush and woods surrounding the outer boundary of the parcel.

No environmental resource areas are present on site, and the site is not located within the 100-year floodplain. According to the Onestop data mapper, the parcel is listed as a remediation site related to previous use as a landfill and a shooting range. Soil borings were conducted by Weston & Sampson in September of 2016 and show varying amounts of sandy fill containing debris throughout the site. The debris generally consists of concrete, brick, asphalt, ash, wood, and leaves. Soil samples were collected while performing the geotechnical borings and subsequently analyzed. Results of the soil samples indicated elevated levels of compounds exceeding soil standards set forth in ENV-OR 606.19, Table 600-2.

According to NRCS soil mapping, the site is comprised of a mix of Udorthents and Hoosic gravelly fine sandy loam (HSG-A), which is supported by the boring data collected. Underlying native soil beneath the fill is consistently composed of sand and gravel with trace amounts of silt. Due to the predominant soil classification of Udorthents, the historic site use as a gravel pit and landfill, and data obtained from geotechnical borings, a site specific soil survey (SSS) was not completed and Natural Resources Conservation Service (NRCS) soil classifications were used to analyze the site. Boring logs and soil testing summary tables can be found in Attachments A & B following this narrative. Full lab testing results can be found in Appendix A following this report.

Drainage Analysis

Pre-Development

Pre-development conditions consist of four sub-catchments contributing to one point of analysis (POI-A), located at City Pond, a small surface water (<3-AC) that receives municipal stormwater run-off. Sub-catchment A1 consists of run-off captured in a series of catch basins in Greenland Road which is routed onto the site via a manhole and several pipe runs, it discharges to a stormwater conveyance swale located on the southwestern corner of the site where it enters into another series of conveyance pipes before discharging out of an existing flared end structure with a rip-rap apron and entering City Pond. Sub-catchment A2 is comprised of an area which flows overland into the stormwater conveyance swale. Sub-catchment A3 is comprised of an area which is captured by the stormwater management system on site. Run-off from this sub-catchment is captured via an underdrain system or from one of five catch basins installed in 2014 and then enters the stormwater conveyance system via the same manhole on-site as sub-catchment A1. Sub-catchment A4 is an area which drains overland in a westerly direction, across the NH Seacoast Greenway Rail Trail and eventually to City Pond.

Post-Development

The proposed project will include the construction of a gravel parking lot, pedestrian walkways, and a skateboarding park. Existing stormwater infrastructure installed in 2014 will be utilized for this project with additional treatment features added to improve water quality. Due to the levels of contaminants shown in lab testing which exceed allowable concentrations set forth in ENV-OR 606.19, our interpretation of ENV-WQ 1507.02(c)(1)b leads us to believe that stormwater infiltration is not allowed on this site. In lieu of an infiltration practice, we have proposed the use of a Contech CDS hydrodynamic separator to treat stormwater run-off from the proposed gravel and asphalt parking lot. Additionally, we propose to retrofit two existing catch basins which will receive parking lot run-off with hooded outlets to minimize the transport of hydrocarbons and trash into the stormwater management system.

The proposed design results in five sub-catchments contributing to POI-A. Sub-catchments A1, A2, and A4 remain largely unchanged in their land cover and drainage patterns. Sub-catchment A3 has now been broken up into two sub-catchments, creating a smaller A3 and area A5. The proposed site improvements to these two sub-catchments result in substantially lower CN values even with the addition of 23,550-SF of impervious area. Significant areas of gravel and bare soil (47,362-SF) will be loamed and seeded, resulting in much better hydrologic conditions on this portion of the site. These improvements in ground cover alone, produce a decrease in peak discharge values during the 2-year, 10-year, and 50-year storm events as shown on the following table.

		Peak Discharge (CFS)	
Analysis Point	24-Hr Storm Event	Pre-Development	Post-Development
A	2-YR	5.17	5.15
	10-YR	10.87	9.68
	50-YR	20.40	17.23

Methodology

Drainage calculations were performed using HydroCAD computer software, version 10.20-2d, which is based upon Technical Release 20 (TR-20), developed by NRCS. Calculations were prepared for the 2-year, 10-year, and 50-year Type III 24-hour storm events and rainfall data was obtained from the Northeast Regional Climate Center.

Additional Information Regarding Nutrients

Stormwater discharges from this project will indirectly enter City Pond. No fertilizers will be utilized and this project will not cause an increase in phosphorus levels to any receiving water body.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including any relevant soil evaluations, computations, Operations and Maintenance Plan, and plans showing erosion control and the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the New Hampshire Department of Environmental Services. I have also determined that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

12/21/2022

Signature and Date

Attachment A - Boring Logs

Weston & Sampson

PROJECT	REPORT OF BORING No.	B-1
Rt. 33 Recreation Field Portsmouth, NH	SHEET	1 OF 1
	Project No.	2160648.A
	CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	55 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/27/16 DATE END 9/27/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	18/24	0-2	5-21-30-35	0.2	Very dense, brown, gravelly, fine to coarse SAND FILL, some silt, trace debris (brick, asphalt); moist. Bottom 12" grades to little silt.	1,2	**SAND FILL WITH DEBRIS**
5		S-2	8/24	5-7	5-6-9-6	0.1	Medium dense, dark brown, fine to medium SAND FILL, some silt, litte gravel; moist.		
10		S-3	14/24	10-12	17-27-21-22	0.1	Dense, brown, fine to medium SAND, little gravel, trace to little silt; moist.		**SAND**
15		S-4	15/24	15-17	13-27-36-59	0.1	Very dense, brown, fine to medium SAND, little gravel, trace silt; moist.		
20		S-5	10/10	20-20.8	88-100/4"		Very dense, brown, fine to medium SAND, some gravel, trace silt; moist.		
25		S-6	13/24	25-27	38-15-18-19		Dense, brown, fine to medium SAND, trace silt; moist.		
							Boring terminated at 27 ft.		
30									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Grab sample submitted for environmental analysis.
2. Periodic auger grinding from about 0 to 25 ft. (possible cobbles, boulders, and/or debris).

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-1

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-2 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	55 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/28/16 DATE END 9/28/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	15/24	0-2	10-19-10-9	0.2	Medium dense, dark brown, fine to medium SILTY SAND FILL, little gravel, little debris (wood, brick); moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	9/19	5-6.6	4-3-7-50/1"	2.4	Medium dense, dark brown, fine to medium SILTY SAND FILL, little gravel, trace debris (wood); moist.	2, 3, 4	
10		S-3	0/24	10-12	7-8-9-8	N/A	No recovery.		
		S-4	8/24	12-14	56-17-19-14	3.3	Dense, dark brown, fine to medium SAND FILL, some debris (wood, concrete, brick, paper), little silt, little gravel; moist.		
15		S-5	7/24	15-17	9-7-9-5	5.4	Medium dense, dark brown, fine to medium SAND FILL, some wood fragments, little to some silt, trace gravel; moist.		
20		S-6	18/24	20-22	12-17-19-16	2.6	Dense, brown, fine to coarse SAND, trace gravel, trace silt; moist.		**SAND**
25		S-7	18/24	25-27	17-18-11-14	0.1	Medium dense, brown, fine to coarse SAND, some gravel, trace to little silt; moist.		
30		S-8	18/24	30-32	16-19-19-20		Dense, dark gray, fine to coarse SAND, some silt, some gravel; moist.		
							Boring terminated at 32 ft.		

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 5 ft.
2. Grab sample submitted for environmental analysis.
3. Auger refusal at 6.5 ft. Moved east 5 ft. Auger refusal at 5 ft. Moved south 8 ft. Auger grinding 0 to 3 ft. and 4.5 to 6.5 ft. with concrete fragments observed in cuttings.
4. Periodic auger grinding from about 7 to 12.5 ft. with wood fragments observed in cuttings. (possible cobbles, boulders, and/or debris)

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-2

Weston & Sampson

PROJECT	REPORT OF BORING No.	B-3
Rt. 33 Recreation Field, Portsmouth, NH	SHEET	1 OF 1
	Project No.	2160648.A
	CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	55 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/27/16 DATE END 9/27/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	15/24	0-2	5-5-4-4	0.0	Stiff, brown, CLAYEY SILT FILL, little fine sand, little gravel, trace debris (asphalt, brick); very moist.		**SAND/CLAYEY SILT FILL WITH DEBRIS**
5		S-2	9/24	5-7	5-8-5-5	0.1	Medium dense, brown, fine to medium SILTY SAND FILL, some gravel; very moist. Bottom 3": pulverized asphalt debris.		
10		S-3	5/24	10-12	4-6-8-11	0.2	Stiff, brown, CLAYEY SILT FILL, little fine sand, little gravel; wet.	1	
15		S-4	13/24	15-17	55-25-29-30	0.4	Very dense, gray-brown fine to coarse SAND FILL, some debris (concrete), some gravel, little silt; moist. Bottom 4": brown, fine to medium SAND, trace gravel, trace silt; moist.	2	
20		S-5	13/24	20-22	28-31-28-25	0.2	Very dense, brown, fine to coarse SAND, little gravel, little silt; moist.		**SAND**
25		S-6	13/24	25-27	27-32-26-31		Very dense, brown, gravelly, fine to coarse SAND, trace silt; moist.		
30		S-7	14/24	30-32	35-29-18-10		Dense, brown, fine to coarse SAND, little gravel, trace silt; moist.		
							Boring terminated at 32 ft.		

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Auger grinding from about 13.5 to 15.5 ft. (possible cobbles, boulders, and/or debris)
2. Grab sample submitted for environmental analysis.
3. Periodic auger grinding from about 18 to 30 ft. (possible cobbles)

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-3

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-4 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/27/16 DATE END 9/27/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	15/24	0-2	17-24-20-11	0.1	Dense, brown, fine to coarse SAND FILL, some gravel, some silt, trace debris (brick, asphalt); moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	12/24	5-7	6-8-9-10	0.5	Medium dense, dark brown, SILTY SAND FILL, little gravel; very moist.		
10		S-3	13/24	10-12	5-6-4-7	0.8	Medium dense, dark brown, fine to medium SAND FILL, some silt, little debris (asphalt), trace gravel, trace organics (roots); moist.	2	
15		S-4	17/24	15-17	25-31-78-71	2.4	Very dense, dark brown, fine to medium SAND FILL, some silt, little debris (wood, asphalt), trace gravel; moist. Bottom 6": brown, fine to coase SAND, some gravel, trace silt; moist.		
20		S-5	3/9	20-20.8	68-100/3"	1.5	Very dense, brown, gravelly, fine to coarse SAND, trace to little silt; moist.		**SAND**
25		S-6	12/24	25-27	73-43-27-37		Very dense, brown, gravelly, fine to coarse SAND, trace silt; moist.		
							Boring terminated at 27 ft.		
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:

1. Periodic auger grinding from about 1 to 25 ft. (possible cobbles, boulders, and/or debris). Wood fragments observed in cuttings to about 18 ft.
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-4

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-5 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	57 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/28/16 DATE END 9/28/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS

TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	12/23	0-1.9	7-8-40-100/5"	0.0	Dense, brown, gravelly, fine to coarse SAND FILL, little silt, trace debris (wood); moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	18/24	5-7	10-79-60-38	0.2	Very dense, dark brown, fine to coarse SAND FILL, some gravel, little silt; moist.		
10		S-3	5/24	10-12	6-7-6-8	0.1	Medium dense, brown, fine to coarse SAND FILL, little gravel, trace silt; moist.		
15		S-4	14/24	15-17	10-28-33-13	0.6	Very dense, brown, gravelly, fine to coarse SAND FILL, some silt, trace debris (asphalt); moist.	2	
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 13 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-5

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-6 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START 9/28/16	DATE END 9/28/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	15/24	0-2	10-19-26-20	0.0	Dense, brown, fine to coarse SAND FILL, little to some gravel, little silt, trace debris (brick, asphalt); moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	4/8	5-5.6	14-100/2"	0.5	Very dense, dark brown, gravelly fine to coarse SAND FILL, little to some silt, little debris (wood fragments); moist.		
10		S-3	13/24	10-12	18-15-12-12	0.0	Medium dense, dark brown, fine to coarse SAND FILL, some silt, little debris (brick, ash, asphalt), trace gravel; moist. Bottom 4": grades to brown, silty.	2	
15		S-4	6/24	15-17	17-15-13-14	0.3	Medium dense, dark brown, fine to medium SAND FILL, some silt, little debris (wood fragments, asphalt), little gravel; moist.		
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 3 to 6 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-6

Weston & Sampson

PROJECT	REPORT OF BORING No.	B-7
Rt. 33 Recreation Field, Portsmouth, NH	SHEET	1 OF 1
	Project No.	2160648.A
	CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/28/16 DATE END 9/28/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	19/24	0-2	9-14-29-23	0.0	Dense, dark brown, fine to coarse SAND FILL, some gravel, little debris (concrete, asphalt), little silt; moist.		**SAND FILL WITH DEBRIS**
5		S-2	8/24	5-7	25-61-16-13	0.3	Very dense, dark brown, fine to coarse SAND FILL, some gravel, some silt, little debris (brick, wood); moist.		
10		S-3	3/24	10-12	10-1/12"-1	1.0	Very loose, dark brown, fine to medium SAND FILL, some silt, some debris (wood, ash), trace gravel; moist.		
15		S-4	12/24	15-17	11-14-13-26	4.1	Medium dense, dark brown, fine to medium SAND FILL with debris (wood, fabric, ash), some silt, little gravel; moist.	1	
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:

1. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-7

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-8 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/28/16 DATE END 9/28/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	12/24	0-2	5-8-18-42	0.2	Medium dense, brown, sandy GRAVEL FILL, little silt; moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	6/24	5-7	13-14-12-10	9.5	Medium dense, dark brown, fine to coarse SAND FILL, trace gravel, trace to little silt, trace debris (wood fragments, brick, asphalt); moist.	2	
10		S-3	6/24	10-12	6-7-4-29	1.6	Medium dense, dark brown, fine to medium SILTY SAND FILL with debris (wood fragments, ash, asphalt), trace gravel; moist.		
15		S-4	5/24	15-17	14-25-15-12	2.6	Dense, dark brown, fine to medium SILTY SAND FILL with wood fragments; very moist.		
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 14 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-8

Weston & Sampson	PROJECT	REPORT OF BORING No.	B-9
	Rt. 33 Recreation Field Portsmouth, NH	SHEET 1 OF 1	
		Project No.	2160648.A
		CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	57 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/27/16 DATE END 9/27/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	13/24	0-2	12-22-27-14	0.0	Very dense, dark brown, gravelly, fine to coarse SAND FILL, little to some silt; moist.	1	**SAND/CLAYEY SILT FILL WITH DEBRIS**
5		S-2	15/24	5-7	3-32-27-6	0.0	Hard, gray, CLAYEY SILT FILL, little gravel, little fine sand; moist.		
10		S-3	7/24	10-12	3-2-3-6	0.7	Medium stiff, gray-brown, ORGANIC CLAYEY SILT FILL, little to some fine sand, trace gravel, trace debris (asphalt); moist.	2	
15		S-4	4/5	15-15.4	100/5"	3.2	Brown WOOD DEBRIS, little fine to medium sand, trace silt, trace gravel; moist.		
20		S-5	12/24	20-22	27-36-30-29	9.6	Very dense, brown, gravelly, fine to coarse SAND, little silt; moist.	3	**SAND**
25		S-6	11/24	25-27	14-21-28-41	1.2	Very dense, brown, gravelly, fine to coarse SAND, litlte silt; moist. Bottom 4": grades to fine to medium SAND, trace silt; moist.		
30		S-7	9/24	30-32	37-41-45-40	2.7	Very dense, brown, gravelly, fine to coarse SAND, trace silt; moist.		
							Boring terminated at 32 ft.		

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 30 ft. with heavy auger grinding from about 15 to 16.5 ft. (over 10 minutes to advance). Wood fragments observed in auger cuttings.
2. Grab sample submitted for environmental analysis.
3. Slow auger advancement from about 20 to 30 ft.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-9

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-10 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/29/16 DATE END 9/29/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	16/24	0-2	8-12-12-12	0.1	Medium dense, brown, fine to medium SAND FILL, little gravel, little silt, trace debris (fabric); moist.	1	**SAND/CLAYEY SILT FILL WITH DEBRIS**
5		S-2	12/24	5-7	4-4-3-4	0.2	Medium stiff, dark brown, CLAYEY SILT FILL, some fine sand, little gravel, trace debris (wood, ash); very moist.		
10		S-3	12/24	10-12	4-3-8-8	0.5	Stiff, brown, CLAYEY SILT FILL, little fine sand, little gravel, trace debris (brick, wood); very moist.	2	
15		S-4	10/24	15-17	15-8-4-3	0.1	Medium dense, brown, fine to medium SAND FILL, little to some silt, little gravel, trace debris (asphalt, ash, wood); moist.		
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic Auger grinding from about 2 to 13ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-10

Weston & Sampson

PROJECT	REPORT OF BORING No.	B-11
Rt. 33 Recreation Field, Portsmouth, NH	SHEET	1 OF 1
	Project No.	2160648.A
	CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/29/16 DATE END 9/29/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	14/24	0-2	17-46-33-24	0.0	Very dense, brown, gravelly, fine to coarse SAND FILL, some silt; moist.	1	
5		S-2	11/24	5-7	8-8-6-7	0.0	Stiff, brown, CLAYEY SILT FILL, some fine sand, some debris (concrete, brick, asphalt), little gravel; moist.	2	**SAND/CLAYEY SILT FILL WITH DEBRIS**
10		S-3	12/24	10-12	22-8-9-9	0.5	Stiff, brown, sandy SILT FILL, little gravel, little clay, trace debris (asphalt); moist. Bottom 6": grades to little organics (fine roots).	3	
15		S-4	13/24	15-17	8-15-17-19		Dense, light brown, fine to medium SAND, trace gravel, trace silt; moist.		**SAND**
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 10 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.
3. Possible buried topsoil layer.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-11

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-12 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	57 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/29/16 DATE END 9/29/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.
CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG
CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	11/24	0-2	14-35-32-69	0.1	Very dense, brown, gravelly, fine to coarse SAND FILL, trace silt; moist.	1, 2	**SAND FILL WITH DEBRIS**
5		S-2	11/24	5-7	8-9-8-2	0.0	Medium dense, dark brown, SILTY SAND FILL, little gravel, trace debris (wood, asphalt); moist.		
10		S-3	7/24	10-12	5-14-15-33	0.2	Very dense, brown, gravelly, fine to coarse SAND FILL, trace silt; moist. Bottom 3": Very dense, brown, gravelly, fine to coarse SAND, trace silt; moist.		
15		S-4	13/24	15-17	18-22-35-24		Very dense, brown, gravelly, fine to coarse SAND, little silt; moist.		**SAND**
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 15 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-12

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-13 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/28/16 DATE END 9/28/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	14/24	0-2	12-21-22-17	0.1	Dense, brown, gravelly, fine to coarse SAND FILL, little silt, trace debris (asphalt, brick); moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	9/24	5-7	8-11-7-6	0.7	Medium dense, dark brown, fine to coarse SAND FILL, some silt, trace debris (asphalt), trace gravel; moist.		
10		S-3	11/24	10-12	7-15-9-12	2.2	Medium dense, dark brown, fine to coarse SAND FILL, some gravel, little silt, trace debris (brick, asphalt); moist.	2	
15		S-4	14/24	15-17	14-23-43-49		Very dense, brown, fine to coarse SAND, some gravel, trace silt; moist.		**SAND**
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 10 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-13

Weston & Sampson	PROJECT	REPORT OF BORING No.	B-14
	Rt. 33 Recreation Field Portsmouth, NH	SHEET	1 OF 1
		Project No.	2160648.A
		CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/29/16 DATE END 9/29/16

SAMPLER:	2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.
CASING:	HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG
CASING SIZE:	2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	11/12	0-1	23-100/6"	0.0	Very dense, brown, fine to coarse SAND FILL, little gravel, little silt; moist. Bottom 3": grades to gravelly.	1	**SAND FILL WITH DEBRIS**
5		S-2	13/24	5-7	30-31-23-18	0.5	Very dense, dark brown, fine to coarse SAND FILL, some debris (asphalt, brick), little gravel, little silt; moist.		
10		S-3	4/14	10-11.1	3-7-100/2"	1.8	Very dense, dark brown, fine to medium SAND FILL with debris (brick, wood), some silt, trace gravel; very moist.	2	
15		S-4	6/24	15-17	11-10-12-10	32.8	Medium dense, dark brown, fine to medium SANDY DEBRIS FILL (wood, asphalt), some silt, little gravel; very moist.	3	
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:

1. Periodic auger grinding from about 1 to 9 ft. (possible cobbles, boulders, and/or debris).
2. Heavy auger grinding from about 9 to 9.5 ft. and 11.5 to 15 ft. (possible cobbles, boulders, and/or debris)
3. Grab sample submitted for environmental analysis.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-14

Weston & Sampson	PROJECT Rt. 33 Recreation Field Portsmouth, NH	REPORT OF BORING No. B-15 SHEET 1 OF 1 Project No. 2160648.A CHKD BY Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/29/16 DATE END 9/29/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.
CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG
CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
Groundwater not observed.				

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	16/24	0-2	6-14-20-21	0.1	Dense, brown, fine to coarse SAND FILL, little gravel, little silt; moist. Bottom 4": grades to some debris (asphalt).	1	**SAND/CLAYEY SILT FILL WITH DEBRIS**
5		S-2	17/24	5-7	15-15-6-8	0.4	Top 7": Medium dense, brown fine to medium SAND FILL, some silt, litlte gravel, trace debris (brick, asphalt); moist. Very stiff, dark gray, CLAYEY SILT FILL, some fine sand, trace debris (asphalt, brick); moist.		
10		S-3	17/24	10-12	8-7-5-4	14.0	Medium dense, dark brown, SILTY SAND FILL with debris (brick, ash, wood, leaves), trace gravel; very moist.	2	
15		S-4	2/24	15-17	5-5-2/12"	0.5	Dark brown, WOOD DEBRIS, some fine sand, some silt; very moist.	3	
							Boring terminated at 17 ft.		
20									
25									
30									

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:
1. Periodic auger grinding from about 0 to 5 ft. (possible cobbles, boulders, and/or debris).
2. Grab sample submitted for environmental analysis.
3. Organic odor emitting from borehole.

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-15

Weston & Sampson

PROJECT	REPORT OF BORING No.	B-16
Rt. 33 Recreation Field, Portsmouth, NH	SHEET	1 OF 1
	Project No.	2160648.A
	CHKD BY	Thomas J. Strike, PE

BORING Co.	New England Boring Contractors	BORING LOCATION	See attached plan
FOREMAN	Sam Shaw	GROUND SURFACE ELEV.	56 ft. +/- DATUM NAVD88
WSE ENGINEER:	Julie A. Eaton, EIT	DATE START	9/29/16 DATE END 9/29/16

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. CATHEAD OPERATED HAMMER.

CASING: HOLLOW STEM AUGER DRILLING METHODS TRUCK RIG

CASING SIZE: 2 1/4 IN. INSIDE DIAMETER. OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
9/29/2016		25 ft. +/-	based on wet sample.	

DEPTH (feet)	CASING (blows/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0		S-1	7/12	0-1	12-32-50/0"	0.0	Dense, dark brown, fine to medium SAND FILL, little to some silt, trace gravel, trace debris (asphalt); moist.	1	**SAND FILL WITH DEBRIS**
5		S-2	8/24	5-7	11-29-20-10	0.2	Dense, dark brown, fine to coarse SAND FILL, little to some silt, trace gravel, trace debris (asphalt, ash, concrete); moist.	2, 3	
10		S-3	12/24	10-12	17-49-13-17	2.2	Dark brown, WOOD FRAGMENTS, trace fine sand; moist. Bottom 6": grades to yellow foam debris.		
15		S-4	11/24	15-17	11-7-5-6	0.2	Medium dense, dark brown, SILTY SAND FILL, some wood fragments, little gravel; moist.		
20		S-5	9/24	20-22	29-10-9-7	1.2	Same as above.	4	
25		S-6	11/24	25-27	16-51-4-2	0.8	Dark brown, SILTY SAND FILL with WOOD FRAGMENTS; wet.		
30		S-7	18/24	30-32	8-7-7-6	0.6	Medium dense, brown, fine to coarse SAND, trace gravel, trace silt; wet.		**SAND**
		S-8	5/24	32-34	10-15-47-48		Very dense, brown, fine to coarse SAND, some gravel, trace silt; wet.		
							Boring terminated at 34 ft.		

GRANULAR SOILS BLOWS/FT	DENSITY	COHESIVE SOILS BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:

1. Spoon was bouncing and tilting. Auger refusal at 1 ft. Moved ~5 ft. south, auger refusal at 1 ft., moved ~8 ft. south, auger grinding from about 0 to 4 ft. and heavy auger grinding from about 4 to 5 ft. (possible boulders and/or debris)
2. Grab sample submitted for environmental analysis.
3. Heavy auger grinding 7 to 7.5 ft. (possible cobbles and/or debris).
4. Periodic auger grinding from about 20 to 27.5 ft. (possible cobbles, boulders, and/or debris).

GENERAL NOTES: i) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
ii) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-16

LEGEND

	LIMIT OF WORK
	PROPERTY LINE
	GUARDRAIL
	EDGE OF WOODS
	OVERHEAD UTILITIES
65	EXISTING CONTOUR
	EXISTING DRAIN
	CATCH BASIN
	UTILITY POLE
	DRAIN MANHOLE
	RIPRAP
	GRAVEL
BK.2562/PG.2783	BOOK NO./PAGE NO.
CB	CATCH BASIN
CPP	CORRUGATED PLASTIC PIPE
DMH	DRAINAGE MANHOLE
EP	EDGE OF PAVEMENT
FES	FLARED END SECTION
HDPE	HIGH DENSITY POLYETHYLENE
INV.	INVERT
L	LENGTH OF CURVE
N/F	NOW OR FORMERLY
PSNH	PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
R	RADIUS
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RCP	REINFORCED CONCRETE PIPE
S.F.	SQUARE FEET
TP	TEST PIT

NOTES

1. THE PARCEL IS LOCATED IN THE MUNICIPAL DISTRICT.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 241 AS LOT 18.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X AS SHOWN ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270E. EFFECTIVE DATE: MAY 17, 2005.
4. OWNER OF RECORD:
   CITY OF PORTSMOUTH
   C/O WATER DEPARTMENT
   DEPARTMENT OF PUBLIC WORKS
   PO BOX 628
   PORTSMOUTH, NH 03802
5. ZONING REQUIREMENTS:
   LOTS AND BUILDINGS IN THE MUNICIPAL DISTRICT ARE EXEMPT FROM ALL DIMENSIONAL AND INTENSITY REGULATIONS.
   SEE SECTION 10.560 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE.
6. VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). CONTOUR INTERVAL IS 1'.
7. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83).
8. THE UNDERGROUND SYSTEM SHOWN HEREON WAS NOT FIELD LOCATED. LOCATION TAKEN FROM "GRADING PLAN ROUTE 33 RECREATION AREA" BY UNDERWOOD ENGINEERS DATED 12/17/2013. THIS LOCATION SHOWN HEREON IS APPROXIMATE ONLY.
9. EXISTING CONDITIONS SURVEY PERFORMED BY ________
   DATED ________

PLAN REFERENCES:

1. "LOT LINE ADJUSTMENT ISLINGTON STREET & GREENLAND ROAD, PORTSMOUTH, NEW HAMPSHIRE FOR CITY OF PORTSMOUTH" BY JAMES VERRA AND ASSOCIATES, INC. DATED 1-30-2002. PLAN NOT RECORDED.
2. "RIGHT OF WAY EASEMENT PLAN FOR THE CITY OF PORTSMOUTH, GREENLAND ROAD/MIDDLE ROAD, PORTSMOUTH, NEW HAMPSHIRE" PREPARED BY VANASSE HANGEN BRUSTLIN, INC. DATED SEPTEMBER 28, 2007, REVISED APRIL 28, 2008. RCRD PLAN #D-35481.
3. "AS BUILT PLAN OF A PORTION OF NH ROUTE 33, PORTSMOUTH, NEW HAMPSHIRE" BY AMES ENGINEERING, INC. DATED AUGUST 2010, REVISED 9/21/10. PLAN NOT RECORDED.
4. "EXISTING FEATURES PLAN TAX MAP 241 LOT 18 PROPERTY OF CITY OF PORTSMOUTH 305 GREENLAND ROAD PORTSMOUTH, NEW HAMPSHIRE COUNTY OF ROCKINGHAM" BY MSC CIVIL ENGINEERS & LAND SURVEYORS, DATED NOVEMBER 2, 2012 WITH REVISION 1 DATED 11/05/2012. PLAN IS NOT RECORDED.

TFM MSC
A division of TFMoran, Inc.
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.mscengineers.com
CONTROL POINT ASSOCIATES, INC.

SCALE: 1" = 40' - 0"
0 40 80 120

Weston & Sampson design studio
85 Devonshire Street, 3rd Floor, Boston, MA 02109
617.412.4480 800.SAMPSON
www.westonandsampson.com

DRAWN BY:	KC
REVIEWED BY:	BK
APPROVED BY:	
DATE:	12/09/22

PROJECT:
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE:
BORING KEY SHEET
90% CONSTRUCTION DOCUMENTS

SHEET:
L100
SKATE PARK

Attachment B - Summary of Soil Analytical Data

Table 1
Summary of Soil Analytical Data
Portsmouth, New Hampshire
Stump Dump
September 2016

Parameter	Units	Soil Remediation Standards (Table-600-2)	Sampling Location							
			B-1 S-1 9/27/2016	B-2 S-2 9/28/2016	B-3 S-4 9/27/2016	B-4 S-3 9/27/2016	B-5 S-4 9/28/2016	B-6 S-3 9/28/2016	B-7 S-4 9/28/2016	B-8 S-2 9/28/2016
VOCs										
1,2,4-Trimethylbenzene	mg/kg	130	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
1,3,5-Trimethylbenzene	mg/kg	96	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
4-Isopropyltoluene	mg/kg	330	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	**0.0312**	**8.86**
Acetone	mg/kg	75	<0.0313	**0.166**	**0.0826**	**0.303**	<0.0379	**0.102**	**0.176**	**0.237**
Ethylbenzene	mg/kg	120	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
Isopropylbenzene	mg/kg	330	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
Naphthalene	mg/kg	5	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	**0.0255**	**0.0047**
n-Butylbenzene	mg/kg	110	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
n-Propylbenzene	mg/kg	85	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
sec-Butylbenzene	mg/kg	130	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
Toluene	mg/kg	100	<0.0031	<0.0036	<0.0038	<0.004	<0.0038	<0.0031	<0.0038	<0.0035
Xylenes (Total)	mg/kg	500	<0.0056	<0.006	<0.0069	<0.0068	<0.007	<0.0053	<0.0065	<0.0063
Total VOCs	mg/kg	NS	<0.0313	**0.166**	**0.0862**	**0.303**	<0.0379	**0.102**	**0.2327**	**9.1017**
SVOCs										
Acenaphthene	mg/kg	340	<0.359	<0.385	<0.358	<0.416	<0.361	<0.42	**1.14**	<0.703
Anthracene	mg/kg	1,000	<0.359	**0.415**	<0.358	<0.416	<0.361	<0.42	**1.71**	<0.703
Benzo(a)anthracene	mg/kg	1	**0.548**	**1.44**	<0.358	**0.993**	<0.361	<0.42	**2.8**	**0.802**
Benzo(a)pyrene	mg/kg	0.7	**0.616**	**1.24**	<0.18	**1.01**	**0.295**	<0.211	**2.38**	**0.83**
Benzo(b)fluoranthene	mg/kg	1	**0.768**	**2.24**	<0.358	**1.54**	**0.466**	<0.42	**3.98**	**1.62**
Benzo(g,h,i)perylene	mg/kg	NS	<0.359	**0.608**	<0.358	**0.602**	<0.361	<0.42	**0.819**	<0.703
Benzo(k)fluoranthene	mg/kg	12	<0.359	**0.921**	<0.358	**0.653**	<0.361	<0.42	**1.15**	<0.703
Carbazole	mg/kg	NS	<0.359	**0.445**	<0.358	<0.416	<0.361	<0.42	**1.29**	<0.703
Chrysene	mg/kg	120	**0.519**	**1.62**	<0.18	**1.03**	**0.289**	<0.211	**2.81**	**0.951**
Dibenzo(a,h)Anthracene	mg/kg	0.7	<0.18	**0.286**	<0.18	**0.235**	<0.181	<0.211	<0.397	<0.352
Dibenzofuran	mg/kg	NS	<0.359	<0.385	<0.358	<0.416	<0.361	<0.42	**1.76**	<0.703
Fluoranthene	mg/kg	960	**1.34**	**4.58**	<0.358	**2.53**	**0.549**	**0.424**	**8.26**	**2.15**
Indeno(1,2,3-cd)Pyrene	mg/kg	1	<0.359	**0.567**	<0.358	**0.495**	<0.361	<0.42	<0.792	<0.703
Phenanthrene	mg/kg	NS	**0.807**	**1.73**	<0.358	**0.847**	<0.361	<0.42	**9.88**	**0.953**
Phenol	mg/kg	56	<0.359	<0.385	<0.358	<0.416	<0.361	<0.42	<0.792	<0.703
Pyrene	mg/kg	720	**1.14**	**3.36**	<0.358	**2.35**	**0.394**	<0.42	**5.32**	**1.46**
Pyridine	mg/kg	NS	<1.8	<1.93	<1.8	<2.08	<1.81	<2.11	<3.97	<3.52
Total SVOCs	mg/kg	NS	**5.738**	**19.452**	<0.358	**12.285**	**1.993**	**0.424**	**46.916**	**8.766**
TPH-ETPH										
Total Petroleum Hydrocarbons	mg/kg	10,000	**158**	**73.5**	**65.8**	**186**	**79.3**	<42.2	**354**	**168**
Total Metals										
Arsenic	mg/kg	11	**8.83**	**8.66**	**10.4**	**4.9**	**10.6**	**11.5**	**7.43**	**6.42**
Barium	mg/kg	1,000	**41.5**	**58.3**	**23.8**	**24.8**	**28.7**	**91.4**	**43.2**	**22.6**
Cadmium	mg/kg	33	<0.44	<0.38	<0.53	<0.45	<0.48	<0.58	<0.55	**0.58**
Chromium	mg/kg	130	**39.3**	**26.9**	**18.7**	**17.6**	**51**	**35.8**	**29**	**28.4**
Lead	mg/kg	400	**24.5**	**132**	**14.6**	**50**	**19.2**	**216**	**307**	**72**
Mercury	mg/kg	7	**0.058**	**2.12**	**0.048**	**0.085**	**0.035**	**0.523**	**0.105**	**0.038**
Selenium	mg/kg	180	<0.44	<0.38	<0.53	<0.45	<0.48	**1.91**	<0.55	<0.52
Silver	mg/kg	89	<0.44	<0.38	<0.53	<0.45	<0.48	<0.58	<0.55	<0.52
PCBs										
Total PCBs	mg/kg	1	<0.0545	<0.0616	<0.0572	<0.0606	<0.0535	<0.0571	<0.0569	<0.0575

Abbreviations:
TPH = Total Petroleum Hydrocarbons
PCBs = Polychlorinated Biphenyls
VOC = Volatile Organic Compound
SVOCs = Semivolatile Organic Compounds
ETPH = Excractable Total Petroleum Hydrocarbons
PAC = Physiologically Available Cyanid
NS = No Standard
ND = Not Detected
mg/kg = milligrams per kilogram
NT = Not Tested

Notes:
< = parameter not detected above laboratory method reporting limit

Total Concentrations represent the sum of detected analytes

BOLD:
Parameter detected above laboratory detection limit
BOLD:
Represents an exceedence of the Soil Standards

Table 1
Summary of Soil Analytical Data
Portsmouth, New Hampshire
Stump Dump
September 2016

Parameter	Units	Soil Remediation Standards (Table-600-2)	Sampling Location							
			B-9 S-3	B-10 S-3	B-11 S-2	B-12 S-1	B-13 S-3	B-14 S-4	B-15 S-3	B-16 S-2
			9/27/2016	9/29/2016	9/29/2016	9/29/2016	9/28/2016	9/29/2016	9/29/2016	9/29/2016
VOCs										
1,2,4-Trimethylbenzene	mg/kg	130	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.146**	<0.0047
1,3,5-Trimethylbenzene	mg/kg	96	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.0534**	<0.0047
4-Isopropyltoluene	mg/kg	330	**0.044**	<0.0036	<0.0034	<0.0037	<0.0034	**0.138**	**0.0074**	<0.0047
Acetone	mg/kg	75	**0.235**	<0.0364	<0.0339	**0.0525**	<0.0336	<0.0446	**0.208**	**0.0867**
Ethylbenzene	mg/kg	120	**0.0045**	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.0156**	<0.0047
Isopropylbenzene	mg/kg	330	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.0065**	<0.0047
Naphthalene	mg/kg	5	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.0097**	<0.0047
n-Butylbenzene	mg/kg	110	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.0097**	<0.0047
n-Propylbenzene	mg/kg	85	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.009**	<0.0047
sec-Butylbenzene	mg/kg	130	<0.0045	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	**0.005**	<0.0047
Toluene	mg/kg	100	**0.0105**	<0.0036	<0.0034	<0.0037	<0.0034	<0.0045	<0.0042	<0.0047
Xylenes (Total)	mg/kg	500	<0.0075	<0.0062	<0.006	<0.0068	<0.0062	<0.0075	**0.0441**	<0.0083
Total VOCs	mg/kg	NS	**0.294**	<0.0364	<0.0339	0.0525	<0.0336	**0.138**	**0.5144**	**0.0867**
SVOCs										
Acenaphthene	mg/kg	340	<0.389	<0.395	<1.58	<0.35	<0.388	**1.44**	<0.423	<0.376
Anthracene	mg/kg	1,000	**0.526**	<0.395	<1.58	<0.35	<0.388	<0.421	<0.423	<0.376
Benzo(a)anthracene	mg/kg	1	**1.09**	**0.982**	<1.58	<0.35	**0.723**	<0.421	<0.423	<0.376
Benzo(a)pyrene	mg/kg	0.7	**0.803**	**1.06**	<0.793	**0.199**	**0.856**	<0.211	<0.212	**0.313**
Benzo(b)fluoranthene	mg/kg	1	**1.19**	**1.67**	<1.58	<0.35	**1.36**	<0.421	<0.423	**0.483**
Benzo(g,h,i)perylene	mg/kg	NS	<0.389	**0.49**	<1.58	<0.35	**0.552**	<0.421	<0.423	<0.376
Benzo(k)fluoranthene	mg/kg	12	**0.395**	**0.523**	<1.58	<0.35	**0.531**	<0.421	<0.423	<0.376
Carbazole	mg/kg	NS	<0.389	<0.395	<1.58	<0.35	<0.388	<0.421	<0.423	<0.376
Chrysene	mg/kg	120	**0.89**	**0.953**	**0.853**	<0.176	**0.922**	<0.211	<0.212	**0.34**
Dibenzo(a,h)Anthracene	mg/kg	0.7	<0.195	**0.205**	<0.793	<0.176	<0.195	<0.211	<0.212	<0.189
Dibenzofuran	mg/kg	NS	<0.389	<0.395	<1.58	<0.35	<0.388	**1.1**	<0.423	<0.376
Fluoranthene	mg/kg	960	**2.88**	**2.26**	<1.58	<0.35	**2.2**	**0.429**	**0.49**	**0.737**
Indeno(1,2,3-cd)Pyrene	mg/kg	1	<0.389	**0.428**	<1.58	<0.35	**0.422**	<0.421	<0.423	<0.376
Phenanthrene	mg/kg	NS	**2.26**	**1.26**	<1.58	<0.35	**0.871**	**1.4**	<0.423	**0.456**
Phenol	mg/kg	56	<0.389	<0.395	<1.58	<0.35	<0.388	<0.421	<0.423	<0.376
Pyrene	mg/kg	720	**3.17**	**1.86**	<1.58	<0.35	**2.21**	<0.421	**0.478**	**0.72**
Pyridine	mg/kg	NS	<1.95	<1.98	7.93	<1.76	<1.95	<2.11	<2.12	<1.89
Total SVOCs	mg/kg	NS	**13.204**	**11.691**	**0.853**	**0.199**	**10.647**	**7.781**	**0.968**	**3.049**
TPH-ETPH										
Total Petroleum Hydrocarbons	mg/kg	10,000	**136**	**64.2**	**209**	**48.3**	**222**	**163**	**319**	**136**
Total Metals										
Arsenic	mg/kg	11	**13.7**	**12.4**	**6.57**	**13.9**	**15.8**	**11.8**	**9.64**	**10.5**
Barium	mg/kg	1,000	**58.4**	**50.4**	**45**	**50.5**	**30.1**	**71.4**	**95.7**	**110**
Cadmium	mg/kg	33	<0.55	<0.47	<0.48	<0.38	<0.51	<0.46	<0.55	**0.49**
Chromium	mg/kg	130	**32.7**	**34.3**	**24.8**	**53**	**27.3**	**57.2**	**31**	**34.4**
Lead	mg/kg	400	**30.9**	**34.1**	**35.3**	**12.5**	**277**	**318**	**221**	**416**
Mercury	mg/kg	7	**0.046**	**0.053**	**0.098**	**0.032**	**0.094**	**0.043**	**0.441**	**0.971**
Selenium	mg/kg	180	<0.55	<0.47	<0.48	<0.38	<0.51	<0.46	<0.55	**0.49**
Silver	mg/kg	89	<0.55	<0.47	**0.78**	<0.38	<0.51	<0.46	<0.55	<0.42
PCBs										
Total PCBs	mg/kg	1	<0.0593	<0.0586	<0.055	<0.056	<0.0536	<0.0601	<0.0654	<0.0551

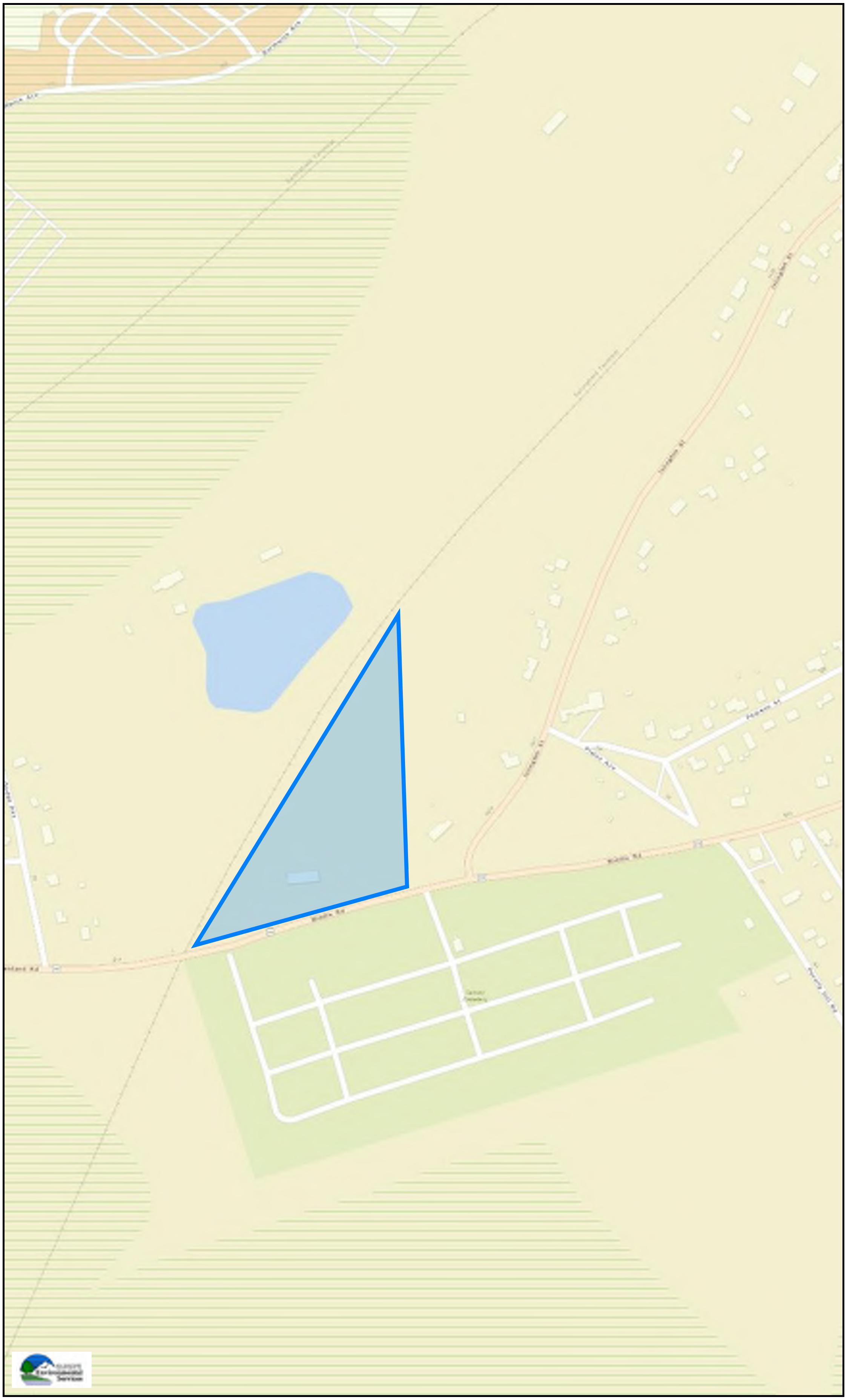
Abbreviations:
TPH = Total Petroleum Hydrocarbons
PCBs = Polychlorinated Biphenyls
VOC = Volatile Organic Compound
SVOCs = Semivolatile Organic Compounds
ETPH = Excractable Total Petroleum Hydrocarbons
PAC = Physiologically Available Cyanid
NS = No Standard
ND = Not Detected
mg/kg = milligrams per kilogram
NT = Not Tested

Notes:
< = parameter not detected above laboratory method reporting limit

Total Concentrations represent the sum of detected analytes

BOLD:
Parameter detected above laboratory detection limit
BOLD:
Represents an exceedence of the Soil Standards

Surface Water Impairments



Legend

Surface Waters with Impairn
2022 with Quarter Mile Buffe

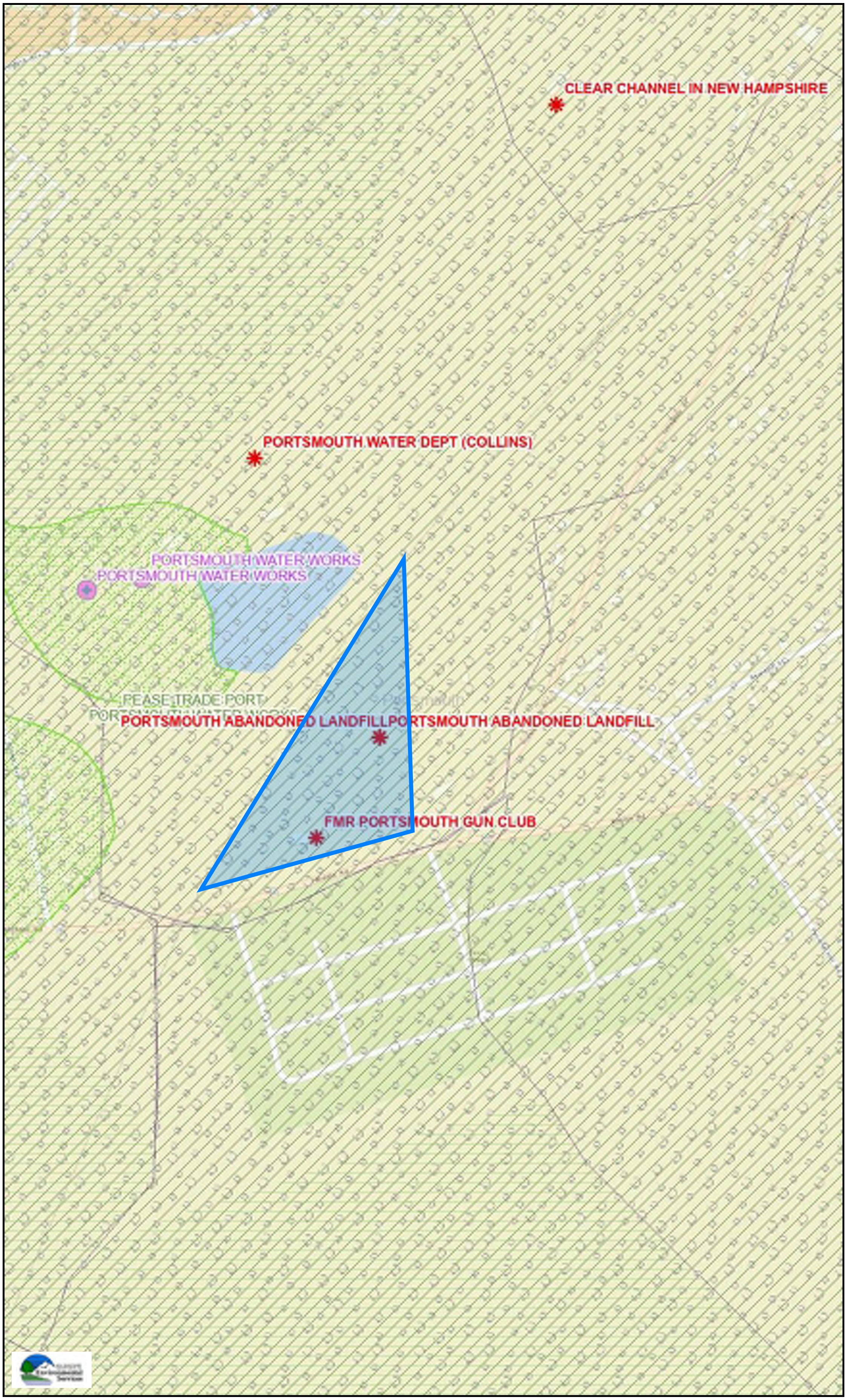
Map Scale

1: 5,000

Map Generated: 12/15/2022

Notes

AOT Screening Layers



Legend

- Surface Waters with Impairm 2022 with Quarter Mile Buffe
- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Watersheds with Chloride Impairments 2022

Map Scale

1: 5,000

Map Generated: 12/15/2022

Notes

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: Devin Batchelder, Weston & Sampson Engineering
55 Walkers Brook Drive
Reading, MA 01857

From: NHB Review, NH Natural Heritage Bureau
Date: 9/14/2022 (valid until 09/14/2023)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Alteration of Terrain Permit

NHB ID: **NHB22-2841** Town: Portsmouth Location: 305 GREENLAND RD
Description: The City is proposing to create a skate park on a previously disturbed property which is currently used for construction storage.
cc: NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: No comments at this time.**
F&G: Please refer to NHFG consultation requirements below.

Vertebrate species	**State[1]**	**Federal**	**Notes**
Blanding's Turtle (*Emydoidea blandingii*)	E	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, “SC” = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

For all animal reviews, refer to ‘IMPORTANT: NHFG Consultation’ section below.

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://wildlife.state.nh.us/wildlife/environmental-review.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

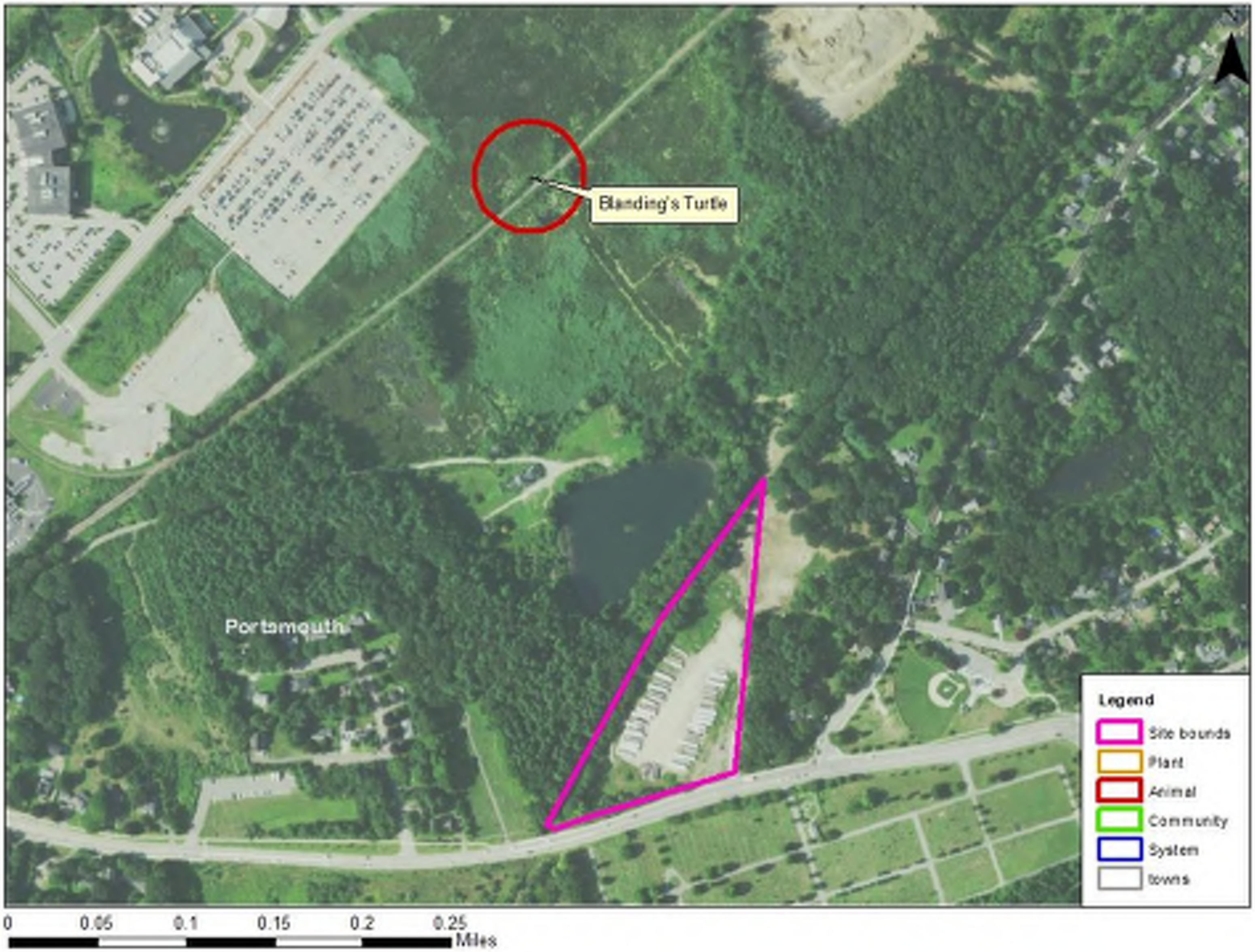
If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule)*, coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle *kim.tuttle@wildlife.nh.gov* with a copy to NHFGreview@wildlife.nh.gov, and include the NHB Datacheck results letter number and "review request" in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

NHB22-2841


Blanding's Turtle
Portsmouth
Legend
Site bounds
Plant
Animal
Community
System
towns
0
0.05
0.1
0.15
0.2
0.25
Miles

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2011: Area 12906: 1 adult observed.
General Area: 2011: Area 12906: Marsh along railroad tracks.
General Comments: --
Management Comments: --

Location

Survey Site Name: Meadowbrook
Managed By: Hospital Corporation of America

County: Rockingham
Town(s): Portsmouth
Size: 1.9 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2011: Area 12906: Marsh adjacent to 333 Borthwick Avenue, behind Portsmouth Regional Hospital.

Dates documented

First reported: 2011-05-07 Last reported: 2011-05-07

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

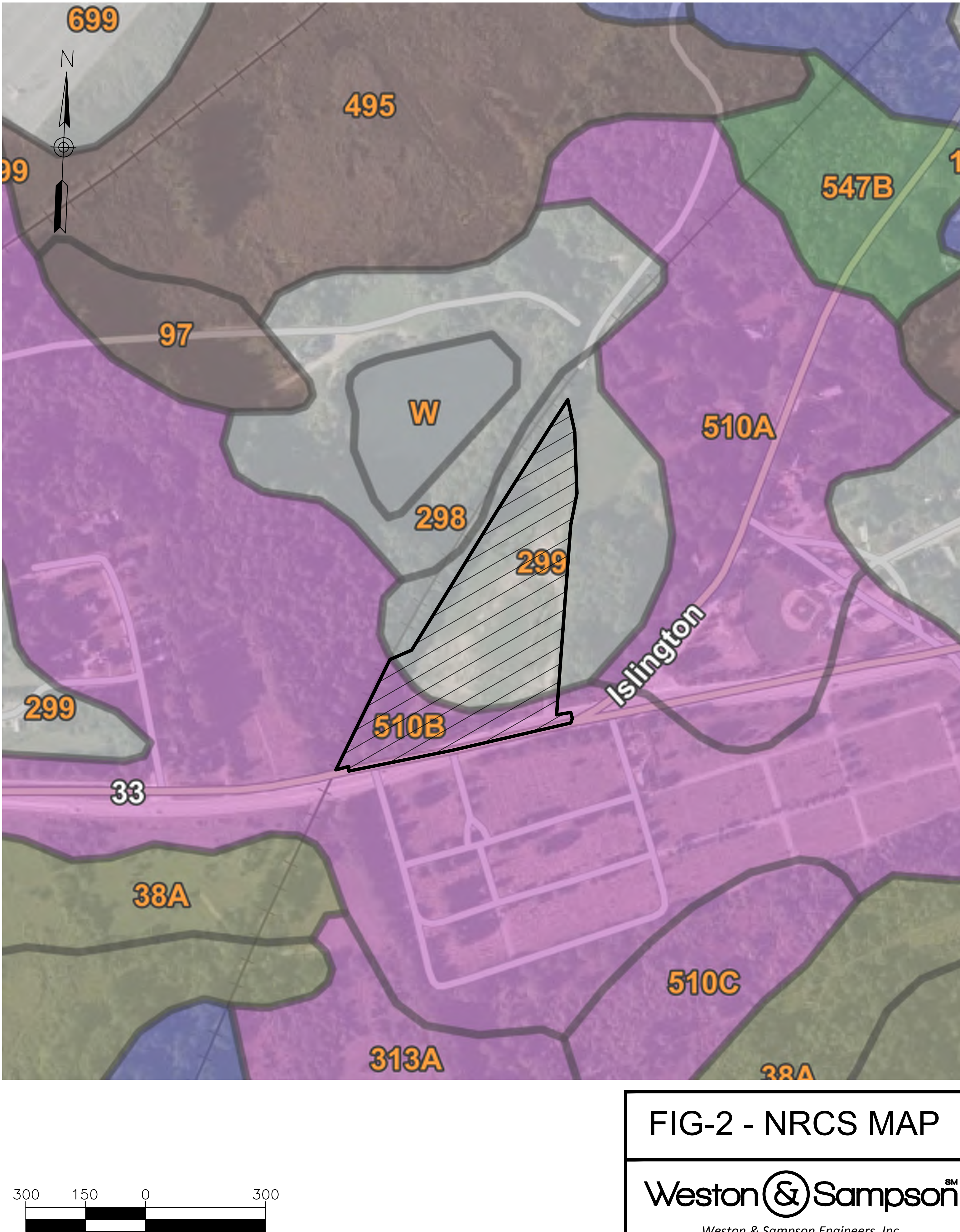


FIG-2 - NRCS MAP

Weston & Sampson
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100, Reading MA 01867

2000 1000 0 2000

SCALE 1"= 2000

FIG-3 - AERIAL

Weston & Sampson℠

Weston & Sampson Engineers, Inc.

55 Walkers Brook Drive, Suite 100, Reading MA 01867

Site Photographs

Site Photos

December 15, 2022

Photo 1: Looking north at the existing site entrance on Greenland Road


Photo 2: Looking west along the frontage of the property at Greenland Road


Photo 3: Looking north from southern edge of property near Greenland Road


Photo 4: Looking southwest into the swale near Greenland Road


Photo 5: Looking southeast towards Greenland Road

Photo 6: Looking northeast towards northern corner of property

Photo 7: Looking southeast towards eastern boundary of property


Photo 8: Looking southwest towards Greenland Road


Photo 9: Looking north towards rail trail along western boundary of property


Photo 10: Looking southwest towards Greenland Road

LEGEND

	LIMIT OF WORK
	PROPERTY LINE
	GUARDRAIL
	EDGE OF WOODS
	OVERHEAD UTILITIES
65	EXISTING CONTOUR
	EXISTING DRAIN
	CATCH BASIN
	UTILITY POLE
	DRAIN MANHOLE
	RIPRAP
	GRAVEL
BK.2562/PG.2783	BOOK NO./PAGE NO.
CB	CATCH BASIN
CPP	CORRUGATED PLASTIC PIPE
DMH	DRAINAGE MANHOLE
EP	EDGE OF PAVEMENT
FES	FLARED END SECTION
HDPE	HIGH DENSITY POLYETHYLENE
INV.	INVERT
L	LENGTH OF CURVE
N/F	NOW OR FORMERLY
PSNH	PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
R	RADIUS
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RCP	REINFORCED CONCRETE PIPE
S.F.	SQUARE FEET
TP	TEST PIT

NOTES

1. THE PARCEL IS LOCATED IN THE MUNICIPAL DISTRICT.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 241 AS LOT 18.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X AS SHOWN ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270E, EFFECTIVE DATE: MAY 17, 2005.
4. OWNER OF RECORD:
   CITY OF PORTSMOUTH
   C/O WATER DEPARTMENT
   DEPARTMENT OF PUBLIC WORKS
   PO BOX 628
   PORTSMOUTH, NH 03802
5. ZONING REQUIREMENTS:
   LOTS AND BUILDINGS IN THE MUNICIPAL DISTRICT ARE EXEMPT FROM ALL DIMENSIONAL AND INTENSITY REGULATIONS.
   SEE SECTION 10.560 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE.
6. VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). CONTOUR INTERVAL IS 1'.
7. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83).
8. THE UNDERGROUND SYSTEM SHOWN HEREON WAS NOT FIELD LOCATED. LOCATION TAKEN FROM "GRADING PLAN ROUTE 33 RECREATION AREA" BY UNDERWOOD ENGINEERS, DATED 12/17/2013. THIS LOCATION SHOWN HEREON IS APPROXIMATE ONLY.
9. EXISTING CONDITIONS SURVEY PERFORMED BY ________
   DATED ________

PLAN REFERENCES:

1. "LOT LINE ADJUSTMENT ISLINGTON STREET & GREENLAND ROAD, PORTSMOUTH, NEW HAMPSHIRE FOR CITY OF PORTSMOUTH" BY JAMES VERRA AND ASSOCIATES, INC DATED 1-30-2002. PLAN NOT RECORDED.
2. "RIGHT OF WAY EASEMENT PLAN FOR THE CITY OF PORTSMOUTH, GREENLAND ROAD/MIDDLE ROAD, PORTSMOUTH, NEW HAMPSHIRE" PREPARED BY VANASSE HANGEN BRUSTLIN, INC., DATED SEPTEMBER 28, 2007, REVISED APRIL 28, 2008. RCRD PLAN #D-35481.
3. "AS BUILT PLAN OF A PORTION OF NH ROUTE 33, PORTSMOUTH, NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC. DATED AUGUST 2010, REVISED 9/21/10. PLAN NOT RECORDED.
4. "EXISTING FEATURES PLAN TAX MAP 241 LOT 18 PROPERTY OF CITY OF PORTSMOUTH 385 GREENLAND ROAD PORTSMOUTH, NEW HAMPSHIRE COUNTY OF ROCKINGHAM" BY MSC CIVIL ENGINEERS & LAND SURVEYORS, DATED NOVEMBER 2, 2012 WITH REVISION 1 DATED 11/05/2012 PLAN IS NOT RECORDED.

TFM MSC
A division of TFMoran, Inc.

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.mscengineers.com

CONTROL POINT ASSOCIATES, INC.

SCALE: 1" = 40' - 0"
0 40 80 120

Weston & Sampson design studio
85 Devonshire Street, 3rd Floor, Boston, MA 02109
617 412 4480 800 SAMPSON
www.westonandsampson.com

DRAWN BY:: KC
REVIEWED BY:: BI
APPROVED BY::
DATE:: 12/09/22

PROJECT:: PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE:: EXISTING CONDITIONS PLAN
90% CONSTRUCTION DOCUMENTS

SHEET:: L100
SKATE PARK

BMP Worksheets

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.54	ac	A = Area draining to the practice
0.29	ac	A_I = Impervious area draining to the practice
0.54	decimal	I = Percent impervious area draining to the practice, in decimal form
0.53	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.29	ac-in	WQV= 1" x Rv x A
1,045	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

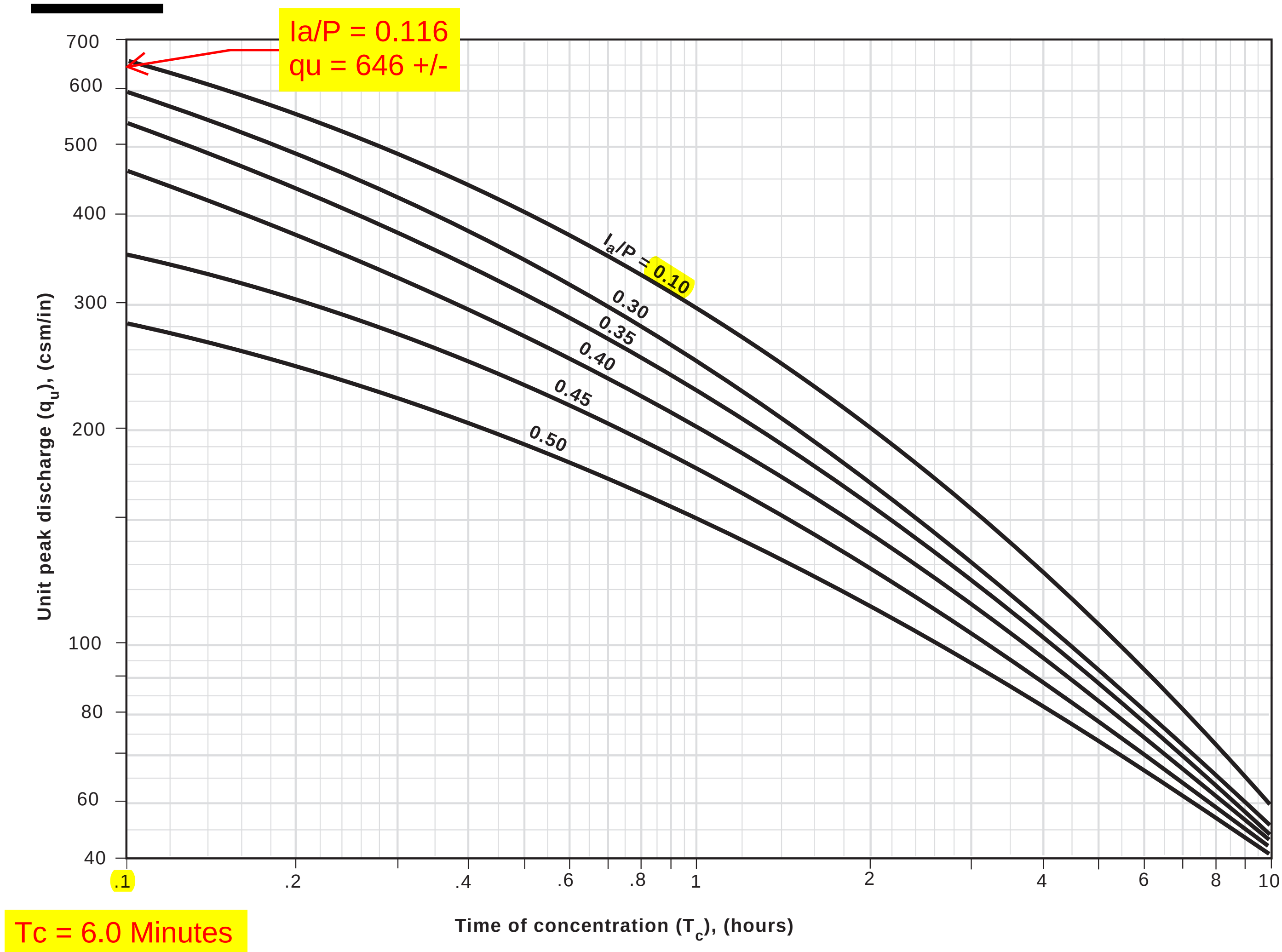
Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.53	inches	Q = Water quality depth. Q = WQV/A
95	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.6	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.116	inches	Ia = Initial abstraction. Ia = 0.2S
6.0	minutes	T_c = Time of Concentration
646.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.291	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes:

These calculations are included to support the design of a Contech CDS water quality treatment unit

Exhibit 4-III Unit peal discharge (q_u) for NRCS (SCS) type III rainfall distribution



CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

ROUTE 33 SKATE PARK
PORTSMOUTH, NH

Area	0.54 ac	Unit Site Designation	CDS
Weighted C	0.63	Rainfall Station #	104
t_c	6 min		
CDS Model	2015-4	CDS Treatment Capacity	0.7 cfs

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	13.0%	13.0%	0.01	0.01	12.6
0.04	12.2%	25.2%	0.01	0.01	11.8
0.06	11.2%	36.4%	0.02	0.02	10.8
0.08	10.0%	46.4%	0.03	0.03	9.6
0.10	8.2%	54.6%	0.03	0.03	7.9
0.12	5.8%	60.4%	0.04	0.04	5.5
0.14	6.5%	66.9%	0.05	0.05	6.2
0.16	4.6%	71.5%	0.05	0.05	4.4
0.18	3.7%	75.2%	0.06	0.06	3.5
0.20	3.3%	78.5%	0.07	0.07	3.1
0.25	6.7%	85.2%	0.09	0.09	6.2
0.30	3.7%	88.9%	0.10	0.10	3.4
0.35	2.4%	91.3%	0.12	0.12	2.2
0.40	1.8%	93.1%	0.14	0.14	1.7
0.45	1.9%	95.0%	0.15	0.15	1.7
0.50	1.1%	96.1%	0.17	0.17	0.9
0.75	2.6%	98.7%	0.26	0.26	2.2
1.00	0.9%	99.6%	0.34	0.34	0.7
1.50	0.4%	100.0%	0.51	0.51	0.3
2.00	0.0%	100.0%	0.68	0.68	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					94.6

Removal Efficiency Adjustment[2] =	6.5%
Predicted % Annual Rainfall Treated =	93.5%
Predicted Net Annual Load Removal Efficiency =	**88.1%**

1 - Based on 10 years of hourly precipitation data from NCDC 1683, Concord WSO Airport, Merrimack County, NH
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Drainage Analysis

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.787 degrees West
Latitude	43.058 degrees North
Elevation	0 feet
Date/Time	Mon, 19 Dec 2022 12:41:39 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.04	2.67	2.93	**1yr**	2.36	2.82	3.23	3.95	4.57	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.34	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.15	4.08	4.60	**5yr**	3.62	4.42	5.06	5.96	6.73	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.73	2.23	2.90	3.76	4.89	5.55	**10yr**	4.33	5.34	6.11	7.14	8.01	**10yr**
25yr	0.48	0.76	0.97	1.34	1.77	2.34	**25yr**	1.53	2.14	2.78	3.64	4.75	6.20	7.13	**25yr**	5.49	6.86	7.84	9.07	10.10	**25yr**
50yr	0.54	0.86	1.10	1.54	2.07	2.76	**50yr**	1.79	2.53	3.29	4.33	5.68	7.43	8.62	**50yr**	6.57	8.29	9.47	10.87	12.04	**50yr**
100yr	0.59	0.96	1.24	1.77	2.42	3.26	**100yr**	2.08	2.98	3.91	5.17	6.79	8.90	10.43	**100yr**	7.88	10.03	11.45	13.04	14.36	**100yr**
200yr	0.67	1.10	1.42	2.04	2.82	3.83	**200yr**	2.44	3.51	4.62	6.14	8.11	10.67	12.62	**200yr**	9.44	12.13	13.84	15.64	17.12	**200yr**
500yr	0.80	1.31	1.71	2.48	3.47	4.76	**500yr**	3.00	4.38	5.77	7.72	10.26	13.56	16.23	**500yr**	12.00	15.61	17.79	19.91	21.63	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.67	2.24	2.54	**1yr**	1.98	2.44	2.87	3.16	3.90	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.07	3.47	**2yr**	2.72	3.34	3.84	4.57	5.09	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.81	4.23	**5yr**	3.37	4.06	4.74	5.57	6.29	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.39	3.06	4.40	4.91	**10yr**	3.90	4.73	5.50	6.47	7.26	**10yr**
25yr	0.44	0.67	0.83	1.19	1.57	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.73	5.97	**25yr**	4.18	5.74	6.74	7.89	8.77	**25yr**
50yr	0.48	0.74	0.92	1.32	1.78	2.17	**50yr**	1.53	2.12	2.35	3.08	3.94	5.34	6.91	**50yr**	4.73	6.65	7.86	9.17	10.13	**50yr**
100yr	0.54	0.82	1.02	1.48	2.03	2.48	**100yr**	1.75	2.42	2.63	3.42	4.37	6.01	8.00	**100yr**	5.32	7.69	9.17	10.68	11.71	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.82	**200yr**	1.98	2.76	2.94	3.79	4.82	6.73	9.26	**200yr**	5.96	8.90	10.70	12.45	13.55	**200yr**
500yr	0.69	1.03	1.33	1.93	2.75	3.38	**500yr**	2.37	3.30	3.42	4.33	5.49	7.83	11.22	**500yr**	6.93	10.79	13.13	15.27	16.41	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	3.00	3.16	**1yr**	2.66	3.04	3.60	4.39	5.07	**1yr**
2yr	0.34	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.44	3.71	**2yr**	3.05	3.56	4.09	4.85	5.66	**2yr**
5yr	0.40	0.62	0.76	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.24	4.35	4.96	**5yr**	3.85	4.77	5.39	6.37	7.16	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.10	3.94	5.36	6.19	**10yr**	4.74	5.95	6.79	7.84	8.75	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.57	**25yr**	1.76	2.51	2.95	4.06	5.12	7.83	8.31	**25yr**	6.93	7.99	9.09	10.32	11.40	**25yr**
50yr	0.67	1.02	1.27	1.82	2.45	3.12	**50yr**	2.12	3.05	3.59	4.98	6.28	9.81	10.39	**50yr**	8.68	10.00	11.33	12.70	13.94	**50yr**
100yr	0.79	1.19	1.49	2.15	2.95	3.80	**100yr**	2.55	3.72	4.36	6.13	7.70	12.28	13.01	**100yr**	10.87	12.51	14.13	15.65	17.05	**100yr**
200yr	0.92	1.38	1.75	2.54	3.54	4.64	**200yr**	3.06	4.53	5.32	7.55	9.45	15.41	16.29	**200yr**	13.64	15.67	17.64	19.27	20.87	**200yr**
500yr	1.14	1.70	2.18	3.17	4.51	6.02	**500yr**	3.89	5.88	6.90	9.97	12.42	20.83	21.95	**500yr**	18.44	21.10	23.67	25.38	27.26	**500yr**

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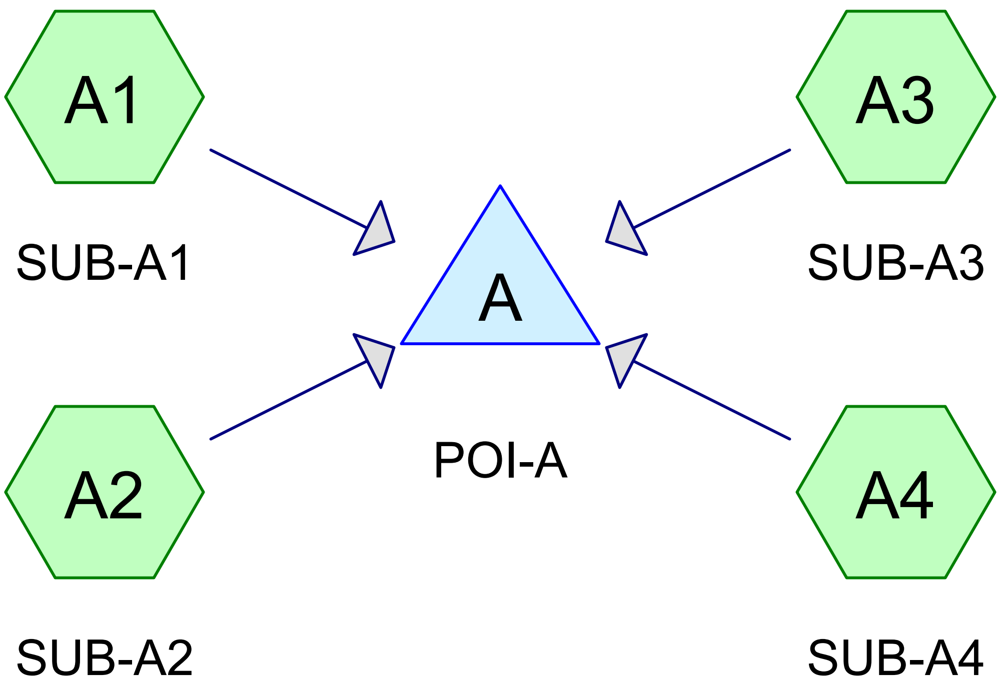
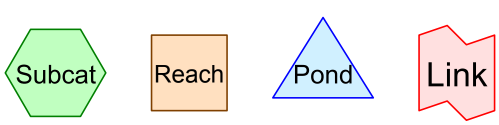
Northeast Regional Climate Center





Routing Diagram for HydroCAD-EX
Prepared by Weston & Sampson Engineers, Inc, Printed 12/20/2022
HydroCAD® 10.20-2d s/n 00455 © 2021 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 YR	Type III 24-hr		Default	24.00	1	2.85	2
2	10 YR	Type III 24-hr		Default	24.00	1	4.33	2
3	50 YR	Type III 24-hr		Default	24.00	1	6.57	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
28,589	30	Brush, Good, HSG A (A2, A3, A4)
30,623	77	Fallow, bare soil, HSG A (A3, A4)
141,895	76	Gravel, HSG A (A2, A3, A4)
1,384	98	Impervious, HSG A (A3)
18,606	98	Paved roads w/curbs & sewers, HSG A (A1)
38,124	30	Woods, Good, HSG A (A2, A3, A4)
259,221	**66**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
259,221	HSG A	A1, A2, A3, A4
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
259,221		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
28,589	0	0	0	0	28,589	Brush, Good
30,623	0	0	0	0	30,623	Fallow, bare soil
141,895	0	0	0	0	141,895	Gravel
1,384	0	0	0	0	1,384	Impervious
18,606	0	0	0	0	18,606	Paved roads w/curbs & sewers
38,124	0	0	0	0	38,124	Woods, Good
259,221	**0**	**0**	**0**	**0**	**259,221**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	A2	0.00	0.00	539.0	0.0200	0.013	0.0	30.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: SUB-A1 Runoff Area=18,606 sf 100.00% Impervious Runoff Depth=2.62"
Tc=6.0 min CN=98 Runoff=1.18 cfs 4,061 cf

SubcatchmentA2: SUB-A2 Runoff Area=57,852 sf 0.00% Impervious Runoff Depth=0.23"
Flow Length=854' Tc=13.6 min CN=WQ Runoff=0.26 cfs 1,088 cf

SubcatchmentA3: SUB-A3 Runoff Area=132,727 sf 1.04% Impervious Runoff Depth=0.86"
Tc=6.0 min CN=WQ Runoff=2.92 cfs 9,548 cf

SubcatchmentA4: SUB-A4 Runoff Area=50,036 sf 0.00% Impervious Runoff Depth=0.71"
Tc=6.0 min CN=WQ Runoff=0.91 cfs 2,961 cf

Pond A: POI-A Inflow=5.17 cfs 17,658 cf
Primary=5.17 cfs 17,658 cf

Total Runoff Area = 259,221 sf Runoff Volume = 17,658 cf Average Runoff Depth = 0.82"
92.29% Pervious = 239,231 sf 7.71% Impervious = 19,990 sf

Summary for Subcatchment A1: SUB-A1

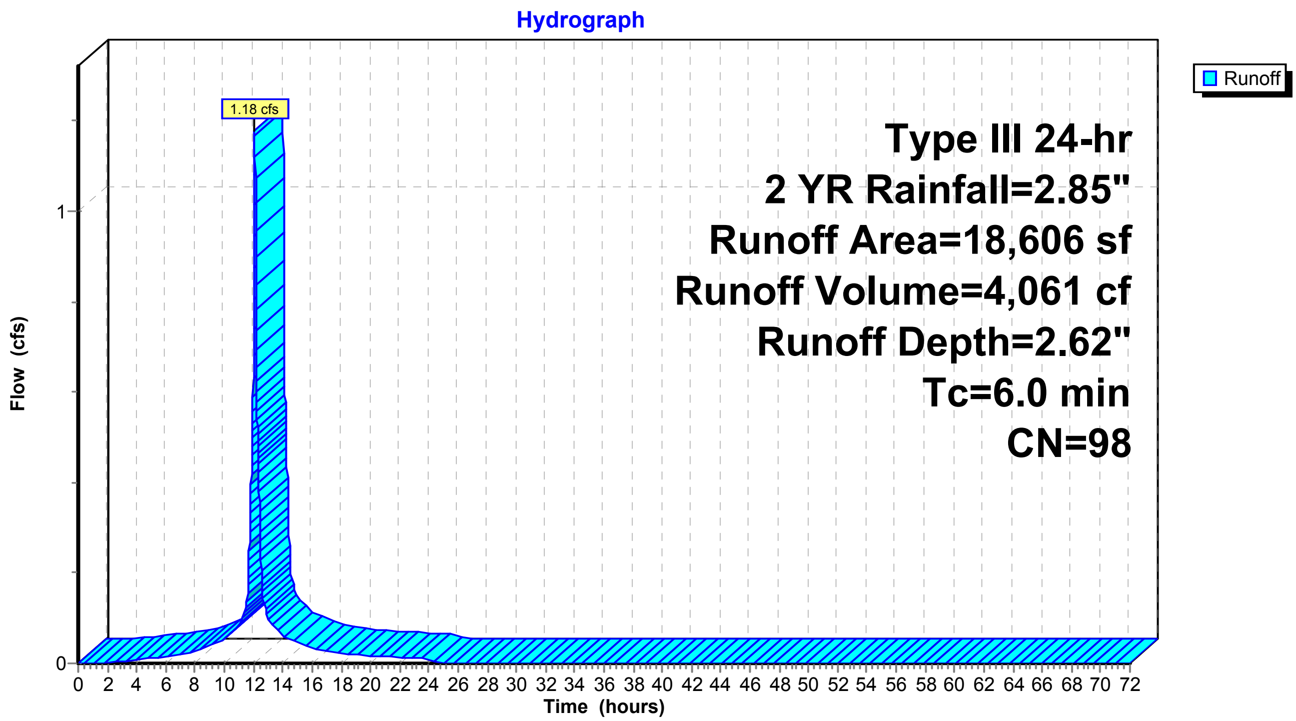
Runoff = 1.18 cfs @ 12.08 hrs, Volume= 4,061 cf, Depth= 2.62"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

Area (sf)	CN	Description
18,606	98	Paved roads w/curbs & sewers, HSG A
18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: SUB-A1



Summary for Subcatchment A2: SUB-A2

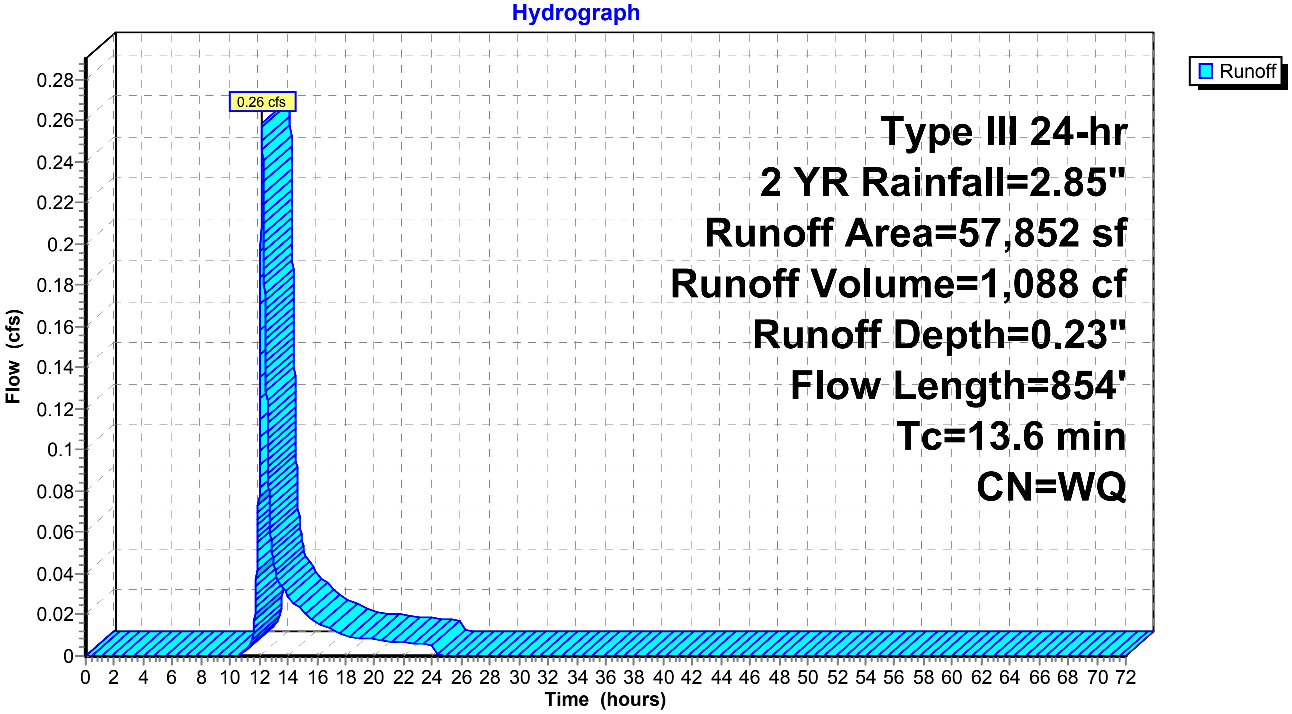
Runoff = 0.26 cfs @ 12.20 hrs, Volume= 1,088 cf, Depth= 0.23"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

	Area (sf)	CN	Description
	28,219	30	Woods, Good, HSG A
	15,368	30	Brush, Good, HSG A
*	14,265	76	Gravel, HSG A
	57,852		Weighted Average
	57,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	25	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.24"
1.5	25	0.0150	0.28		**Sheet Flow,** Fallow n= 0.050 P2= 3.24"
0.6	83	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	182	0.0030	0.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	539	0.0200	11.82	58.01	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
13.6	854	Total			

Subcatchment A2: SUB-A2



Summary for Subcatchment A3: SUB-A3

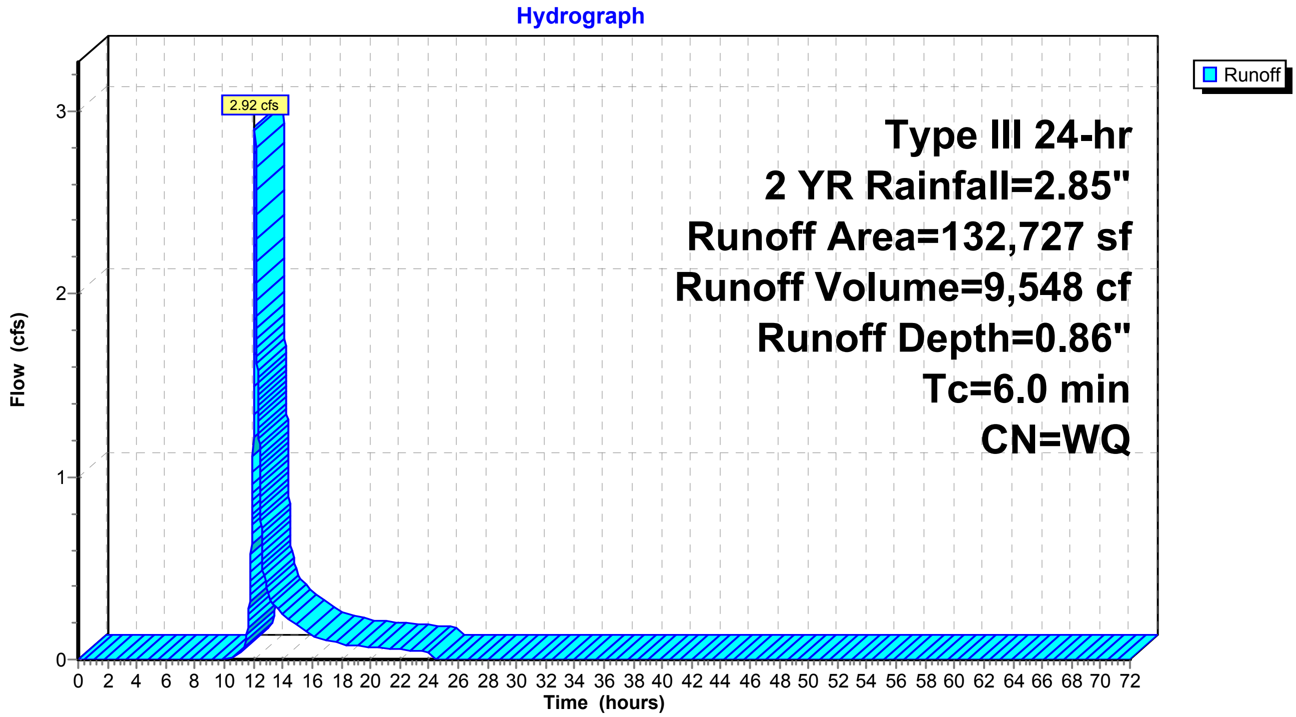
Runoff = 2.92 cfs @ 12.10 hrs, Volume= 9,548 cf, Depth= 0.86"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

	Area (sf)	CN	Description
*	97,147	76	Gravel, HSG A
	22,748	77	Fallow, bare soil, HSG A
	5,871	30	Woods, Good, HSG A
	5,577	30	Brush, Good, HSG A
*	1,384	98	Impervious, HSG A
	132,727		Weighted Average
	131,343		98.96% Pervious Area
	1,384		1.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: SUB-A3



Summary for Subcatchment A4: SUB-A4

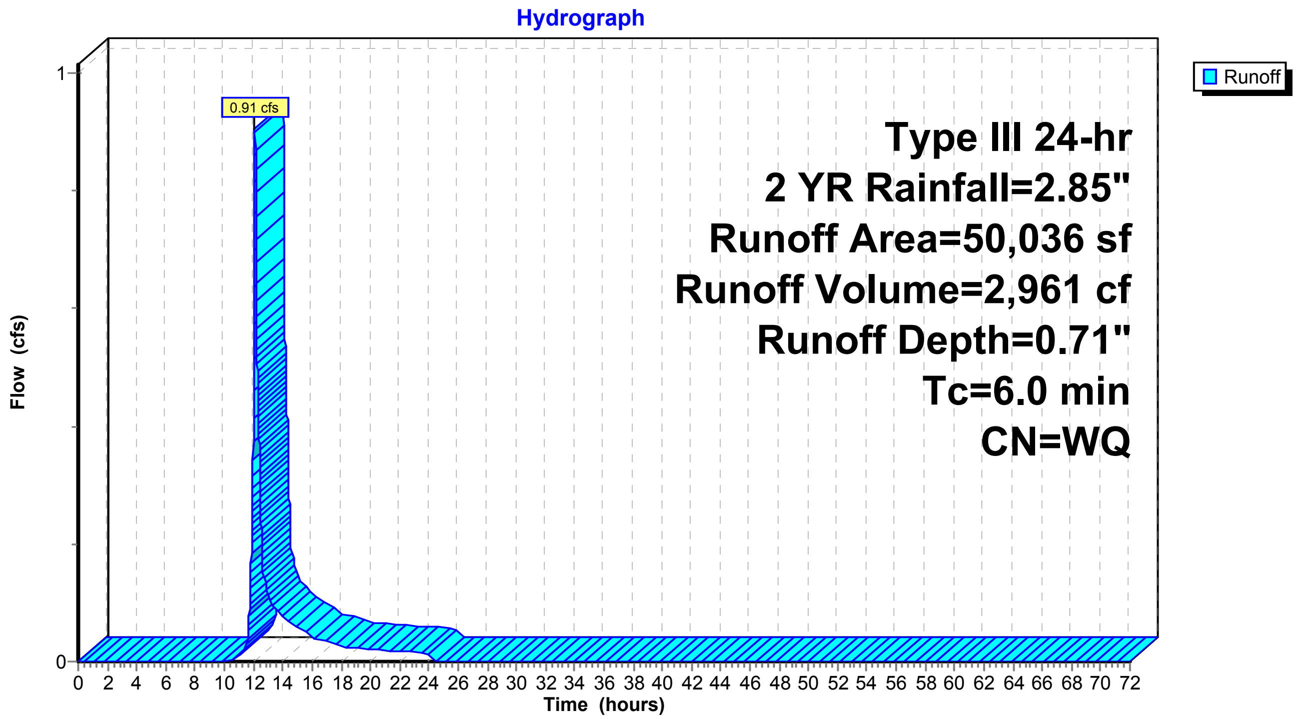
Runoff = 0.91 cfs @ 12.10 hrs, Volume= 2,961 cf, Depth= 0.71"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

	Area (sf)	CN	Description
*	30,483	76	Gravel, HSG A
	7,875	77	Fallow, bare soil, HSG A
	7,644	30	Brush, Good, HSG A
	4,034	30	Woods, Good, HSG A
	50,036		Weighted Average
	50,036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

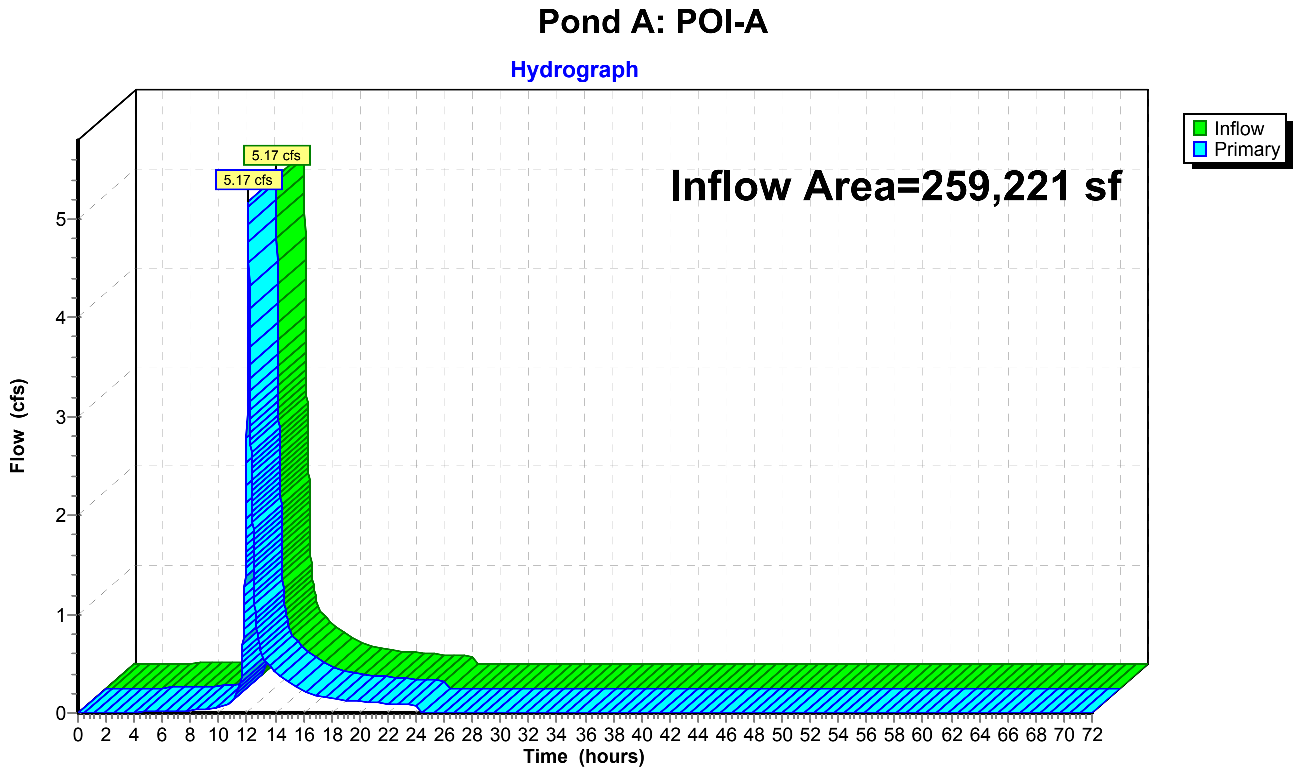
Subcatchment A4: SUB-A4



Summary for Pond A: POI-A

Inflow Area =	259,221 sf,	7.71% Impervious,	Inflow Depth = 0.82"	for 2 YR event
Inflow =	5.17 cfs @	12.09 hrs, Volume=	17,658 cf	
Primary =	5.17 cfs @	12.09 hrs, Volume=	17,658 cf,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: SUB-A1 Runoff Area=18,606 sf 100.00% Impervious Runoff Depth=4.09"
Tc=6.0 min CN=98 Runoff=1.81 cfs 6,348 cf

SubcatchmentA2: SUB-A2 Runoff Area=57,852 sf 0.00% Impervious Runoff Depth=0.49"
Flow Length=854' Tc=13.6 min CN=WQ Runoff=0.60 cfs 2,372 cf

SubcatchmentA3: SUB-A3 Runoff Area=132,727 sf 1.04% Impervious Runoff Depth=1.86"
Tc=6.0 min CN=WQ Runoff=6.58 cfs 20,553 cf

SubcatchmentA4: SUB-A4 Runoff Area=50,036 sf 0.00% Impervious Runoff Depth=1.54"
Tc=6.0 min CN=WQ Runoff=2.06 cfs 6,428 cf

Pond A: POI-A Inflow=10.87 cfs 35,702 cf
Primary=10.87 cfs 35,702 cf

Total Runoff Area = 259,221 sf Runoff Volume = 35,702 cf Average Runoff Depth = 1.65"
92.29% Pervious = 239,231 sf 7.71% Impervious = 19,990 sf

Summary for Subcatchment A1: SUB-A1

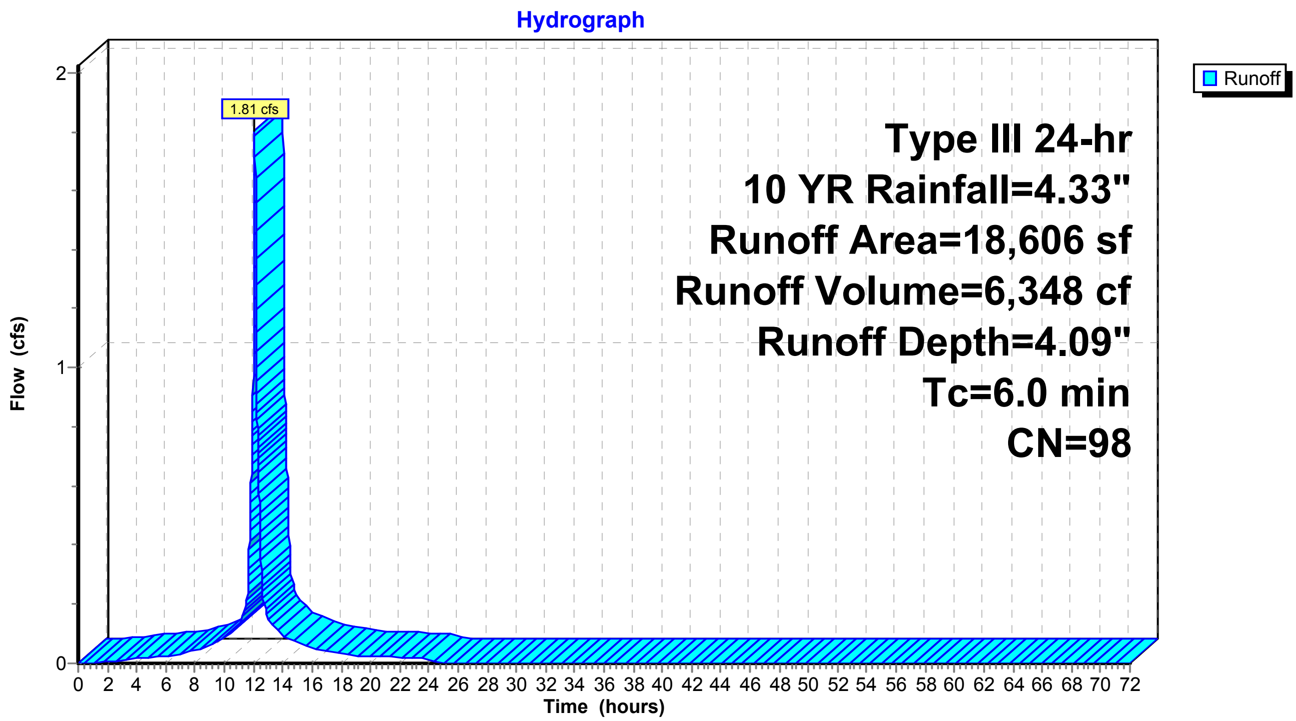
Runoff = 1.81 cfs @ 12.08 hrs, Volume= 6,348 cf, Depth= 4.09"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

Area (sf)	CN	Description
18,606	98	Paved roads w/curbs & sewers, HSG A
18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: SUB-A1



Summary for Subcatchment A2: SUB-A2

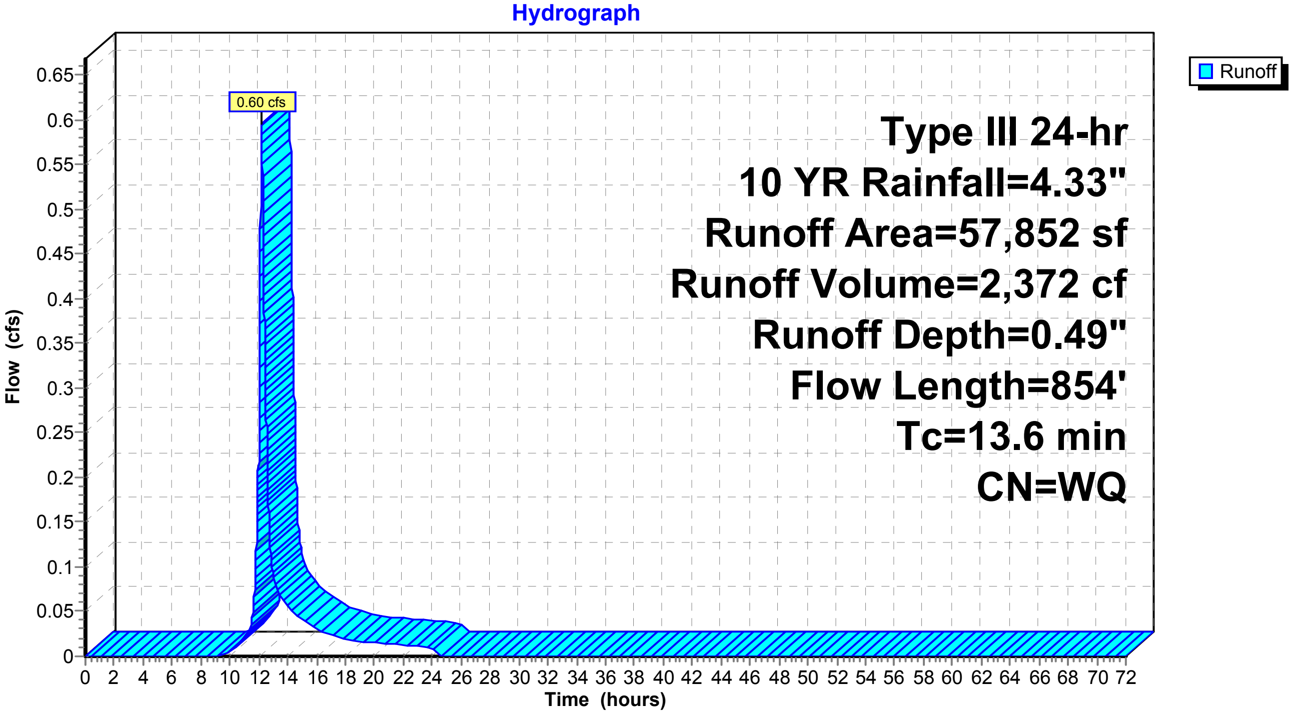
Runoff = 0.60 cfs @ 12.19 hrs, Volume= 2,372 cf, Depth= 0.49"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
	28,219	30	Woods, Good, HSG A
	15,368	30	Brush, Good, HSG A
*	14,265	76	Gravel, HSG A
	57,852		Weighted Average
	57,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	25	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.24"
1.5	25	0.0150	0.28		**Sheet Flow,** Fallow n= 0.050 P2= 3.24"
0.6	83	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	182	0.0030	0.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	539	0.0200	11.82	58.01	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
13.6	854	Total			

Subcatchment A2: SUB-A2



Summary for Subcatchment A3: SUB-A3

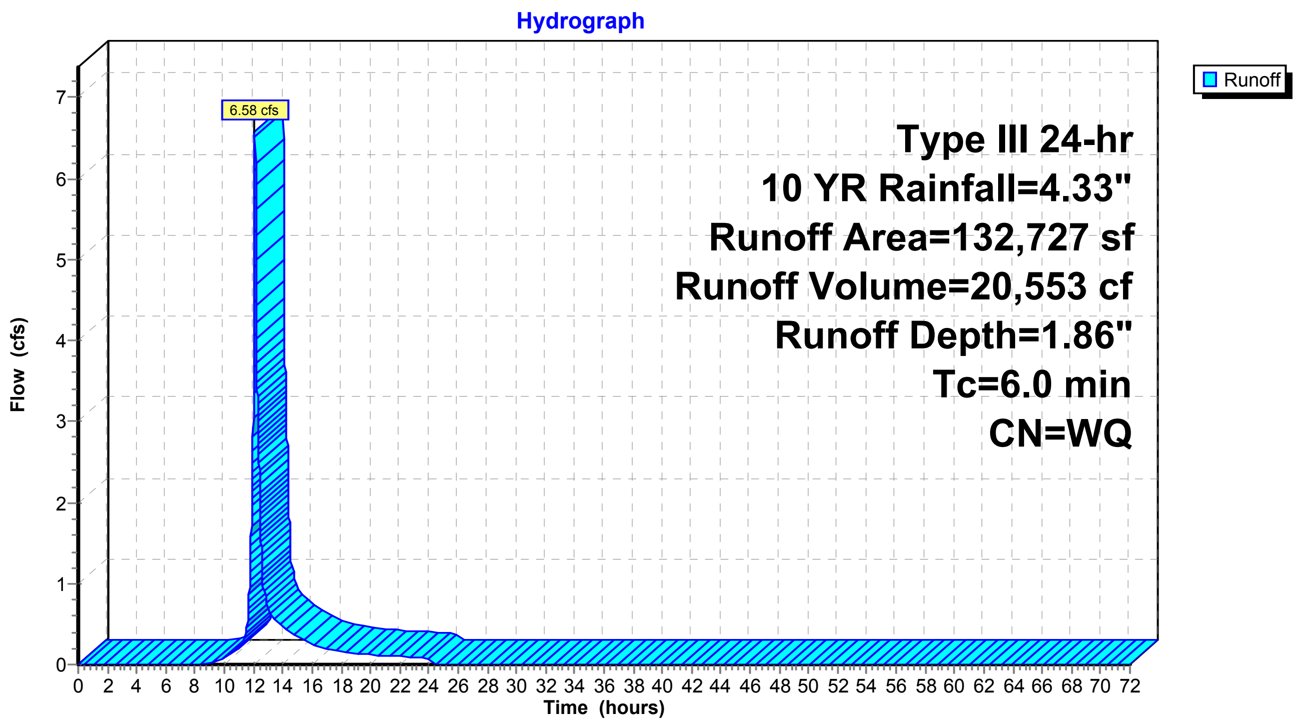
Runoff = 6.58 cfs @ 12.09 hrs, Volume= 20,553 cf, Depth= 1.86"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
*	97,147	76	Gravel, HSG A
	22,748	77	Fallow, bare soil, HSG A
	5,871	30	Woods, Good, HSG A
	5,577	30	Brush, Good, HSG A
*	1,384	98	Impervious, HSG A
	132,727		Weighted Average
	131,343		98.96% Pervious Area
	1,384		1.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: SUB-A3



Summary for Subcatchment A4: SUB-A4

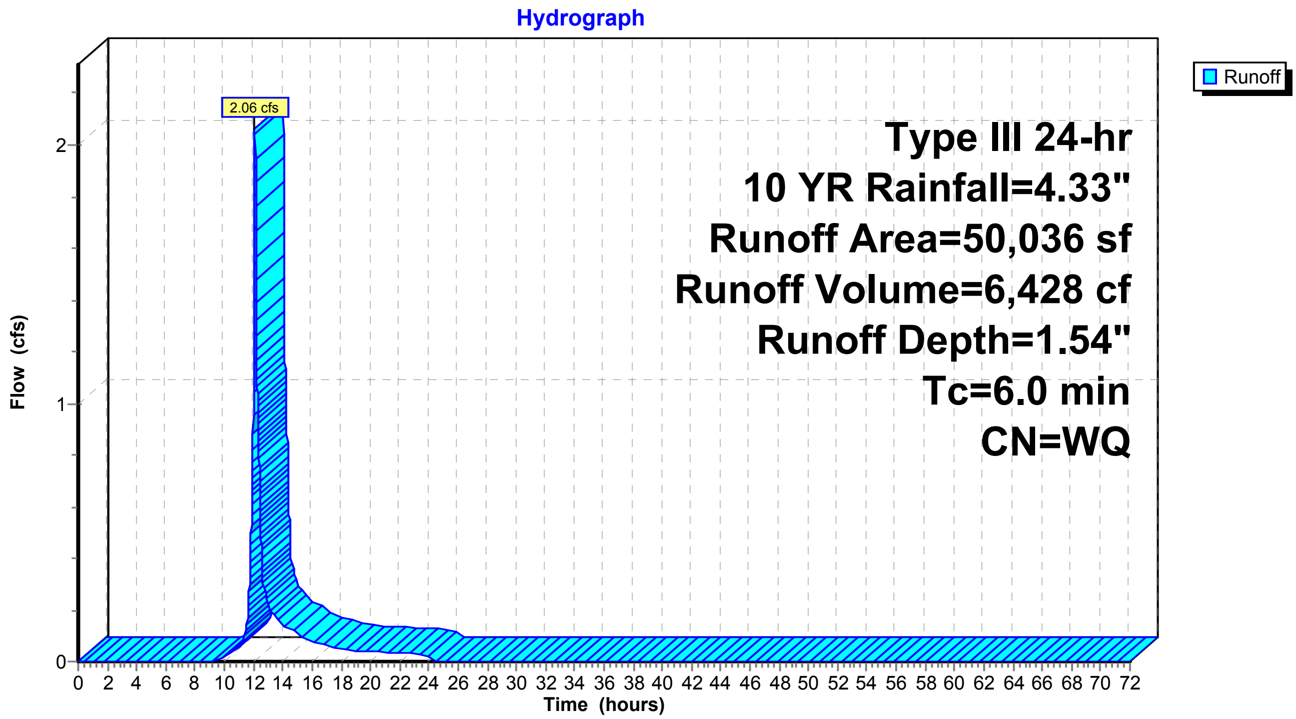
Runoff = 2.06 cfs @ 12.09 hrs, Volume= 6,428 cf, Depth= 1.54"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
*	30,483	76	Gravel, HSG A
	7,875	77	Fallow, bare soil, HSG A
	7,644	30	Brush, Good, HSG A
	4,034	30	Woods, Good, HSG A
	50,036		Weighted Average
	50,036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A4: SUB-A4

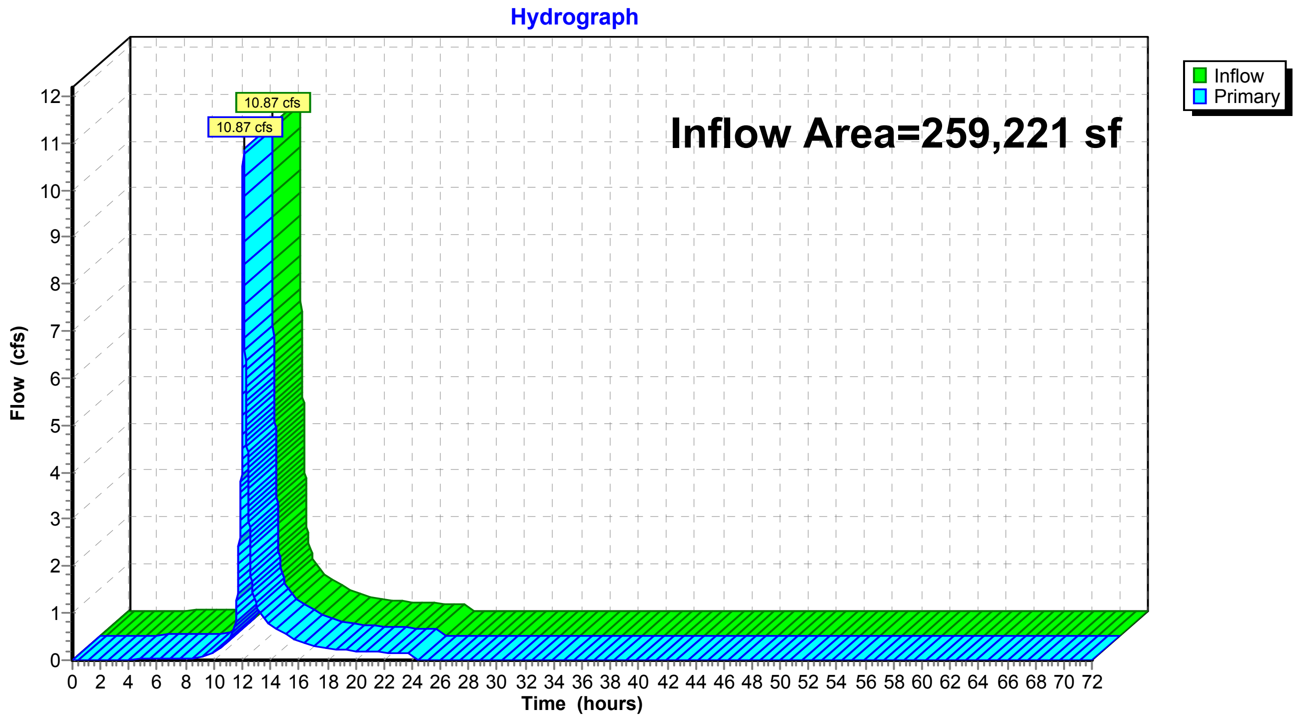


Summary for Pond A: POI-A

Inflow Area =	259,221 sf,	7.71% Impervious,	Inflow Depth = 1.65"	for 10 YR event
Inflow =	10.87 cfs @	12.09 hrs, Volume=	35,702 cf	
Primary =	10.87 cfs @	12.09 hrs, Volume=	35,702 cf,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond A: POI-A



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: SUB-A1 Runoff Area=18,606 sf 100.00% Impervious Runoff Depth=6.33"
Tc=6.0 min CN=98 Runoff=2.75 cfs 9,817 cf

SubcatchmentA2: SUB-A2 Runoff Area=57,852 sf 0.00% Impervious Runoff Depth=1.06"
Flow Length=854' Tc=13.6 min CN=WQ Runoff=1.17 cfs 5,130 cf

SubcatchmentA3: SUB-A3 Runoff Area=132,727 sf 1.04% Impervious Runoff Depth=3.60"
Tc=6.0 min CN=WQ Runoff=12.77 cfs 39,800 cf

SubcatchmentA4: SUB-A4 Runoff Area=50,036 sf 0.00% Impervious Runoff Depth=3.02"
Tc=6.0 min CN=WQ Runoff=4.02 cfs 12,601 cf

Pond A: POI-A Inflow=20.40 cfs 67,347 cf
Primary=20.40 cfs 67,347 cf

Total Runoff Area = 259,221 sf Runoff Volume = 67,347 cf Average Runoff Depth = 3.12"
92.29% Pervious = 239,231 sf 7.71% Impervious = 19,990 sf

Summary for Subcatchment A1: SUB-A1

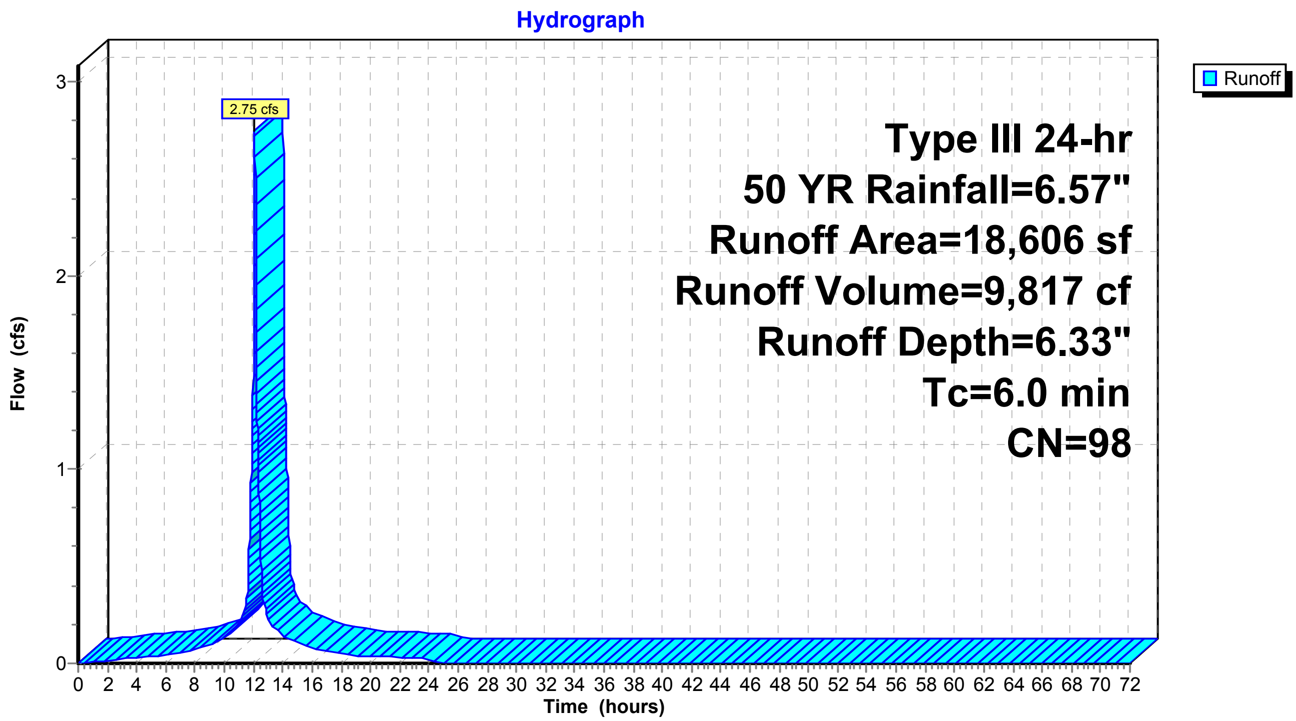
Runoff = 2.75 cfs @ 12.08 hrs, Volume= 9,817 cf, Depth= 6.33"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

Area (sf)	CN	Description
18,606	98	Paved roads w/curbs & sewers, HSG A
18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: SUB-A1



Summary for Subcatchment A2: SUB-A2

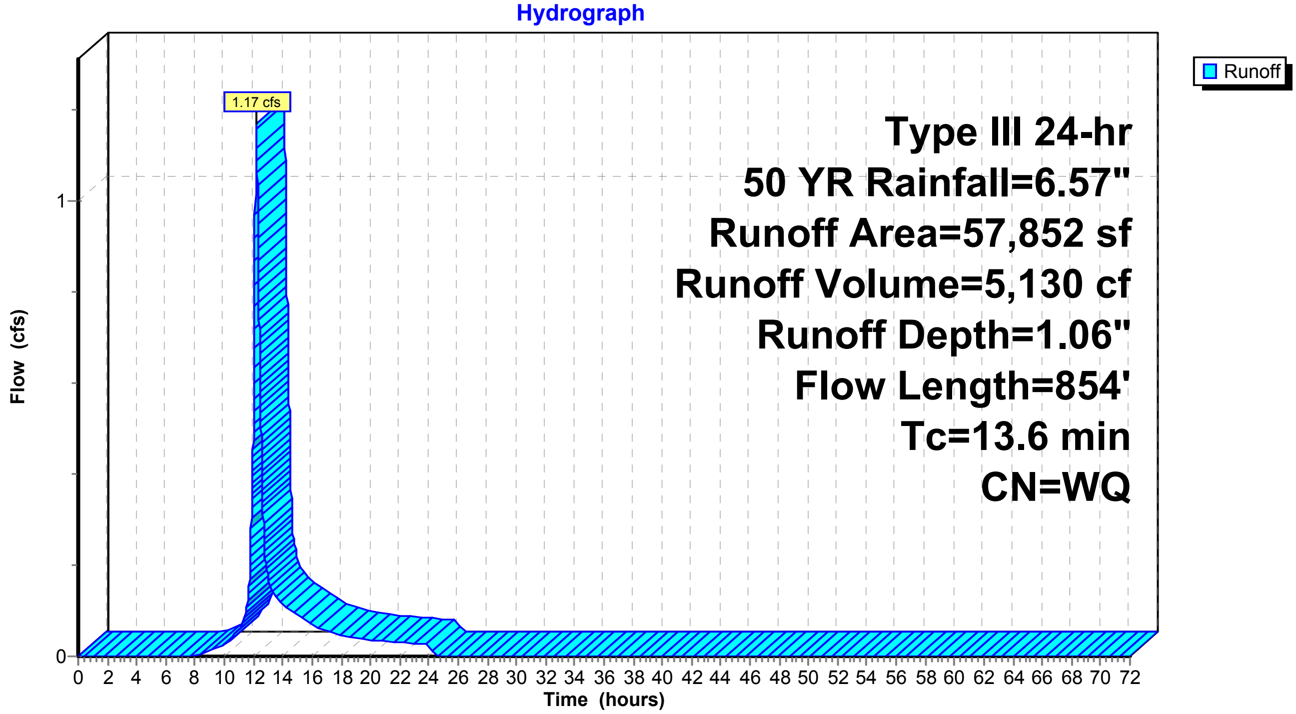
Runoff = 1.17 cfs @ 12.19 hrs, Volume= 5,130 cf, Depth= 1.06"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

	Area (sf)	CN	Description
	28,219	30	Woods, Good, HSG A
	15,368	30	Brush, Good, HSG A
*	14,265	76	Gravel, HSG A
	57,852		Weighted Average
	57,852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	25	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.24"
1.5	25	0.0150	0.28		**Sheet Flow,** Fallow n= 0.050 P2= 3.24"
0.6	83	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	182	0.0030	0.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	539	0.0200	11.82	58.01	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
13.6	854	Total			

Subcatchment A2: SUB-A2



Summary for Subcatchment A3: SUB-A3

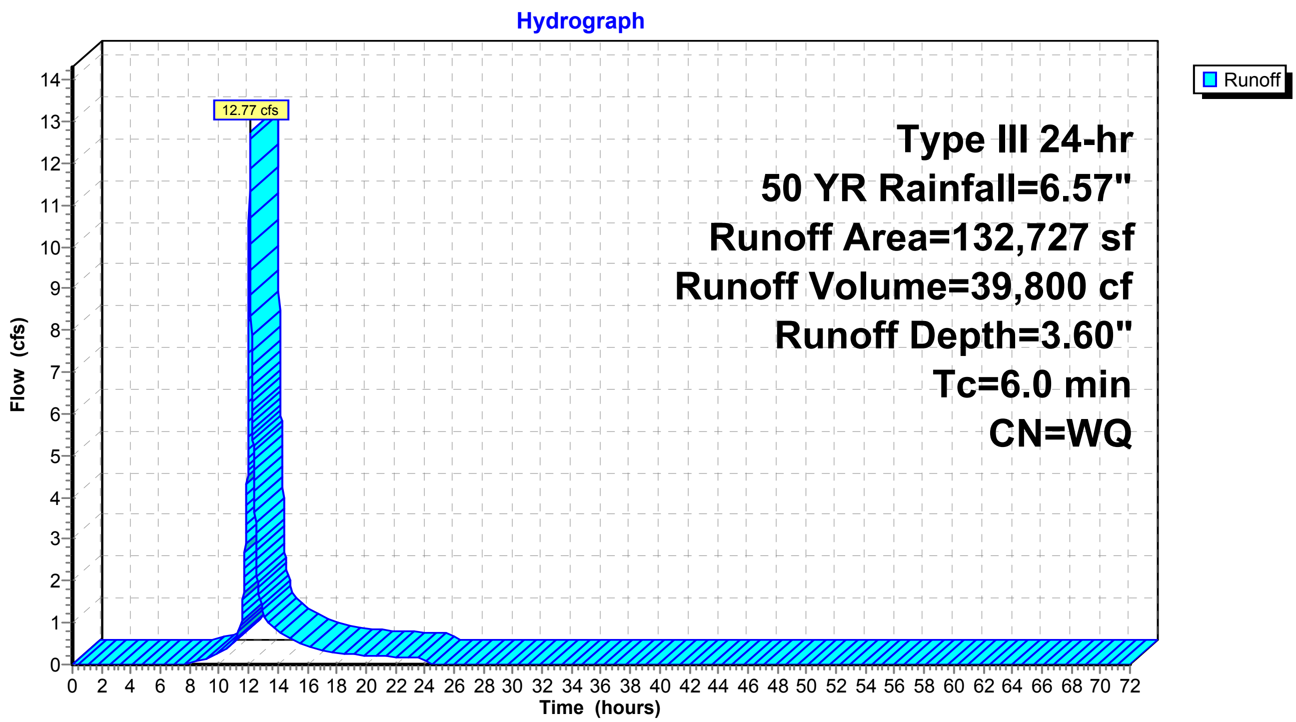
Runoff = 12.77 cfs @ 12.09 hrs, Volume= 39,800 cf, Depth= 3.60"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

	Area (sf)	CN	Description
*	97,147	76	Gravel, HSG A
	22,748	77	Fallow, bare soil, HSG A
	5,871	30	Woods, Good, HSG A
	5,577	30	Brush, Good, HSG A
*	1,384	98	Impervious, HSG A
	132,727		Weighted Average
	131,343		98.96% Pervious Area
	1,384		1.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: SUB-A3



Summary for Subcatchment A4: SUB-A4

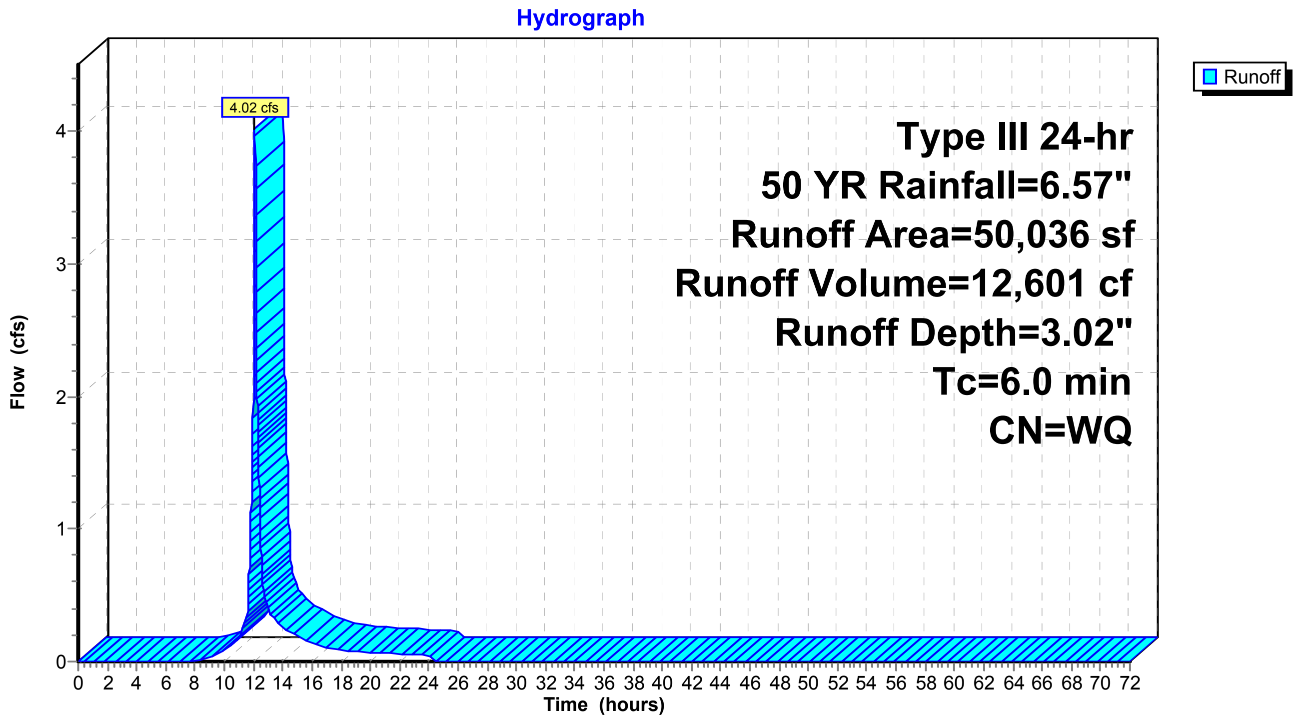
Runoff = 4.02 cfs @ 12.09 hrs, Volume= 12,601 cf, Depth= 3.02"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

	Area (sf)	CN	Description
*	30,483	76	Gravel, HSG A
	7,875	77	Fallow, bare soil, HSG A
	7,644	30	Brush, Good, HSG A
	4,034	30	Woods, Good, HSG A
	50,036		Weighted Average
	50,036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A4: SUB-A4

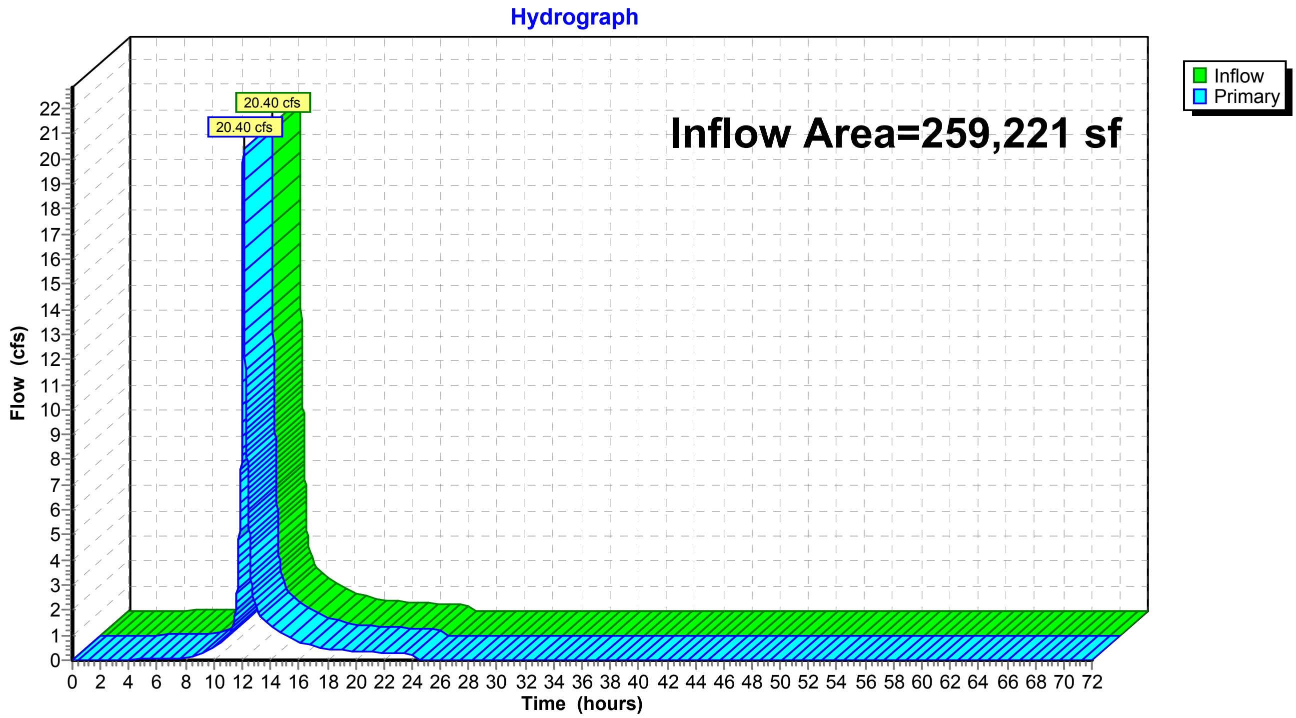


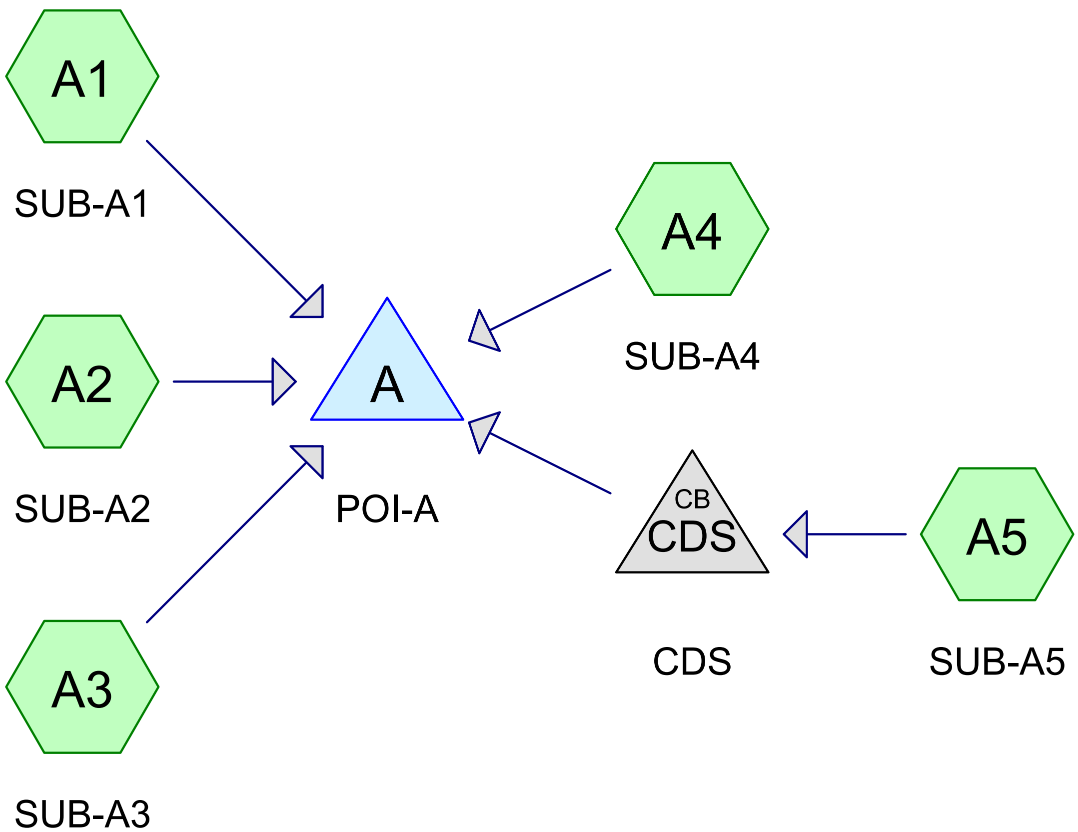
Summary for Pond A: POI-A

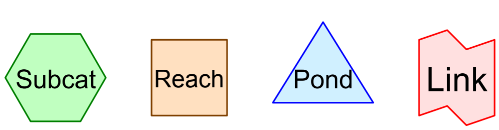
Inflow Area = 259,221 sf, 7.71% Impervious, Inflow Depth = 3.12" for 50 YR event
Inflow = 20.40 cfs @ 12.09 hrs, Volume= 67,347 cf
Primary = 20.40 cfs @ 12.09 hrs, Volume= 67,347 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond A: POI-A







Routing Diagram for HydroCAD-PR
Prepared by Weston & Sampson Engineers, Inc, Printed 12/20/2022

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 YR	Type III 24-hr		Default	24.00	1	2.85	2
2	10 YR	Type III 24-hr		Default	24.00	1	4.33	2
3	50 YR	Type III 24-hr		Default	24.00	1	6.57	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
57,503	39	>75% Grass cover, Good, HSG A (A2, A3, A5)
23,197	30	Brush, Good, HSG A (A2, A3, A4)
30,074	77	Fallow, bare soil, HSG A (A3, A4)
70,983	76	Gravel, HSG A (A3, A4, A5)
24,934	98	Impervious, HSG A (A3, A5)
18,606	98	Paved roads w/curbs & sewers, HSG A (A1)
33,924	30	Woods, Good, HSG A (A2, A3, A4, A5)
259,221	**61**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
259,221	HSG A	A1, A2, A3, A4, A5
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
259,221		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
57,503	0	0	0	0	57,503	>75% Grass cover, Good
23,197	0	0	0	0	23,197	Brush, Good
30,074	0	0	0	0	30,074	Fallow, bare soil
70,983	0	0	0	0	70,983	Gravel
24,934	0	0	0	0	24,934	Impervious
18,606	0	0	0	0	18,606	Paved roads w/curbs & sewers
33,924	0	0	0	0	33,924	Woods, Good
259,221	**0**	**0**	**0**	**0**	**259,221**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	A2	0.00	0.00	539.0	0.0200	0.013	0.0	30.0	0.0
2	CDS	52.27	51.19	151.5	0.0071	0.013	0.0	12.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: SUB-A1 Runoff Area=18,606 sf 100.00% Impervious Runoff Depth=2.62"
Tc=6.0 min CN=98 Runoff=1.18 cfs 4,061 cf

SubcatchmentA2: SUB-A2 Runoff Area=49,161 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=858' Tc=11.3 min CN=WQ Runoff=0.00 cfs 0 cf

SubcatchmentA3: SUB-A3 Runoff Area=117,921 sf 18.47% Impervious Runoff Depth=0.91"
Tc=6.0 min CN=WQ Runoff=2.65 cfs 8,916 cf

SubcatchmentA4: SUB-A4 Runoff Area=50,036 sf 0.00% Impervious Runoff Depth=0.71"
Tc=6.0 min CN=WQ Runoff=0.91 cfs 2,961 cf

SubcatchmentA5: SUB-A5 Runoff Area=23,497 sf 13.44% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=WQ Runoff=0.42 cfs 1,406 cf

Pond A: POI-A Inflow=5.15 cfs 17,344 cf
Primary=5.15 cfs 17,344 cf

Pond CDS: CDS Peak Elev=52.63' Inflow=0.42 cfs 1,406 cf
12.0" Round Culvert n=0.013 L=151.5' S=0.0071 '/' Outflow=0.42 cfs 1,406 cf

Total Runoff Area = 259,221 sf Runoff Volume = 17,344 cf Average Runoff Depth = 0.80"
83.20% Pervious = 215,681 sf 16.80% Impervious = 43,540 sf

Summary for Subcatchment A1: SUB-A1

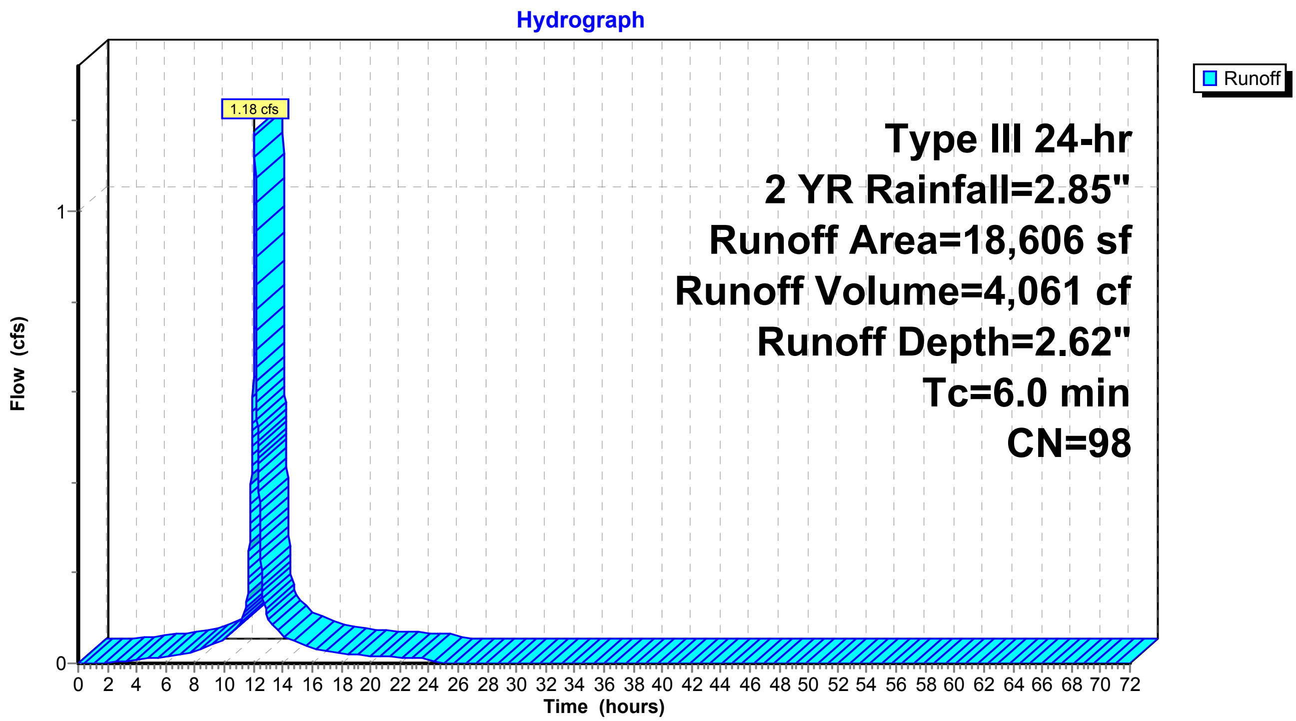
Runoff = 1.18 cfs @ 12.08 hrs, Volume= 4,061 cf, Depth= 2.62"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

Area (sf)	CN	Description
18,606	98	Paved roads w/curbs & sewers, HSG A
18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: SUB-A1



Summary for Subcatchment A2: SUB-A2

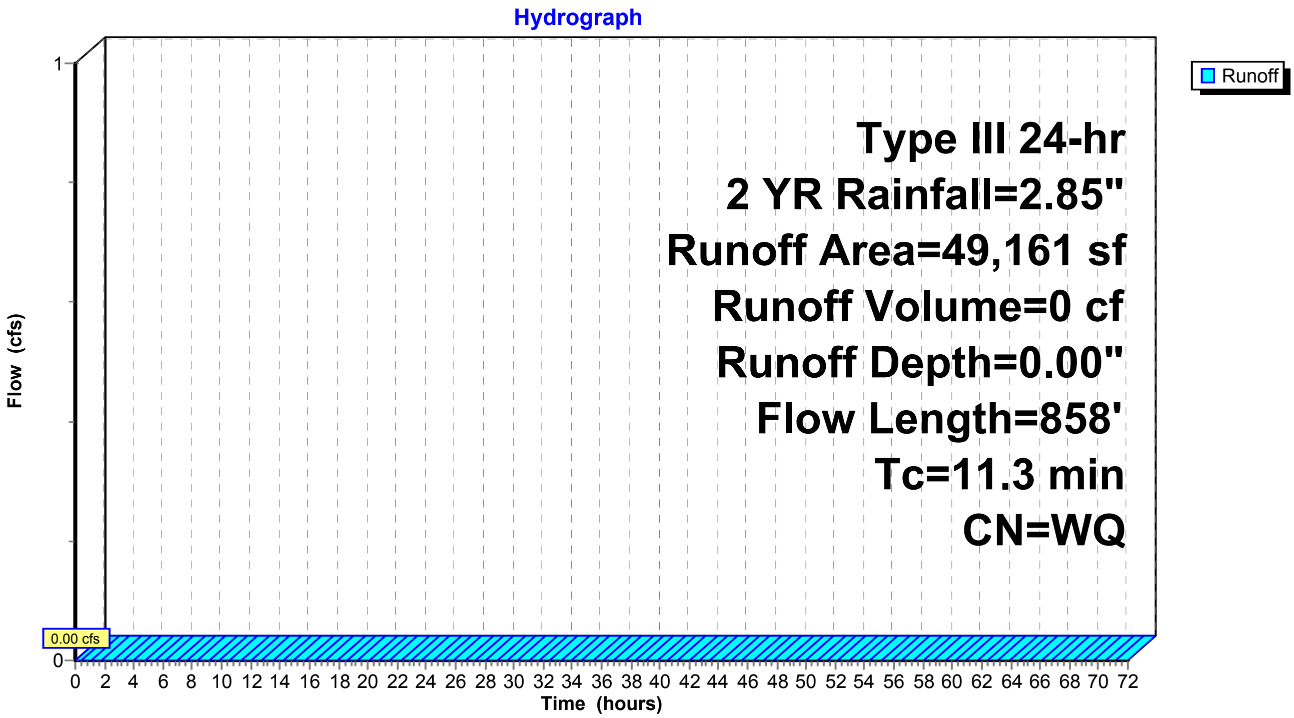
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

Area (sf)	CN	Description
25,149	30	Woods, Good, HSG A
13,489	30	Brush, Good, HSG A
10,523	39	>75% Grass cover, Good, HSG A
49,161		Weighted Average
49,161		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.24"
0.6	87	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	182	0.0030	0.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	539	0.0200	11.82	58.01	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
11.3	858	Total			

Subcatchment A2: SUB-A2



Summary for Subcatchment A3: SUB-A3

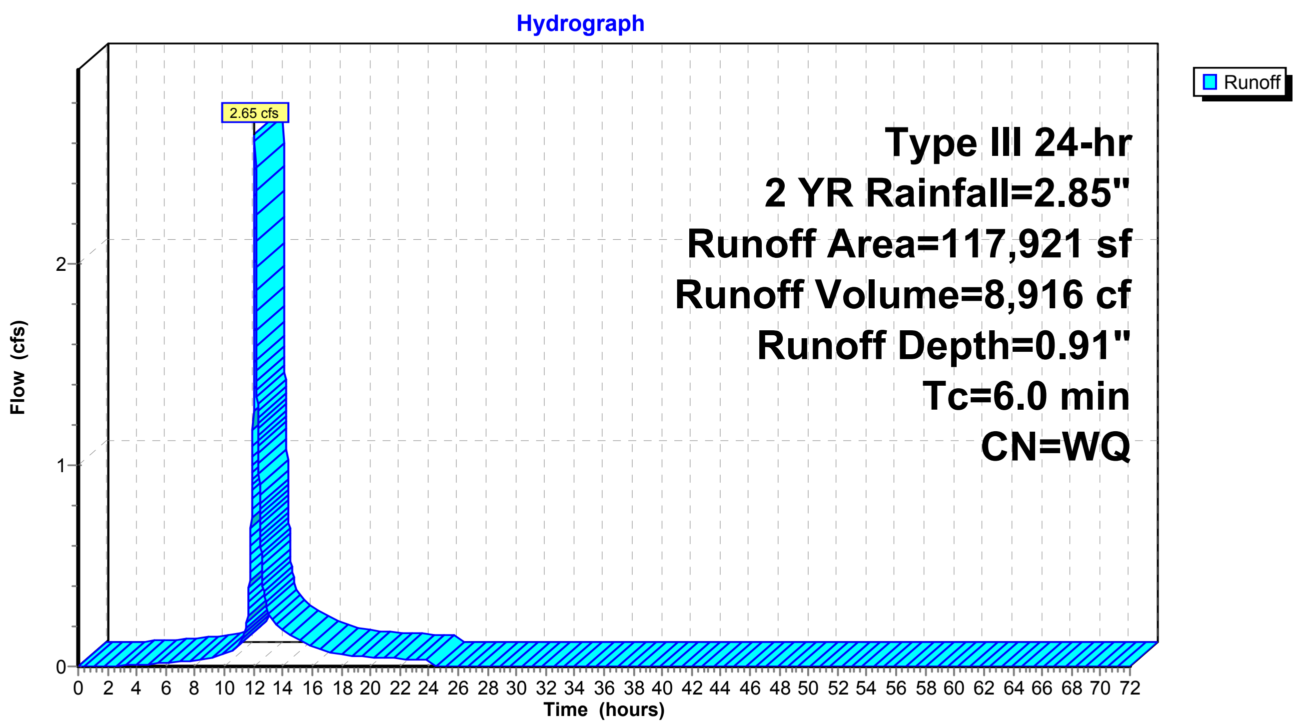
Runoff = 2.65 cfs @ 12.09 hrs, Volume= 8,916 cf, Depth= 0.91"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

	Area (sf)	CN	Description
	38,646	39	>75% Grass cover, Good, HSG A
*	31,098	76	Gravel, HSG A
	22,199	77	Fallow, bare soil, HSG A
*	21,776	98	Impervious, HSG A
	2,138	30	Woods, Good, HSG A
	2,064	30	Brush, Good, HSG A
	117,921		Weighted Average
	96,145		81.53% Pervious Area
	21,776		18.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: SUB-A3



Summary for Subcatchment A4: SUB-A4

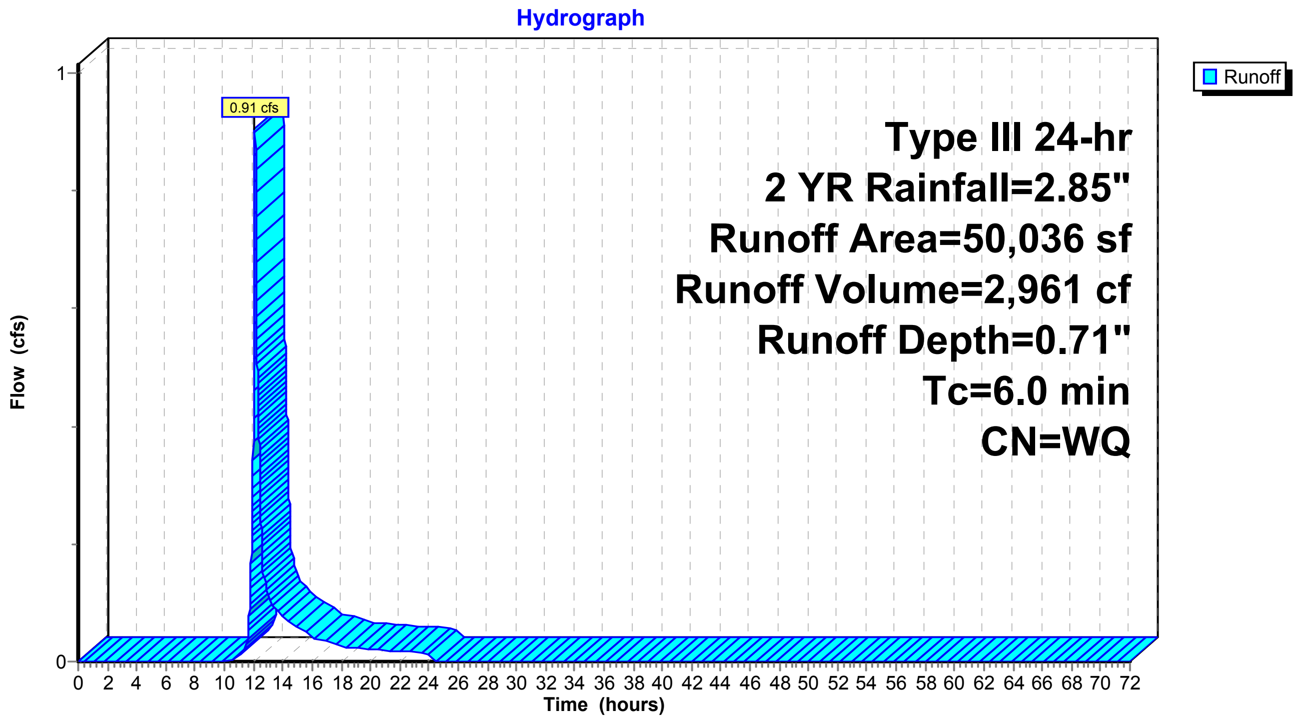
Runoff = 0.91 cfs @ 12.10 hrs, Volume= 2,961 cf, Depth= 0.71"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

	Area (sf)	CN	Description
*	30,483	76	Gravel, HSG A
	7,875	77	Fallow, bare soil, HSG A
	7,644	30	Brush, Good, HSG A
	4,034	30	Woods, Good, HSG A
	50,036		Weighted Average
	50,036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A4: SUB-A4



Summary for Subcatchment A5: SUB-A5

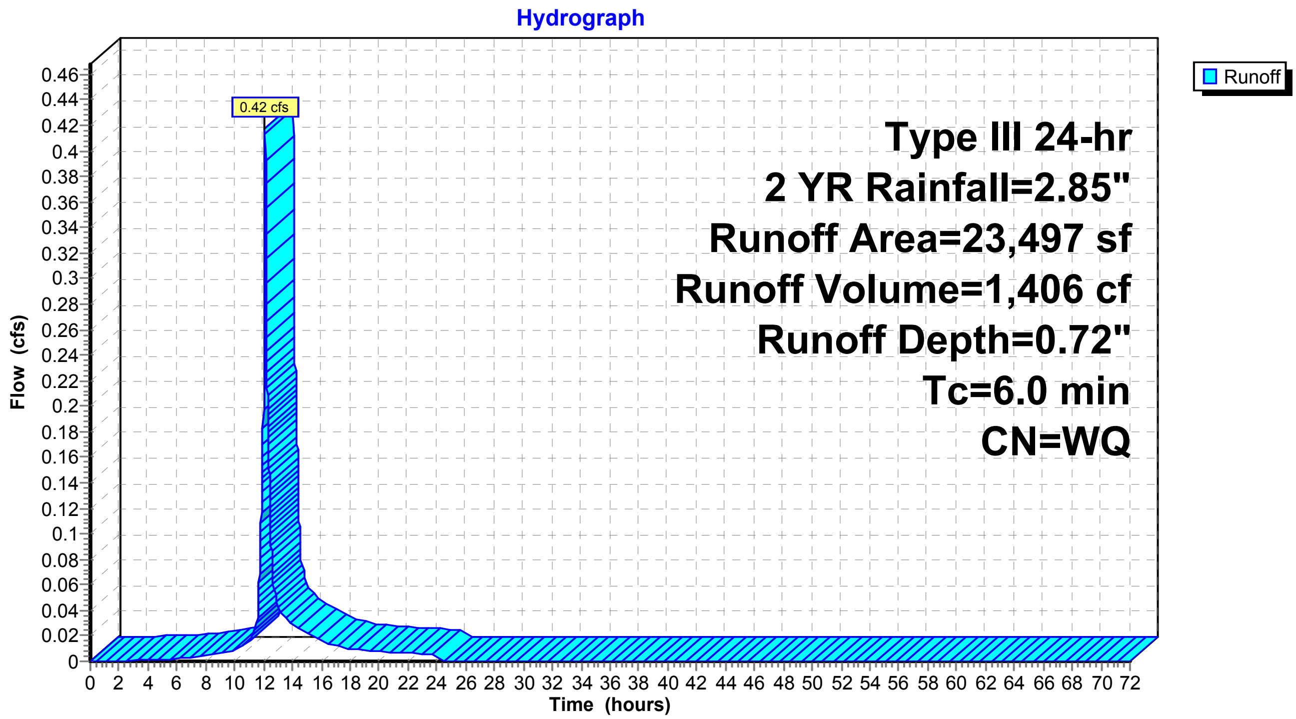
Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,406 cf, Depth= 0.72"
Routed to Pond CDS : CDS

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YR Rainfall=2.85"

	Area (sf)	CN	Description
*	9,402	76	Gravel, HSG A
	8,334	39	>75% Grass cover, Good, HSG A
*	3,158	98	Impervious, HSG A
	2,603	30	Woods, Good, HSG A
	23,497		Weighted Average
	20,339		86.56% Pervious Area
	3,158		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

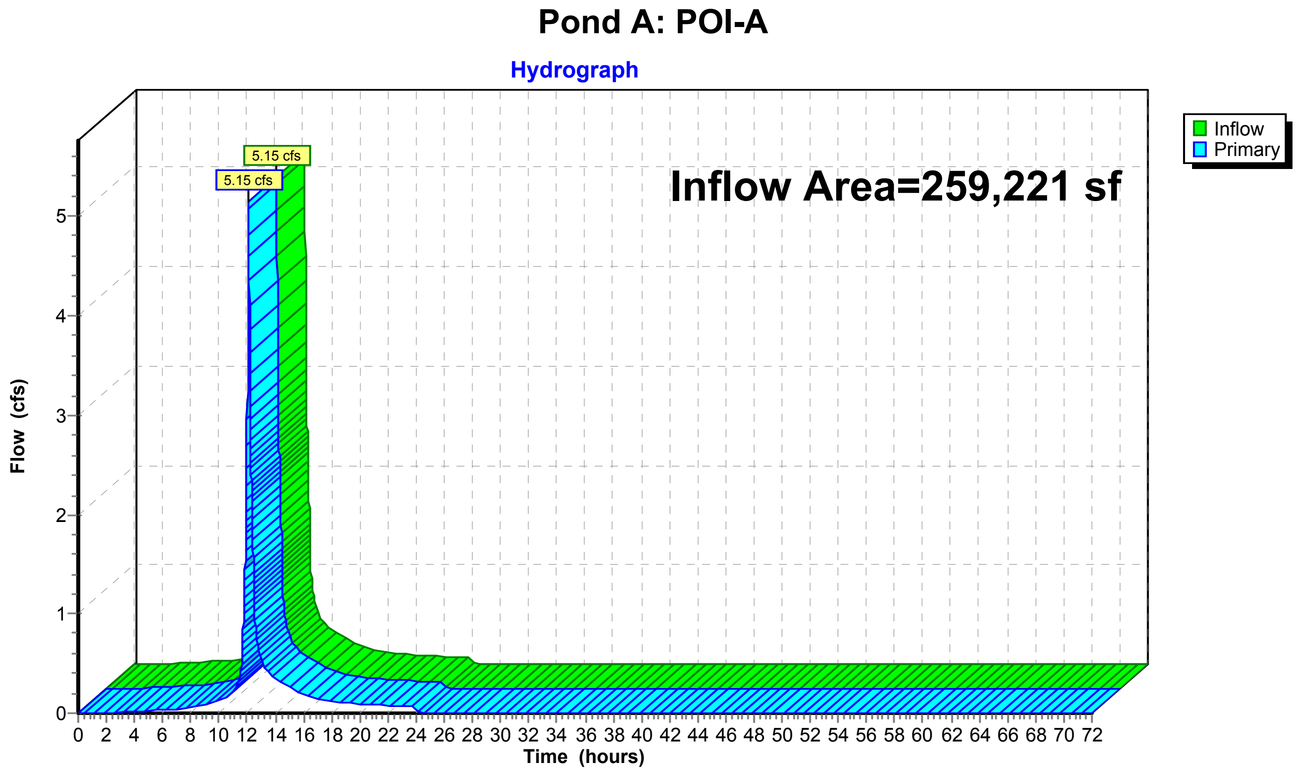
Subcatchment A5: SUB-A5



Summary for Pond A: POI-A

Inflow Area = 259,221 sf, 16.80% Impervious, Inflow Depth = 0.80" for 2 YR event
Inflow = 5.15 cfs @ 12.09 hrs, Volume= 17,344 cf
Primary = 5.15 cfs @ 12.09 hrs, Volume= 17,344 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



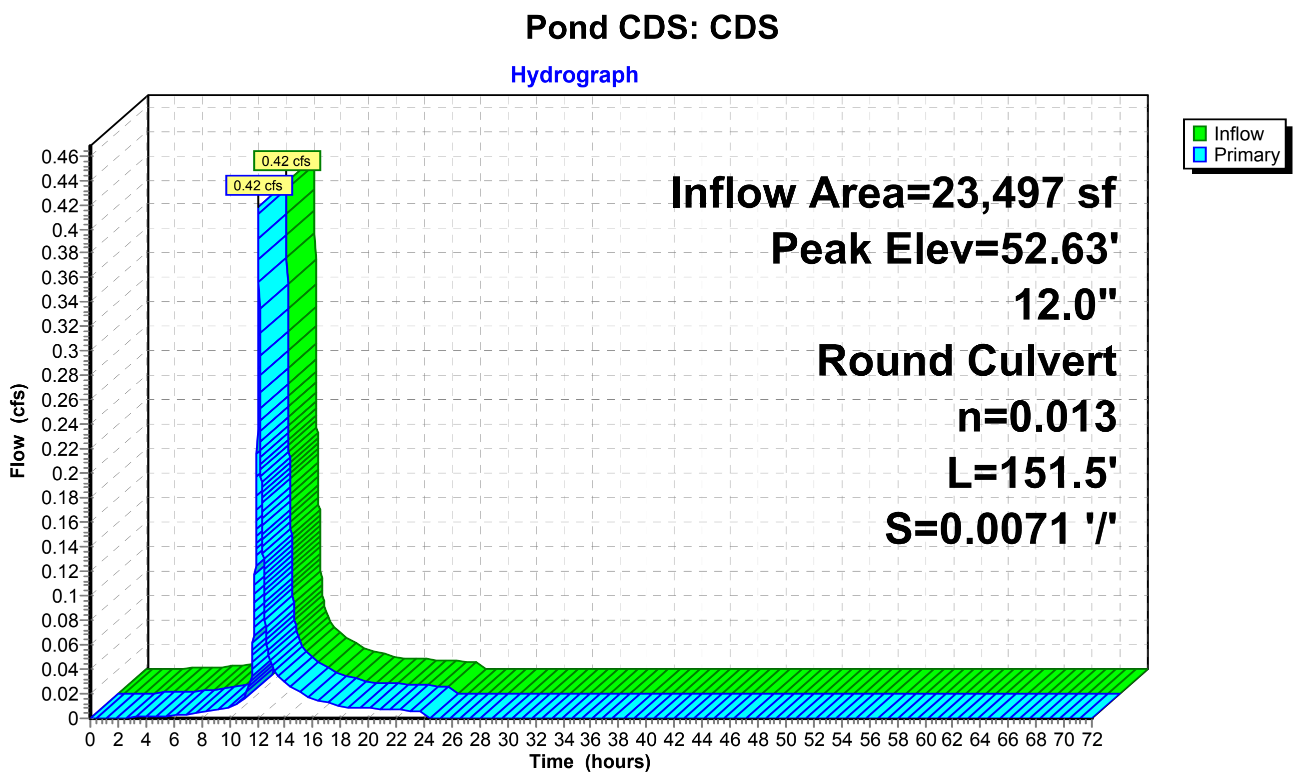
Summary for Pond CDS: CDS

Inflow Area = 23,497 sf, 13.44% Impervious, Inflow Depth = 0.72" for 2 YR event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 1,406 cf
Outflow = 0.42 cfs @ 12.09 hrs, Volume= 1,406 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.09 hrs, Volume= 1,406 cf
Routed to Pond A : POI-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 52.63' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	52.27'	**12.0" Round Culvert** L= 151.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.27' / 51.19' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=52.63' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.42 cfs @ 1.62 fps)



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: SUB-A1 Runoff Area=18,606 sf 100.00% Impervious Runoff Depth=4.09"
Tc=6.0 min CN=98 Runoff=1.81 cfs 6,348 cf

SubcatchmentA2: SUB-A2 Runoff Area=49,161 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=858' Tc=11.3 min CN=WQ Runoff=0.00 cfs 75 cf

SubcatchmentA3: SUB-A3 Runoff Area=117,921 sf 18.47% Impervious Runoff Depth=1.70"
Tc=6.0 min CN=WQ Runoff=5.00 cfs 16,712 cf

SubcatchmentA4: SUB-A4 Runoff Area=50,036 sf 0.00% Impervious Runoff Depth=1.54"
Tc=6.0 min CN=WQ Runoff=2.06 cfs 6,428 cf

SubcatchmentA5: SUB-A5 Runoff Area=23,497 sf 13.44% Impervious Runoff Depth=1.38"
Tc=6.0 min CN=WQ Runoff=0.81 cfs 2,700 cf

Pond A: POI-A Inflow=9.68 cfs 32,264 cf
Primary=9.68 cfs 32,264 cf

Pond CDS: CDS Peak Elev=52.79' Inflow=0.81 cfs 2,700 cf
12.0" Round Culvert n=0.013 L=151.5' S=0.0071 '/' Outflow=0.81 cfs 2,700 cf

Total Runoff Area = 259,221 sf Runoff Volume = 32,264 cf Average Runoff Depth = 1.49"
83.20% Pervious = 215,681 sf 16.80% Impervious = 43,540 sf

Summary for Subcatchment A1: SUB-A1

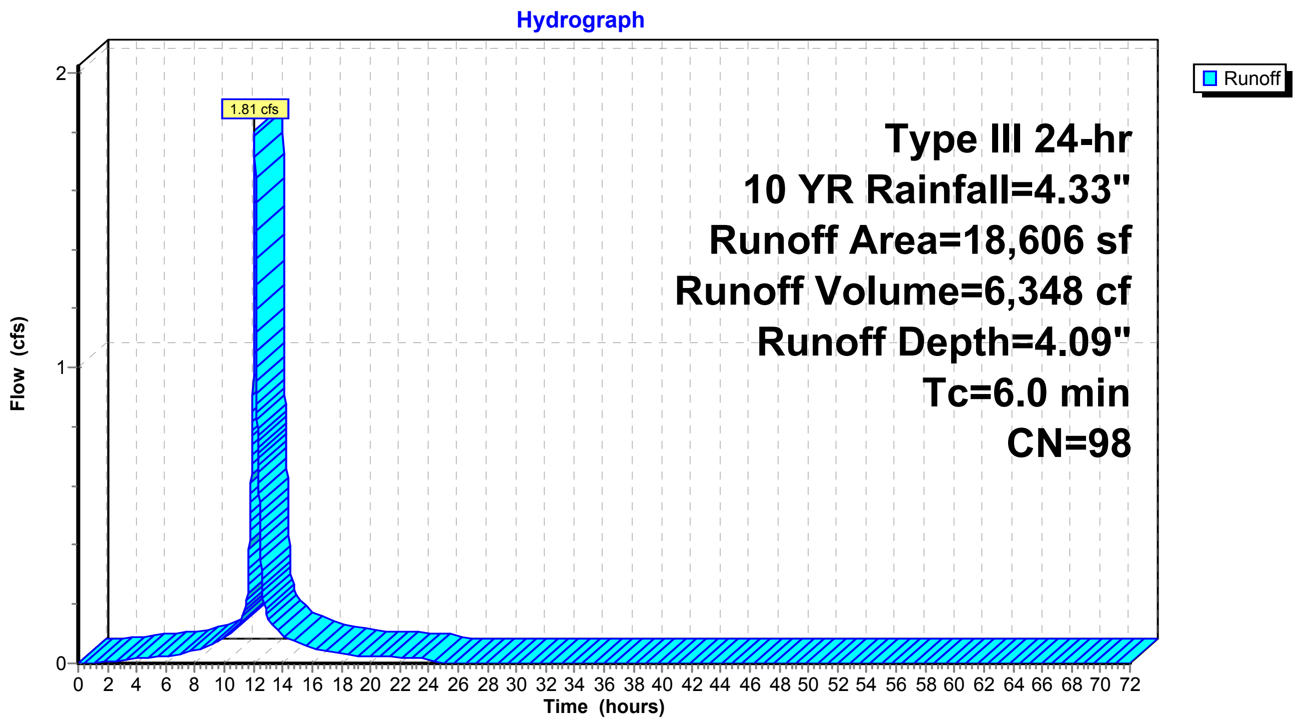
Runoff = 1.81 cfs @ 12.08 hrs, Volume= 6,348 cf, Depth= 4.09"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

Area (sf)	CN	Description
18,606	98	Paved roads w/curbs & sewers, HSG A
18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: SUB-A1



Summary for Subcatchment A2: SUB-A2

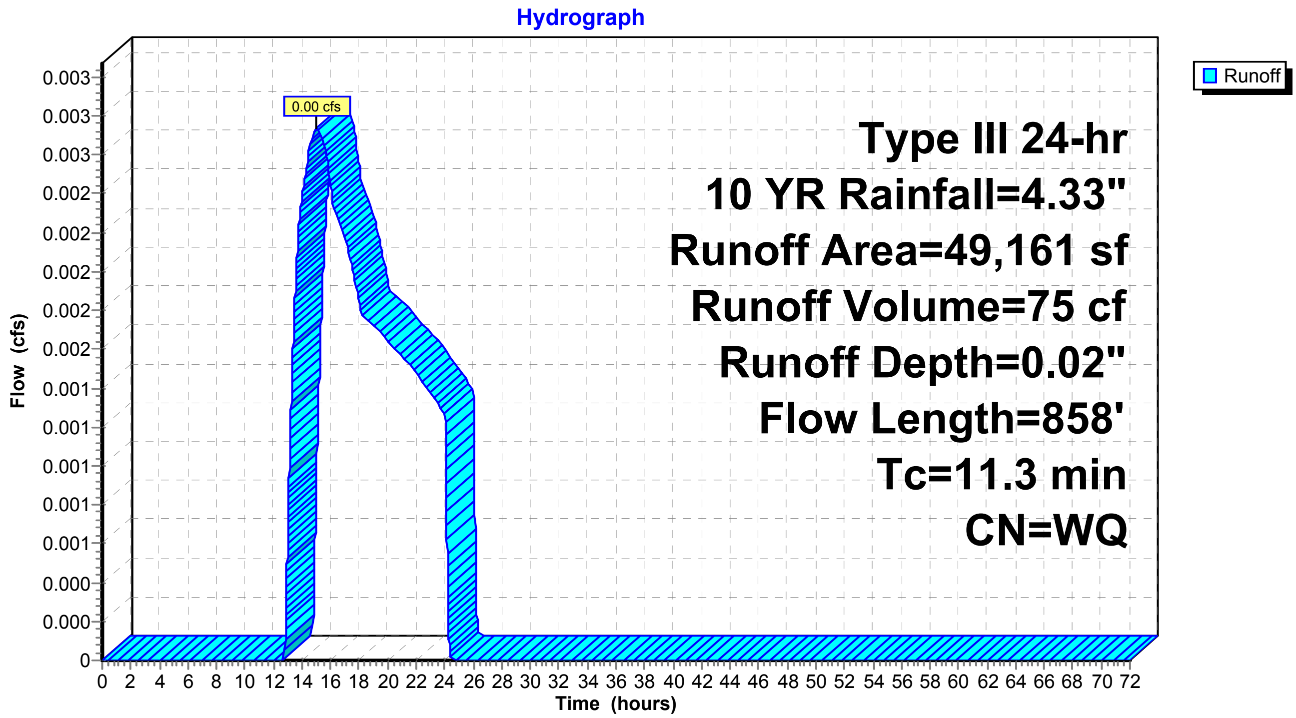
Runoff = 0.00 cfs @ 15.03 hrs, Volume= 75 cf, Depth= 0.02"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

Area (sf)	CN	Description
25,149	30	Woods, Good, HSG A
13,489	30	Brush, Good, HSG A
10,523	39	>75% Grass cover, Good, HSG A
49,161		Weighted Average
49,161		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.24"
0.6	87	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	182	0.0030	0.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	539	0.0200	11.82	58.01	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
11.3	858	Total			

Subcatchment A2: SUB-A2



Summary for Subcatchment A3: SUB-A3

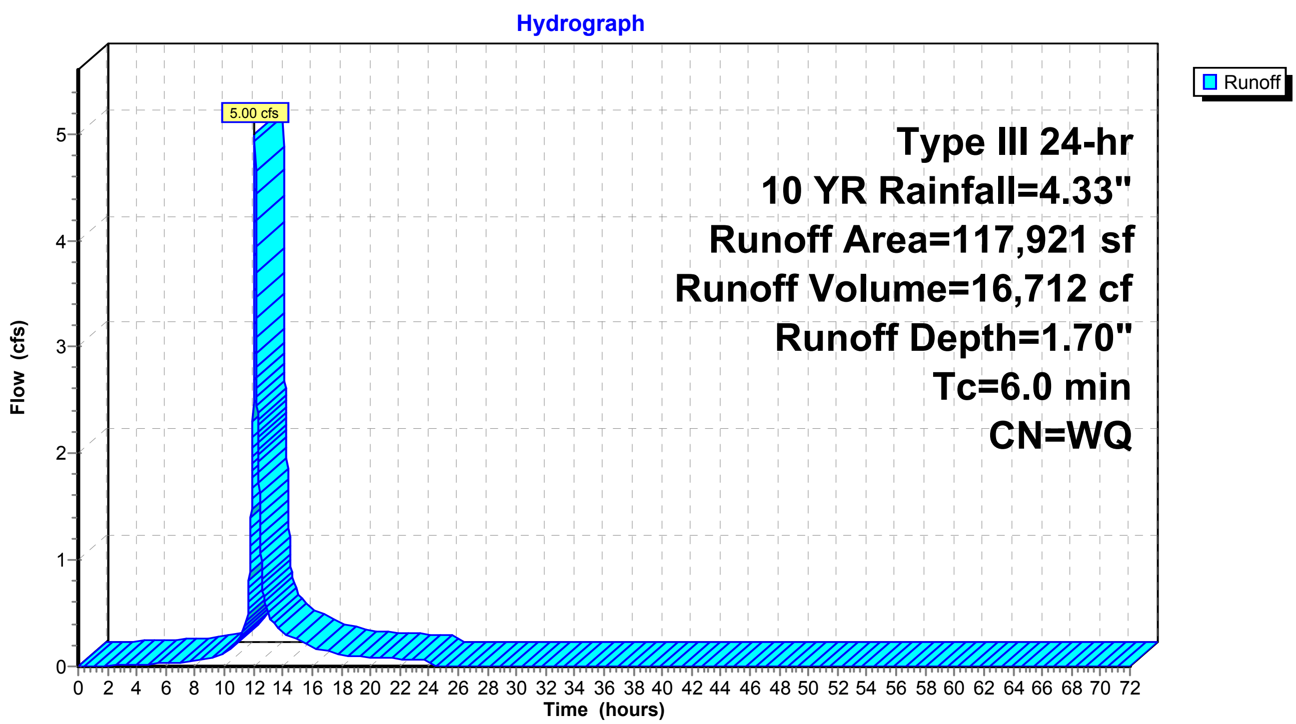
Runoff = 5.00 cfs @ 12.09 hrs, Volume= 16,712 cf, Depth= 1.70"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
	38,646	39	>75% Grass cover, Good, HSG A
*	31,098	76	Gravel, HSG A
	22,199	77	Fallow, bare soil, HSG A
*	21,776	98	Impervious, HSG A
	2,138	30	Woods, Good, HSG A
	2,064	30	Brush, Good, HSG A
	117,921		Weighted Average
	96,145		81.53% Pervious Area
	21,776		18.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: SUB-A3



Summary for Subcatchment A4: SUB-A4

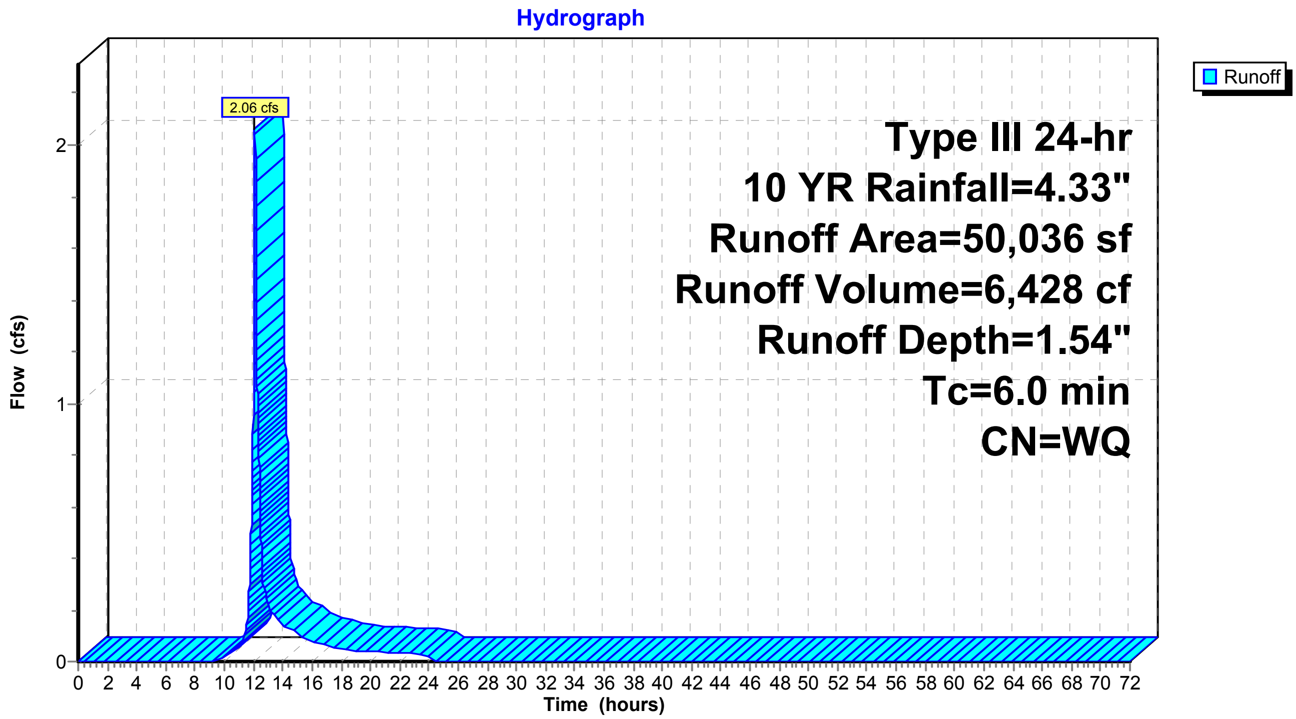
Runoff = 2.06 cfs @ 12.09 hrs, Volume= 6,428 cf, Depth= 1.54"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
*	30,483	76	Gravel, HSG A
	7,875	77	Fallow, bare soil, HSG A
	7,644	30	Brush, Good, HSG A
	4,034	30	Woods, Good, HSG A
	50,036		Weighted Average
	50,036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A4: SUB-A4



Summary for Subcatchment A5: SUB-A5

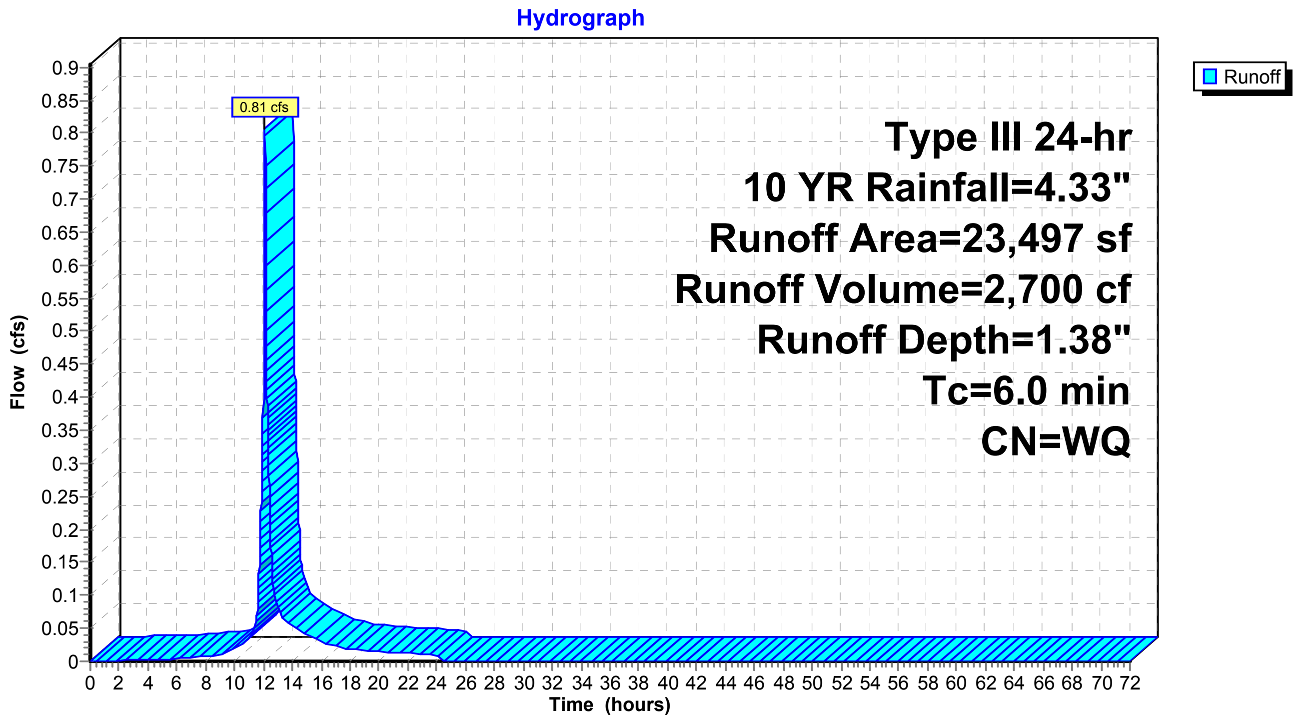
Runoff = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf, Depth= 1.38"
Routed to Pond CDS : CDS

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
*	9,402	76	Gravel, HSG A
	8,334	39	>75% Grass cover, Good, HSG A
*	3,158	98	Impervious, HSG A
	2,603	30	Woods, Good, HSG A
	23,497		Weighted Average
	20,339		86.56% Pervious Area
	3,158		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A5: SUB-A5

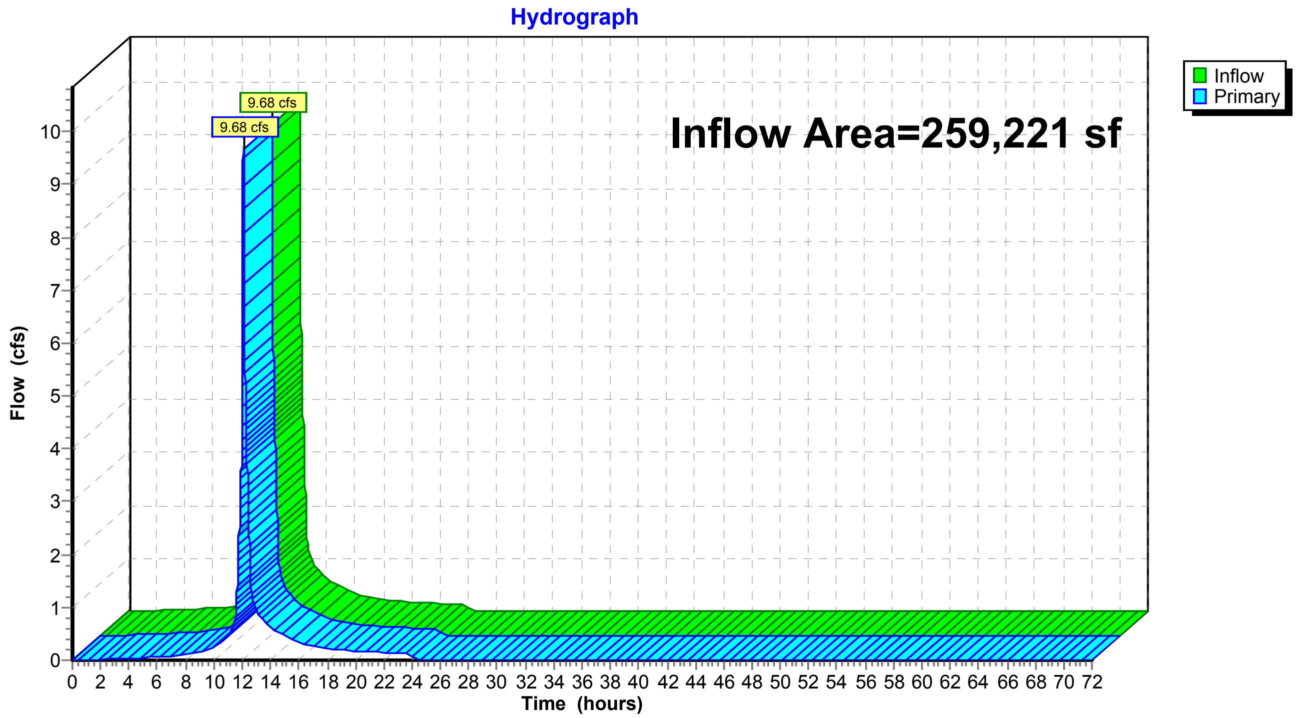


Summary for Pond A: POI-A

Inflow Area =	259,221 sf,	16.80% Impervious,	Inflow Depth = 1.49"	for 10 YR event	
Inflow =	9.68 cfs @	12.09 hrs,	Volume=	32,264 cf	
Primary =	9.68 cfs @	12.09 hrs,	Volume=	32,264 cf,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond A: POI-A



Summary for Pond CDS: CDS

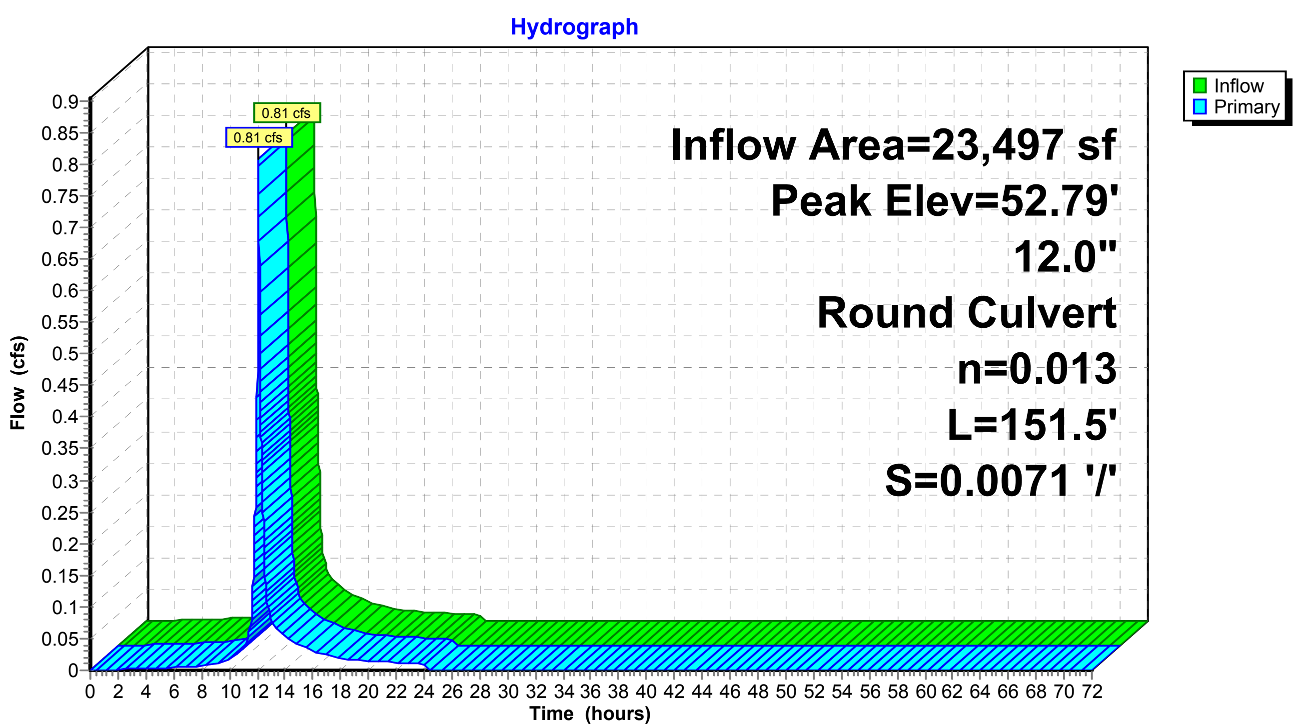
Inflow Area = 23,497 sf, 13.44% Impervious, Inflow Depth = 1.38" for 10 YR event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf
Outflow = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf
Routed to Pond A : POI-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 52.79' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	52.27'	**12.0" Round Culvert** L= 151.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.27' / 51.19' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.09 hrs HW=52.79' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.81 cfs @ 1.94 fps)

Pond CDS: CDS



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentA1: SUB-A1 Runoff Area=18,606 sf 100.00% Impervious Runoff Depth=6.33"
Tc=6.0 min CN=98 Runoff=2.75 cfs 9,817 cf

SubcatchmentA2: SUB-A2 Runoff Area=49,161 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=858' Tc=11.3 min CN=WQ Runoff=0.07 cfs 1,007 cf

SubcatchmentA3: SUB-A3 Runoff Area=117,921 sf 18.47% Impervious Runoff Depth=3.15"
Tc=6.0 min CN=WQ Runoff=8.98 cfs 30,951 cf

SubcatchmentA4: SUB-A4 Runoff Area=50,036 sf 0.00% Impervious Runoff Depth=3.02"
Tc=6.0 min CN=WQ Runoff=4.02 cfs 12,601 cf

SubcatchmentA5: SUB-A5 Runoff Area=23,497 sf 13.44% Impervious Runoff Depth=2.64"
Tc=6.0 min CN=WQ Runoff=1.48 cfs 5,166 cf

Pond A: POI-A Inflow=17.23 cfs 59,540 cf
Primary=17.23 cfs 59,540 cf

Pond CDS: CDS Peak Elev=53.02' Inflow=1.48 cfs 5,166 cf
12.0" Round Culvert n=0.013 L=151.5' S=0.0071 '/' Outflow=1.48 cfs 5,166 cf

Total Runoff Area = 259,221 sf Runoff Volume = 59,540 cf Average Runoff Depth = 2.76"
83.20% Pervious = 215,681 sf 16.80% Impervious = 43,540 sf

Summary for Subcatchment A1: SUB-A1

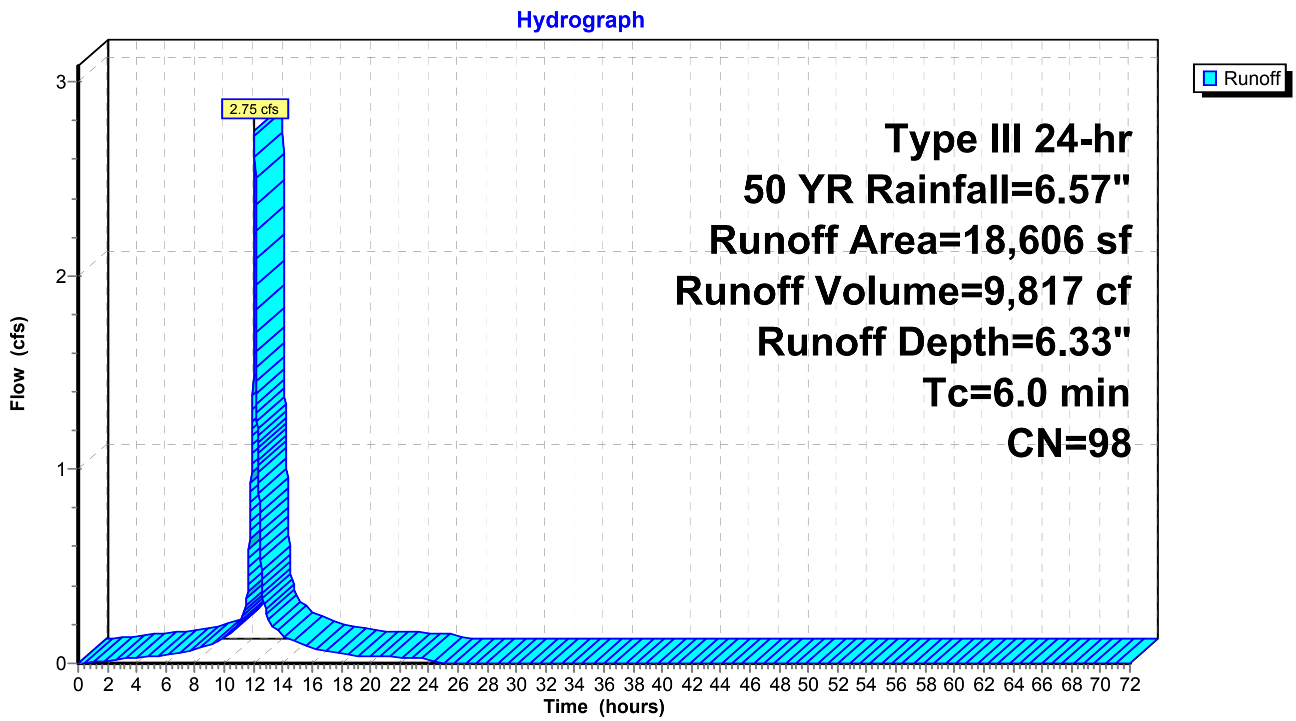
Runoff = 2.75 cfs @ 12.08 hrs, Volume= 9,817 cf, Depth= 6.33"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

Area (sf)	CN	Description
18,606	98	Paved roads w/curbs & sewers, HSG A
18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A1: SUB-A1



Summary for Subcatchment A2: SUB-A2

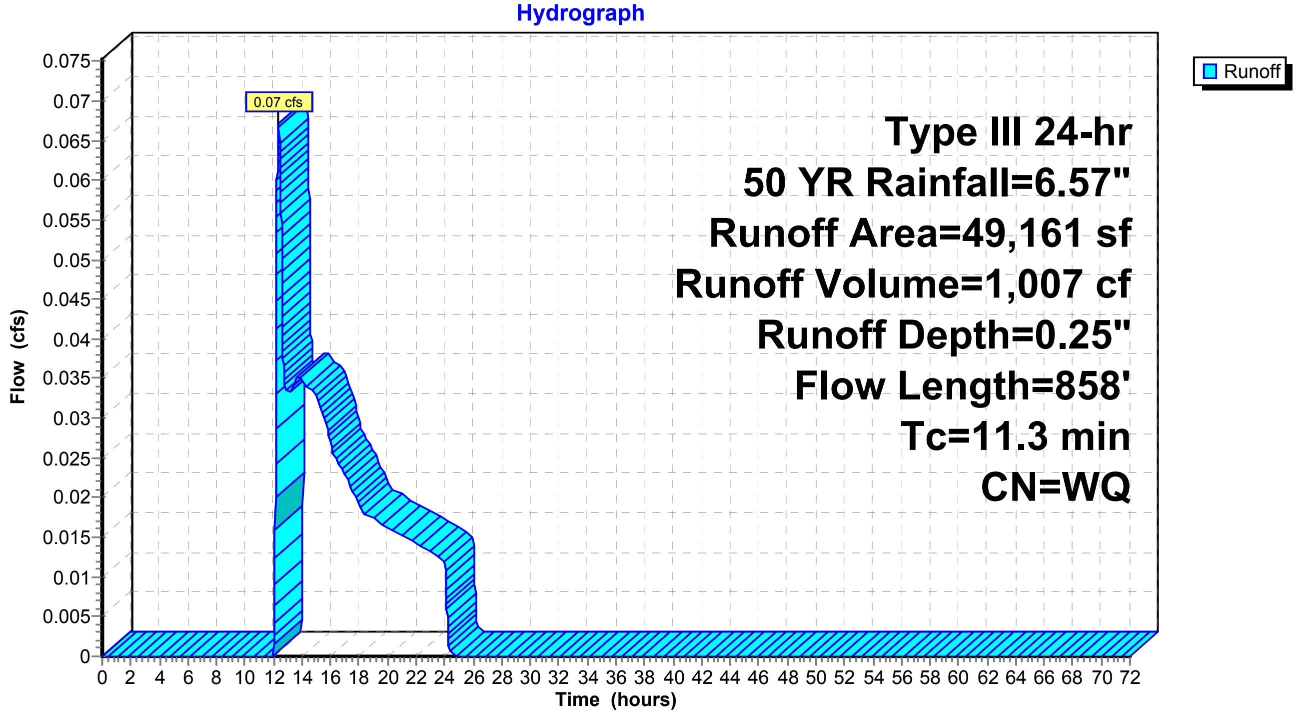
Runoff = 0.07 cfs @ 12.37 hrs, Volume= 1,007 cf, Depth= 0.25"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

Area (sf)	CN	Description
25,149	30	Woods, Good, HSG A
13,489	30	Brush, Good, HSG A
10,523	39	>75% Grass cover, Good, HSG A
49,161		Weighted Average
49,161		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.0400	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.24"
0.6	87	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.7	182	0.0030	0.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	539	0.0200	11.82	58.01	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
11.3	858	Total			

Subcatchment A2: SUB-A2



Summary for Subcatchment A3: SUB-A3

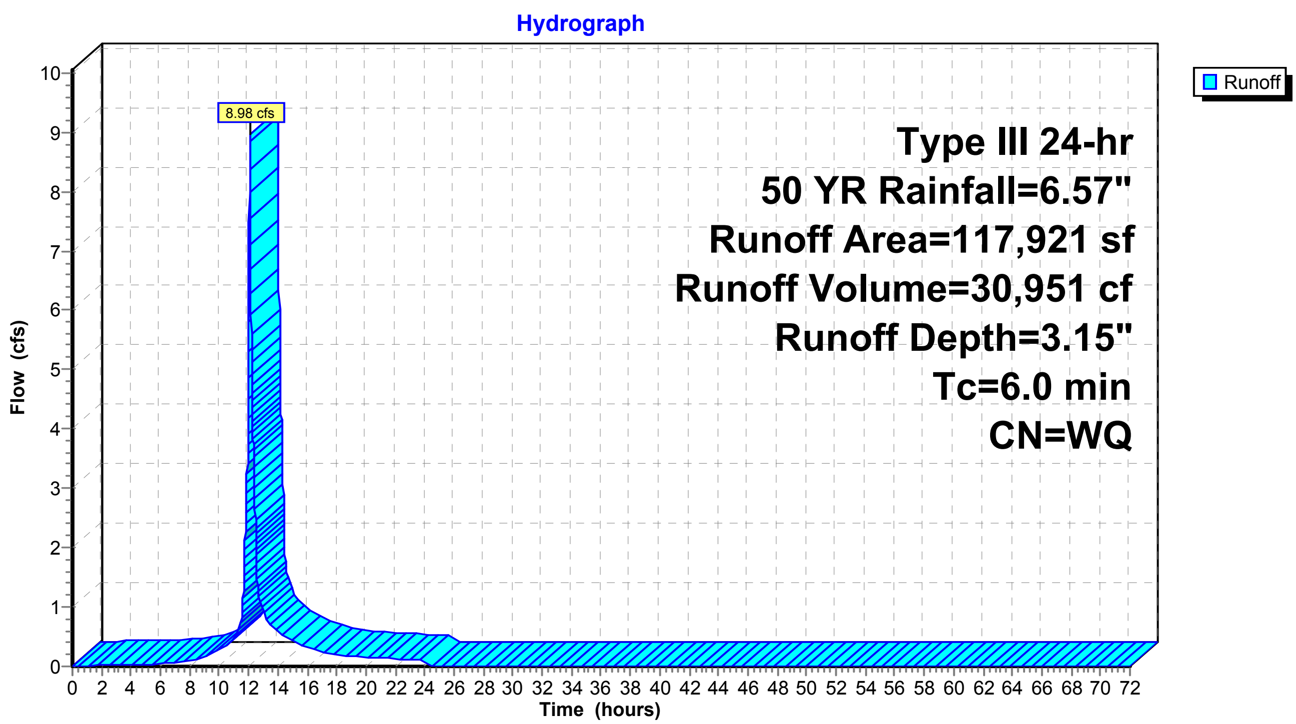
Runoff = 8.98 cfs @ 12.09 hrs, Volume= 30,951 cf, Depth= 3.15"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

	Area (sf)	CN	Description
	38,646	39	>75% Grass cover, Good, HSG A
*	31,098	76	Gravel, HSG A
	22,199	77	Fallow, bare soil, HSG A
*	21,776	98	Impervious, HSG A
	2,138	30	Woods, Good, HSG A
	2,064	30	Brush, Good, HSG A
	117,921		Weighted Average
	96,145		81.53% Pervious Area
	21,776		18.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A3: SUB-A3



Summary for Subcatchment A4: SUB-A4

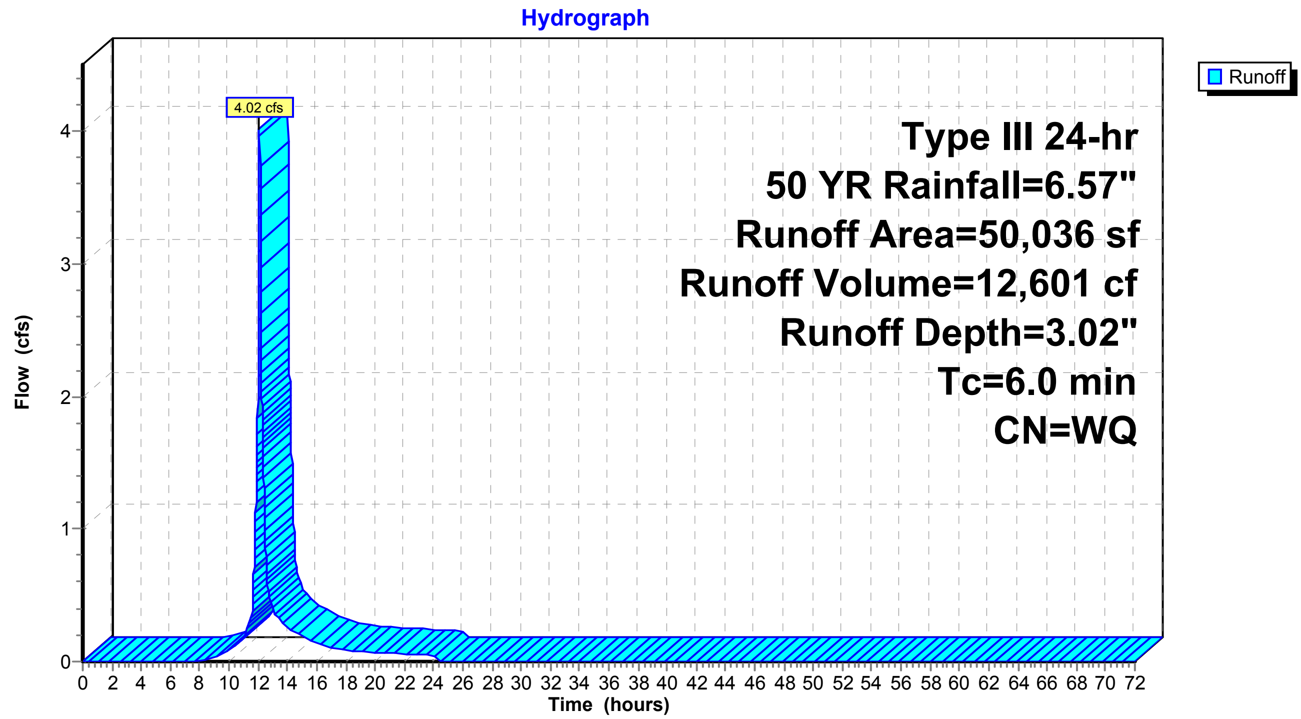
Runoff = 4.02 cfs @ 12.09 hrs, Volume= 12,601 cf, Depth= 3.02"
Routed to Pond A : POI-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

	Area (sf)	CN	Description
*	30,483	76	Gravel, HSG A
	7,875	77	Fallow, bare soil, HSG A
	7,644	30	Brush, Good, HSG A
	4,034	30	Woods, Good, HSG A
	50,036		Weighted Average
	50,036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A4: SUB-A4



Summary for Subcatchment A5: SUB-A5

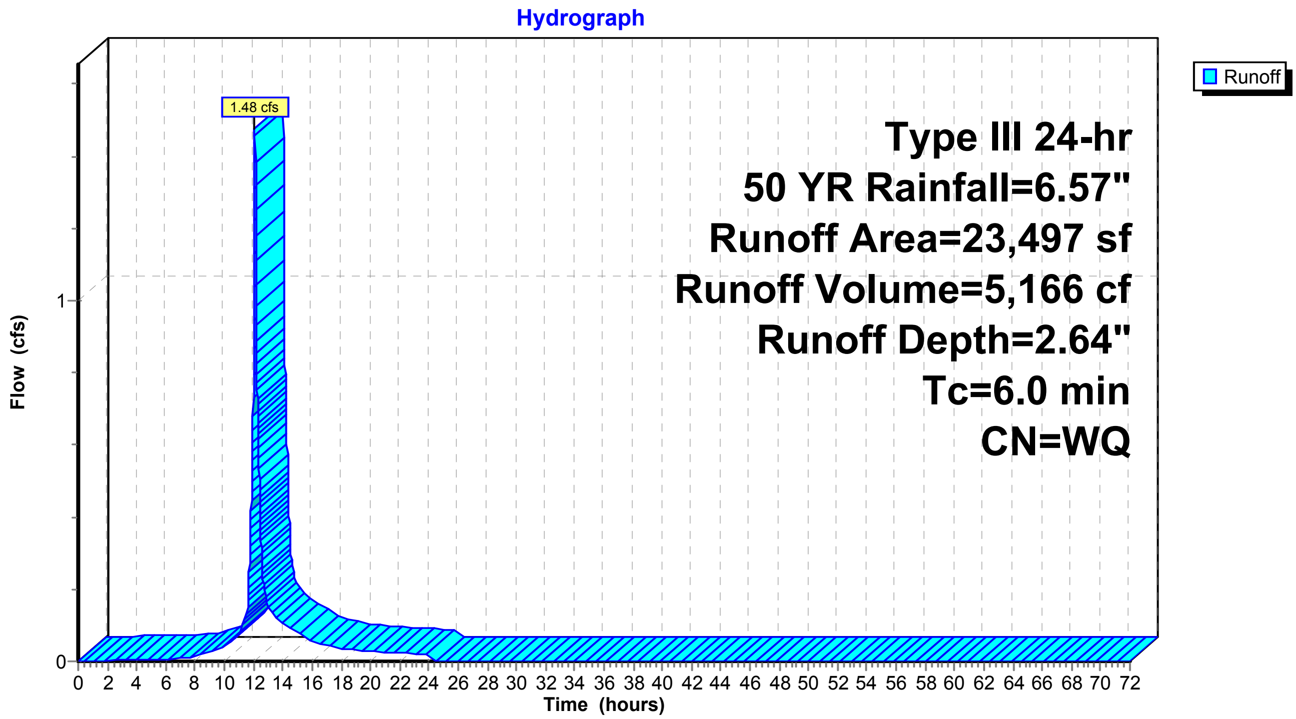
Runoff = 1.48 cfs @ 12.09 hrs, Volume= 5,166 cf, Depth= 2.64"
Routed to Pond CDS : CDS

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=6.57"

	Area (sf)	CN	Description
*	9,402	76	Gravel, HSG A
	8,334	39	>75% Grass cover, Good, HSG A
*	3,158	98	Impervious, HSG A
	2,603	30	Woods, Good, HSG A
	23,497		Weighted Average
	20,339		86.56% Pervious Area
	3,158		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment A5: SUB-A5

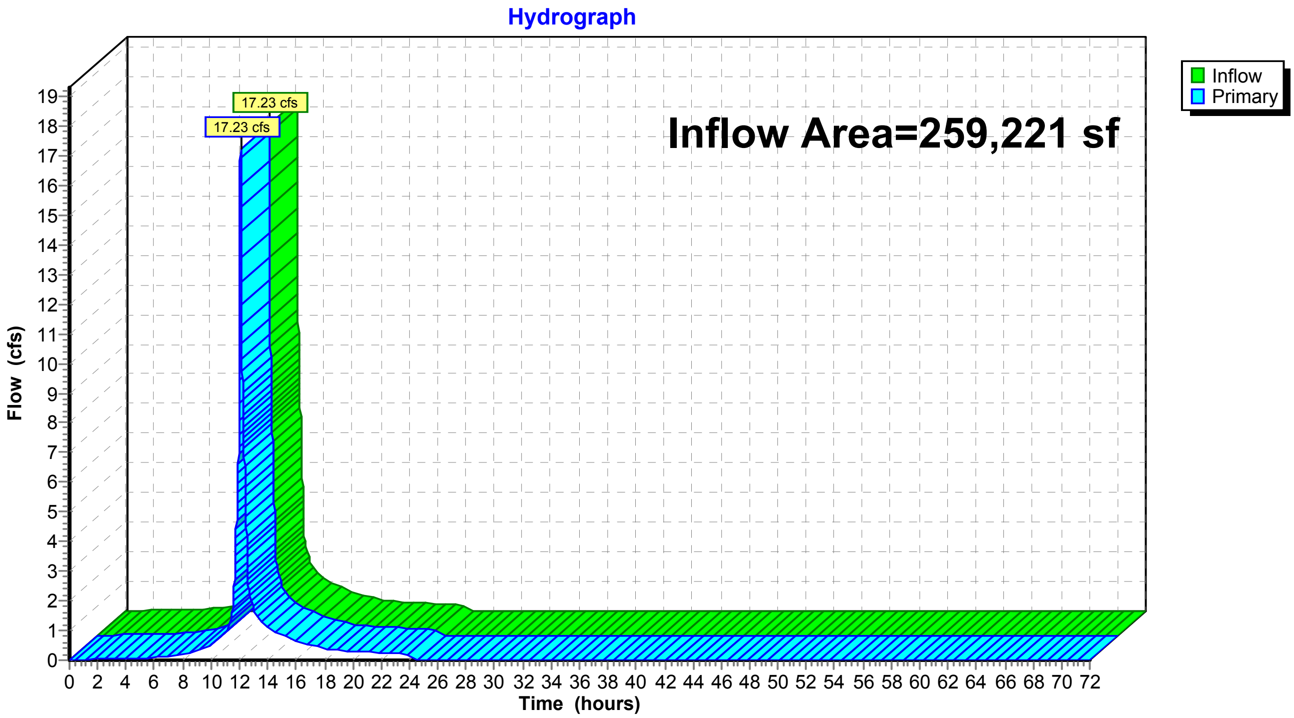


Summary for Pond A: POI-A

Inflow Area = 259,221 sf, 16.80% Impervious, Inflow Depth = 2.76" for 50 YR event
Inflow = 17.23 cfs @ 12.09 hrs, Volume= 59,540 cf
Primary = 17.23 cfs @ 12.09 hrs, Volume= 59,540 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Pond A: POI-A



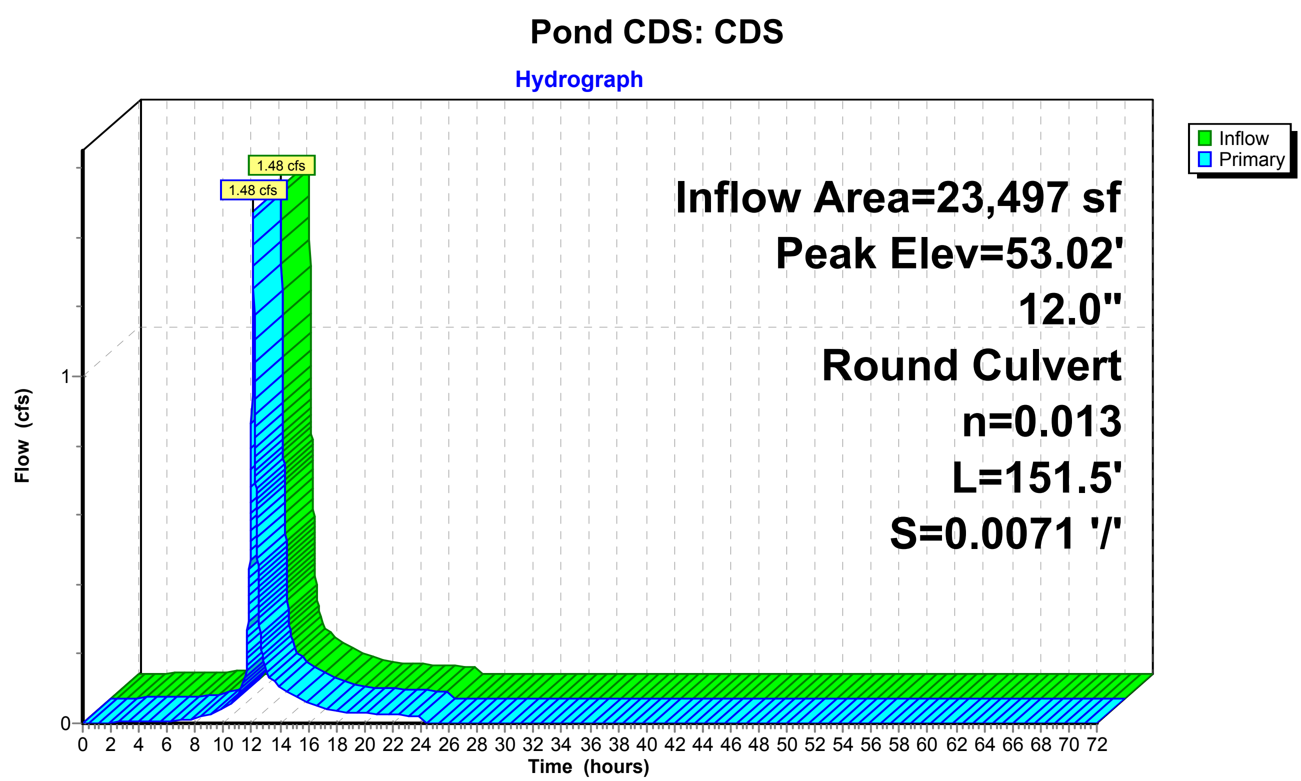
Summary for Pond CDS: CDS

Inflow Area = 23,497 sf, 13.44% Impervious, Inflow Depth = 2.64" for 50 YR event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 5,166 cf
Outflow = 1.48 cfs @ 12.09 hrs, Volume= 5,166 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.48 cfs @ 12.09 hrs, Volume= 5,166 cf
Routed to Pond A : POI-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 53.02' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	52.27'	**12.0" Round Culvert** L= 151.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.27' / 51.19' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.48 cfs @ 12.09 hrs HW=53.02' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.48 cfs @ 2.33 fps)



Outlet Protection Calculations

Project: Route 33 Skate Park
Portsmouth, NH

Prepared By: AKG
Checked By: JIP
Date: 12/22/22

OUTLET PROTECTION SIZING CALCULATION SHEET

Design Criteria

$$L_A = \frac{1.8Q}{Do^{1.5}} + 7Do$$

$$W_1 = 3Do$$

$$W_2 = 3Do + L_A$$

$$d_{50} = \frac{0.02}{Tw} \times \frac{Q^{1.33}}{Do}$$

Where,

L_A = the length of the apron (FT)
W_1 = the width of apron at outlet of the pipe or width of channel (FT)
W_2 = the width of the downstream end of the apron (FT)
d_{50} = the median stone diameter (FT)
Q = the discharge from the pipe during the 10-year storm event (CFS)
Do = the diameter of the pipe of width of the box culvert (FT)
Tw = the tailwater depth above the invert of the pipe (FT)

Outlet	Q (10 Yr) (CFS)	Do (Ft.)	Barrels	Min. L_A (Ft.)	Min. W_1 (Ft.)	Min. W_2 (Ft.)	Tw (Ft.)	Min. d_{50} (Ft.)	Velocity (FPS)	Req'd V>2.5 fps
EXISTING	**8.34**	**2.0**	**1**	19.3	6.0	25.3	**0.60**	0.28	2.65	Yes
PROP	**7.58**	**2.0**	**1**	18.8	6.0	24.8	**0.60**	0.25	2.41	No

Notes:
1. The 10 Year flow for each outlet was generated using HydroCAD
2. This analysis compares existing conditions to proposed conditions at the existing pipe outlet and demonstrates a decrease in outlet velocity. No improvement to the existing rip-rap outlet is necessary.

Summary for Subcatchment A1: SUB-A1

Runoff = 1.81 cfs @ 12.08 hrs, Volume= 6,348 cf, Depth= 4.09"
Routed to Reach 24" PIPE : EXISTING OUTLET

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
	18,606	98	Paved roads w/curbs & sewers, HSG A
	18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment A3: SUB-A3

Runoff = 6.58 cfs @ 12.09 hrs, Volume= 20,553 cf, Depth= 1.86"
Routed to Reach 24" PIPE : EXISTING OUTLET

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
*	97,147	76	Gravel, HSG A
	22,748	77	Fallow, bare soil, HSG A
	5,871	30	Woods, Good, HSG A
	5,577	30	Brush, Good, HSG A
*	1,384	98	Impervious, HSG A
	132,727		Weighted Average
	131,343		98.96% Pervious Area
	1,384		1.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

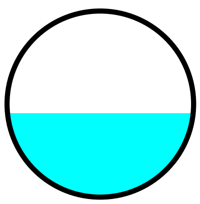
Summary for Reach 24" PIPE: EXISTING OUTLET

Inflow Area = 151,333 sf, 13.21% Impervious, Inflow Depth = 2.13" for 10 YR event
Inflow = 8.38 cfs @ 12.09 hrs, Volume= 26,902 cf
Outflow = 8.34 cfs @ 12.10 hrs, Volume= 26,902 cf, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.07 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 2.1 min

Peak Storage= 324 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.90' , Surface Width= 1.99'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 19.99 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 235.7' Slope= 0.0078 '/'
Inlet Invert= 47.50', Outlet Invert= 45.66'



THE REACH IS REPRESENTATIVE OF THE EXISTING 24" OUTLET AND EXISTING RIP-RAP APRON WHICH RECEIVES STORMWATER FLOW FROM PORTIONS OF GREENLAND ROAD & THE EXISTING STORMWATER INFRASTRUCTURE ON SITE. UNDER EXISTING CONDITIONS, PEAK DISCHARGE RATE DURING THE 10 YEAR STORM EVENT AT THE PIPE OUTLET IS 8.34-CFS

Summary for Subcatchment A1: SUB-A1

Runoff = 1.81 cfs @ 12.08 hrs, Volume= 6,348 cf, Depth= 4.09"
Routed to Reach 24" PIPE : EXISTING OUTLET

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
	18,606	98	Paved roads w/curbs & sewers, HSG A
	18,606		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment A3: SUB-A3

Runoff = 5.00 cfs @ 12.09 hrs, Volume= 16,712 cf, Depth= 1.70"
Routed to Reach 24" PIPE : EXISTING OUTLET

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
	38,646	39	>75% Grass cover, Good, HSG A
*	31,098	76	Gravel, HSG A
	22,199	77	Fallow, bare soil, HSG A
*	21,776	98	Impervious, HSG A
	2,138	30	Woods, Good, HSG A
	2,064	30	Brush, Good, HSG A
	117,921		Weighted Average
	96,145		81.53% Pervious Area
	21,776		18.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment A5: SUB-A5

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf, Depth= 1.38"
Routed to Pond CDS : CDS

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YR Rainfall=4.33"

	Area (sf)	CN	Description
*	9,402	76	Gravel, HSG A
	8,334	39	>75% Grass cover, Good, HSG A
*	3,158	98	Impervious, HSG A
	2,603	30	Woods, Good, HSG A
	23,497		Weighted Average
	20,339		86.56% Pervious Area
	3,158		13.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

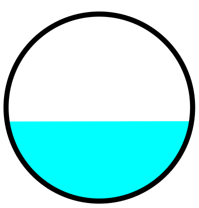
Summary for Reach 24" PIPE: EXISTING OUTLET

Inflow Area = 160,024 sf, 27.21% Impervious, Inflow Depth = 1.93" for 10 YR event
Inflow = 7.61 cfs @ 12.09 hrs, Volume= 25,760 cf
Outflow = 7.58 cfs @ 12.09 hrs, Volume= 25,760 cf, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.92 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 2.1 min

Peak Storage= 301 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.85' , Surface Width= 1.98'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 19.99 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 235.7' Slope= 0.0078 '/'
Inlet Invert= 47.50', Outlet Invert= 45.66'



Summary for Pond CDS: CDS

Inflow Area = 23,497 sf, 13.44% Impervious, Inflow Depth = 1.38" for 10 YR event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf
Outflow = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 12.09 hrs, Volume= 2,700 cf
Routed to Reach 24" PIPE : EXISTING OUTLET

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 52.79' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	52.27'	**12.0" Round Culvert** L= 151.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 52.27' / 51.19' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.09 hrs HW=52.79' TW=48.35' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.81 cfs @ 1.94 fps)

THE REACH IS REPRESENTATIVE OF THE EXISTING 24" OUTLET AND EXISTING RIP-RAP APRON WHICH RECEIVES STORMWATER FLOW FROM PORTIONS OF GREENLAND ROAD & THE EXISTING STORMWATER INFRASTRUCTURE ON SITE. UNDER PROPOSED CONDITIONS, PEAK DISCHARGE RATE DURING THE 10 YEAR STORM EVENT IS 7.58-CFS AT THE PIPE OUTLET

Operations & Maintenance Plan

1.0 Introduction

This Operations and Maintenance plan has been prepared in accordance with the Stormwater Management Policy issued by the New Hampshire Department of Environmental Services (NHDES). Upon completion of construction activities, all structural BMPs shall be inspected per the frequencies listed in this document. All inspection and maintenance activities shall be recorded in the provided maintenance logs, with photographs taken of the BMP at each inspection, and records provided to NHDES upon request.

2.0 Purpose

This Operation and Maintenance Plan (O&M Plan) is intended to provide a mechanism for the consistent inspection and maintenance of each BMP installed on the project site. Included in this O&M Plan is a description of the BMP type and an inspection form for the BMP. The City of Portsmouth Department of Public Works is the owner and operator of the system and is responsible for its upkeep and maintenance. This work will be funded on an annual basis through the owner's operating budget.

In the event the Owner sells the property, it is the Owner's responsibility to transfer this plan as well as the past operation and maintenance records to the new property owner.

3.0 BMP Description and Locations

3.1 Deep Sump Hooded Catch Basins

There are three catch basins on site that will receive stormwater run-off from the proposed development. The deep sump hooded catch basins provide pre-treatment to remove sediment and hydrocarbons from stormwater run-off.

3.2 CDS Hydrodynamic Separator

There is one CDS unit on site that will receive stormwater run-off from the proposed development. The CDS unit is a hydrodynamic separator design to remove sediments, hydrocarbons, and trash from stormwater run-off to improve water quality.
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4.0 Inspection, Maintenance Checklist and Schedule

4.1 Snow Storage & Removal

Snow removed from the proposed parking lot and pedestrian areas on site will be placed or disposed of in designated areas. Under no circumstances shall snow be placed within wetland resource areas. If conditions arise where snow storage areas are at capacity, the Owner shall remove and dispose of snow off-site according to all local, state, and federal regulations.

4.2 Deep Sump Hooded Catch Basins

Deep sump hooded catch basins shall be inspected and/or cleaned at least four times per year, and at the end of foliage and snow removal seasons. Sediment shall be removed at least four times per year or when the depth of sediment is greater than or equal to one half the depth measured from the sump to the invert of the lowest outlet. When cleaning is necessary, use a vacuum truck to clean and remove pollutants. All pollutants shall be disposed of according to all local, state, and federal regulations.

4.3 CDS Hydrodynamic Separator

The CDS unit shall be inspected every three months for the first year, then twice a year at a minimum thereafter. The maintenance cycle shall be determined by the depth of sediment and hydrocarbon buildup witnessed in previous inspections. See the CDS operations and maintenance guide following this O&M plan for additional information regarding maintenance intervals and procedures.

The interior of the CDS unit shall be visually inspected upon opening. Use a sediment probe and oil dipstick to check respected levels of accumulation. When cleaning is necessary, use a vacuum truck to clean and remove pollutants. All pollutants shall be disposed of according to all local, state, and federal regulations.

4.4 Invasive Species Control

Care must be taken to not allow invasive species to take hold. Monitor frequently for invasive species. When invasive species are discovered, remove by hand pulling, mechanical harvesting, hydro-raking, chemical treatment, or biological controls. If invasive species are discovered, the Owner shall also report the discovery to the Exotic Species Program at NHDES. See additional documentation following this O&M plan for guidance.

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4.5 Inspections and Record Keeping

- An inspection form should be filled out each, and every time maintenance work is performed.
- Photographs of the BMP shall be taken each time it is inspected.

- A binder should be kept that contains all of the completed inspection forms and any other related materials.
- A review of Operations & Maintenance actions should take place annually such that the Stormwater BMPs are being taken care of in the manner illustrated in this Operations & Maintenance Plan.
- Operations & Maintenance log forms for the last three years, at a minimum, shall be kept.
- The inspection and maintenance schedule may be refined in the future based on the findings and results of this Operations & Maintenance program or policy.

5 Public Safety Features

No public safety features will be necessary.

6 Stormwater Management System Owner/Responsible Party

The stormwater management system shall be owned and maintained by the following party or its future designee/assigns:

City of Portsmouth, Department of Public Works
680 Peverly Hill Road,
Portsmouth, NH 03801

This operation and Maintenance Plan will be recorded with the registry of deeds so that current and future owners are aware of the requirement for proper operation and maintenance of the onsite stormwater system

7 General Good Housekeeping Practices

All non-hazardous waste shall be stored in designated trash or recycling containers onsite for periodic collection by the local trash collector. The owner shall have maintenance staff who monitor the site for the accumulation of trash. Any trash that is seen onsite shall immediately be collected and placed into designated trash or recycling containers. The owner's maintenance staff shall make an inspection of the site once per week at minimum.

8 Estimated Operations and Maintenance Budget

The estimated budget for annual operations and maintenance of this stormwater system is $1,000 per year.

Deep Sump Hooded Catch Basins

Frequency: The catch basins shall be inspected and/or cleaned at least four times per year, and at the end of foliage and snow seasons.

Structure No.: ___________________________________

Inspected By: __________________ Date: ____________

Observations: ____________________________________
____
____

Actions Taken: ____________________________________
____
____

Instructions: Sediment shall be removed at least four times per year or when the depth of sediment is greater than or equal to one half the depth measured from the sump to the invert of the lowest outlet. When cleaning is necessary, use a vacuum truck to clean and remove pollutants. All pollutants shall be disposed of according to all local, state, and federal regulations.

CDS Hydrodynamic Separator

Frequency: Inspect and clean the CDS unit every three months for the first year and at a minimum, at least twice a year or as necessary thereafter.

Structure No.: ___________________________________

Inspected By: __________________ Date: _____________

Observations: _____________________________________
____
____

Actions Taken: _____________________________________
____
____

Instructions: Clean the system whenever the depth of the deposits is equal to 50% of the maximum storage volume. Visually inspect unit via manhole. Use vacuum truck to remove sediment, trash and hydrocarbons. See CDS maintenance guide for additional information. All pollutants shall be disposed of according to all local, state, and federal regulations.

CDS Inspection & Maintenance Log

CDS Model: ______________________ Location: ______________________

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile**.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

DE-ICING LOG

DATE	NOTES	INITIALS

CONTECH®
ENGINEERED SOLUTIONS

CDS Guide
Operation, Design, Performance and Maintenance

CDS®

Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Inline units can treat up to 6 cfs, and internally bypass flows in excess of 50 cfs (1416 L/s). Available precast or cast-in-place, offline units can treat flows from 1 to 300 cfs (28.3 to 8495 L/s). The pollutant removal capacity of the CDS system has been proven in lab and field testing.

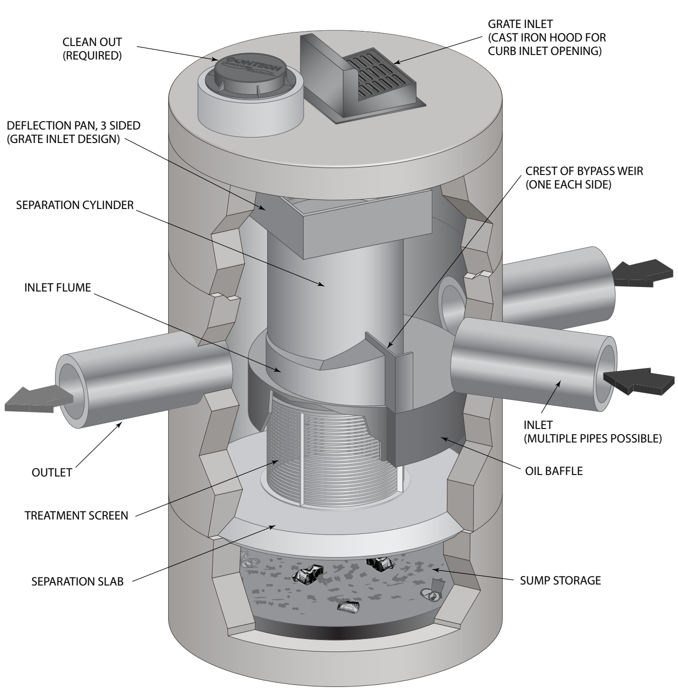
Operation Overview

Stormwater enters the diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the flow. All flows up to the system's treatment design capacity enter the separation chamber and are treated.

Swirl concentration and screen deflection force floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During the flow events exceeding the treatment design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants are retained in the separation cylinder.



Design Basics

There are three primary methods of sizing a CDS system. The Water Quality Flow Rate Method determines which model size provides the desired removal efficiency at a given flow rate for a defined particle size. The Rational Rainfall Method™ or the and Probabilistic Method is used when a specific removal efficiency of the net annual sediment load is required.

Typically in the Unites States, CDS systems are designed to achieve an 80% annual solids load reduction based on lab generated performance curves for a gradation with an average particle size (d50) of 125 microns (μm). For some regulatory environments, CDS systems can also be designed to achieve an 80% annual solids load reduction based on an average particle size (d50) of 75 microns (μm) or 50 microns (μm).

Water Quality Flow Rate Method

In some cases, regulations require that a specific treatment rate, often referred to as the water quality design flow (WQQ), be treated. This WQQ represents the peak flow rate from either an event with a specific recurrence interval, e.g. the six-month storm, or a water quality depth, e.g. 1/2-inch (13 mm) of rainfall.

The CDS is designed to treat all flows up to the WQQ. At influent rates higher than the WQQ, the diversion weir will direct most flow exceeding the WQQ around the separation chamber. This allows removal efficiency to remain relatively constant in the separation chamber and eliminates the risk of washout during bypass flows regardless of influent flow rates.

Treatment flow rates are defined as the rate at which the CDS will remove a specific gradation of sediment at a specific removal efficiency. Therefore the treatment flow rate is variable, based on the gradation and removal efficiency specified by the design engineer.

Rational Rainfall Method™

Differences in local climate, topography and scale make every site hydraulically unique. It is important to take these factors into consideration when estimating the long-term performance of any stormwater treatment system. The Rational Rainfall Method combines site-specific information with laboratory generated performance data, and local historical precipitation records to estimate removal efficiencies as accurately as possible.

Short duration rain gauge records from across the United States and Canada were analyzed to determine the percent of the total annual rainfall that fell at a range of intensities. US stations' depths were totaled every 15 minutes, or hourly, and recorded in 0.01-inch increments. Depths were recorded hourly with 1-mm resolution at Canadian stations. One trend was consistent at all sites; the vast majority of precipitation fell at low intensities and high intensity storms contributed relatively little to the total annual depth.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Rainfall Method. Since most sites are relatively small and highly impervious, the Rational Rainfall Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS system are determined. Performance efficiency curve determined from full scale laboratory tests on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Probabilistic Rational Method

The Probabilistic Rational Method is a sizing program Contech developed to estimate a net annual sediment load reduction for a particular CDS model based on site size, site runoff coefficient, regional rainfall intensity distribution, and anticipated pollutant characteristics.

The Probabilistic Method is an extension of the Rational Method used to estimate peak discharge rates generated by storm events of varying statistical return frequencies (e.g. 2-year storm event). Under the Rational Method, an adjustment factor is used to adjust the runoff coefficient estimated for the 10-year event, correlating a known hydrologic parameter with the target storm event. The rainfall intensities vary depending on the return frequency of the storm event under consideration. In general, these two frequency dependent parameters (rainfall intensity and runoff coefficient) increase as the return frequency increases while the drainage area remains constant.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Method. Since most sites are relatively small and highly impervious, the Rational Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS are determined. Performance efficiency curve on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Treatment Flow Rate

The inlet throat area is sized to ensure that the WQQ passes through the separation chamber at a water surface elevation equal to the crest of the diversion weir. The diversion weir bypasses excessive flows around the separation chamber, thus preventing re-suspension or re-entrainment of previously captured particles.

Hydraulic Capacity

The hydraulic capacity of a CDS system is determined by the length and height of the diversion weir and by the maximum allowable head in the system. Typical configurations allow hydraulic capacities of up to ten times the treatment flow rate. The crest of the diversion weir may be lowered and the inlet throat may be widened to increase the capacity of the system at a given water surface elevation. The unit is designed to meet project specific hydraulic requirements.

Performance

Full-Scale Laboratory Test Results

A full-scale CDS system (Model CDS2020-5B) was tested at the facility of University of Florida, Gainesville, FL. This CDS unit was evaluated under controlled laboratory conditions of influent flow rate and addition of sediment.

Two different gradations of silica sand material (UF Sediment & OK-110) were used in the CDS performance evaluation. The particle size distributions (PSDs) of the test materials were analyzed using standard method "Gradation ASTM D-422 "Standard Test Method for Particle-Size Analysis of Soils" by a certified laboratory.

UF Sediment is a mixture of three different products produced by the U.S. Silica Company: "Sil-Co-Sil 106", "#1 DRY" and "20/40 Oil Frac". Particle size distribution analysis shows that the UF Sediment has a very fine gradation (d50 = 20 to 30 μm) covering a wide size range (Coefficient of Uniformity, C averaged at 10.6). In comparison with the hypothetical TSS gradation specified in the NJDEP (New Jersey Department of Environmental Protection) and NJCAT (New Jersey Corporation for Advanced Technology) protocol for lab testing, the UF Sediment covers a similar range of particle size but with a finer d50 (d50 for NJDEP is approximately 50 μm) (NJDEP, 2003).

The OK-110 silica sand is a commercial product of U.S. Silica Sand. The particle size distribution analysis of this material, also included in Figure 1, shows that 99.9% of the OK-110 sand is finer than 250 microns, with a mean particle size (d50) of 106 microns. The PSDs for the test material are shown in Figure 1.

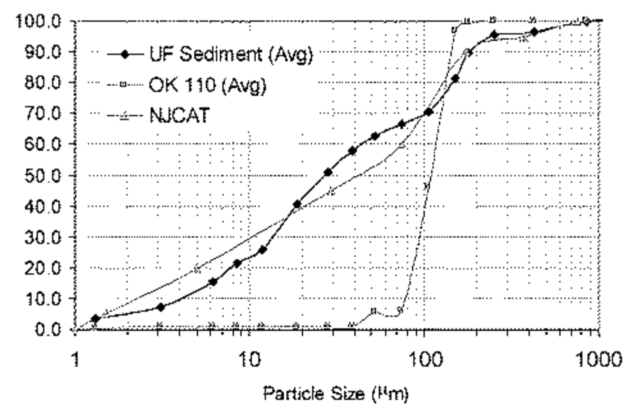


Figure 1. Particle size distributions

Tests were conducted to quantify the performance of a specific CDS unit (1.1 cfs (31.3-L/s) design capacity) at various flow rates, ranging from 1% up to 125% of the treatment design capacity of the unit, using the 2400 micron screen. All tests were conducted with controlled influent concentrations of approximately 200 mg/L. Effluent samples were taken at equal time intervals across the entire duration of each test run. These samples were then processed with a Dekaport Cone sample splitter to obtain representative sub-samples for Suspended Sediment Concentration (SSC) testing using ASTM D3977-97 "Standard Test Methods for Determining Sediment Concentration in Water Samples", and particle size distribution analysis.

Results and Modeling

Based on the data from the University of Florida, a performance model was developed for the CDS system. A regression analysis was used to develop a fitting curve representative of the scattered data points at various design flow rates. This model, which demonstrated good agreement with the laboratory data, can then be used to predict CDS system performance with respect to SSC removal for any particle size gradation, assuming the particles are inorganic sandy-silt. Figure 2 shows CDS predictive performance for two typical particle size gradations (NJCAT gradation and OK-110 sand) as a function of operating rate.

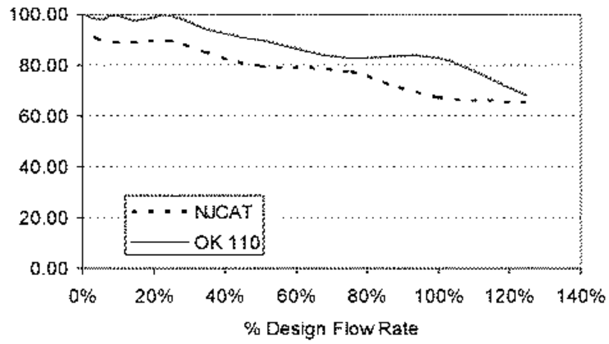


Figure 2. CDS stormwater treatment predictive performance for various particle gradations as a function of operating rate.

Many regulatory jurisdictions set a performance standard for hydrodynamic devices by stating that the devices shall be capable of achieving an 80% removal efficiency for particles having a mean particle size (d50) of 125 microns (e.g. Washington State Department of Ecology — WASDOE - 2008). The model can be used to calculate the expected performance of such a PSD (shown in Figure 3). The model indicates (Figure 4) that the CDS system with 2400 micron screen achieves approximately 80% removal at the design (100%) flow rate, for this particle size distribution (d50 = 125 μm).

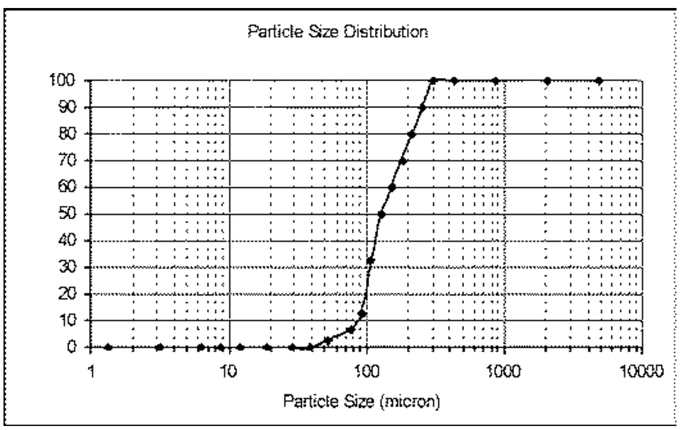


Figure 3. WASDOE PSD

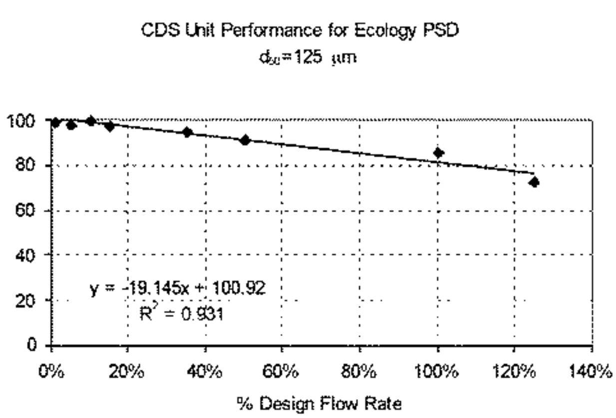


Figure 4. Modeled performance for WASDOE PSD.

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified

during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

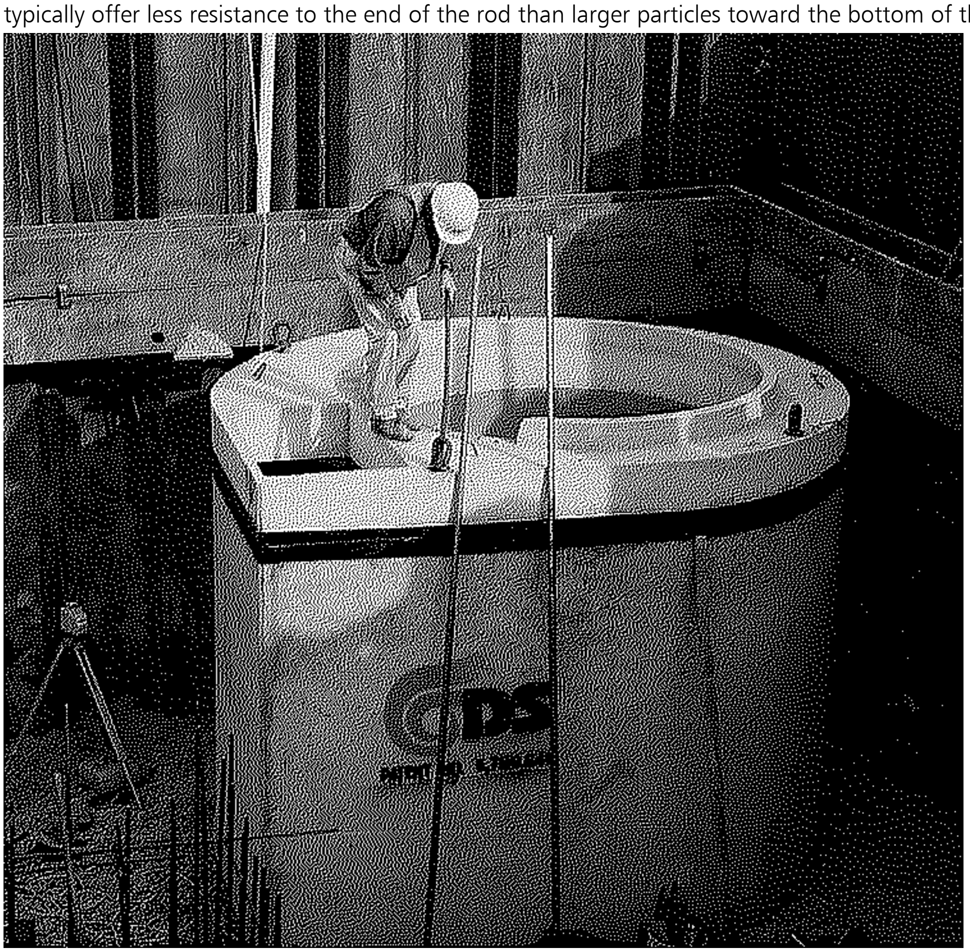
In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be cleaned to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Note: To avoid underestimating the volume of sediment in the chamber, carefully lower the measuring device to the top of the sediment pile. Finer silty particles at the top of the pile may be more difficult to feel with a measuring stick. These finer particles typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.



CDS Inspection & Maintenance Log

CDS Model: ______________________ Location: ______________________

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile**.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

SUPPORT

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from our engineers.

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cds_manual 3/17 PDF

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Background:

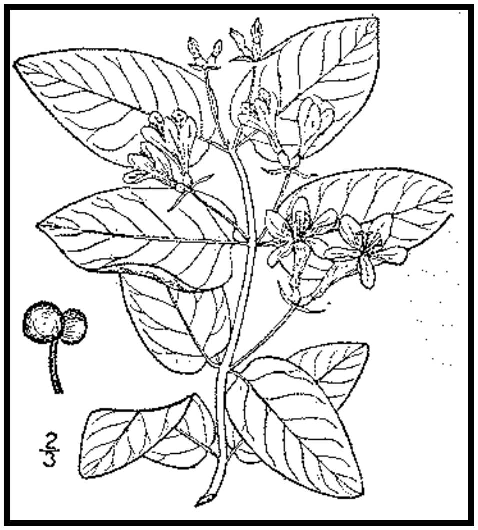
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Methods for Disposing Non-Native Invasive Plants

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions.* Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

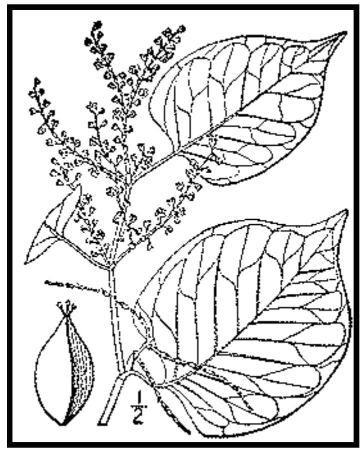
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

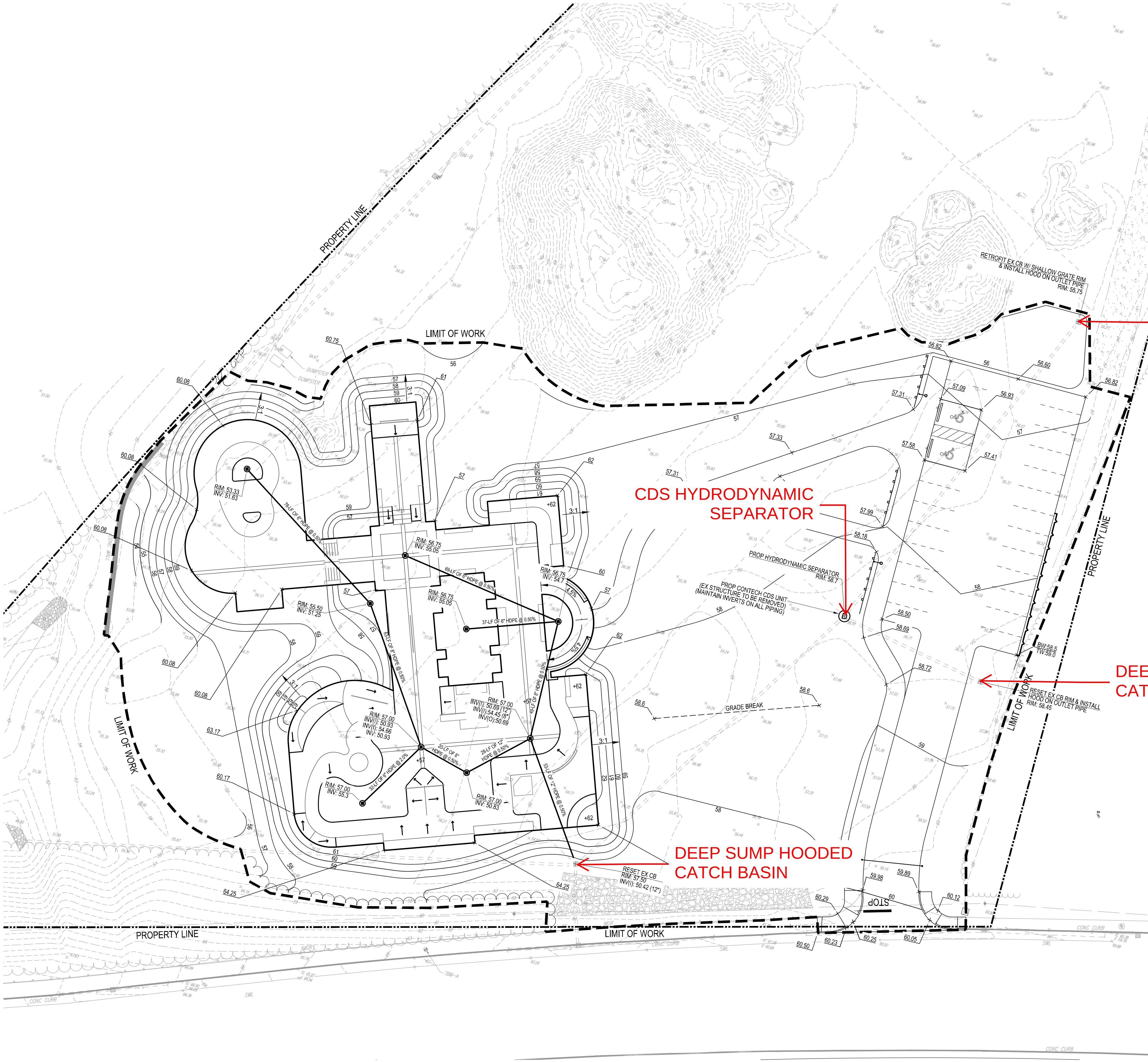
Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds</td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments</td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds**	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010



LEGEND

	LIMIT OF WORK
	PROPERTY LINE
	EXISTING DRAINAGE STRUCTURE. SEE UTILITIES PLAN
12	EXISTING CONTOURS
14	PROPOSED CONTOURS
95.10	EXISTING SPOT ELEVATION
	CATCH BASIN OR PVC AREA DRAIN, REFER TO PLANS
	HDPE OR PVC SOLID DRAIN PIPE, DIAMETER VARIES
	GRADE BREAK
HP	HIGH POINT
LP	LOW POINT
TW	TOP OF WALL
BW	BOTTOM OF WALL

SCALE: 1" = 20'-0"
0 20 40 60

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www.westonandsampson.com

DRAWN BY: KC
REVIEWED BY: BK
APPROVED BY:
DATE: 12/09/22

PROJECT:
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:
SOURCE CONTROL PLAN
90% CONSTRUCTION DOCUMENTS

SHEET:
L140
SKATE PARK

Appendix A – Soil Lab Testing Reports

CERTIFICATE OF ANALYSIS

Ken Gendron
Weston & Sampson Engineers, Inc.
427 Main St
Worcester, MA 01608

RE: RTE 33 Portsmouth (N/A)
ESS Laboratory Work Order Number: 1610112

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

REVIEWED
By ESS Laboratory at 4:02 pm, Oct 14, 2016

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with NELAC Standards, A2LA and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth

ESS Laboratory Work Order: 1610112

SAMPLE RECEIPT

The following samples were received on October 06, 2016 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by Weston and Sampson on day of sampling.

Lab Number	Sample Name	Matrix	Analysis
1610112-01	B-1 S-1	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-02	B-2 S-2	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-03	B-3 S-4	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-04	B-4 S-3	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-05	B-5 S-4	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-06	B-6 S-3	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-07	B-7 S-4	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-08	B-8 S-2	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B, 8260B Low, 8270D
1610112-09	B-9 S-3	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-10	B-10 S-3	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-11	B-11 S-2	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-12	B-12 S-1	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-13	B-13 S-3	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-14	B-14 S-4	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-15	B-15 S-3	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
1610112-16	B-16 S-2	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

1610112-08	**Reported above the quantitation limit; Estimated value (E).**
	4-Isopropyltoluene
CJ61137-BS1	**Blank Spike recovery is above upper control limit (B+).**
	Methylene Chloride (131% @ 70-130%)

8270D Semi-Volatile Organic Compounds

1610112-01	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (29% @ 50-200%)
1610112-02	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (45% @ 50-200%)
1610112-03	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (48% @ 50-200%)
1610112-03	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	2,4,6-Tribromophenol (5% @ 30-130%), 2-Fluorophenol (19% @ 30-130%)
1610112-04	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (31% @ 50-200%)
1610112-09	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (40% @ 50-200%)
1610112-13	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (49% @ 50-200%)
1610112-15	**Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**
	Perylene-d12 (49% @ 50-200%)
CJ61112-BS1	**Blank Spike recovery is below lower control limit (B-).**
	Aniline (39% @ 40-140%), Benzidine (% @ 40-140%), Hexachlorocyclopentadiene (11% @ 40-140%)
CJ61112-BSD1	**Blank Spike recovery is below lower control limit (B-).**
	Benzidine (% @ 40-140%), Hexachlorocyclopentadiene (11% @ 40-140%)
CJ61112-BSD1	**Relative percent difference for duplicate is outside of criteria (D+).**
	Benzoic Acid (36% @ 30%)
CZJ0067-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (106% @ 80-120%)
CZJ0067-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Benzidine (21% @ %)
CZJ0094-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (95% @ 80-120%)
CZJ0113-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (84% @ 80-120%)
CZJ0113-CCV1	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	4-Nitrophenol (36% @ 20%), Benzo(g,h,i)perylene (21% @ 20%), Pentachlorophenol (21% @ 20%)
CZJ0125-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (84% @ 80-120%), Benzoic Acid (77% @ 80-120%), Pentachlorophenol (86% @ 80-120%)

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

CZJ0125-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Benzoic Acid (23% @ 20%)

CZJ0132-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (74% @ 80-120%)

CZJ0132-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2,4-Dinitrophenol (26% @ 20%), 4,6-Dinitro-2-Methylphenol (22% @ 20%), 4-Nitroaniline (24% @ 20%), 4-Nitrophenol (45% @ 20%), Benzoic Acid (31% @ 20%), Pentachlorophenol (24% @ 20%)

CZJ0162-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (84% @ 80-120%), Pentachlorophenol (88% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**8.83** (2.21)		6010C		1	KJK	10/12/16 20:00	2.52	100	CJ61103
Barium	**41.5** (2.21)		6010C		1	KJK	10/12/16 20:00	2.52	100	CJ61103
Cadmium	ND (0.44)		6020A		20	NAR	10/13/16 14:57	2.52	100	CJ61103
Chromium	**39.3** (0.88)		6010C		1	KJK	10/12/16 20:00	2.52	100	CJ61103
Lead	**24.5** (4.42)		6010C		1	KJK	10/12/16 20:00	2.52	100	CJ61103
Mercury	**0.058** (0.036)		7471B		1	BJV	10/11/16 12:55	0.62	40	CJ61104
Selenium	ND (0.44)		6020A		20	NAR	10/13/16 14:57	2.52	100	CJ61103
Silver	ND (0.44)		6010C		1	KJK	10/12/16 20:00	2.52	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 8.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0028)		8260B Low		0	10/07/16 17:24		[CALC]
1,4-Dichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0625)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
2-Butanone	ND (0.0313)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
2-Hexanone	ND (0.0313)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
4-Isopropyltoluene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0313)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Acetone	ND (0.0313)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Acrylonitrile	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Allyl Chloride	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 8.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Bromobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Bromochloromethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Bromoform	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Bromomethane	ND (0.0063)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Chlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Chloroethane	ND (0.0063)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Chloroform	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Chloromethane	ND (0.0063)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Dibromomethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0063)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Diethyl Ether	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Ethylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Methylene Chloride	ND (0.0156)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Naphthalene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Styrene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0313)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 8.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Toluene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Trichloroethene	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0031)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0063)		8260B Low		1	10/07/16 17:24	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0056)		8260B Low		1	10/07/16 17:24		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*118 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*107 %*		*70-130*
Surrogate: Toluene-d8	*105 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 20.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1221	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1232	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1242	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1248	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1254	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1260	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1262	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604
Aroclor 1268	ND (0.0545)		8082A		1	10/11/16 15:01		CJ60604

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*64 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*72 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*77 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 20.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**158** (40.3)		8100M		1	10/07/16 15:39	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*73 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
1,2,4-Trichlorobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
1,2-Dichlorobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
1,3-Dichlorobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
1,4-Dichlorobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,4,5-Trichlorophenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,4,6-Trichlorophenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,4-Dichlorophenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,4-Dimethylphenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,4-Dinitrophenol	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,4-Dinitrotoluene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2,6-Dinitrotoluene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2-Chloronaphthalene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2-Chlorophenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2-Methylnaphthalene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2-Methylphenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2-Nitroaniline	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
2-Nitrophenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
3,3´-Dichlorobenzidine	ND (0.718)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
3+4-Methylphenol	ND (0.718)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
3-Nitroaniline	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4-Bromophenyl-phenylether	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4-Chloro-3-Methylphenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4-Chloroaniline	ND (0.718)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4-Nitroaniline	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
4-Nitrophenol	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Acenaphthene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Acenaphthylene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.718)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Aniline	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Anthracene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Azobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzidine	ND (0.718)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzo(a)anthracene	**0.548** (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzo(a)pyrene	**0.616** (0.180)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzo(b)fluoranthene	**0.768** (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzo(g,h,i)perylene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzo(k)fluoranthene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzoic Acid	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Benzyl Alcohol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
bis(2-Chloroethoxy)methane	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
bis(2-Chloroethyl)ether	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Butylbenzylphthalate	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Carbazole	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Chrysene	**0.519** (0.180)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Dibenzo(a,h)Anthracene	ND (0.180)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Dibenzofuran	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Diethylphthalate	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Dimethylphthalate	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Di-n-butylphthalate	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Di-n-octylphthalate	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Fluoranthene	**1.34** (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Fluorene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Hexachlorobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Hexachlorobutadiene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Hexachlorocyclopentadiene	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Hexachloroethane	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-1 S-1
Date Sampled: 09/27/16 12:00
Percent Solids: 90
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Naphthalene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Nitrobenzene	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
N-Nitrosodimethylamine	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
N-nitrosodiphenylamine	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Pentachlorophenol	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Phenanthrene	**0.807** (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Phenol	ND (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Pyrene	**1.14** (0.359)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609
Pyridine	ND (1.80)		8270D		1	10/08/16 3:30	CZJ0094	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*51 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*75 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*55 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*57 %*		*30-130*
Surrogate: 2-Fluorophenol	*52 %*		*30-130*
Surrogate: Nitrobenzene-d5	*52 %*		*30-130*
Surrogate: Phenol-d6	*56 %*		*30-130*
Surrogate: p-Terphenyl-d14	*87 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**8.66** (1.88)		6010C		1	KJK	10/12/16 20:03	3.18	100	CJ61103
Barium	**58.3** (1.88)		6010C		1	KJK	10/12/16 20:03	3.18	100	CJ61103
Cadmium	ND (0.38)		6020A		20	NAR	10/13/16 15:15	3.18	100	CJ61103
Chromium	**26.9** (0.75)		6010C		1	KJK	10/12/16 20:03	3.18	100	CJ61103
Lead	**132** (3.76)		6010C		1	KJK	10/12/16 20:03	3.18	100	CJ61103
Mercury	**2.12** (0.394)		7471B		10	BJV	10/11/16 15:39	0.6	40	CJ61104
Selenium	ND (0.38)		6020A		20	NAR	10/13/16 15:15	3.18	100	CJ61103
Silver	ND (0.38)		6010C		1	KJK	10/12/16 20:03	3.18	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 8.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0030)		8260B Low		0	10/07/16 17:50		[CALC]
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0711)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
2-Butanone	ND (0.0355)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
2-Hexanone	ND (0.0355)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
4-Isopropyltoluene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0355)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Acetone	**0.166** (0.0355)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Acrylonitrile	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Allyl Chloride	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 8.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Bromobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Bromochloromethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Bromoform	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Bromomethane	ND (0.0071)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Chlorobenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Chloroethane	ND (0.0071)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Chloroform	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Chloromethane	ND (0.0071)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Dibromomethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0071)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Diethyl Ether	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Ethylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Methylene Chloride	ND (0.0178)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Naphthalene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Styrene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0355)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 8.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Toluene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Trichloroethene	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0071)		8260B Low		1	10/07/16 17:50	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0060)		8260B Low		1	10/07/16 17:50		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*118 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*108 %*		*70-130*
Surrogate: Toluene-d8	*108 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 19.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1221	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1232	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1242	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1248	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1254	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1260	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1262	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604
Aroclor 1268	ND (0.0616)		8082A		1	10/11/16 16:23		CJ60604

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*61 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*67 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*61 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*64 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 20.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**73.5** (43.7)		8100M		1	10/07/16 16:19	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*75 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
1,2,4-Trichlorobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
1,2-Dichlorobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
1,3-Dichlorobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
1,4-Dichlorobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,4,5-Trichlorophenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,4,6-Trichlorophenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,4-Dichlorophenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,4-Dimethylphenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,4-Dinitrophenol	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,4-Dinitrotoluene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2,6-Dinitrotoluene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2-Chloronaphthalene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2-Chlorophenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2-Methylnaphthalene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2-Methylphenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2-Nitroaniline	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
2-Nitrophenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
3,3´-Dichlorobenzidine	ND (0.771)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
3+4-Methylphenol	ND (0.771)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
3-Nitroaniline	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4-Bromophenyl-phenylether	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4-Chloro-3-Methylphenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4-Chloroaniline	ND (0.771)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4-Nitroaniline	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
4-Nitrophenol	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Acenaphthene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Acenaphthylene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.771)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Aniline	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Anthracene	**0.415** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Azobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzidine	ND (0.771)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzo(a)anthracene	**1.44** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzo(a)pyrene	**1.24** (0.193)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzo(b)fluoranthene	**2.24** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzo(g,h,i)perylene	**0.608** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzo(k)fluoranthene	**0.921** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzoic Acid	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Benzyl Alcohol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
bis(2-Chloroethoxy)methane	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
bis(2-Chloroethyl)ether	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Butylbenzylphthalate	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Carbazole	**0.445** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Chrysene	**1.62** (0.193)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Dibenzo(a,h)Anthracene	**0.286** (0.193)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Dibenzofuran	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Diethylphthalate	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Dimethylphthalate	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Di-n-butylphthalate	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Di-n-octylphthalate	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Fluoranthene	**4.58** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Fluorene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Hexachlorobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Hexachlorobutadiene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Hexachlorocyclopentadiene	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Hexachloroethane	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Indeno(1,2,3-cd)Pyrene	**0.567** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-2 S-2
Date Sampled: 09/28/16 08:10
Percent Solids: 84
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Naphthalene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Nitrobenzene	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
N-Nitrosodimethylamine	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
N-nitrosodiphenylamine	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Pentachlorophenol	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Phenanthrene	**1.73** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Phenol	ND (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Pyrene	**3.36** (0.385)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609
Pyridine	ND (1.93)		8270D		1	10/08/16 4:07	CZJ0094	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*75 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*89 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*81 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*75 %*		*30-130*
Surrogate: 2-Fluorophenol	*76 %*		*30-130*
Surrogate: Nitrobenzene-d5	*74 %*		*30-130*
Surrogate: Phenol-d6	*82 %*		*30-130*
Surrogate: p-Terphenyl-d14	*110 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**10.4** (2.64)		6010C		1	KJK	10/12/16 20:20	2.08	100	CJ61103
Barium	**23.8** (2.64)		6010C		1	KJK	10/12/16 20:20	2.08	100	CJ61103
Cadmium	ND (0.53)		6020A		20	NAR	10/13/16 15:20	2.08	100	CJ61103
Chromium	**18.7** (1.06)		6010C		1	KJK	10/12/16 20:20	2.08	100	CJ61103
Lead	**14.6** (5.28)		6010C		1	KJK	10/12/16 20:20	2.08	100	CJ61103
Mercury	**0.048** (0.034)		7471B		1	BJV	10/11/16 12:59	0.64	40	CJ61104
Selenium	ND (0.53)		6020A		20	NAR	10/13/16 15:20	2.08	100	CJ61103
Silver	ND (0.53)		6010C		1	KJK	10/12/16 20:20	2.08	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0035)		8260B Low		0	10/07/16 18:16		[CALC]
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0762)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
2-Butanone	ND (0.0381)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
2-Hexanone	ND (0.0381)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
4-Isopropyltoluene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0381)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Acetone	**0.0826** (0.0381)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Acrylonitrile	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Allyl Chloride	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Bromobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Bromochloromethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Bromoform	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Bromomethane	ND (0.0076)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Chlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Chloroethane	ND (0.0076)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Chloroform	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Chloromethane	ND (0.0076)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Dibromomethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0076)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Diethyl Ether	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Ethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Methylene Chloride	ND (0.0191)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Naphthalene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Styrene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0381)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Toluene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Trichloroethene	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0076)		8260B Low		1	10/07/16 18:16	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0069)		8260B Low		1	10/07/16 18:16		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*118 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*103 %*		*70-130*
Surrogate: Dibromofluoromethane	*76 %*		*70-130*
Surrogate: Toluene-d8	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 19.2
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1221	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1232	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1242	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1248	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1254	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1260	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1262	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604
Aroclor 1268	ND (0.0572)		8082A		1	10/11/16 16:41		CJ60604

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*70 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*79 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 19.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**65.8** (41.6)		8100M		1	10/07/16 16:58	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*79 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
1,2,4-Trichlorobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
1,2-Dichlorobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
1,3-Dichlorobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
1,4-Dichlorobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,4,5-Trichlorophenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,4,6-Trichlorophenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,4-Dichlorophenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,4-Dimethylphenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,4-Dinitrophenol	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,4-Dinitrotoluene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2,6-Dinitrotoluene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2-Chloronaphthalene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2-Chlorophenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2-Methylnaphthalene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2-Methylphenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2-Nitroaniline	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
2-Nitrophenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
3,3´-Dichlorobenzidine	ND (0.718)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
3+4-Methylphenol	ND (0.718)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
3-Nitroaniline	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4-Bromophenyl-phenylether	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4-Chloro-3-Methylphenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4-Chloroaniline	ND (0.718)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4-Nitroaniline	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
4-Nitrophenol	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Acenaphthene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Acenaphthylene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.718)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Aniline	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Anthracene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Azobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzidine	ND (0.718)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzo(a)anthracene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzo(a)pyrene	ND (0.180)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzo(b)fluoranthene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzo(g,h,i)perylene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzo(k)fluoranthene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzoic Acid	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Benzyl Alcohol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
bis(2-Chloroethoxy)methane	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
bis(2-Chloroethyl)ether	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Butylbenzylphthalate	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Carbazole	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Chrysene	ND (0.180)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Dibenzo(a,h)Anthracene	ND (0.180)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Dibenzofuran	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Diethylphthalate	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Dimethylphthalate	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Di-n-butylphthalate	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Di-n-octylphthalate	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Fluoranthene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Fluorene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Hexachlorobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Hexachlorobutadiene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Hexachlorocyclopentadiene	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Hexachloroethane	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-3 S-4
Date Sampled: 09/27/16 13:25
Percent Solids: 91
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Naphthalene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Nitrobenzene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
N-Nitrosodimethylamine	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
N-nitrosodiphenylamine	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Pentachlorophenol	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Phenanthrene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Phenol	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Pyrene	ND (0.358)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609
Pyridine	ND (1.80)		8270D		1	10/08/16 4:45	CZJ0094	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*68 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*5 %*	*SM*	*30-130*
Surrogate: 2-Chlorophenol-d4	*34 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: 2-Fluorophenol	*19 %*	*SM*	*30-130*
Surrogate: Nitrobenzene-d5	*68 %*		*30-130*
Surrogate: Phenol-d6	*49 %*		*30-130*
Surrogate: p-Terphenyl-d14	*117 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**4.90** (2.27)		6010C		1	KJK	10/12/16 20:26	2.6	100	CJ61103
Barium	**24.8** (2.27)		6010C		1	KJK	10/12/16 20:26	2.6	100	CJ61103
Cadmium	ND (0.45)		6020A		20	NAR	10/13/16 15:26	2.6	100	CJ61103
Chromium	**17.6** (0.91)		6010C		1	KJK	10/12/16 20:26	2.6	100	CJ61103
Lead	**50.0** (4.54)		6010C		1	KJK	10/12/16 20:26	2.6	100	CJ61103
Mercury	**0.085** (0.033)		7471B		1	BJV	10/11/16 13:01	0.71	40	CJ61104
Selenium	ND (0.45)		6020A		20	NAR	10/13/16 15:26	2.6	100	CJ61103
Silver	ND (0.45)		6010C		1	KJK	10/12/16 20:26	2.6	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0034)		8260B Low		0	10/07/16 18:42		[CALC]
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0809)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
2-Butanone	ND (0.0405)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
2-Hexanone	ND (0.0405)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0405)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Acetone	**0.303** (0.0405)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Acrylonitrile	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Allyl Chloride	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Bromobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Bromochloromethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Bromoform	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Bromomethane	ND (0.0081)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Chlorobenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Chloroethane	ND (0.0081)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Chloroform	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Chloromethane	ND (0.0081)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Dibromomethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Diethyl Ether	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Ethylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Methylene Chloride	ND (0.0202)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Naphthalene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Styrene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0405)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Toluene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Trichloroethene	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0081)		8260B Low		1	10/07/16 18:42	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0068)		8260B Low		1	10/07/16 18:42		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*120 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*108 %*		*70-130*
Surrogate: Toluene-d8	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 19.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1221	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1232	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1242	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1248	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1254	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1260	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1262	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327
Aroclor 1268	ND (0.0606)		8082A		1	10/12/16 19:12		CJ61327

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*67 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*75 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 20.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**186** (43.9)		8100M		1	10/07/16 17:38	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*85 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
1,2,4-Trichlorobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
1,2-Dichlorobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
1,3-Dichlorobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
1,4-Dichlorobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,3,4,6-Tetrachlorophenol	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,4,5-Trichlorophenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,4,6-Trichlorophenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,4-Dichlorophenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,4-Dimethylphenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,4-Dinitrophenol	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,4-Dinitrotoluene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2,6-Dinitrotoluene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2-Chloronaphthalene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2-Chlorophenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2-Methylnaphthalene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2-Methylphenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2-Nitroaniline	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
2-Nitrophenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
3,3´-Dichlorobenzidine	ND (0.832)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
3+4-Methylphenol	ND (0.832)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
3-Nitroaniline	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4,6-Dinitro-2-Methylphenol	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4-Bromophenyl-phenylether	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4-Chloro-3-Methylphenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4-Chloroaniline	ND (0.832)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4-Nitroaniline	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
4-Nitrophenol	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Acenaphthene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Acenaphthylene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.832)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Aniline	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Anthracene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Azobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzidine	ND (0.832)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzo(a)anthracene	**0.993** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzo(a)pyrene	**1.01** (0.208)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzo(b)fluoranthene	**1.54** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzo(g,h,i)perylene	**0.602** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzo(k)fluoranthene	**0.653** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzoic Acid	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Benzyl Alcohol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
bis(2-Chloroethoxy)methane	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
bis(2-Chloroethyl)ether	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Butylbenzylphthalate	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Carbazole	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Chrysene	**1.03** (0.208)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Dibenzo(a,h)Anthracene	**0.235** (0.208)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Dibenzofuran	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Diethylphthalate	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Dimethylphthalate	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Di-n-butylphthalate	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Di-n-octylphthalate	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Fluoranthene	**2.53** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Fluorene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Hexachlorobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Hexachlorobutadiene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Hexachlorocyclopentadiene	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Hexachloroethane	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Indeno(1,2,3-cd)Pyrene	**0.495** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-4 S-3
Date Sampled: 09/27/16 15:25
Percent Solids: 85
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Naphthalene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Nitrobenzene	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
N-Nitrosodimethylamine	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
N-nitrosodiphenylamine	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Pentachlorophenol	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Phenanthrene	**0.847** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Phenol	ND (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Pyrene	**2.35** (0.416)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609
Pyridine	ND (2.08)		8270D		1	10/08/16 5:22	CZJ0094	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*67 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*83 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*69 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*73 %*		*30-130*
Surrogate: 2-Fluorophenol	*66 %*		*30-130*
Surrogate: Nitrobenzene-d5	*67 %*		*30-130*
Surrogate: Phenol-d6	*69 %*		*30-130*
Surrogate: p-Terphenyl-d14	*118 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**10.6** (2.38)		6010C		1	KJK	10/12/16 20:30	2.26	100	CJ61103
Barium	**28.7** (2.38)		6010C		1	KJK	10/12/16 20:30	2.26	100	CJ61103
Cadmium	ND (0.48)		6020A		20	NAR	10/13/16 15:32	2.26	100	CJ61103
Chromium	**51.0** (0.95)		6010C		1	KJK	10/12/16 20:30	2.26	100	CJ61103
Lead	**19.2** (4.76)		6010C		1	KJK	10/12/16 20:30	2.26	100	CJ61103
Mercury	**0.035** (0.032)		7471B		1	BJV	10/11/16 13:03	0.67	40	CJ61104
Selenium	ND (0.48)		6020A		20	NAR	10/13/16 15:32	2.26	100	CJ61103
Silver	ND (0.48)		6010C		1	KJK	10/12/16 20:30	2.26	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 7.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0035)		8260B Low		0	10/07/16 19:08		[CALC]
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0758)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
2-Butanone	ND (0.0379)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
2-Hexanone	ND (0.0379)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
4-Isopropyltoluene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0379)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Acetone	ND (0.0379)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Acrylonitrile	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Allyl Chloride	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 7.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Bromobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Bromochloromethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Bromoform	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Bromomethane	ND (0.0076)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Chlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Chloroethane	ND (0.0076)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Chloroform	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Chloromethane	ND (0.0076)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Dibromomethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0076)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Diethyl Ether	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Ethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Methylene Chloride	ND (0.0189)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Naphthalene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Styrene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0379)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 7.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Toluene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Trichloroethene	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0076)		8260B Low		1	10/07/16 19:08	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0070)		8260B Low		1	10/07/16 19:08		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*116 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*107 %*		*70-130*
Surrogate: Toluene-d8	*107 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1221	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1232	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1242	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1248	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1254	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1260	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1262	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604
Aroclor 1268	ND (0.0535)		8082A		1	10/11/16 19:12		CJ60604

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*69 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*75 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 20.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**79.3** (38.6)		8100M		1	10/07/16 18:18	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*72 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 14.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2-Chlorophenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2-Methylphenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2-Nitroaniline	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
2-Nitrophenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (0.723)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
3+4-Methylphenol	ND (0.723)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
3-Nitroaniline	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4-Chloroaniline	ND (0.723)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4-Nitroaniline	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
4-Nitrophenol	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Acenaphthene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Acenaphthylene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 14.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.723)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Aniline	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Anthracene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Azobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzidine	ND (0.723)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzo(a)anthracene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzo(a)pyrene	**0.295** (0.181)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzo(b)fluoranthene	**0.466** (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzo(g,h,i)perylene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzo(k)fluoranthene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzoic Acid	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Carbazole	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Chrysene	**0.289** (0.181)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.181)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Dibenzofuran	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Diethylphthalate	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Dimethylphthalate	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Fluoranthene	**0.549** (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Fluorene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Hexachloroethane	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-5 S-4
Date Sampled: 09/28/16 14:15
Percent Solids: 93
Initial Volume: 14.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Naphthalene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Nitrobenzene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Pentachlorophenol	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Phenanthrene	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Phenol	ND (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Pyrene	**0.394** (0.361)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609
Pyridine	ND (1.81)		8270D		1	10/11/16 15:14	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*80 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*92 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*87 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*80 %*		*30-130*
Surrogate: 2-Fluorophenol	*84 %*		*30-130*
Surrogate: Nitrobenzene-d5	*81 %*		*30-130*
Surrogate: Phenol-d6	*92 %*		*30-130*
Surrogate: p-Terphenyl-d14	*82 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**11.5** (2.90)		6010C		1	KJK	10/12/16 20:34	2.03	100	CJ61103
Barium	**91.4** (2.90)		6010C		1	KJK	10/12/16 20:34	2.03	100	CJ61103
Cadmium	ND (0.58)		6020A		20	NAR	10/13/16 15:38	2.03	100	CJ61103
Chromium	**35.8** (1.16)		6010C		1	KJK	10/12/16 20:34	2.03	100	CJ61103
Lead	**216** (5.80)		6010C		1	KJK	10/12/16 20:34	2.03	100	CJ61103
Mercury	**0.523** (0.033)		7471B		1	BJV	10/11/16 13:05	0.7	40	CJ61104
Selenium	**1.91** (0.58)		6020A		20	NAR	10/13/16 15:38	2.03	100	CJ61103
Silver	ND (0.58)		6010C		1	KJK	10/12/16 20:34	2.03	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 9.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0027)		8260B Low		0	10/07/16 19:34		[CALC]
1,4-Dichlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0626)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
2-Butanone	ND (0.0313)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
2-Hexanone	ND (0.0313)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
4-Isopropyltoluene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0313)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Acetone	**0.102** (0.0313)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Acrylonitrile	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Allyl Chloride	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 9.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Bromobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Bromochloromethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Bromoform	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Bromomethane	ND (0.0063)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Chlorobenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Chloroethane	ND (0.0063)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Chloroform	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Chloromethane	ND (0.0063)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Dibromomethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0063)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Diethyl Ether	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Ethylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Methylene Chloride	ND (0.0156)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Naphthalene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Styrene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0313)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 9.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Toluene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Trichloroethene	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0031)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0063)		8260B Low		1	10/07/16 19:34	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0053)		8260B Low		1	10/07/16 19:34		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*125 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*94 %*		*70-130*
Surrogate: Dibromofluoromethane	*110 %*		*70-130*
Surrogate: Toluene-d8	*112 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 20.6
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1221	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1232	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1242	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1248	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1254	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1260	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1262	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604
Aroclor 1268	ND (0.0571)		8082A		1	10/11/16 19:31		CJ60604

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*86 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*95 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*84 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*90 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 20.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (42.2)		8100M		1	10/07/16 18:58	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*66 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
1,2,4-Trichlorobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
1,2-Dichlorobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
1,3-Dichlorobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
1,4-Dichlorobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,3,4,6-Tetrachlorophenol	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,4,5-Trichlorophenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,4,6-Trichlorophenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,4-Dichlorophenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,4-Dimethylphenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,4-Dinitrophenol	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,4-Dinitrotoluene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2,6-Dinitrotoluene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2-Chloronaphthalene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2-Chlorophenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2-Methylnaphthalene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2-Methylphenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2-Nitroaniline	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
2-Nitrophenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
3,3´-Dichlorobenzidine	ND (0.841)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
3+4-Methylphenol	ND (0.841)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
3-Nitroaniline	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4,6-Dinitro-2-Methylphenol	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4-Bromophenyl-phenylether	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4-Chloro-3-Methylphenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4-Chloroaniline	ND (0.841)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4-Nitroaniline	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
4-Nitrophenol	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Acenaphthene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Acenaphthylene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.841)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Aniline	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Anthracene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Azobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzidine	ND (0.841)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzo(a)anthracene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzo(a)pyrene	ND (0.211)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzo(b)fluoranthene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzo(g,h,i)perylene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzo(k)fluoranthene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzoic Acid	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Benzyl Alcohol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
bis(2-Chloroethoxy)methane	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
bis(2-Chloroethyl)ether	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Butylbenzylphthalate	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Carbazole	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Chrysene	ND (0.211)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Dibenzo(a,h)Anthracene	ND (0.211)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Dibenzofuran	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Diethylphthalate	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Dimethylphthalate	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Di-n-butylphthalate	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Di-n-octylphthalate	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Fluoranthene	**0.424** (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Fluorene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Hexachlorobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Hexachlorobutadiene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Hexachlorocyclopentadiene	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Hexachloroethane	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-6 S-3
Date Sampled: 09/28/16 12:20
Percent Solids: 85
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Naphthalene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Nitrobenzene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
N-Nitrosodimethylamine	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
N-nitrosodiphenylamine	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Pentachlorophenol	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Phenanthrene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Phenol	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Pyrene	ND (0.420)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609
Pyridine	ND (2.11)		8270D		1	10/08/16 6:37	CZJ0094	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*73 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*83 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*76 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: 2-Fluorophenol	*75 %*		*30-130*
Surrogate: Nitrobenzene-d5	*74 %*		*30-130*
Surrogate: Phenol-d6	*77 %*		*30-130*
Surrogate: p-Terphenyl-d14	*105 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**7.43** (2.77)		6010C		1	KJK	10/12/16 20:38	2.12	100	CJ61103
Barium	**43.2** (2.77)		6010C		1	KJK	10/12/16 20:38	2.12	100	CJ61103
Cadmium	ND (0.55)		6020A		20	NAR	10/13/16 15:44	2.12	100	CJ61103
Chromium	**29.0** (1.11)		6010C		1	KJK	10/12/16 20:38	2.12	100	CJ61103
Lead	**307** (5.53)		6010C		1	KJK	10/12/16 20:38	2.12	100	CJ61103
Mercury	**0.105** (0.037)		7471B		1	BJV	10/11/16 13:07	0.62	40	CJ61104
Selenium	ND (0.55)		6020A		20	NAR	10/13/16 15:44	2.12	100	CJ61103
Silver	ND (0.55)		6010C		1	KJK	10/12/16 20:38	2.12	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 7.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0032)		8260B Low		0	10/07/16 20:00		[CALC]
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0762)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
2-Butanone	ND (0.0381)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
2-Hexanone	ND (0.0381)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
4-Isopropyltoluene	**0.0312** (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0381)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Acetone	**0.176** (0.0381)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Acrylonitrile	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Allyl Chloride	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 7.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Bromobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Bromochloromethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Bromoform	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Bromomethane	ND (0.0076)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Chlorobenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Chloroethane	ND (0.0076)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Chloroform	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Chloromethane	ND (0.0076)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Dibromomethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0076)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Diethyl Ether	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Ethylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Methylene Chloride	ND (0.0190)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Naphthalene	**0.0255** (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Styrene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0381)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 7.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Toluene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Trichloroethene	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0076)		8260B Low		1	10/07/16 20:00	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0065)		8260B Low		1	10/07/16 20:00		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*124 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*110 %*		*70-130*
Surrogate: Toluene-d8	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 20.6
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1221	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1232	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1242	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1248	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1254	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1260	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1262	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327
Aroclor 1268	ND (0.0569)		8082A		1	10/12/16 19:31		CJ61327

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*93 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*105 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*63 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*57 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 19.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**354** (45.8)		8100M		1	10/07/16 19:39	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*72 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2-Chlorophenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2-Methylphenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2-Nitroaniline	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
2-Nitrophenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (1.59)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
3+4-Methylphenol	ND (1.59)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
3-Nitroaniline	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4-Chloroaniline	ND (1.59)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4-Nitroaniline	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
4-Nitrophenol	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Acenaphthene	**1.14** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Acenaphthylene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (1.59)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Aniline	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Anthracene	**1.71** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Azobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzidine	ND (1.59)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzo(a)anthracene	**2.80** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzo(a)pyrene	**2.38** (0.397)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzo(b)fluoranthene	**3.98** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzo(g,h,i)perylene	**0.819** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzo(k)fluoranthene	**1.15** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzoic Acid	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Carbazole	**1.29** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Chrysene	**2.81** (0.397)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.397)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Dibenzofuran	**1.76** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Diethylphthalate	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Dimethylphthalate	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Fluoranthene	**8.26** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Fluorene	**2.72** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Hexachloroethane	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-7 S-4
Date Sampled: 09/28/16 12:00
Percent Solids: 85
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Naphthalene	**0.897** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Nitrobenzene	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Pentachlorophenol	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Phenanthrene	**9.88** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Phenol	ND (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Pyrene	**5.32** (0.792)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609
Pyridine	ND (3.97)		8270D		2	10/11/16 15:52	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*67 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*88 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*72 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: 2-Fluorophenol	*68 %*		*30-130*
Surrogate: Nitrobenzene-d5	*65 %*		*30-130*
Surrogate: Phenol-d6	*75 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**6.42** (2.60)		6010C		1	KJK	10/12/16 20:42	2.11	100	CJ61103
Barium	**22.6** (2.60)		6010C		1	KJK	10/12/16 20:42	2.11	100	CJ61103
Cadmium	**0.58** (0.52)		6020A		20	NAR	10/13/16 15:50	2.11	100	CJ61103
Chromium	**28.4** (1.04)		6010C		1	KJK	10/12/16 20:42	2.11	100	CJ61103
Lead	**72.0** (5.20)		6010C		1	KJK	10/12/16 20:42	2.11	100	CJ61103
Mercury	**0.038** (0.031)		7471B		1	BJV	10/11/16 13:13	0.7	40	CJ61104
Selenium	ND (0.52)		6020A		20	NAR	10/13/16 15:50	2.11	100	CJ61103
Silver	ND (0.52)		6010C		1	KJK	10/12/16 20:42	2.11	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0032)		8260B Low		0	10/07/16 20:26		[CALC]
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0695)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
2-Butanone	ND (0.0347)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
2-Hexanone	ND (0.0347)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
4-Isopropyltoluene	**E 0.337** (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0347)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Acetone	**0.237** (0.0347)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Acrylonitrile	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Allyl Chloride	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Bromobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Bromochloromethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Bromoform	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Bromomethane	ND (0.0069)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Chlorobenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Chloroethane	ND (0.0069)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Chloroform	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Chloromethane	ND (0.0069)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Dibromomethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0069)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Diethyl Ether	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Ethylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Methylene Chloride	ND (0.0174)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Naphthalene	**0.0047** (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Styrene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0347)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Toluene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Trichloroethene	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0069)		8260B Low		1	10/07/16 20:26	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0063)		8260B Low		1	10/07/16 20:26		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*119 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*103 %*		*70-130*
Surrogate: Dibromofluoromethane	*106 %*		*70-130*
Surrogate: Toluene-d8	*108 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 26.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,1,1-Trichloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,1,2,2-Tetrachloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,1,2-Trichloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,1-Dichloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,1-Dichloroethene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,1-Dichloropropene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2,3-Trichlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2,3-Trichloropropane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2,4-Trichlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2,4-Trimethylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2-Dibromo-3-Chloropropane	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2-Dibromoethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2-Dichlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2-Dichloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,2-Dichloropropane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,3 Dichloropropene (Total)	ND (0.145)		8260B		1	10/11/16 15:59		[CALC]
1,3,5-Trichlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,3,5-Trimethylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,3-Dichlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,4-Dichlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
1,4-Dioxane - Screen	ND (28.9)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
2,2-Dichloropropane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
2-Butanone	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
2-Chlorotoluene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
2-Hexanone	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
4-Chlorotoluene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
4-Isopropyltoluene	**8.86** (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
4-Methyl-2-Pentanone	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Acetone	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Acrylonitrile	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Allyl Chloride	ND (0.289)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 26.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Bromobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Bromochloromethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Bromodichloromethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Bromoform	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Bromomethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Carbon Disulfide	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Carbon Tetrachloride	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Chlorobenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Chloroethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Chloroform	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Chloromethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
cis-1,2-Dichloroethene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Dibromochloromethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Dibromomethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Dichlorodifluoromethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Diethyl Ether	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Di-isopropyl ether	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Ethyl tertiary-butyl ether	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Ethylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Hexachlorobutadiene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Isopropylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Methyl tert-Butyl Ether	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Methylene Chloride	ND (0.289)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Naphthalene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
n-Butylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
n-Propylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
sec-Butylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Styrene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
tert-Butylbenzene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Tertiary-amyl methyl ether	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Tetrachloroethene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 26.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrahydrofuran	ND (0.723)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Toluene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
trans-1,2-Dichloroethene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Trichloroethene	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Trichlorofluoromethane	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Vinyl Chloride	ND (0.145)		8260B		1	10/11/16 15:59	CZJ0121	CJ61136
Xylenes (Total)	ND (0.289)		8260B		1	10/11/16 15:59		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*94 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*93 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 19.1
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1221	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1232	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1242	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1248	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1254	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1260	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1262	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327
Aroclor 1268	ND (0.0575)		8082A		1	10/12/16 19:50		CJ61327

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*65 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*73 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*71 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*73 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 19.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**168** (42.4)		8100M		1	10/07/16 20:19	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*68 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 15.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2-Chlorophenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2-Methylphenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2-Nitroaniline	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
2-Nitrophenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (1.41)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
3+4-Methylphenol	ND (1.41)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
3-Nitroaniline	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4-Chloroaniline	ND (1.41)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4-Nitroaniline	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
4-Nitrophenol	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Acenaphthene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Acenaphthylene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 15.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (1.41)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Aniline	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Anthracene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Azobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzidine	ND (1.41)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzo(a)anthracene	**0.802** (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzo(a)pyrene	**0.830** (0.352)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzo(b)fluoranthene	**1.62** (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzo(g,h,i)perylene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzo(k)fluoranthene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzoic Acid	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Carbazole	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Chrysene	**0.951** (0.352)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.352)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Dibenzofuran	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Diethylphthalate	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Dimethylphthalate	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Fluoranthene	**2.15** (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Fluorene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Hexachloroethane	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-8 S-2
Date Sampled: 09/28/16 14:40
Percent Solids: 91
Initial Volume: 15.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Naphthalene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Nitrobenzene	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Pentachlorophenol	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Phenanthrene	**0.953** (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Phenol	ND (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Pyrene	**1.46** (0.703)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609
Pyridine	ND (3.52)		8270D		2	10/11/16 16:29	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*68 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*93 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*76 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: 2-Fluorophenol	*71 %*		*30-130*
Surrogate: Nitrobenzene-d5	*68 %*		*30-130*
Surrogate: Phenol-d6	*81 %*		*30-130*
Surrogate: p-Terphenyl-d14	*96 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**13.7** (2.75)		6010C		1	KJK	10/12/16 20:46	2.21	100	CJ61103
Barium	**58.4** (2.75)		6010C		1	KJK	10/12/16 20:46	2.21	100	CJ61103
Cadmium	ND (0.55)		6020A		20	NAR	10/13/16 15:56	2.21	100	CJ61103
Chromium	**32.7** (1.10)		6010C		1	KJK	10/12/16 20:46	2.21	100	CJ61103
Lead	**30.9** (5.50)		6010C		1	KJK	10/12/16 20:46	2.21	100	CJ61103
Mercury	**0.046** (0.033)		7471B		1	BJV	10/11/16 13:15	0.73	40	CJ61104
Selenium	ND (0.55)		6020A		20	NAR	10/13/16 15:56	2.21	100	CJ61103
Silver	ND (0.55)		6010C		1	KJK	10/12/16 20:46	2.21	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,3,5-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,3-Dichloropropene (Total)	ND (0.0037)		8260B Low		0	10/07/16 20:52		[CALC]
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
1,4-Dioxane	ND (0.0907)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
2-Butanone	ND (0.0453)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
2-Chlorotoluene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
2-Hexanone	ND (0.0453)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
4-Chlorotoluene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
4-Isopropyltoluene	**0.0440** (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
4-Methyl-2-Pentanone	ND (0.0453)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Acetone	**0.235** (0.0453)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Acrylonitrile	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Allyl Chloride	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Bromobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Bromochloromethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Bromodichloromethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Bromoform	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Bromomethane	ND (0.0091)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Carbon Disulfide	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Chlorobenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Chloroethane	ND (0.0091)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Chloroform	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Chloromethane	ND (0.0091)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Dibromochloromethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Dibromomethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Dichlorodifluoromethane	ND (0.0091)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Diethyl Ether	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Di-isopropyl ether	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Ethylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Isopropylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Methylene Chloride	ND (0.0227)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Naphthalene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
n-Butylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
n-Propylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
sec-Butylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Styrene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
tert-Butylbenzene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Tertiary-butyl Alcohol	ND (0.0453)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Tetrahydrofuran	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Toluene	**0.0105** (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Trichloroethene	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Vinyl Chloride	ND (0.0091)		8260B Low		1	10/07/16 20:52	CZJ0093	CJ60724
Xylenes (Total)	ND (0.0075)		8260B Low		1	10/07/16 20:52		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*112 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*103 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 20.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 11:45

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1221	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1232	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1242	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1248	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1254	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1260	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1262	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604
Aroclor 1268	ND (0.0593)		8082A		1	10/11/16 20:27		CJ60604

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*72 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*82 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*87 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 19
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**136** (48.0)		8100M		1	10/07/16 21:01	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*67 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 15.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
1,2,4-Trichlorobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
1,2-Dichlorobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
1,3-Dichlorobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
1,4-Dichlorobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,4,5-Trichlorophenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,4,6-Trichlorophenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,4-Dichlorophenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,4-Dimethylphenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,4-Dinitrophenol	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,4-Dinitrotoluene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2,6-Dinitrotoluene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2-Chloronaphthalene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2-Chlorophenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2-Methylnaphthalene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2-Methylphenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2-Nitroaniline	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
2-Nitrophenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
3,3´-Dichlorobenzidine	ND (0.779)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
3+4-Methylphenol	ND (0.779)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
3-Nitroaniline	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4-Bromophenyl-phenylether	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4-Chloro-3-Methylphenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4-Chloroaniline	ND (0.779)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4-Nitroaniline	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
4-Nitrophenol	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Acenaphthene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Acenaphthylene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 15.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.779)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Aniline	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Anthracene	**0.526** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Azobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzidine	ND (0.779)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzo(a)anthracene	**1.09** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzo(a)pyrene	**0.803** (0.195)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzo(b)fluoranthene	**1.19** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzo(g,h,i)perylene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzo(k)fluoranthene	**0.395** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzoic Acid	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Benzyl Alcohol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
bis(2-Chloroethoxy)methane	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
bis(2-Chloroethyl)ether	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Butylbenzylphthalate	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Carbazole	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Chrysene	**0.890** (0.195)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Dibenzo(a,h)Anthracene	ND (0.195)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Dibenzofuran	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Diethylphthalate	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Dimethylphthalate	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Di-n-butylphthalate	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Di-n-octylphthalate	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Fluoranthene	**2.88** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Fluorene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Hexachlorobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Hexachlorobutadiene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Hexachlorocyclopentadiene	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Hexachloroethane	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-9 S-3
Date Sampled: 09/27/16 11:20
Percent Solids: 82
Initial Volume: 15.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Naphthalene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Nitrobenzene	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
N-Nitrosodimethylamine	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
N-nitrosodiphenylamine	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Pentachlorophenol	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Phenanthrene	**2.26** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Phenol	ND (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Pyrene	**3.17** (0.389)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609
Pyridine	ND (1.95)		8270D		1	10/08/16 8:29	CZJ0094	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*65 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*75 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*72 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*60 %*		*30-130*
Surrogate: 2-Fluorophenol	*71 %*		*30-130*
Surrogate: Nitrobenzene-d5	*59 %*		*30-130*
Surrogate: Phenol-d6	*75 %*		*30-130*
Surrogate: p-Terphenyl-d14	*129 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**12.4** (2.37)		6010C		1	KJK	10/12/16 20:50	2.49	100	CJ61103
Barium	**50.4** (2.37)		6010C		1	KJK	10/12/16 20:50	2.49	100	CJ61103
Cadmium	ND (0.47)		6020A		20	NAR	10/13/16 16:01	2.49	100	CJ61103
Chromium	**34.3** (0.95)		6010C		1	KJK	10/12/16 20:50	2.49	100	CJ61103
Lead	**34.1** (4.73)		6010C		1	KJK	10/12/16 20:50	2.49	100	CJ61103
Mercury	**0.053** (0.034)		7471B		1	BJV	10/11/16 13:17	0.69	40	CJ61104
Selenium	ND (0.47)		6020A		20	NAR	10/13/16 16:01	2.49	100	CJ61103
Silver	ND (0.47)		6010C		1	KJK	10/12/16 20:50	2.49	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0031)		8260B Low		0	10/11/16 17:12		[CALC]
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0727)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
2-Butanone	ND (0.0364)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
2-Hexanone	ND (0.0364)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
4-Isopropyltoluene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0364)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Acetone	ND (0.0364)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Acrylonitrile	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Allyl Chloride	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Bromobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Bromochloromethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Bromoform	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Bromomethane	ND (0.0073)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Chlorobenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Chloroethane	ND (0.0073)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Chloroform	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Chloromethane	ND (0.0073)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Dibromomethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0073)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Diethyl Ether	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Ethylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Isopropylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Methylene Chloride	ND (0.0182)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Naphthalene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
n-Butylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
n-Propylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
sec-Butylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Styrene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0364)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Toluene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Trichloroethene	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0073)		8260B Low		1	10/11/16 17:12	CZJ0122	CJ61137
Xylenes (Total)	ND (0.0062)		8260B Low		1	10/11/16 17:12		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*122 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*103 %*		*70-130*
Surrogate: Dibromofluoromethane	*115 %*		*70-130*
Surrogate: Toluene-d8	*108 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 20.1
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1221	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1232	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1242	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1248	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1254	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1260	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1262	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709
Aroclor 1268	ND (0.0586)		8082A		1	10/11/16 20:46		CJ60709

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*65 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*71 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*72 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 19.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DPS
Prepared: 10/7/16 9:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**64.2** (44.9)		8100M		1	10/07/16 21:39	CZJ0081	CJ60608

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*74 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 14.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2-Chlorophenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2-Methylphenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2-Nitroaniline	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
2-Nitrophenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (0.791)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
3+4-Methylphenol	ND (0.791)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
3-Nitroaniline	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4-Chloroaniline	ND (0.791)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4-Nitroaniline	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
4-Nitrophenol	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Acenaphthene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Acenaphthylene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 14.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.791)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Aniline	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Anthracene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Azobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzidine	ND (0.791)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzo(a)anthracene	**0.982** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzo(a)pyrene	**1.06** (0.198)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzo(b)fluoranthene	**1.67** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzo(g,h,i)perylene	**0.490** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzo(k)fluoranthene	**0.523** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzoic Acid	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Carbazole	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Chrysene	**0.953** (0.198)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	**0.205** (0.198)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Dibenzofuran	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Diethylphthalate	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Dimethylphthalate	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Fluoranthene	**2.26** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Fluorene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Hexachloroethane	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	**0.428** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-10 S-3
Date Sampled: 09/29/16 14:10
Percent Solids: 85
Initial Volume: 14.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Naphthalene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Nitrobenzene	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Pentachlorophenol	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Phenanthrene	**1.26** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Phenol	ND (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Pyrene	**1.86** (0.395)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609
Pyridine	ND (1.98)		8270D		1	10/11/16 17:06	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*54 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*90 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*63 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*59 %*		*30-130*
Surrogate: 2-Fluorophenol	*59 %*		*30-130*
Surrogate: Nitrobenzene-d5	*55 %*		*30-130*
Surrogate: Phenol-d6	*66 %*		*30-130*
Surrogate: p-Terphenyl-d14	*109 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**6.57** (2.39)		6010C		1	KJK	10/12/16 20:54	2.38	100	CJ61103
Barium	**45.0** (2.39)		6010C		1	KJK	10/12/16 20:54	2.38	100	CJ61103
Cadmium	ND (0.48)		6020A		20	NAR	10/13/16 16:07	2.38	100	CJ61103
Chromium	**24.8** (0.96)		6010C		1	KJK	10/12/16 20:54	2.38	100	CJ61103
Lead	**35.3** (4.79)		6010C		1	KJK	10/12/16 20:54	2.38	100	CJ61103
Mercury	**0.098** (0.033)		7471B		1	BJV	10/11/16 13:19	0.69	40	CJ61104
Selenium	ND (0.48)		6020A		20	NAR	10/13/16 16:07	2.38	100	CJ61103
Silver	**0.78** (0.48)		6010C		1	KJK	10/12/16 20:54	2.38	100	CJ61103

ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory
The Microbiology Division of Thielsch Engineering, Inc.

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 8.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0030)		8260B Low		0	10/11/16 17:38		[CALC]
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0678)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
2-Butanone	ND (0.0339)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
2-Hexanone	ND (0.0339)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0339)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Acetone	ND (0.0339)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Acrylonitrile	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Allyl Chloride	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 8.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Bromobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Bromochloromethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Bromoform	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Bromomethane	ND (0.0068)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Chlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Chloroethane	ND (0.0068)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Chloroform	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Chloromethane	ND (0.0068)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Dibromomethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0068)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Diethyl Ether	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Ethylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Isopropylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Methylene Chloride	ND (0.0170)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Naphthalene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
n-Butylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
n-Propylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
sec-Butylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Styrene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0339)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 8.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Toluene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Trichloroethene	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0068)		8260B Low		1	10/11/16 17:38	CZJ0122	CJ61137
Xylenes (Total)	ND (0.0060)		8260B Low		1	10/11/16 17:38		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*125 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*105 %*		*70-130*
Surrogate: Dibromofluoromethane	*116 %*		*70-130*
Surrogate: Toluene-d8	*105 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 20.7
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1221	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1232	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1242	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1248	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1254	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1260	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1262	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709
Aroclor 1268	ND (0.0550)		8082A		1	10/11/16 21:04		CJ60709

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*61 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*68 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*72 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*72 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 19.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ZLC
Prepared: 10/7/16 10:00

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**209** (43.2)		8100M		1	10/07/16 15:39	CZJ0090	CJ60712

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*62 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 14.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
1,2,4-Trichlorobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
1,2-Dichlorobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
1,3-Dichlorobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
1,4-Dichlorobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,3,4,6-Tetrachlorophenol	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,4,5-Trichlorophenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,4,6-Trichlorophenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,4-Dichlorophenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,4-Dimethylphenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,4-Dinitrophenol	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,4-Dinitrotoluene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2,6-Dinitrotoluene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2-Chloronaphthalene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2-Chlorophenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2-Methylnaphthalene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2-Methylphenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2-Nitroaniline	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
2-Nitrophenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
3,3´-Dichlorobenzidine	ND (3.17)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
3+4-Methylphenol	ND (3.17)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
3-Nitroaniline	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4,6-Dinitro-2-Methylphenol	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4-Bromophenyl-phenylether	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4-Chloro-3-Methylphenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4-Chloroaniline	ND (3.17)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4-Chloro-phenyl-phenyl ether	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4-Nitroaniline	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
4-Nitrophenol	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Acenaphthene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Acenaphthylene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 14.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (3.17)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Aniline	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Anthracene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Azobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzidine	ND (3.17)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzo(a)anthracene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzo(a)pyrene	ND (0.793)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzo(b)fluoranthene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzo(g,h,i)perylene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzo(k)fluoranthene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzoic Acid	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Benzyl Alcohol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
bis(2-Chloroethoxy)methane	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
bis(2-Chloroethyl)ether	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
bis(2-chloroisopropyl)Ether	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
bis(2-Ethylhexyl)phthalate	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Butylbenzylphthalate	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Carbazole	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Chrysene	**0.853** (0.793)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Dibenzo(a,h)Anthracene	ND (0.793)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Dibenzofuran	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Diethylphthalate	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Dimethylphthalate	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Di-n-butylphthalate	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Di-n-octylphthalate	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Fluoranthene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Fluorene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Hexachlorobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Hexachlorobutadiene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Hexachlorocyclopentadiene	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Hexachloroethane	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-11 S-2
Date Sampled: 09/29/16 14:45
Percent Solids: 88
Initial Volume: 14.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Naphthalene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Nitrobenzene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
N-Nitrosodimethylamine	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
N-Nitroso-Di-n-Propylamine	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
N-nitrosodiphenylamine	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Pentachlorophenol	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Phenanthrene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Phenol	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Pyrene	ND (1.58)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609
Pyridine	ND (7.93)		8270D		4	10/13/16 19:03	CZJ0162	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*56 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*73 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*64 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*72 %*		*30-130*
Surrogate: 2-Fluorophenol	*64 %*		*30-130*
Surrogate: Nitrobenzene-d5	*59 %*		*30-130*
Surrogate: Phenol-d6	*65 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**13.9** (1.92)		6010C		1	KJK	10/12/16 20:59	2.83	100	CJ61103
Barium	**50.5** (1.92)		6010C		1	KJK	10/12/16 20:59	2.83	100	CJ61103
Cadmium	ND (0.38)		6020A		20	NAR	10/13/16 16:25	2.83	100	CJ61103
Chromium	**53.0** (0.77)		6010C		1	KJK	10/12/16 20:59	2.83	100	CJ61103
Lead	**12.5** (3.84)		6010C		1	KJK	10/12/16 20:59	2.83	100	CJ61103
Mercury	ND (0.032)		7471B		1	BJV	10/11/16 13:21	0.67	40	CJ61104
Selenium	ND (0.38)		6020A		20	NAR	10/13/16 16:25	2.83	100	CJ61103
Silver	ND (0.38)		6010C		1	KJK	10/12/16 20:59	2.83	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0034)		8260B Low		0	10/11/16 18:04		[CALC]
1,4-Dichlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0744)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
2-Butanone	ND (0.0372)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
2-Hexanone	ND (0.0372)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
4-Isopropyltoluene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0372)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Acetone	**0.0525** (0.0372)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Acrylonitrile	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Allyl Chloride	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Bromobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Bromochloromethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Bromoform	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Bromomethane	ND (0.0074)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Chlorobenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Chloroethane	ND (0.0074)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Chloroform	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Chloromethane	ND (0.0074)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Dibromomethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0074)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Diethyl Ether	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Ethylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Isopropylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Methylene Chloride	ND (0.0186)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Naphthalene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
n-Butylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
n-Propylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
sec-Butylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Styrene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0372)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 7.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Toluene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Trichloroethene	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0037)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0074)		8260B Low		1	10/11/16 18:04	CZJ0122	CJ61137
Xylenes (Total)	ND (0.0068)		8260B Low		1	10/11/16 18:04		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*124 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*104 %*		*70-130*
Surrogate: Dibromofluoromethane	*117 %*		*70-130*
Surrogate: Toluene-d8	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 19.4
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1221	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1232	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1242	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1248	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1254	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1260	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1262	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709
Aroclor 1268	ND (0.0560)		8082A		1	10/11/16 21:23		CJ60709

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*71 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*78 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 19.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ZLC
Prepared: 10/7/16 10:00

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**48.3** (42.0)		8100M		1	10/07/16 16:18	CZJ0090	CJ60712

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*60 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2-Chlorophenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2-Methylphenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2-Nitroaniline	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
2-Nitrophenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (0.701)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
3+4-Methylphenol	ND (0.701)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
3-Nitroaniline	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4-Chloroaniline	ND (0.701)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4-Nitroaniline	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
4-Nitrophenol	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Acenaphthene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Acenaphthylene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.701)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Aniline	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Anthracene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Azobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzidine	ND (0.701)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzo(a)anthracene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzo(a)pyrene	**0.199** (0.176)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzo(b)fluoranthene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzo(g,h,i)perylene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzo(k)fluoranthene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzoic Acid	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Carbazole	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Chrysene	ND (0.176)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.176)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Dibenzofuran	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Diethylphthalate	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Dimethylphthalate	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Fluoranthene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Fluorene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Hexachloroethane	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-12 S-1
Date Sampled: 09/29/16 15:05
Percent Solids: 92
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Naphthalene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Nitrobenzene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Pentachlorophenol	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Phenanthrene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Phenol	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Pyrene	ND (0.350)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609
Pyridine	ND (1.76)		8270D		1	10/11/16 18:21	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*79 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*89 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*85 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*78 %*		*30-130*
Surrogate: 2-Fluorophenol	*80 %*		*30-130*
Surrogate: Nitrobenzene-d5	*80 %*		*30-130*
Surrogate: Phenol-d6	*87 %*		*30-130*
Surrogate: p-Terphenyl-d14	*102 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**15.8** (2.55)		6010C		1	KJK	10/12/16 21:18	2.13	100	CJ61103
Barium	**30.1** (2.55)		6010C		1	KJK	10/12/16 21:18	2.13	100	CJ61103
Cadmium	ND (0.51)		6020A		20	NAR	10/13/16 16:31	2.13	100	CJ61103
Chromium	**27.3** (1.02)		6010C		1	KJK	10/12/16 21:18	2.13	100	CJ61103
Lead	**277** (5.11)		6010C		1	KJK	10/12/16 21:18	2.13	100	CJ61103
Mercury	**0.094** (0.030)		7471B		1	BJV	10/11/16 13:23	0.71	40	CJ61104
Selenium	ND (0.51)		6020A		20	NAR	10/13/16 16:31	2.13	100	CJ61103
Silver	ND (0.51)		6010C		1	KJK	10/12/16 21:18	2.13	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0031)		8260B Low		0	10/11/16 18:30		[CALC]
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0671)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
2-Butanone	ND (0.0336)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
2-Hexanone	ND (0.0336)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0336)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Acetone	ND (0.0336)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Acrylonitrile	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Allyl Chloride	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Bromobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Bromochloromethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Bromoform	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Bromomethane	ND (0.0067)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Chlorobenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Chloroethane	ND (0.0067)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Chloroform	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Chloromethane	ND (0.0067)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Dibromomethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0067)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Diethyl Ether	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Ethylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Isopropylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Methylene Chloride	ND (0.0168)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Naphthalene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
n-Butylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
n-Propylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
sec-Butylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Styrene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0336)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 8.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Toluene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Trichloroethene	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0067)		8260B Low		1	10/11/16 18:30	CZJ0122	CJ61137
Xylenes (Total)	ND (0.0062)		8260B Low		1	10/11/16 18:30		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*123 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*100 %*		*70-130*
Surrogate: Dibromofluoromethane	*115 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 20.3
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1221	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1232	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1242	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1248	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1254	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1260	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1262	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709
Aroclor 1268	ND (0.0536)		8082A		1	10/11/16 22:20		CJ60709

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*79 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*91 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*96 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 19.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ZLC
Prepared: 10/7/16 10:00

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**222** (41.0)		8100M		1	10/07/16 18:14	CZJ0090	CJ60712

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*76 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2-Chlorophenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2-Methylphenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2-Nitroaniline	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
2-Nitrophenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (0.777)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
3+4-Methylphenol	ND (0.777)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
3-Nitroaniline	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4-Chloroaniline	ND (0.777)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4-Nitroaniline	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
4-Nitrophenol	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Acenaphthene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Acenaphthylene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.777)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Aniline	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Anthracene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Azobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzidine	ND (0.777)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzo(a)anthracene	**0.723** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzo(a)pyrene	**0.856** (0.195)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzo(b)fluoranthene	**1.36** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzo(g,h,i)perylene	**0.552** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzo(k)fluoranthene	**0.531** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzoic Acid	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Carbazole	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Chrysene	**0.922** (0.195)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.195)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Dibenzofuran	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Diethylphthalate	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Dimethylphthalate	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Fluoranthene	**2.20** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Fluorene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Hexachloroethane	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	**0.422** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-13 S-3
Date Sampled: 09/28/16 14:50
Percent Solids: 92
Initial Volume: 14
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Naphthalene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Nitrobenzene	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Pentachlorophenol	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Phenanthrene	**0.871** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Phenol	ND (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Pyrene	**2.21** (0.388)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609
Pyridine	ND (1.95)		8270D		1	10/11/16 18:59	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*61 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*87 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*73 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: 2-Fluorophenol	*68 %*		*30-130*
Surrogate: Nitrobenzene-d5	*65 %*		*30-130*
Surrogate: Phenol-d6	*76 %*		*30-130*
Surrogate: p-Terphenyl-d14	*120 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**11.8** (2.28)		6010C		1	KJK	10/12/16 21:22	2.62	100	CJ61103
Barium	**71.4** (2.28)		6010C		1	KJK	10/12/16 21:22	2.62	100	CJ61103
Cadmium	ND (0.46)		6020A		20	NAR	10/13/16 16:37	2.62	100	CJ61103
Chromium	**57.2** (0.91)		6010C		1	KJK	10/12/16 21:22	2.62	100	CJ61103
Lead	**318** (4.56)		6010C		1	KJK	10/12/16 21:22	2.62	100	CJ61103
Mercury	**0.043** (0.039)		7471B		1	BJV	10/11/16 13:25	0.6	40	CJ61104
Selenium	ND (0.46)		6020A		20	NAR	10/13/16 16:37	2.62	100	CJ61103
Silver	ND (0.46)		6010C		1	KJK	10/12/16 21:22	2.62	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0037)		8260B Low		0	10/11/16 18:56		[CALC]
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0892)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
2-Butanone	ND (0.0446)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
2-Hexanone	ND (0.0446)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
4-Isopropyltoluene	**0.138** (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0446)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Acetone	ND (0.0446)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Acrylonitrile	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Allyl Chloride	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Bromobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Bromochloromethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Bromoform	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Bromomethane	ND (0.0089)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Chlorobenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Chloroethane	ND (0.0089)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Chloroform	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Chloromethane	ND (0.0089)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Dibromomethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Diethyl Ether	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Ethylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Isopropylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Methylene Chloride	ND (0.0223)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Naphthalene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
n-Butylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
n-Propylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
sec-Butylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Styrene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0446)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 6.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Toluene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Trichloroethene	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0089)		8260B Low		1	10/11/16 18:56	CZJ0122	CJ61137
Xylenes (Total)	ND (0.0075)		8260B Low		1	10/11/16 18:56		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*117 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*107 %*		*70-130*
Surrogate: Dibromofluoromethane	*111 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 19.9
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1221	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1232	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1242	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1248	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1254	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1260	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1262	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709
Aroclor 1268	ND (0.0601)		8082A		1	10/11/16 22:39		CJ60709

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*70 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*74 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 19.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ZLC
Prepared: 10/7/16 10:00

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**163** (46.2)		8100M		1	10/07/16 18:53	CZJ0090	CJ60712

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*69 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2-Chlorophenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2-Methylnaphthalene	**1.67** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2-Methylphenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2-Nitroaniline	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
2-Nitrophenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (0.843)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
3+4-Methylphenol	ND (0.843)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
3-Nitroaniline	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4-Chloroaniline	ND (0.843)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4-Nitroaniline	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
4-Nitrophenol	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Acenaphthene	**1.44** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Acenaphthylene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.843)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Aniline	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Anthracene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Azobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzidine	ND (0.843)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzo(a)anthracene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzo(a)pyrene	ND (0.211)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzo(b)fluoranthene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzo(g,h,i)perylene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzo(k)fluoranthene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzoic Acid	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Carbazole	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Chrysene	ND (0.211)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.211)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Dibenzofuran	**1.10** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Diethylphthalate	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Dimethylphthalate	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Fluoranthene	**0.429** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Fluorene	**0.992** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Hexachloroethane	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-14 S-4
Date Sampled: 09/29/16 12:25
Percent Solids: 84
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Naphthalene	**2.42** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Nitrobenzene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Pentachlorophenol	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Phenanthrene	**1.40** (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Phenol	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Pyrene	ND (0.421)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609
Pyridine	ND (2.11)		8270D		1	10/11/16 19:36	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*77 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*90 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*82 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: 2-Fluorophenol	*78 %*		*30-130*
Surrogate: Nitrobenzene-d5	*77 %*		*30-130*
Surrogate: Phenol-d6	*83 %*		*30-130*
Surrogate: p-Terphenyl-d14	*116 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**9.64** (2.77)		6010C		1	KJK	10/12/16 21:31	2.43	100	CJ61103
Barium	**95.7** (2.77)		6010C		1	KJK	10/12/16 21:31	2.43	100	CJ61103
Cadmium	ND (0.55)		6020A		20	NAR	10/13/16 16:42	2.43	100	CJ61103
Chromium	**31.0** (1.11)		6010C		1	KJK	10/12/16 21:31	2.43	100	CJ61103
Lead	**221** (5.54)		6010C		1	KJK	10/12/16 21:31	2.43	100	CJ61103
Mercury	**0.441** (0.044)		7471B		1	BJV	10/11/16 13:27	0.61	40	CJ61104
Selenium	ND (0.55)		6020A		20	NAR	10/13/16 16:42	2.43	100	CJ61103
Silver	ND (0.55)		6010C		1	KJK	10/12/16 21:31	2.43	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	**0.146** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	**0.0534** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0031)		8260B Low		0	10/11/16 19:48		[CALC]
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0842)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
2-Butanone	ND (0.0421)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
2-Hexanone	ND (0.0421)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
4-Isopropyltoluene	**0.0074** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0421)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Acetone	**0.208** (0.0421)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Acrylonitrile	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Allyl Chloride	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Bromobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Bromochloromethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Bromoform	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Bromomethane	ND (0.0084)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Chlorobenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Chloroethane	ND (0.0084)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Chloroform	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Chloromethane	ND (0.0084)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Dibromomethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0084)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Diethyl Ether	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Ethylbenzene	**0.0156** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Isopropylbenzene	**0.0065** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Methylene Chloride	ND (0.0211)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Naphthalene	**0.0097** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
n-Butylbenzene	**0.0097** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
n-Propylbenzene	**0.0090** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
sec-Butylbenzene	**0.0050** (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Styrene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0421)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Toluene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Trichloroethene	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0084)		8260B Low		1	10/11/16 19:48	CZJ0122	CJ61137
Xylenes (Total)	**0.0441** (0.0062)		8260B Low		1	10/11/16 19:48		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*122 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*113 %*		*70-130*
Surrogate: Toluene-d8	*107 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 20.6
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1221	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1232	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1242	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1248	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1254	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1260	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1262	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328
Aroclor 1268	ND (0.0654)		8082A		1	10/12/16 19:11		CJ61328

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*83 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*82 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*66 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*74 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 20.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ZLC
Prepared: 10/7/16 10:00

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**319** (48.3)		8100M		1	10/07/16 19:31	CZJ0090	CJ60712

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*63 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
1,2,4-Trichlorobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
1,2-Dichlorobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
1,2-Diphenylhydrazine as Azobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
1,3-Dichlorobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
1,4-Dichlorobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,3,4,6-Tetrachlorophenol	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,4,5-Trichlorophenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,4,6-Trichlorophenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,4-Dichlorophenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,4-Dimethylphenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,4-Dinitrophenol	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,4-Dinitrotoluene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2,6-Dinitrotoluene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2-Chloronaphthalene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2-Chlorophenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2-Methylnaphthalene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2-Methylphenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2-Nitroaniline	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
2-Nitrophenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
3,3´-Dichlorobenzidine	ND (0.848)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
3+4-Methylphenol	ND (0.848)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
3-Nitroaniline	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4,6-Dinitro-2-Methylphenol	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4-Bromophenyl-phenylether	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4-Chloro-3-Methylphenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4-Chloroaniline	ND (0.848)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4-Chloro-phenyl-phenyl ether	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4-Nitroaniline	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
4-Nitrophenol	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Acenaphthene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Acenaphthylene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.848)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Aniline	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Anthracene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Azobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzidine	ND (0.848)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzo(a)anthracene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzo(a)pyrene	ND (0.212)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzo(b)fluoranthene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzo(g,h,i)perylene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzo(k)fluoranthene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzoic Acid	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Benzyl Alcohol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
bis(2-Chloroethoxy)methane	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
bis(2-Chloroethyl)ether	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
bis(2-chloroisopropyl)Ether	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
bis(2-Ethylhexyl)phthalate	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Butylbenzylphthalate	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Carbazole	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Chrysene	ND (0.212)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Dibenzo(a,h)Anthracene	ND (0.212)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Dibenzofuran	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Diethylphthalate	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Dimethylphthalate	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Di-n-butylphthalate	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Di-n-octylphthalate	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Fluoranthene	**0.490** (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Fluorene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Hexachlorobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Hexachlorobutadiene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Hexachlorocyclopentadiene	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Hexachloroethane	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Indeno(1,2,3-cd)Pyrene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-15 S-3
Date Sampled: 09/29/16 10:05
Percent Solids: 74
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/7/16 10:05

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Naphthalene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Nitrobenzene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
N-Nitrosodimethylamine	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
N-Nitroso-Di-n-Propylamine	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
N-nitrosodiphenylamine	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Pentachlorophenol	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Phenanthrene	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Phenol	ND (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Pyrene	**0.478** (0.423)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609
Pyridine	ND (2.12)		8270D		1	10/11/16 20:13	CZJ0113	CJ60609

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*56 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*84 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*67 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*62 %*		*30-130*
Surrogate: 2-Fluorophenol	*63 %*		*30-130*
Surrogate: Nitrobenzene-d5	*57 %*		*30-130*
Surrogate: Phenol-d6	*71 %*		*30-130*
Surrogate: p-Terphenyl-d14	*122 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**10.5** (2.10)		6010C		1	KJK	10/12/16 21:35	2.69	100	CJ61103
Barium	**110** (2.10)		6010C		1	KJK	10/12/16 21:35	2.69	100	CJ61103
Cadmium	**0.49** (0.42)		6020A		20	NAR	10/13/16 16:48	2.69	100	CJ61103
Chromium	**34.4** (0.84)		6010C		1	KJK	10/12/16 21:35	2.69	100	CJ61103
Lead	**416** (4.20)		6010C		1	KJK	10/12/16 21:35	2.69	100	CJ61103
Mercury	**0.971** (0.170)		7471B		5	BJV	10/11/16 15:41	0.66	40	CJ61104
Selenium	**0.49** (0.42)		6020A		20	NAR	10/13/16 16:48	2.69	100	CJ61103
Silver	ND (0.42)		6010C		1	KJK	10/12/16 21:35	2.69	100	CJ61103

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,1,1-Trichloroethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,1,2,2-Tetrachloroethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,1,2-Trichloroethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,1-Dichloroethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,1-Dichloroethene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,1-Dichloropropene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2,3-Trichlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2,3-Trichloropropane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2,4-Trichlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2,4-Trimethylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2-Dibromo-3-Chloropropane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2-Dibromoethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2-Dichlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2-Dichloroethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,2-Dichloropropane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,3,5-Trichlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,3,5-Trimethylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,3-Dichlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,3-Dichloropropene (Total)	ND (0.0042)		8260B Low		0	10/11/16 19:22		[CALC]
1,4-Dichlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
1,4-Dioxane	ND (0.0942)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
2,2-Dichloropropane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
2-Butanone	ND (0.0471)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
2-Chlorotoluene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
2-Hexanone	ND (0.0471)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
4-Chlorotoluene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
4-Isopropyltoluene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
4-Methyl-2-Pentanone	ND (0.0471)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Acetone	**0.0867** (0.0471)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Acrylonitrile	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Allyl Chloride	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Bromobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Bromochloromethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Bromodichloromethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Bromoform	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Bromomethane	ND (0.0094)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Carbon Disulfide	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Carbon Tetrachloride	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Chlorobenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Chloroethane	ND (0.0094)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Chloroform	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Chloromethane	ND (0.0094)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
cis-1,2-Dichloroethene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Dibromochloromethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Dibromomethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Dichlorodifluoromethane	ND (0.0094)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Diethyl Ether	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Di-isopropyl ether	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Ethyl tertiary-butyl ether	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Ethylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Hexachlorobutadiene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Isopropylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Methyl tert-Butyl Ether	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Methylene Chloride	ND (0.0236)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Naphthalene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
n-Butylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
n-Propylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
sec-Butylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Styrene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
tert-Butylbenzene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Tertiary-amyl methyl ether	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Tertiary-butyl Alcohol	ND (0.0471)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 6
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Tetrahydrofuran	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Toluene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
trans-1,2-Dichloroethene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Trichloroethene	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Trichlorofluoromethane	ND (0.0047)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Vinyl Chloride	ND (0.0094)		8260B Low		1	10/11/16 19:22	CZJ0122	CJ61137
Xylenes (Total)	ND (0.0083)		8260B Low		1	10/11/16 19:22		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*117 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*103 %*		*70-130*
Surrogate: Dibromofluoromethane	*112 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 20.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 10/7/16 16:53

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1221	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1232	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1242	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1248	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1254	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1260	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1262	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328
Aroclor 1268	ND (0.0551)		8082A		1	10/12/16 19:29		CJ61328

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*86 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*91 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*71 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*79 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 19.6
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: ZLC
Prepared: 10/7/16 10:00

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**136** (43.3)		8100M		1	10/07/16 20:10	CZJ0090	CJ60712

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*78 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/11/16 17:24

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
1,2,4-Trichlorobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
1,2-Dichlorobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
1,2-Diphenylhydrazine as Azobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
1,3-Dichlorobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
1,4-Dichlorobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,3,4,6-Tetrachlorophenol	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,4,5-Trichlorophenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,4,6-Trichlorophenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,4-Dichlorophenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,4-Dimethylphenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,4-Dinitrophenol	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,4-Dinitrotoluene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2,6-Dinitrotoluene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2-Chloronaphthalene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2-Chlorophenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2-Methylnaphthalene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2-Methylphenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2-Nitroaniline	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
2-Nitrophenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
3,3´-Dichlorobenzidine	ND (0.754)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
3+4-Methylphenol	ND (0.754)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
3-Nitroaniline	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4,6-Dinitro-2-Methylphenol	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4-Bromophenyl-phenylether	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4-Chloro-3-Methylphenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4-Chloroaniline	ND (0.754)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4-Chloro-phenyl-phenyl ether	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4-Nitroaniline	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
4-Nitrophenol	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Acenaphthene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Acenaphthylene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/11/16 17:24

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (0.754)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Aniline	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Anthracene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Azobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzidine	ND (0.754)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzo(a)anthracene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzo(a)pyrene	**0.313** (0.189)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzo(b)fluoranthene	**0.483** (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzo(g,h,i)perylene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzo(k)fluoranthene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzoic Acid	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Benzyl Alcohol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
bis(2-Chloroethoxy)methane	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
bis(2-Chloroethyl)ether	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
bis(2-chloroisopropyl)Ether	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
bis(2-Ethylhexyl)phthalate	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Butylbenzylphthalate	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Carbazole	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Chrysene	**0.340** (0.189)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Dibenzo(a,h)Anthracene	ND (0.189)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Dibenzofuran	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Diethylphthalate	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Dimethylphthalate	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Di-n-butylphthalate	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Di-n-octylphthalate	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Fluoranthene	**0.737** (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Fluorene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Hexachlorobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Hexachlorobutadiene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Hexachlorocyclopentadiene	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Hexachloroethane	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Indeno(1,2,3-cd)Pyrene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
Client Sample ID: B-16 S-2
Date Sampled: 09/29/16 09:20
Percent Solids: 88
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1610112
ESS Laboratory Sample ID: 1610112-16
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 10/11/16 17:24

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Naphthalene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Nitrobenzene	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
N-Nitrosodimethylamine	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
N-Nitroso-Di-n-Propylamine	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
N-nitrosodiphenylamine	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Pentachlorophenol	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Phenanthrene	**0.456** (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Phenol	ND (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Pyrene	**0.720** (0.376)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112
Pyridine	ND (1.89)		8270D		1	10/13/16 3:49	CZJ0132	CJ61112

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*41 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*51 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*42 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*42 %*		*30-130*
Surrogate: 2-Fluorophenol	*41 %*		*30-130*
Surrogate: Nitrobenzene-d5	*41 %*		*30-130*
Surrogate: Phenol-d6	*43 %*		*30-130*
Surrogate: p-Terphenyl-d14	*65 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CJ61103 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
LCS										
Arsenic	151	9.26	mg/kg wet	161.0		94	80-120			
Barium	333	9.26	mg/kg wet	351.0		95	80-120			
Cadmium	190	23.1	mg/kg wet	190.0		100	80-120			
Chromium	85.1	3.70	mg/kg wet	87.90		97	80-120			
Lead	134	18.5	mg/kg wet	138.0		97	80-120			
Selenium	310	23.1	mg/kg wet	305.0		101	80-120			
Silver	56.7	1.85	mg/kg wet	58.00		98	80-120			
LCS Dup										
Arsenic	145	9.62	mg/kg wet	161.0		90	80-120	4	20	
Barium	323	9.62	mg/kg wet	351.0		92	80-120	3	20	
Cadmium	190	24.0	mg/kg wet	190.0		100	80-120	0.01	30	
Chromium	82.5	3.85	mg/kg wet	87.90		94	80-120	3	20	
Lead	131	19.2	mg/kg wet	138.0		95	80-120	3	20	
Selenium	306	24.0	mg/kg wet	305.0		100	80-120	1	30	
Silver	55.0	1.92	mg/kg wet	58.00		95	80-120	3	20	
Batch CJ61104 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	16.2	1.65	mg/kg wet	15.90		102	80-120			
LCS Dup										
Mercury	16.1	1.83	mg/kg wet	15.90		101	80-120	1	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CJ60724 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ60724 - 5035										
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropene (Total)	ND	0.0050	mg/kg							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Acrylonitrile	ND	0.0050	mg/kg wet							
Allyl Chloride	ND	0.0050	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				5035/8260B Volatile Organic Compounds / Low Level						
Batch CJ60724 - 5035										
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tertiary-butyl Alcohol	ND	0.0500	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg							
Surrogate: 1,2-Dichloroethane-d4	*0.0544*		mg/kg wet	*0.05000*		*109*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0507*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0522*		mg/kg wet	*0.05000*		*104*	*70-130*			
Surrogate: Toluene-d8	*0.0534*		mg/kg wet	*0.05000*		*107*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
1,1,1-Trichloroethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,1,2,2-Tetrachloroethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,2-Trichloroethane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
1,1-Dichloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,1-Dichloroethene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloropropene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,3-Trichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,3-Trichloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,2,4-Trichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trimethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,2-Dibromoethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dichlorobenzene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dichloroethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dichloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,3,5-Trichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,3,5-Trimethylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,3-Dichlorobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,3-Dichloropropene (Total)	0.0881	0.0050	mg/kg							
1,4-Dichlorobenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ60724 - 5035										
1,4-Dioxane	1.01	0.100	mg/kg wet	1.000		101	70-130			
2,2-Dichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
2-Butanone	0.238	0.0500	mg/kg wet	0.2500		95	70-130			
2-Chlorotoluene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
2-Hexanone	0.233	0.0500	mg/kg wet	0.2500		93	70-130			
4-Chlorotoluene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
4-Isopropyltoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
4-Methyl-2-Pentanone	0.214	0.0500	mg/kg wet	0.2500		86	70-130			
Acetone	0.238	0.0500	mg/kg wet	0.2500		95	70-130			
Acrylonitrile	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Allyl Chloride	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Benzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Bromobenzene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Bromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
Bromodichloromethane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Bromoform	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
Bromomethane	0.0496	0.0100	mg/kg wet	0.05000		99	70-130			
Carbon Disulfide	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Carbon Tetrachloride	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
Chlorobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Chloroethane	0.0435	0.0100	mg/kg wet	0.05000		87	70-130			
Chloroform	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Chloromethane	0.0545	0.0100	mg/kg wet	0.05000		109	70-130			
cis-1,2-Dichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Dibromochloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromomethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Dichlorodifluoromethane	0.0468	0.0100	mg/kg wet	0.05000		94	70-130			
Diethyl Ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Di-isopropyl ether	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Ethyl tertiary-butyl ether	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Ethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
Hexachlorobutadiene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Isopropylbenzene	0.0413	0.0050	mg/kg wet	0.05000		83	70-130			
Methyl tert-Butyl Ether	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Methylene Chloride	0.0434	0.0250	mg/kg wet	0.05000		87	70-130			
Naphthalene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
n-Butylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
n-Propylbenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
sec-Butylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Styrene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
tert-Butylbenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Tertiary-amyl methyl ether	0.0415	0.0050	mg/kg wet	0.05000		83	70-130			
Tertiary-butyl Alcohol	0.212	0.0500	mg/kg wet	0.2500		85	70-130			
Tetrachloroethene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Tetrahydrofuran	0.0382	0.0050	mg/kg wet	0.05000		76	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ60724 - 5035										
Toluene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
trans-1,2-Dichloroethene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Trichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Trichlorofluoromethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Vinyl Chloride	0.0552	0.0100	mg/kg wet	0.05000		110	70-130			
Xylenes (Total)	0.152	0.0100	mg/kg							
Surrogate: 1,2-Dichloroethane-d4	*0.0578*		mg/kg wet	*0.05000*		*116*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0562*		mg/kg wet	*0.05000*		*112*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0549*		mg/kg wet	*0.05000*		*110*	*70-130*			
Surrogate: Toluene-d8	*0.0547*		mg/kg wet	*0.05000*		*109*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
1,1,1-Trichloroethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	4	25	
1,1,2,2-Tetrachloroethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	8	25	
1,1,2-Trichloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
1,1-Dichloroethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
1,1-Dichloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
1,1-Dichloropropene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
1,2,3-Trichlorobenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	7	25	
1,2,3-Trichloropropane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	7	25	
1,2,4-Trichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
1,2,4-Trimethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
1,2-Dibromo-3-Chloropropane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
1,2-Dibromoethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.5	25	
1,2-Dichlorobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
1,2-Dichloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	4	25	
1,2-Dichloropropane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
1,3,5-Trichlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
1,3,5-Trimethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
1,3-Dichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,3-Dichloropropene (Total)	0.0934	0.0050	mg/kg							
1,4-Dichlorobenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
1,4-Dioxane	1.05	0.100	mg/kg wet	1.000		105	70-130	4	20	
2,2-Dichloropropane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
2-Butanone	0.253	0.0500	mg/kg wet	0.2500		101	70-130	6	25	
2-Chlorotoluene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
2-Hexanone	0.239	0.0500	mg/kg wet	0.2500		96	70-130	2	25	
4-Chlorotoluene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
4-Isopropyltoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
4-Methyl-2-Pentanone	0.233	0.0500	mg/kg wet	0.2500		93	70-130	9	25	
Acetone	0.255	0.0500	mg/kg wet	0.2500		102	70-130	7	25	
Acrylonitrile	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
Allyl Chloride	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	7	25	
Benzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
Bromobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	5	25	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CJ60724 - 5035										
Bromochloromethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
Bromodichloromethane	0.0575	0.0050	mg/kg wet	0.05000		115	70-130	5	25	
Bromoform	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
Bromomethane	0.0512	0.0100	mg/kg wet	0.05000		102	70-130	3	25	
Carbon Disulfide	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
Carbon Tetrachloride	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	3	25	
Chlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
Chloroethane	0.0448	0.0100	mg/kg wet	0.05000		90	70-130	3	25	
Chloroform	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
Chloromethane	0.0576	0.0100	mg/kg wet	0.05000		115	70-130	6	25	
cis-1,2-Dichloroethene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
Dibromochloromethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Dibromomethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
Dichlorodifluoromethane	0.0483	0.0100	mg/kg wet	0.05000		97	70-130	3	25	
Diethyl Ether	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
Di-isopropyl ether	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
Ethyl tertiary-butyl ether	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	7	25	
Ethylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
Hexachlorobutadiene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Isopropylbenzene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	3	25	
Methyl tert-Butyl Ether	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	7	25	
Methylene Chloride	0.0456	0.0250	mg/kg wet	0.05000		91	70-130	5	25	
Naphthalene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	10	25	
n-Butylbenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
n-Propylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
sec-Butylbenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Styrene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
tert-Butylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
Tertiary-amyl methyl ether	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	7	25	
Tertiary-butyl Alcohol	0.233	0.0500	mg/kg wet	0.2500		93	70-130	9	20	
Tetrachloroethene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
Tetrahydrofuran	0.0407	0.0050	mg/kg wet	0.05000		81	70-130	6	25	
Toluene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
trans-1,2-Dichloroethene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
Trichloroethene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Trichlorofluoromethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Vinyl Chloride	0.0576	0.0100	mg/kg wet	0.05000		115	70-130	4	25	
Xylenes (Total)	0.149	0.0100	mg/kg							
Surrogate: 1,2-Dichloroethane-d4	*0.0574*		mg/kg wet	*0.05000*		*115*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0527*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0546*		mg/kg wet	*0.05000*		*109*	*70-130*			
Surrogate: Toluene-d8	*0.0517*		mg/kg wet	*0.05000*		*103*	*70-130*			
Batch CJ61137 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CJ61137 - 5035										
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropene (Total)	ND	0.0050	mg/kg							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Acrylonitrile	ND	0.0050	mg/kg wet							
Allyl Chloride	ND	0.0050	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
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Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ61137 - 5035										
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tertiary-butyl Alcohol	ND	0.0500	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg							
Surrogate: 1,2-Dichloroethane-d4	*0.0539*		mg/kg wet	*0.05000*		*108*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0517*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0545*		mg/kg wet	*0.05000*		*109*	*70-130*			
Surrogate: Toluene-d8	*0.0542*		mg/kg wet	*0.05000*		*108*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,1,1-Trichloroethane	0.0585	0.0050	mg/kg wet	0.05000		117	70-130			
1,1,2,2-Tetrachloroethane	0.0570	0.0050	mg/kg wet	0.05000		114	70-130			
1,1,2-Trichloroethane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,1-Dichloroethane	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
1,1-Dichloroethene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
1,1-Dichloropropene	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
1,2,3-Trichlorobenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,3-Trichloropropane	0.0566	0.0050	mg/kg wet	0.05000		113	70-130			
1,2,4-Trichlorobenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,4-Trimethylbenzene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
1,2-Dibromo-3-Chloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dibromoethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dichlorobenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ61137 - 5035										
1,2-Dichloroethane	0.0577	0.0050	mg/kg wet	0.05000		115	70-130			
1,2-Dichloropropane	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
1,3,5-Trichlorobenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
1,3,5-Trimethylbenzene	0.0565	0.0050	mg/kg wet	0.05000		113	70-130			
1,3-Dichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,3-Dichloropropene (Total)	0.107	0.0050	mg/kg							
1,4-Dichlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,4-Dioxane	1.08	0.100	mg/kg wet	1.000		108	70-130			
2,2-Dichloropropane	0.0589	0.0050	mg/kg wet	0.05000		118	70-130			
2-Butanone	0.275	0.0500	mg/kg wet	0.2500		110	70-130			
2-Chlorotoluene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
2-Hexanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130			
4-Chlorotoluene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
4-Isopropyltoluene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
4-Methyl-2-Pentanone	0.254	0.0500	mg/kg wet	0.2500		101	70-130			
Acetone	0.279	0.0500	mg/kg wet	0.2500		112	70-130			
Acrylonitrile	0.0564	0.0050	mg/kg wet	0.05000		113	70-130			
Allyl Chloride	0.0584	0.0050	mg/kg wet	0.05000		117	70-130			
Benzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
Bromobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Bromochloromethane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130			
Bromodichloromethane	0.0633	0.0050	mg/kg wet	0.05000		127	70-130			
Bromoform	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Bromomethane	0.0576	0.0100	mg/kg wet	0.05000		115	70-130			
Carbon Disulfide	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Carbon Tetrachloride	0.0584	0.0050	mg/kg wet	0.05000		117	70-130			
Chlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Chloroethane	0.0520	0.0100	mg/kg wet	0.05000		104	70-130			
Chloroform	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
Chloromethane	0.0613	0.0100	mg/kg wet	0.05000		123	70-130			
cis-1,2-Dichloroethene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Dibromochloromethane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Dibromomethane	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
Dichlorodifluoromethane	0.0488	0.0100	mg/kg wet	0.05000		98	70-130			
Diethyl Ether	0.0570	0.0050	mg/kg wet	0.05000		114	70-130			
Di-isopropyl ether	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
Ethyl tertiary-butyl ether	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Ethylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Hexachlorobutadiene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Isopropylbenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Methyl tert-Butyl Ether	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
Methylene Chloride	0.0655	0.0250	mg/kg wet	0.05000		131	70-130			B+
Naphthalene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
n-Butylbenzene	0.0594	0.0050	mg/kg wet	0.05000		119	70-130			
n-Propylbenzene	0.0557	0.0050	mg/kg wet	0.05000		111	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ61137 - 5035										
sec-Butylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Styrene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
tert-Butylbenzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
Tertiary-amyl methyl ether	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Tertiary-butyl Alcohol	0.256	0.0500	mg/kg wet	0.2500		102	70-130			
Tetrachloroethene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Tetrahydrofuran	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
Toluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
trans-1,2-Dichloroethene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Trichloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Trichlorofluoromethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Vinyl Chloride	0.0616	0.0100	mg/kg wet	0.05000		123	70-130			
Xylenes (Total)	0.145	0.0100	mg/kg							
Surrogate: 1,2-Dichloroethane-d4	*0.0583*		mg/kg wet	*0.05000*		*117*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0518*		mg/kg wet	*0.05000*		*104*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0574*		mg/kg wet	*0.05000*		*115*	*70-130*			
Surrogate: Toluene-d8	*0.0511*		mg/kg wet	*0.05000*		*102*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
1,1,1-Trichloroethane	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	6	25	
1,1,2,2-Tetrachloroethane	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	4	25	
1,1,2-Trichloroethane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	3	25	
1,1-Dichloroethane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	5	25	
1,1-Dichloroethene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
1,1-Dichloropropene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
1,2,3-Trichlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,2,3-Trichloropropane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
1,2,4-Trichlorobenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
1,2,4-Trimethylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,2-Dibromo-3-Chloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	7	25	
1,2-Dibromoethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,2-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,2-Dichloroethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	5	25	
1,2-Dichloropropane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,3,5-Trichlorobenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
1,3,5-Trimethylbenzene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
1,3-Dichlorobenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,3-Dichloropropene (Total)	0.102	0.0050	mg/kg							
1,4-Dichlorobenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,4-Dioxane	1.09	0.100	mg/kg wet	1.000		109	70-130	0.7	20	
2,2-Dichloropropane	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	7	25	
2-Butanone	0.262	0.0500	mg/kg wet	0.2500		105	70-130	5	25	
2-Chlorotoluene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
2-Hexanone	0.225	0.0500	mg/kg wet	0.2500		90	70-130	7	25	
4-Chlorotoluene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	5	25	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CJ61137 - 5035										
4-Isopropyltoluene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
4-Methyl-2-Pentanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	5	25	
Acetone	0.264	0.0500	mg/kg wet	0.2500		106	70-130	5	25	
Acrylonitrile	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	3	25	
Allyl Chloride	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	3	25	
Benzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Bromobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Bromochloromethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
Bromodichloromethane	0.0597	0.0050	mg/kg wet	0.05000		119	70-130	6	25	
Bromoform	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
Bromomethane	0.0548	0.0100	mg/kg wet	0.05000		110	70-130	5	25	
Carbon Disulfide	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
Carbon Tetrachloride	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	6	25	
Chlorobenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	5	25	
Chloroethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130	8	25	
Chloroform	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
Chloromethane	0.0593	0.0100	mg/kg wet	0.05000		119	70-130	3	25	
cis-1,2-Dichloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Dibromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	5	25	
Dibromomethane	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
Dichlorodifluoromethane	0.0449	0.0100	mg/kg wet	0.05000		90	70-130	8	25	
Diethyl Ether	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
Di-isopropyl ether	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
Ethyl tertiary-butyl ether	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Ethylbenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	6	25	
Hexachlorobutadiene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
Isopropylbenzene	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	5	25	
Methyl tert-Butyl Ether	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
Methylene Chloride	0.0626	0.0250	mg/kg wet	0.05000		125	70-130	4	25	
Naphthalene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	5	25	
n-Butylbenzene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	7	25	
n-Propylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
sec-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
Styrene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
tert-Butylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
Tertiary-amyl methyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
Tertiary-butyl Alcohol	0.248	0.0500	mg/kg wet	0.2500		99	70-130	3	20	
Tetrachloroethene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	7	25	
Tetrahydrofuran	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	3	25	
Toluene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
trans-1,2-Dichloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
Trichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
Trichlorofluoromethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
Vinyl Chloride	0.0583	0.0100	mg/kg wet	0.05000		117	70-130	6	25	
Xylenes (Total)	0.137	0.0100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CJ61137 - 5035										
Surrogate: 1,2-Dichloroethane-d4	*0.0585*		mg/kg wet	*0.05000*		*117*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0511*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0573*		mg/kg wet	*0.05000*		*115*	*70-130*			
Surrogate: Toluene-d8	*0.0514*		mg/kg wet	*0.05000*		*103*	*70-130*			
5035/8260B Volatile Organic Compounds / Methanol										
Batch CJ61136 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3 Dichloropropene (Total)	ND	0.200	mg/kg wet							
1,3,5-Trichlorobenzene	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Acrylonitrile	ND	1.00	mg/kg wet							
Allyl Chloride	ND	0.400	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CJ61136 - 5035										
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.70*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.04*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*5.12*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Toluene-d8	*4.90*		mg/kg wet	*5.000*		*98*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,1,1-Trichloroethane	1.97	0.200	mg/kg wet	2.000		99	70-130			
1,1,2,2-Tetrachloroethane	1.88	0.200	mg/kg wet	2.000		94	70-130			
1,1,2-Trichloroethane	1.89	0.200	mg/kg wet	2.000		95	70-130			
1,1-Dichloroethane	1.90	0.200	mg/kg wet	2.000		95	70-130			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				5035/8260B Volatile Organic Compounds / Methanol						
Batch CJ61136 - 5035										
1,1-Dichloroethene	1.99	0.200	mg/kg wet	2.000		100	70-130			
1,1-Dichloropropene	2.00	0.200	mg/kg wet	2.000		100	70-130			
1,2,3-Trichlorobenzene	2.01	0.200	mg/kg wet	2.000		100	70-130			
1,2,3-Trichloropropane	2.00	0.200	mg/kg wet	2.000		100	70-130			
1,2,4-Trichlorobenzene	1.94	0.200	mg/kg wet	2.000		97	70-130			
1,2,4-Trimethylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,2-Dibromo-3-Chloropropane	1.92	1.00	mg/kg wet	2.000		96	70-130			
1,2-Dibromoethane	1.93	0.200	mg/kg wet	2.000		96	70-130			
1,2-Dichlorobenzene	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,2-Dichloroethane	1.87	0.200	mg/kg wet	2.000		94	70-130			
1,2-Dichloropropane	1.93	0.200	mg/kg wet	2.000		97	70-130			
1,3 Dichloropropene (Total)	3.88	0.200	mg/kg wet							
1,3,5-Trichlorobenzene	2.14	0.200	mg/kg wet	2.000		107	70-130			
1,3,5-Trimethylbenzene	1.96	0.200	mg/kg wet	2.000		98	70-130			
1,3-Dichlorobenzene	1.93	0.200	mg/kg wet	2.000		96	70-130			
1,4-Dichlorobenzene	1.89	0.200	mg/kg wet	2.000		95	70-130			
1,4-Dioxane - Screen	50.0	40.0	mg/kg wet	40.00		125	44-241			
2,2-Dichloropropane	1.97	0.200	mg/kg wet	2.000		99	70-130			
2-Butanone	9.55	1.00	mg/kg wet	10.00		95	70-130			
2-Chlorotoluene	1.96	0.200	mg/kg wet	2.000		98	70-130			
2-Hexanone	9.95	1.00	mg/kg wet	10.00		99	70-130			
4-Chlorotoluene	1.94	0.200	mg/kg wet	2.000		97	70-130			
4-Isopropyltoluene	2.01	0.200	mg/kg wet	2.000		100	70-130			
4-Methyl-2-Pentanone	10.1	1.00	mg/kg wet	10.00		101	70-130			
Acetone	9.92	1.00	mg/kg wet	10.00		99	70-130			
Acrylonitrile	1.66	1.00	mg/kg wet	2.000		83	70-130			
Allyl Chloride	1.94	0.400	mg/kg wet	2.000		97	70-130			
Benzene	2.03	0.200	mg/kg wet	2.000		101	70-130			
Bromobenzene	1.98	0.200	mg/kg wet	2.000		99	70-130			
Bromochloromethane	1.92	0.200	mg/kg wet	2.000		96	70-130			
Bromodichloromethane	2.05	0.200	mg/kg wet	2.000		102	70-130			
Bromoform	2.15	0.200	mg/kg wet	2.000		108	70-130			
Bromomethane	1.97	0.200	mg/kg wet	2.000		98	70-130			
Carbon Disulfide	1.94	0.200	mg/kg wet	2.000		97	70-130			
Carbon Tetrachloride	2.04	0.200	mg/kg wet	2.000		102	70-130			
Chlorobenzene	1.93	0.200	mg/kg wet	2.000		97	70-130			
Chloroethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
Chloroform	1.95	0.200	mg/kg wet	2.000		97	70-130			
Chloromethane	1.98	0.200	mg/kg wet	2.000		99	70-130			
cis-1,2-Dichloroethene	1.94	0.200	mg/kg wet	2.000		97	70-130			
Dibromochloromethane	2.20	0.200	mg/kg wet	2.000		110	70-130			
Dibromomethane	1.82	0.200	mg/kg wet	2.000		91	70-130			
Dichlorodifluoromethane	1.83	0.200	mg/kg wet	2.000		92	70-130			
Diethyl Ether	1.96	0.200	mg/kg wet	2.000		98	70-130			
Di-isopropyl ether	1.94	0.200	mg/kg wet	2.000		97	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				5035/8260B Volatile Organic Compounds / Methanol						
Batch CJ61136 - 5035										
Ethyl tertiary-butyl ether	2.03	0.200	mg/kg wet	2.000		102	70-130			
Ethylbenzene	1.97	0.200	mg/kg wet	2.000		99	70-130			
Hexachlorobutadiene	1.99	0.200	mg/kg wet	2.000		100	70-130			
Isopropylbenzene	1.64	0.200	mg/kg wet	2.000		82	70-130			
Methyl tert-Butyl Ether	1.89	0.200	mg/kg wet	2.000		95	70-130			
Methylene Chloride	1.87	0.400	mg/kg wet	2.000		93	70-130			
Naphthalene	2.04	0.200	mg/kg wet	2.000		102	70-130			
n-Butylbenzene	1.99	0.200	mg/kg wet	2.000		100	70-130			
n-Propylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130			
sec-Butylbenzene	1.91	0.200	mg/kg wet	2.000		95	70-130			
Styrene	2.06	0.200	mg/kg wet	2.000		103	70-130			
tert-Butylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
Tertiary-amyl methyl ether	1.95	0.200	mg/kg wet	2.000		98	70-130			
Tetrachloroethene	1.98	0.200	mg/kg wet	2.000		99	70-130			
Tetrahydrofuran	1.73	1.00	mg/kg wet	2.000		87	70-130			
Toluene	1.91	0.200	mg/kg wet	2.000		96	70-130			
trans-1,2-Dichloroethene	1.94	0.200	mg/kg wet	2.000		97	70-130			
Trichloroethene	1.95	0.200	mg/kg wet	2.000		98	70-130			
Trichlorofluoromethane	1.67	0.200	mg/kg wet	2.000		83	70-130			
Vinyl Chloride	1.91	0.200	mg/kg wet	2.000		95	70-130			
Xylenes (Total)	5.88	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.81*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.07*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*5.27*		mg/kg wet	*5.000*		*105*	*70-130*			
Surrogate: Toluene-d8	*4.99*		mg/kg wet	*5.000*		*100*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	2.06	0.200	mg/kg wet	2.000		103	70-130	1	25	
1,1,1-Trichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130	3	25	
1,1,2,2-Tetrachloroethane	1.87	0.200	mg/kg wet	2.000		93	70-130	0.9	25	
1,1,2-Trichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130	1	25	
1,1-Dichloroethane	1.81	0.200	mg/kg wet	2.000		91	70-130	5	25	
1,1-Dichloroethene	1.83	0.200	mg/kg wet	2.000		92	70-130	8	25	
1,1-Dichloropropene	2.04	0.200	mg/kg wet	2.000		102	70-130	2	25	
1,2,3-Trichlorobenzene	1.99	0.200	mg/kg wet	2.000		99	70-130	1	25	
1,2,3-Trichloropropane	1.98	0.200	mg/kg wet	2.000		99	70-130	0.8	25	
1,2,4-Trichlorobenzene	1.95	0.200	mg/kg wet	2.000		97	70-130	0.2	25	
1,2,4-Trimethylbenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	3	25	
1,2-Dibromo-3-Chloropropane	2.03	1.00	mg/kg wet	2.000		102	70-130	5	25	
1,2-Dibromoethane	1.90	0.200	mg/kg wet	2.000		95	70-130	2	25	
1,2-Dichlorobenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	1	25	
1,2-Dichloroethane	1.78	0.200	mg/kg wet	2.000		89	70-130	5	25	
1,2-Dichloropropane	2.03	0.200	mg/kg wet	2.000		102	70-130	5	25	
1,3 Dichloropropene (Total)	3.59	0.200	mg/kg wet							
1,3,5-Trichlorobenzene	2.07	0.200	mg/kg wet	2.000		104	70-130	3	25	
1,3,5-Trimethylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CJ61136 - 5035										
1,3-Dichlorobenzene	1.95	0.200	mg/kg wet	2.000		97	70-130	1	25	
1,4-Dichlorobenzene	1.93	0.200	mg/kg wet	2.000		96	70-130	2	25	
1,4-Dioxane - Screen	48.7	40.0	mg/kg wet	40.00		122	44-241	3	200	
2,2-Dichloropropane	1.88	0.200	mg/kg wet	2.000		94	70-130	5	25	
2-Butanone	8.90	1.00	mg/kg wet	10.00		89	70-130	7	25	
2-Chlorotoluene	1.97	0.200	mg/kg wet	2.000		98	70-130	0.3	25	
2-Hexanone	10.1	1.00	mg/kg wet	10.00		101	70-130	1	25	
4-Chlorotoluene	1.92	0.200	mg/kg wet	2.000		96	70-130	0.9	25	
4-Isopropyltoluene	2.05	0.200	mg/kg wet	2.000		103	70-130	2	25	
4-Methyl-2-Pentanone	9.17	1.00	mg/kg wet	10.00		92	70-130	10	25	
Acetone	8.98	1.00	mg/kg wet	10.00		90	70-130	10	25	
Acrylonitrile	1.86	1.00	mg/kg wet	2.000		93	70-130	12	25	
Allyl Chloride	1.90	0.400	mg/kg wet	2.000		95	70-130	2	25	
Benzene	2.03	0.200	mg/kg wet	2.000		102	70-130	0.4	25	
Bromobenzene	1.97	0.200	mg/kg wet	2.000		98	70-130	0.5	25	
Bromochloromethane	1.86	0.200	mg/kg wet	2.000		93	70-130	3	25	
Bromodichloromethane	1.98	0.200	mg/kg wet	2.000		99	70-130	3	25	
Bromoform	2.11	0.200	mg/kg wet	2.000		106	70-130	2	25	
Bromomethane	1.97	0.200	mg/kg wet	2.000		99	70-130	0.2	25	
Carbon Disulfide	1.96	0.200	mg/kg wet	2.000		98	70-130	0.8	25	
Carbon Tetrachloride	2.00	0.200	mg/kg wet	2.000		100	70-130	2	25	
Chlorobenzene	1.93	0.200	mg/kg wet	2.000		97	70-130	0.1	25	
Chloroethane	1.77	0.200	mg/kg wet	2.000		88	70-130	2	25	
Chloroform	1.80	0.200	mg/kg wet	2.000		90	70-130	8	25	
Chloromethane	1.96	0.200	mg/kg wet	2.000		98	70-130	1	25	
cis-1,2-Dichloroethene	1.79	0.200	mg/kg wet	2.000		89	70-130	8	25	
Dibromochloromethane	2.07	0.200	mg/kg wet	2.000		103	70-130	6	25	
Dibromomethane	1.79	0.200	mg/kg wet	2.000		90	70-130	1	25	
Dichlorodifluoromethane	1.76	0.200	mg/kg wet	2.000		88	70-130	4	25	
Diethyl Ether	1.79	0.200	mg/kg wet	2.000		90	70-130	9	25	
Di-isopropyl ether	1.93	0.200	mg/kg wet	2.000		96	70-130	0.6	25	
Ethyl tertiary-butyl ether	1.93	0.200	mg/kg wet	2.000		97	70-130	5	25	
Ethylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130	1	25	
Hexachlorobutadiene	1.93	0.200	mg/kg wet	2.000		96	70-130	3	25	
Isopropylbenzene	1.68	0.200	mg/kg wet	2.000		84	70-130	2	25	
Methyl tert-Butyl Ether	1.75	0.200	mg/kg wet	2.000		87	70-130	8	25	
Methylene Chloride	1.91	0.400	mg/kg wet	2.000		96	70-130	2	25	
Naphthalene	2.02	0.200	mg/kg wet	2.000		101	70-130	1	25	
n-Butylbenzene	1.97	0.200	mg/kg wet	2.000		99	70-130	0.8	25	
n-Propylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130	4	25	
sec-Butylbenzene	1.89	0.200	mg/kg wet	2.000		95	70-130	0.6	25	
Styrene	2.03	0.200	mg/kg wet	2.000		102	70-130	1	25	
tert-Butylbenzene	2.04	0.200	mg/kg wet	2.000		102	70-130	2	25	
Tertiary-amyl methyl ether	1.92	0.200	mg/kg wet	2.000		96	70-130	2	25	
Tetrachloroethene	2.02	0.200	mg/kg wet	2.000		101	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CJ61136 - 5035										
Tetrahydrofuran	1.69	1.00	mg/kg wet	2.000		84	70-130	3	25	
Toluene	1.92	0.200	mg/kg wet	2.000		96	70-130	0.3	25	
trans-1,2-Dichloroethene	1.81	0.200	mg/kg wet	2.000		90	70-130	7	25	
Trichloroethene	1.92	0.200	mg/kg wet	2.000		96	70-130	2	25	
Trichlorofluoromethane	1.54	0.200	mg/kg wet	2.000		77	70-130	8	25	
Vinyl Chloride	1.97	0.200	mg/kg wet	2.000		98	70-130	3	25	
Xylenes (Total)	5.89	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.49*		mg/kg wet	*5.000*		*90*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.05*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*4.90*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Toluene-d8	*5.04*		mg/kg wet	*5.000*		*101*	*70-130*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CJ60604 - 3540C										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0222*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0229*		mg/kg wet	*0.02500*		*92*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0188*		mg/kg wet	*0.02500*		*75*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0185*		mg/kg wet	*0.02500*		*74*	*30-150*			
LCS										
Aroclor 1016	0.444	0.0500	mg/kg wet	0.5000		89	40-140			
Aroclor 1260	0.455	0.0500	mg/kg wet	0.5000		91	40-140			
Surrogate: Decachlorobiphenyl	*0.0233*		mg/kg wet	*0.02500*		*93*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0249*		mg/kg wet	*0.02500*		*100*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0211*		mg/kg wet	*0.02500*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0192*		mg/kg wet	*0.02500*		*77*	*30-150*			
LCS Dup										
Aroclor 1016	0.449	0.0500	mg/kg wet	0.5000		90	40-140	1	30	
Aroclor 1260	0.461	0.0500	mg/kg wet	0.5000		92	40-140	1	30	
Surrogate: Decachlorobiphenyl	*0.0231*		mg/kg wet	*0.02500*		*92*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0246*		mg/kg wet	*0.02500*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0210*		mg/kg wet	*0.02500*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

8082A Polychlorinated Biphenyls (PCB)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ60709 - 3540C										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0200*		mg/kg wet	*0.02500*		*80*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0207*		mg/kg wet	*0.02500*		*83*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0183*		mg/kg wet	*0.02500*		*73*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0183*		mg/kg wet	*0.02500*		*73*	*30-150*			
LCS										
Aroclor 1016	0.447	0.0500	mg/kg wet	0.5000		89	40-140			
Aroclor 1260	0.452	0.0500	mg/kg wet	0.5000		90	40-140			
Surrogate: Decachlorobiphenyl	*0.0216*		mg/kg wet	*0.02500*		*87*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0225*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0207*		mg/kg wet	*0.02500*		*83*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			
LCS Dup										
Aroclor 1016	0.430	0.0500	mg/kg wet	0.5000		86	40-140	4	30	
Aroclor 1260	0.441	0.0500	mg/kg wet	0.5000		88	40-140	3	30	
Surrogate: Decachlorobiphenyl	*0.0214*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0223*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0200*		mg/kg wet	*0.02500*		*80*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0184*		mg/kg wet	*0.02500*		*74*	*30-150*			
Batch CJ61327 - 3540C										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0212*		mg/kg wet	*0.02500*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0226*		mg/kg wet	*0.02500*		*90*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth

ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8082A Polychlorinated Biphenyls (PCB)						
Batch CJ61327 - 3540C										
Surrogate: Tetrachloro-m-xylene	*0.0195*		mg/kg wet	*0.02500*		*78*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			
LCS										
Aroclor 1016	0.462	0.0500	mg/kg wet	0.5000		92	40-140			
Aroclor 1260	0.460	0.0500	mg/kg wet	0.5000		92	40-140			
Surrogate: Decachlorobiphenyl	*0.0226*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0245*		mg/kg wet	*0.02500*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0221*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0204*		mg/kg wet	*0.02500*		*82*	*30-150*			
LCS Dup										
Aroclor 1016	0.450	0.0500	mg/kg wet	0.5000		90	40-140	3	30	
Aroclor 1260	0.446	0.0500	mg/kg wet	0.5000		89	40-140	3	30	
Surrogate: Decachlorobiphenyl	*0.0214*		mg/kg wet	*0.02500*		*86*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0231*		mg/kg wet	*0.02500*		*92*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0211*		mg/kg wet	*0.02500*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0196*		mg/kg wet	*0.02500*		*78*	*30-150*			
Batch CJ61328 - 3540C										
Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0193*		mg/kg wet	*0.02500*		*77*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0201*		mg/kg wet	*0.02500*		*81*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0168*		mg/kg wet	*0.02500*		*67*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0189*		mg/kg wet	*0.02500*		*76*	*30-150*			
LCS										
Aroclor 1016	0.486	0.0500	mg/kg wet	0.5000		97	40-140			
Aroclor 1260	0.444	0.0500	mg/kg wet	0.5000		89	40-140			
Surrogate: Decachlorobiphenyl	*0.0233*		mg/kg wet	*0.02500*		*93*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0248*		mg/kg wet	*0.02500*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0196*		mg/kg wet	*0.02500*		*78*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0206*		mg/kg wet	*0.02500*		*83*	*30-150*			
LCS Dup										
Aroclor 1016	0.489	0.0500	mg/kg wet	0.5000		98	40-140	0.7	30	
Aroclor 1260	0.466	0.0500	mg/kg wet	0.5000		93	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CJ61328 - 3540C										
Surrogate: Decachlorobiphenyl	*0.0245*		mg/kg wet	*0.02500*		*98*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0258*		mg/kg wet	*0.02500*		*103*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0198*		mg/kg wet	*0.02500*		*79*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0208*		mg/kg wet	*0.02500*		*83*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CJ60608 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.68*		mg/kg wet	*5.000*		*94*	*40-140*			
LCS										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		78	40-140			
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Dodecane (C12)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Eicosane (C20)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Hexadecane (C16)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		69	30-140			
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		86	40-140			
Total Petroleum Hydrocarbons	32.8	37.5	mg/kg wet	35.00		94	40-140			
Triacontane (C30)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Surrogate: O-Terphenyl	*4.89*		mg/kg wet	*5.000*		*98*	*40-140*			
LCS Dup										
Decane (C10)	2.2	0.2	mg/kg wet	2.500		87	40-140	11	50	
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		101	40-140	4	50	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
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Quality Control Data

8100M Total Petroleum Hydrocarbons

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ60608 - 3546										
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		89	40-140	5	50	
Eicosane (C20)	2.6	0.2	mg/kg wet	2.500		103	40-140	4	50	
Hexacosane (C26)	2.5	0.2	mg/kg wet	2.500		101	40-140	4	50	
Hexadecane (C16)	2.5	0.2	mg/kg wet	2.500		102	40-140	7	50	
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		92	40-140	5	50	
Nonane (C9)	1.9	0.2	mg/kg wet	2.500		77	30-140	11	50	
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		101	40-140	5	50	
Octadecane (C18)	2.5	0.2	mg/kg wet	2.500		99	40-140	5	50	
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		101	40-140	4	50	
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		92	40-140	7	50	
Total Petroleum Hydrocarbons	34.1	37.5	mg/kg wet	35.00		97	40-140	4	50	
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		101	40-140	4	50	
Surrogate: O-Terphenyl	*5.02*		mg/kg wet	*5.000*		*100*	*40-140*			
Batch CJ60712 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.60*		mg/kg wet	*5.000*		*92*	*40-140*			
LCS										
Decane (C10)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Dodecane (C12)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Eicosane (C20)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Hexadecane (C16)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Nonane (C9)	1.9	0.2	mg/kg wet	2.500		76	30-140			
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Octadecane (C18)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Tetradecane (C14)	2.4	0.2	mg/kg wet	2.500		94	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CJ60712 - 3546										
Total Petroleum Hydrocarbons	33.4	37.5	mg/kg wet	35.00		95	40-140			
Triacontane (C30)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Surrogate: O-Terphenyl	*4.52*		mg/kg wet	*5.000*		*90*	*40-140*			
LCS Dup										
Decane (C10)	2.1	0.2	mg/kg wet	2.500		84	40-140	4	50	
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		96	40-140	4	50	
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		88	40-140	4	50	
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		97	40-140	4	50	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		94	40-140	3	50	
Hexadecane (C16)	2.5	0.2	mg/kg wet	2.500		99	40-140	2	50	
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		97	40-140	4	50	
Nonane (C9)	1.8	0.2	mg/kg wet	2.500		73	30-140	5	50	
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		92	40-140	4	50	
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		95	40-140	4	50	
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		95	40-140	4	50	
Tetradecane (C14)	2.4	0.2	mg/kg wet	2.500		95	40-140	0.3	50	
Total Petroleum Hydrocarbons	32.3	37.5	mg/kg wet	35.00		92	40-140	3	50	
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		92	40-140	3	50	
Surrogate: O-Terphenyl	*4.30*		mg/kg wet	*5.000*		*86*	*40-140*			
8270D Semi-Volatile Organic Compounds										
Batch CJ60609 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,2-Diphenylhydrazine as Azobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth

ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8270D Semi-Volatile Organic Compounds						
Batch CJ60609 - 3546										
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzidine	ND	0.667	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CJ60609 - 3546										
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.63*		mg/kg wet	*3.333*		*79*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.46*		mg/kg wet	*5.000*		*89*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.99*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.75*		mg/kg wet	*3.333*		*82*	*30-130*			
Surrogate: 2-Fluorophenol	*3.92*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.68*		mg/kg wet	*3.333*		*80*	*30-130*			
Surrogate: Phenol-d6	*4.01*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.07*		mg/kg wet	*3.333*		*92*	*30-130*			
LCS										
1,1-Biphenyl	2.46	0.333	mg/kg wet	3.333		74	40-140			
1,2,4-Trichlorobenzene	2.29	0.333	mg/kg wet	3.333		69	40-140			
1,2-Dichlorobenzene	2.19	0.333	mg/kg wet	3.333		66	40-140			
1,2-Diphenylhydrazine as Azobenzene	2.59	0.333	mg/kg wet	3.333		78	40-140			
1,3-Dichlorobenzene	2.20	0.333	mg/kg wet	3.333		66	40-140			
1,4-Dichlorobenzene	2.15	0.333	mg/kg wet	3.333		65	40-140			
2,3,4,6-Tetrachlorophenol	2.77	1.67	mg/kg wet	3.333		83	30-130			
2,4,5-Trichlorophenol	2.99	0.333	mg/kg wet	3.333		90	30-130			
2,4,6-Trichlorophenol	2.81	0.333	mg/kg wet	3.333		84	30-130			
2,4-Dichlorophenol	2.57	0.333	mg/kg wet	3.333		77	30-130			
2,4-Dimethylphenol	2.59	0.333	mg/kg wet	3.333		78	30-130			
2,4-Dinitrophenol	2.74	1.67	mg/kg wet	3.333		82	30-130			
2,4-Dinitrotoluene	3.11	0.333	mg/kg wet	3.333		93	40-140			
2,6-Dinitrotoluene	2.77	0.333	mg/kg wet	3.333		83	40-140			
2-Chloronaphthalene	2.20	0.333	mg/kg wet	3.333		66	40-140			
2-Chlorophenol	2.29	0.333	mg/kg wet	3.333		69	30-130			
2-Methylnaphthalene	2.40	0.333	mg/kg wet	3.333		72	40-140			
2-Methylphenol	2.39	0.333	mg/kg wet	3.333		72	30-130			
2-Nitroaniline	2.58	0.333	mg/kg wet	3.333		77	40-140			
2-Nitrophenol	2.48	0.333	mg/kg wet	3.333		74	30-130			
3,3´-Dichlorobenzidine	2.73	0.667	mg/kg wet	3.333		82	40-140			
3+4-Methylphenol	4.74	0.667	mg/kg wet	6.667		71	30-130			
3-Nitroaniline	2.72	0.333	mg/kg wet	3.333		82	40-140			
4,6-Dinitro-2-Methylphenol	2.96	1.67	mg/kg wet	3.333		89	30-130			
4-Bromophenyl-phenylether	2.70	0.333	mg/kg wet	3.333		81	40-140			
4-Chloro-3-Methylphenol	2.80	0.333	mg/kg wet	3.333		84	30-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CJ60609 - 3546										
4-Chloroaniline	2.28	0.667	mg/kg wet	3.333		68	40-140			
4-Chloro-phenyl-phenyl ether	2.65	0.333	mg/kg wet	3.333		79	40-140			
4-Nitroaniline	2.77	0.333	mg/kg wet	3.333		83	40-140			
4-Nitrophenol	2.80	1.67	mg/kg wet	3.333		84	30-130			
Acenaphthene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Acenaphthylene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Acetophenone	2.32	0.667	mg/kg wet	3.333		70	40-140			
Aniline	1.76	1.67	mg/kg wet	3.333		53	40-140			
Anthracene	2.86	0.333	mg/kg wet	3.333		86	40-140			
Azobenzene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Benzidine	1.58	0.667	mg/kg wet	3.333		47	40-140			
Benzo(a)anthracene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)pyrene	3.10	0.167	mg/kg wet	3.333		93	40-140			
Benzo(b)fluoranthene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(g,h,i)perylene	3.06	0.333	mg/kg wet	3.333		92	40-140			
Benzo(k)fluoranthene	2.86	0.333	mg/kg wet	3.333		86	40-140			
Benzoic Acid	2.82	1.67	mg/kg wet	3.333		84	40-140			
Benzyl Alcohol	2.36	0.333	mg/kg wet	3.333		71	40-140			
bis(2-Chloroethoxy)methane	2.37	0.333	mg/kg wet	3.333		71	40-140			
bis(2-Chloroethyl)ether	2.12	0.333	mg/kg wet	3.333		64	40-140			
bis(2-chloroisopropyl)Ether	2.24	0.333	mg/kg wet	3.333		67	40-140			
bis(2-Ethylhexyl)phthalate	3.04	0.333	mg/kg wet	3.333		91	40-140			
Butylbenzylphthalate	2.97	0.333	mg/kg wet	3.333		89	40-140			
Carbazole	2.97	0.333	mg/kg wet	3.333		89	40-140			
Chrysene	2.90	0.167	mg/kg wet	3.333		87	40-140			
Dibenzo(a,h)Anthracene	3.11	0.167	mg/kg wet	3.333		93	40-140			
Dibenzofuran	2.61	0.333	mg/kg wet	3.333		78	40-140			
Diethylphthalate	2.89	0.333	mg/kg wet	3.333		87	40-140			
Dimethylphthalate	2.77	0.333	mg/kg wet	3.333		83	40-140			
Di-n-butylphthalate	3.17	0.333	mg/kg wet	3.333		95	40-140			
Di-n-octylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140			
Fluoranthene	3.04	0.333	mg/kg wet	3.333		91	40-140			
Fluorene	2.76	0.333	mg/kg wet	3.333		83	40-140			
Hexachlorobenzene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Hexachlorobutadiene	2.32	0.333	mg/kg wet	3.333		70	40-140			
Hexachlorocyclopentadiene	2.22	1.67	mg/kg wet	3.333		67	40-140			
Hexachloroethane	2.12	0.333	mg/kg wet	3.333		64	40-140			
Indeno(1,2,3-cd)Pyrene	3.11	0.333	mg/kg wet	3.333		93	40-140			
Isophorone	2.57	0.333	mg/kg wet	3.333		77	40-140			
Naphthalene	2.26	0.333	mg/kg wet	3.333		68	40-140			
Nitrobenzene	2.32	0.333	mg/kg wet	3.333		70	40-140			
N-Nitrosodimethylamine	2.30	0.333	mg/kg wet	3.333		69	40-140			
N-Nitroso-Di-n-Propylamine	2.46	0.333	mg/kg wet	3.333		74	40-140			
N-nitrosodiphenylamine	2.94	0.333	mg/kg wet	3.333		88	40-140			
Pentachlorophenol	3.16	1.67	mg/kg wet	3.333		95	30-130			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CJ60609 - 3546										
Phenanthrene	2.76	0.333	mg/kg wet	3.333		83	40-140			
Phenol	2.36	0.333	mg/kg wet	3.333		71	30-130			
Pyrene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Pyridine	1.85	1.67	mg/kg wet	3.333		55	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.40*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.78*		mg/kg wet	*5.000*		*96*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.81*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.71*		mg/kg wet	*3.333*		*81*	*30-130*			
Surrogate: 2-Fluorophenol	*3.70*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.59*		mg/kg wet	*3.333*		*78*	*30-130*			
Surrogate: Phenol-d6	*3.98*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.42*		mg/kg wet	*3.333*		*102*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.21	0.333	mg/kg wet	3.333		66	40-140	11	30	
1,2,4-Trichlorobenzene	2.04	0.333	mg/kg wet	3.333		61	40-140	11	30	
1,2-Dichlorobenzene	1.99	0.333	mg/kg wet	3.333		60	40-140	10	30	
1,2-Diphenylhydrazine as Azobenzene	2.42	0.333	mg/kg wet	3.333		72	40-140	7	30	
1,3-Dichlorobenzene	1.99	0.333	mg/kg wet	3.333		60	40-140	10	30	
1,4-Dichlorobenzene	1.95	0.333	mg/kg wet	3.333		59	40-140	10	30	
2,3,4,6-Tetrachlorophenol	2.61	1.67	mg/kg wet	3.333		78	30-130	6	30	
2,4,5-Trichlorophenol	2.76	0.333	mg/kg wet	3.333		83	30-130	8	30	
2,4,6-Trichlorophenol	2.59	0.333	mg/kg wet	3.333		78	30-130	8	30	
2,4-Dichlorophenol	2.30	0.333	mg/kg wet	3.333		69	30-130	11	30	
2,4-Dimethylphenol	2.30	0.333	mg/kg wet	3.333		69	30-130	12	30	
2,4-Dinitrophenol	2.66	1.67	mg/kg wet	3.333		80	30-130	3	30	
2,4-Dinitrotoluene	2.92	0.333	mg/kg wet	3.333		88	40-140	6	30	
2,6-Dinitrotoluene	2.60	0.333	mg/kg wet	3.333		78	40-140	7	30	
2-Chloronaphthalene	1.95	0.333	mg/kg wet	3.333		59	40-140	12	30	
2-Chlorophenol	2.08	0.333	mg/kg wet	3.333		62	30-130	10	30	
2-Methylnaphthalene	2.12	0.333	mg/kg wet	3.333		64	40-140	12	30	
2-Methylphenol	2.19	0.333	mg/kg wet	3.333		66	30-130	9	30	
2-Nitroaniline	2.41	0.333	mg/kg wet	3.333		72	40-140	7	30	
2-Nitrophenol	2.19	0.333	mg/kg wet	3.333		66	30-130	13	30	
3,3´-Dichlorobenzidine	2.64	0.667	mg/kg wet	3.333		79	40-140	3	30	
3+4-Methylphenol	4.41	0.667	mg/kg wet	6.667		66	30-130	7	30	
3-Nitroaniline	2.57	0.333	mg/kg wet	3.333		77	40-140	6	30	
4,6-Dinitro-2-Methylphenol	2.85	1.67	mg/kg wet	3.333		85	30-130	4	30	
4-Bromophenyl-phenylether	2.57	0.333	mg/kg wet	3.333		77	40-140	5	30	
4-Chloro-3-Methylphenol	2.53	0.333	mg/kg wet	3.333		76	30-130	10	30	
4-Chloroaniline	2.05	0.667	mg/kg wet	3.333		61	40-140	11	30	
4-Chloro-phenyl-phenyl ether	2.43	0.333	mg/kg wet	3.333		73	40-140	9	30	
4-Nitroaniline	2.70	0.333	mg/kg wet	3.333		81	40-140	3	30	
4-Nitrophenol	2.64	1.67	mg/kg wet	3.333		79	30-130	6	30	
Acenaphthene	2.37	0.333	mg/kg wet	3.333		71	40-140	10	30	
Acenaphthylene	2.45	0.333	mg/kg wet	3.333		74	40-140	10	30	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ60609 - 3546										
Acetophenone	2.12	0.667	mg/kg wet	3.333		64	40-140	9	30	
Aniline	1.58	1.67	mg/kg wet	3.333		47	40-140	11	30	
Anthracene	2.73	0.333	mg/kg wet	3.333		82	40-140	5	30	
Azobenzene	2.42	0.333	mg/kg wet	3.333		72	40-140	7	30	
Benzidine	1.72	0.667	mg/kg wet	3.333		52	40-140	8	30	
Benzo(a)anthracene	2.81	0.333	mg/kg wet	3.333		84	40-140	6	30	
Benzo(a)pyrene	2.98	0.167	mg/kg wet	3.333		89	40-140	4	30	
Benzo(b)fluoranthene	2.78	0.333	mg/kg wet	3.333		83	40-140	8	30	
Benzo(g,h,i)perylene	2.96	0.333	mg/kg wet	3.333		89	40-140	3	30	
Benzo(k)fluoranthene	2.88	0.333	mg/kg wet	3.333		86	40-140	0.8	30	
Benzoic Acid	2.74	1.67	mg/kg wet	3.333		82	40-140	3	30	
Benzyl Alcohol	2.12	0.333	mg/kg wet	3.333		64	40-140	10	30	
bis(2-Chloroethoxy)methane	2.07	0.333	mg/kg wet	3.333		62	40-140	13	30	
bis(2-Chloroethyl)ether	1.96	0.333	mg/kg wet	3.333		59	40-140	8	30	
bis(2-chloroisopropyl)Ether	2.02	0.333	mg/kg wet	3.333		60	40-140	10	30	
bis(2-Ethylhexyl)phthalate	2.86	0.333	mg/kg wet	3.333		86	40-140	6	30	
Butylbenzylphthalate	2.81	0.333	mg/kg wet	3.333		84	40-140	6	30	
Carbazole	2.84	0.333	mg/kg wet	3.333		85	40-140	4	30	
Chrysene	2.78	0.167	mg/kg wet	3.333		83	40-140	4	30	
Dibenzo(a,h)Anthracene	3.00	0.167	mg/kg wet	3.333		90	40-140	3	30	
Dibenzofuran	2.37	0.333	mg/kg wet	3.333		71	40-140	10	30	
Diethylphthalate	2.72	0.333	mg/kg wet	3.333		82	40-140	6	30	
Dimethylphthalate	2.59	0.333	mg/kg wet	3.333		78	40-140	7	30	
Di-n-butylphthalate	3.03	0.333	mg/kg wet	3.333		91	40-140	5	30	
Di-n-octylphthalate	2.74	0.333	mg/kg wet	3.333		82	40-140	5	30	
Fluoranthene	2.93	0.333	mg/kg wet	3.333		88	40-140	4	30	
Fluorene	2.54	0.333	mg/kg wet	3.333		76	40-140	8	30	
Hexachlorobenzene	2.64	0.333	mg/kg wet	3.333		79	40-140	5	30	
Hexachlorobutadiene	1.98	0.333	mg/kg wet	3.333		60	40-140	16	30	
Hexachlorocyclopentadiene	1.66	1.67	mg/kg wet	3.333		50	40-140	29	30	
Hexachloroethane	1.96	0.333	mg/kg wet	3.333		59	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	2.99	0.333	mg/kg wet	3.333		90	40-140	4	30	
Isophorone	2.26	0.333	mg/kg wet	3.333		68	40-140	13	30	
Naphthalene	2.00	0.333	mg/kg wet	3.333		60	40-140	12	30	
Nitrobenzene	2.07	0.333	mg/kg wet	3.333		62	40-140	12	30	
N-Nitrosodimethylamine	2.04	0.333	mg/kg wet	3.333		61	40-140	12	30	
N-Nitroso-Di-n-Propylamine	2.21	0.333	mg/kg wet	3.333		66	40-140	11	30	
N-nitrosodiphenylamine	2.80	0.333	mg/kg wet	3.333		84	40-140	5	30	
Pentachlorophenol	3.01	1.67	mg/kg wet	3.333		90	30-130	5	30	
Phenanthrene	2.67	0.333	mg/kg wet	3.333		80	40-140	3	30	
Phenol	2.13	0.333	mg/kg wet	3.333		64	30-130	10	30	
Pyrene	2.82	0.333	mg/kg wet	3.333		84	40-140	6	30	
Pyridine	1.66	1.67	mg/kg wet	3.333		50	40-140	11	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.12*		mg/kg wet	*3.333*		*64*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.50*		mg/kg wet	*5.000*		*90*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8270D Semi-Volatile Organic Compounds						
Batch CJ60609 - 3546										
Surrogate: 2-Chlorophenol-d4	*3.33*		mg/kg wet	*5.000*		*67*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.30*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2-Fluorophenol	*3.21*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.22*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: Phenol-d6	*3.44*		mg/kg wet	*5.000*		*69*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.09*		mg/kg wet	*3.333*		*93*	*30-130*			
Batch CJ61112 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,2-Diphenylhydrazine as Azobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CJ61112 - 3546										
Benzidine	ND	0.667	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.34*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.02*		mg/kg wet	*5.000*		*60*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.60*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.37*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2-Fluorophenol	*3.61*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.34*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: Phenol-d6	*3.72*		mg/kg wet	*5.000*		*74*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CJ61112 - 3546										
Surrogate: p-Terphenyl-d14	*3.53*		mg/kg wet	*3.333*		*106*	*30-130*			
LCS										
1,1-Biphenyl	2.35	0.333	mg/kg wet	3.333		70	40-140			
1,2,4-Trichlorobenzene	2.18	0.333	mg/kg wet	3.333		65	40-140			
1,2-Dichlorobenzene	2.10	0.333	mg/kg wet	3.333		63	40-140			
1,2-Diphenylhydrazine as Azobenzene	2.41	0.333	mg/kg wet	3.333		72	40-140			
1,3-Dichlorobenzene	2.14	0.333	mg/kg wet	3.333		64	40-140			
1,4-Dichlorobenzene	2.12	0.333	mg/kg wet	3.333		64	40-140			
2,3,4,6-Tetrachlorophenol	2.23	1.67	mg/kg wet	3.333		67	30-130			
2,4,5-Trichlorophenol	2.72	0.333	mg/kg wet	3.333		81	30-130			
2,4,6-Trichlorophenol	2.50	0.333	mg/kg wet	3.333		75	30-130			
2,4-Dichlorophenol	2.41	0.333	mg/kg wet	3.333		72	30-130			
2,4-Dimethylphenol	2.28	0.333	mg/kg wet	3.333		69	30-130			
2,4-Dinitrophenol	2.23	1.67	mg/kg wet	3.333		67	30-130			
2,4-Dinitrotoluene	2.91	0.333	mg/kg wet	3.333		87	40-140			
2,6-Dinitrotoluene	2.54	0.333	mg/kg wet	3.333		76	40-140			
2-Chloronaphthalene	2.14	0.333	mg/kg wet	3.333		64	40-140			
2-Chlorophenol	2.25	0.333	mg/kg wet	3.333		68	30-130			
2-Methylnaphthalene	2.22	0.333	mg/kg wet	3.333		67	40-140			
2-Methylphenol	2.27	0.333	mg/kg wet	3.333		68	30-130			
2-Nitroaniline	2.37	0.333	mg/kg wet	3.333		71	40-140			
2-Nitrophenol	2.31	0.333	mg/kg wet	3.333		69	30-130			
3,3´-Dichlorobenzidine	1.67	0.667	mg/kg wet	3.333		50	40-140			
3+4-Methylphenol	4.65	0.667	mg/kg wet	6.667		70	30-130			
3-Nitroaniline	2.40	0.333	mg/kg wet	3.333		72	40-140			
4,6-Dinitro-2-Methylphenol	2.46	1.67	mg/kg wet	3.333		74	30-130			
4-Bromophenyl-phenylether	2.39	0.333	mg/kg wet	3.333		72	40-140			
4-Chloro-3-Methylphenol	2.41	0.333	mg/kg wet	3.333		72	30-130			
4-Chloroaniline	1.93	0.667	mg/kg wet	3.333		58	40-140			
4-Chloro-phenyl-phenyl ether	2.43	0.333	mg/kg wet	3.333		73	40-140			
4-Nitroaniline	2.91	0.333	mg/kg wet	3.333		87	40-140			
4-Nitrophenol	2.66	1.67	mg/kg wet	3.333		80	30-130			
Acenaphthene	2.41	0.333	mg/kg wet	3.333		72	40-140			
Acenaphthylene	2.39	0.333	mg/kg wet	3.333		72	40-140			
Acetophenone	2.24	0.667	mg/kg wet	3.333		67	40-140			
Aniline	1.30	1.67	mg/kg wet	3.333		39	40-140			B-
Anthracene	2.65	0.333	mg/kg wet	3.333		79	40-140			
Azobenzene	2.41	0.333	mg/kg wet	3.333		72	40-140			
Benzidine	ND	0.667	mg/kg wet	3.333			40-140			B-
Benzo(a)anthracene	2.68	0.333	mg/kg wet	3.333		80	40-140			
Benzo(a)pyrene	2.92	0.167	mg/kg wet	3.333		88	40-140			
Benzo(b)fluoranthene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Benzo(g,h,i)perylene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Benzo(k)fluoranthene	2.95	0.333	mg/kg wet	3.333		88	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CJ61112 - 3546										
Benzoic Acid	2.18	1.67	mg/kg wet	3.333		66	40-140			
Benzyl Alcohol	2.24	0.333	mg/kg wet	3.333		67	40-140			
bis(2-Chloroethoxy)methane	2.23	0.333	mg/kg wet	3.333		67	40-140			
bis(2-Chloroethyl)ether	2.53	0.333	mg/kg wet	3.333		76	40-140			
bis(2-chloroisopropyl)Ether	2.21	0.333	mg/kg wet	3.333		66	40-140			
bis(2-Ethylhexyl)phthalate	3.05	0.333	mg/kg wet	3.333		91	40-140			
Butylbenzylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140			
Carbazole	2.79	0.333	mg/kg wet	3.333		84	40-140			
Chrysene	2.73	0.167	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.91	0.167	mg/kg wet	3.333		87	40-140			
Dibenzofuran	2.38	0.333	mg/kg wet	3.333		72	40-140			
Diethylphthalate	2.62	0.333	mg/kg wet	3.333		79	40-140			
Dimethylphthalate	2.48	0.333	mg/kg wet	3.333		74	40-140			
Di-n-butylphthalate	2.97	0.333	mg/kg wet	3.333		89	40-140			
Di-n-octylphthalate	2.72	0.333	mg/kg wet	3.333		82	40-140			
Fluoranthene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Fluorene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Hexachlorobenzene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Hexachlorobutadiene	2.18	0.333	mg/kg wet	3.333		65	40-140			
Hexachlorocyclopentadiene	0.361	1.67	mg/kg wet	3.333		11	40-140			B-
Hexachloroethane	2.13	0.333	mg/kg wet	3.333		64	40-140			
Indeno(1,2,3-cd)Pyrene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Isophorone	2.34	0.333	mg/kg wet	3.333		70	40-140			
Naphthalene	2.21	0.333	mg/kg wet	3.333		66	40-140			
Nitrobenzene	2.26	0.333	mg/kg wet	3.333		68	40-140			
N-Nitrosodimethylamine	2.13	0.333	mg/kg wet	3.333		64	40-140			
N-Nitroso-Di-n-Propylamine	2.34	0.333	mg/kg wet	3.333		70	40-140			
N-nitrosodiphenylamine	2.66	0.333	mg/kg wet	3.333		80	40-140			
Pentachlorophenol	2.77	1.67	mg/kg wet	3.333		83	30-130			
Phenanthrene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Phenol	2.23	0.333	mg/kg wet	3.333		67	30-130			
Pyrene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Pyridine	1.81	1.67	mg/kg wet	3.333		54	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.47*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.00*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.87*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.64*		mg/kg wet	*3.333*		*79*	*30-130*			
Surrogate: 2-Fluorophenol	*3.88*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.60*		mg/kg wet	*3.333*		*78*	*30-130*			
Surrogate: Phenol-d6	*4.04*		mg/kg wet	*5.000*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.34*		mg/kg wet	*3.333*		*100*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.52	0.333	mg/kg wet	3.333		76	40-140	7	30	
1,2,4-Trichlorobenzene	2.32	0.333	mg/kg wet	3.333		70	40-140	6	30	
1,2-Dichlorobenzene	2.24	0.333	mg/kg wet	3.333		67	40-140	6	30	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CJ61112 - 3546										
1,2-Diphenylhydrazine as Azobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140	7	30	
1,3-Dichlorobenzene	2.31	0.333	mg/kg wet	3.333		69	40-140	7	30	
1,4-Dichlorobenzene	2.22	0.333	mg/kg wet	3.333		67	40-140	5	30	
2,3,4,6-Tetrachlorophenol	2.45	1.67	mg/kg wet	3.333		73	30-130	9	30	
2,4,5-Trichlorophenol	2.92	0.333	mg/kg wet	3.333		88	30-130	7	30	
2,4,6-Trichlorophenol	2.72	0.333	mg/kg wet	3.333		81	30-130	8	30	
2,4-Dichlorophenol	2.59	0.333	mg/kg wet	3.333		78	30-130	7	30	
2,4-Dimethylphenol	2.48	0.333	mg/kg wet	3.333		75	30-130	8	30	
2,4-Dinitrophenol	2.55	1.67	mg/kg wet	3.333		76	30-130	13	30	
2,4-Dinitrotoluene	3.04	0.333	mg/kg wet	3.333		91	40-140	4	30	
2,6-Dinitrotoluene	2.66	0.333	mg/kg wet	3.333		80	40-140	5	30	
2-Chloronaphthalene	2.30	0.333	mg/kg wet	3.333		69	40-140	7	30	
2-Chlorophenol	2.45	0.333	mg/kg wet	3.333		74	30-130	9	30	
2-Methylnaphthalene	2.37	0.333	mg/kg wet	3.333		71	40-140	6	30	
2-Methylphenol	2.50	0.333	mg/kg wet	3.333		75	30-130	10	30	
2-Nitroaniline	2.49	0.333	mg/kg wet	3.333		75	40-140	5	30	
2-Nitrophenol	2.55	0.333	mg/kg wet	3.333		76	30-130	10	30	
3,3´-Dichlorobenzidine	1.42	0.667	mg/kg wet	3.333		43	40-140	16	30	
3+4-Methylphenol	5.08	0.667	mg/kg wet	6.667		76	30-130	9	30	
3-Nitroaniline	2.44	0.333	mg/kg wet	3.333		73	40-140	2	30	
4,6-Dinitro-2-Methylphenol	2.78	1.67	mg/kg wet	3.333		83	30-130	12	30	
4-Bromophenyl-phenylether	2.59	0.333	mg/kg wet	3.333		78	40-140	8	30	
4-Chloro-3-Methylphenol	2.56	0.333	mg/kg wet	3.333		77	30-130	6	30	
4-Chloroaniline	2.11	0.667	mg/kg wet	3.333		63	40-140	9	30	
4-Chloro-phenyl-phenyl ether	2.56	0.333	mg/kg wet	3.333		77	40-140	5	30	
4-Nitroaniline	3.12	0.333	mg/kg wet	3.333		94	40-140	7	30	
4-Nitrophenol	2.82	1.67	mg/kg wet	3.333		84	30-130	6	30	
Acenaphthene	2.56	0.333	mg/kg wet	3.333		77	40-140	6	30	
Acenaphthylene	2.55	0.333	mg/kg wet	3.333		77	40-140	7	30	
Acetophenone	2.43	0.667	mg/kg wet	3.333		73	40-140	8	30	
Aniline	1.53	1.67	mg/kg wet	3.333		46	40-140	17	30	
Anthracene	2.82	0.333	mg/kg wet	3.333		85	40-140	6	30	
Azobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140	7	30	
Benzidine	ND	0.667	mg/kg wet	3.333			40-140		30	B-
Benzo(a)anthracene	2.90	0.333	mg/kg wet	3.333		87	40-140	8	30	
Benzo(a)pyrene	3.13	0.167	mg/kg wet	3.333		94	40-140	7	30	
Benzo(b)fluoranthene	3.09	0.333	mg/kg wet	3.333		93	40-140	4	30	
Benzo(g,h,i)perylene	3.08	0.333	mg/kg wet	3.333		92	40-140	6	30	
Benzo(k)fluoranthene	3.17	0.333	mg/kg wet	3.333		95	40-140	7	30	
Benzoic Acid	3.14	1.67	mg/kg wet	3.333		94	40-140	36	30	D+
Benzyl Alcohol	2.47	0.333	mg/kg wet	3.333		74	40-140	10	30	
bis(2-Chloroethoxy)methane	2.39	0.333	mg/kg wet	3.333		72	40-140	7	30	
bis(2-Chloroethyl)ether	2.71	0.333	mg/kg wet	3.333		81	40-140	7	30	
bis(2-chloroisopropyl)Ether	2.36	0.333	mg/kg wet	3.333		71	40-140	7	30	
bis(2-Ethylhexyl)phthalate	3.24	0.333	mg/kg wet	3.333		97	40-140	6	30	

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8270D Semi-Volatile Organic Compounds						
Batch CJ61112 - 3546										
Butylbenzylphthalate	3.09	0.333	mg/kg wet	3.333		93	40-140	6	30	
Carbazole	2.96	0.333	mg/kg wet	3.333		89	40-140	6	30	
Chrysene	2.85	0.167	mg/kg wet	3.333		85	40-140	4	30	
Dibenzo(a,h)Anthracene	3.14	0.167	mg/kg wet	3.333		94	40-140	7	30	
Dibenzofuran	2.51	0.333	mg/kg wet	3.333		75	40-140	5	30	
Diethylphthalate	2.72	0.333	mg/kg wet	3.333		82	40-140	4	30	
Dimethylphthalate	2.57	0.333	mg/kg wet	3.333		77	40-140	4	30	
Di-n-butylphthalate	3.17	0.333	mg/kg wet	3.333		95	40-140	6	30	
Di-n-octylphthalate	2.88	0.333	mg/kg wet	3.333		86	40-140	6	30	
Fluoranthene	3.05	0.333	mg/kg wet	3.333		92	40-140	9	30	
Fluorene	2.62	0.333	mg/kg wet	3.333		79	40-140	4	30	
Hexachlorobenzene	2.71	0.333	mg/kg wet	3.333		81	40-140	8	30	
Hexachlorobutadiene	2.31	0.333	mg/kg wet	3.333		69	40-140	6	30	
Hexachlorocyclopentadiene	0.359	1.67	mg/kg wet	3.333		11	40-140	0.6	30	B-
Hexachloroethane	2.25	0.333	mg/kg wet	3.333		67	40-140	5	30	
Indeno(1,2,3-cd)Pyrene	3.12	0.333	mg/kg wet	3.333		94	40-140	7	30	
Isophorone	2.48	0.333	mg/kg wet	3.333		74	40-140	6	30	
Naphthalene	2.34	0.333	mg/kg wet	3.333		70	40-140	5	30	
Nitrobenzene	2.40	0.333	mg/kg wet	3.333		72	40-140	6	30	
N-Nitrosodimethylamine	2.33	0.333	mg/kg wet	3.333		70	40-140	9	30	
N-Nitroso-Di-n-Propylamine	2.53	0.333	mg/kg wet	3.333		76	40-140	8	30	
N-nitrosodiphenylamine	2.82	0.333	mg/kg wet	3.333		84	40-140	6	30	
Pentachlorophenol	3.14	1.67	mg/kg wet	3.333		94	30-130	13	30	
Phenanthrene	2.77	0.333	mg/kg wet	3.333		83	40-140	6	30	
Phenol	2.39	0.333	mg/kg wet	3.333		72	30-130	7	30	
Pyrene	2.94	0.333	mg/kg wet	3.333		88	40-140	5	30	
Pyridine	1.93	1.67	mg/kg wet	3.333		58	40-140	6	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.51*		mg/kg wet	*3.333*		*75*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.26*		mg/kg wet	*5.000*		*85*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.02*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.73*		mg/kg wet	*3.333*		*82*	*30-130*			
Surrogate: 2-Fluorophenol	*4.00*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.65*		mg/kg wet	*3.333*		*80*	*30-130*			
Surrogate: Phenol-d6	*4.25*		mg/kg wet	*5.000*		*85*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.38*		mg/kg wet	*3.333*		*102*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth
ESS Laboratory Work Order: 1610112

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
Q	Calibration required quadratic regression (Q).
IM	Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
E	Reported above the quantitation limit; Estimated value (E).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B+	Blank Spike recovery is above upper control limit (B+).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report

CERTIFICATE OF ANALYSIS

Client Name: Weston & Sampson Engineers, Inc.
Client Project ID: RTE 33 Portsmouth

ESS Laboratory Work Order: 1610112

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/documents/AllLabs.xls

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.depweb.state.pa.us/portal/server.pt/community/labs/13780/laboratory_accreditation_program/590095

```
File        :Q:\SVOA\MS5\MS5-1016\100716\SV563934.D
Operator    : TJ
Acquired    :  8 Oct 2016   3:30 am using AcqMethod SV5A.M
Instrument  :   SVOAMS5
Sample Name: 1610112-01
Misc Info   :
Vial Number: 12
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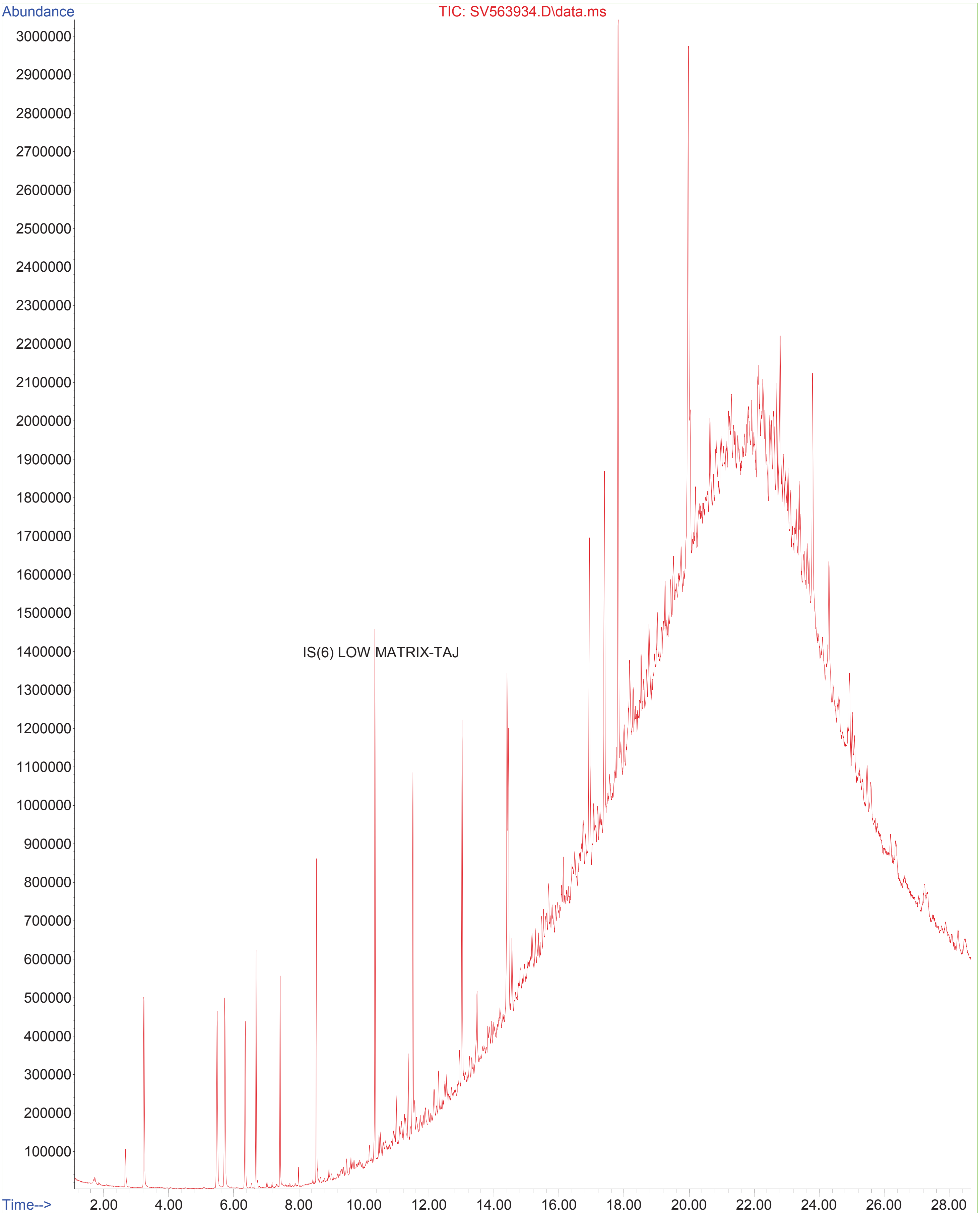

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File       :Q:\SVOA\MS5\MS5-1016\100716\SV563935.D
Operator   : TJ
Acquired   :  8 Oct 2016   4:07 am using AcqMethod SV5A.M
Instrument :   SVOAMS5
Sample Name: 1610112-02
Misc Info  :
Vial Number: 13
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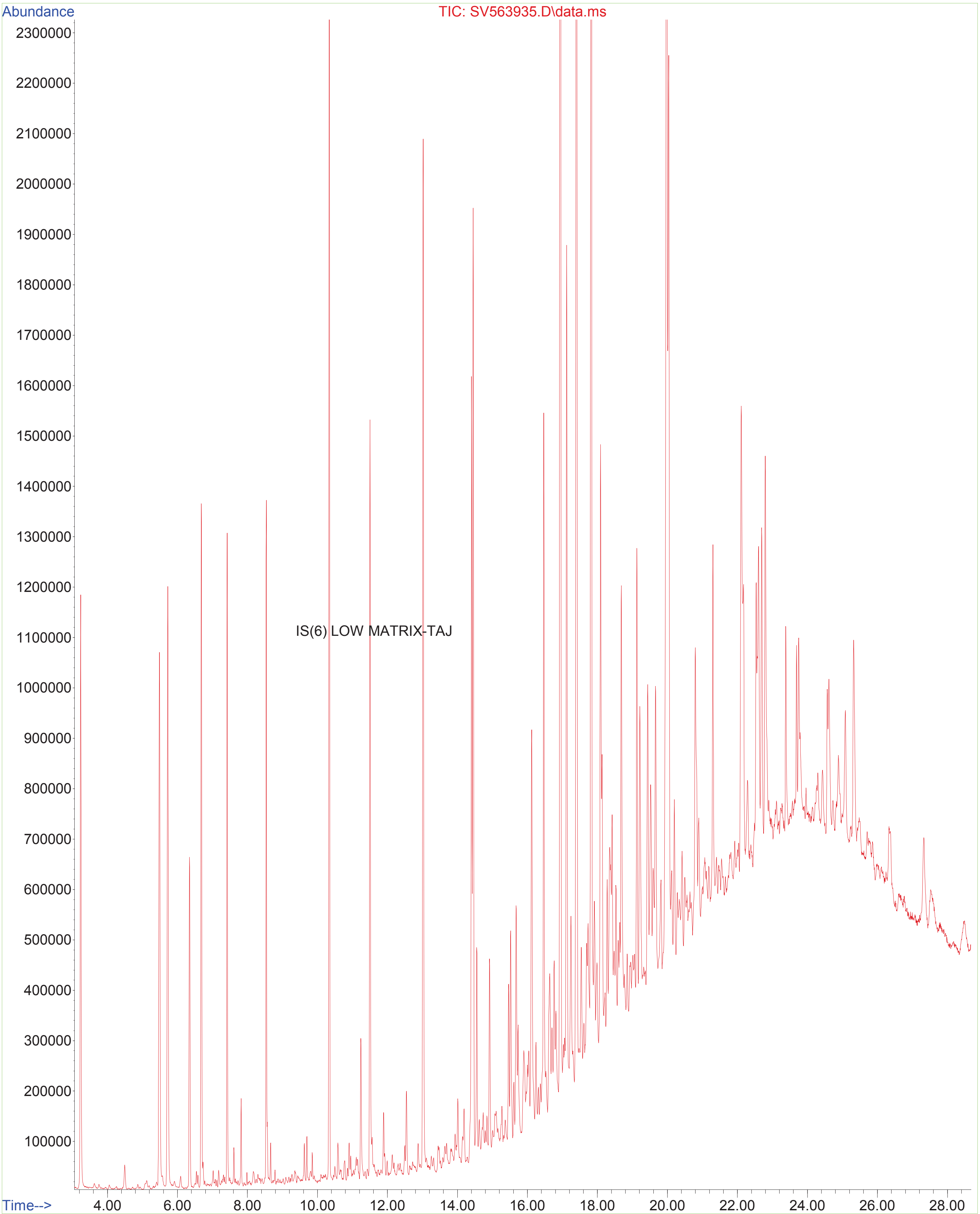

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Operator   : TJ
Acquired   :  8 Oct 2016   4:45 am using AcqMethod SV5A.M
Instrument :   SVOAMS5
Sample Name: 1610112-03
Misc Info  :
Vial Number: 14
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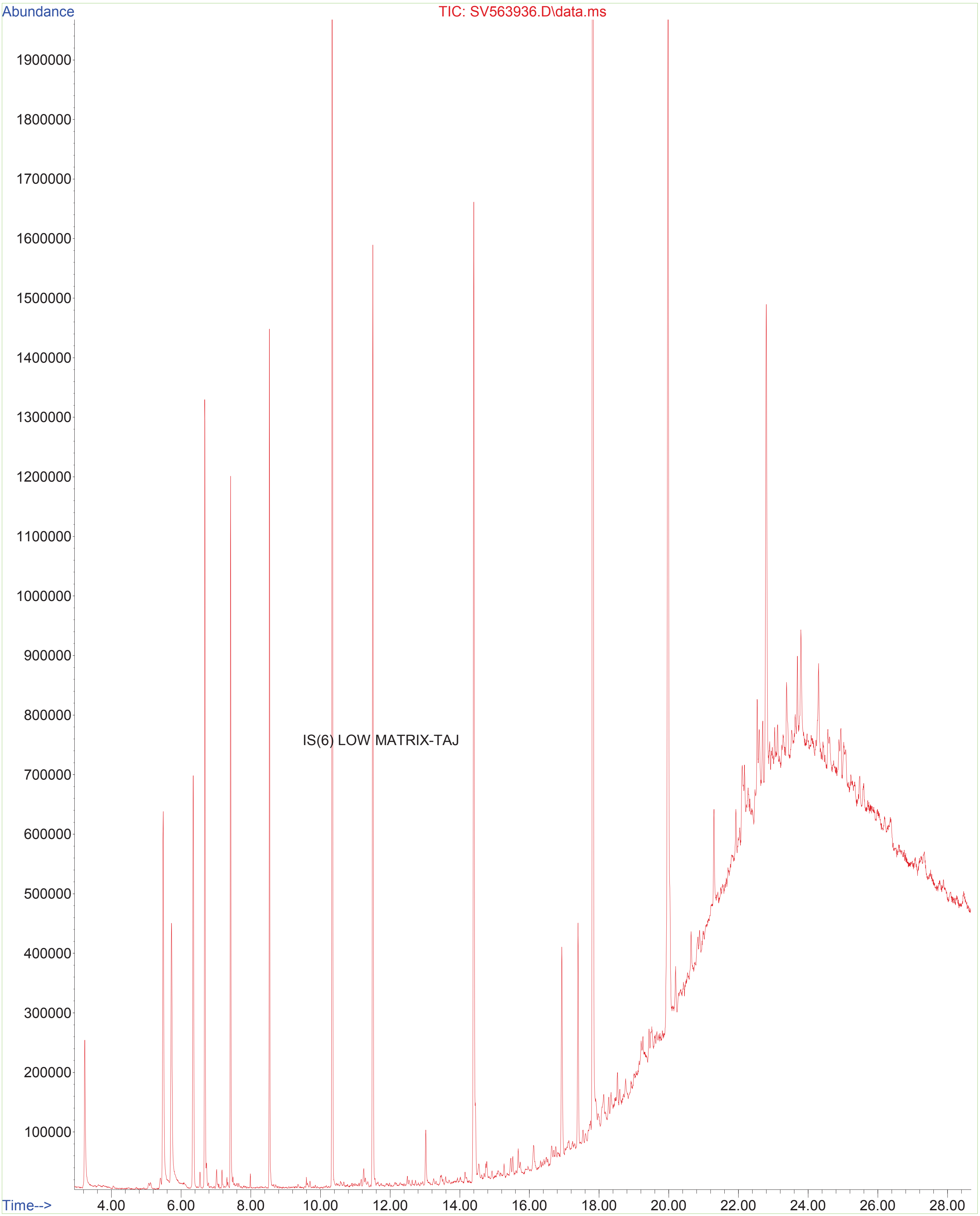

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Operator   : TJ
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Instrument :   SVOAMS5
Sample Name: 1610112-04
Misc Info  :
Vial Number: 15
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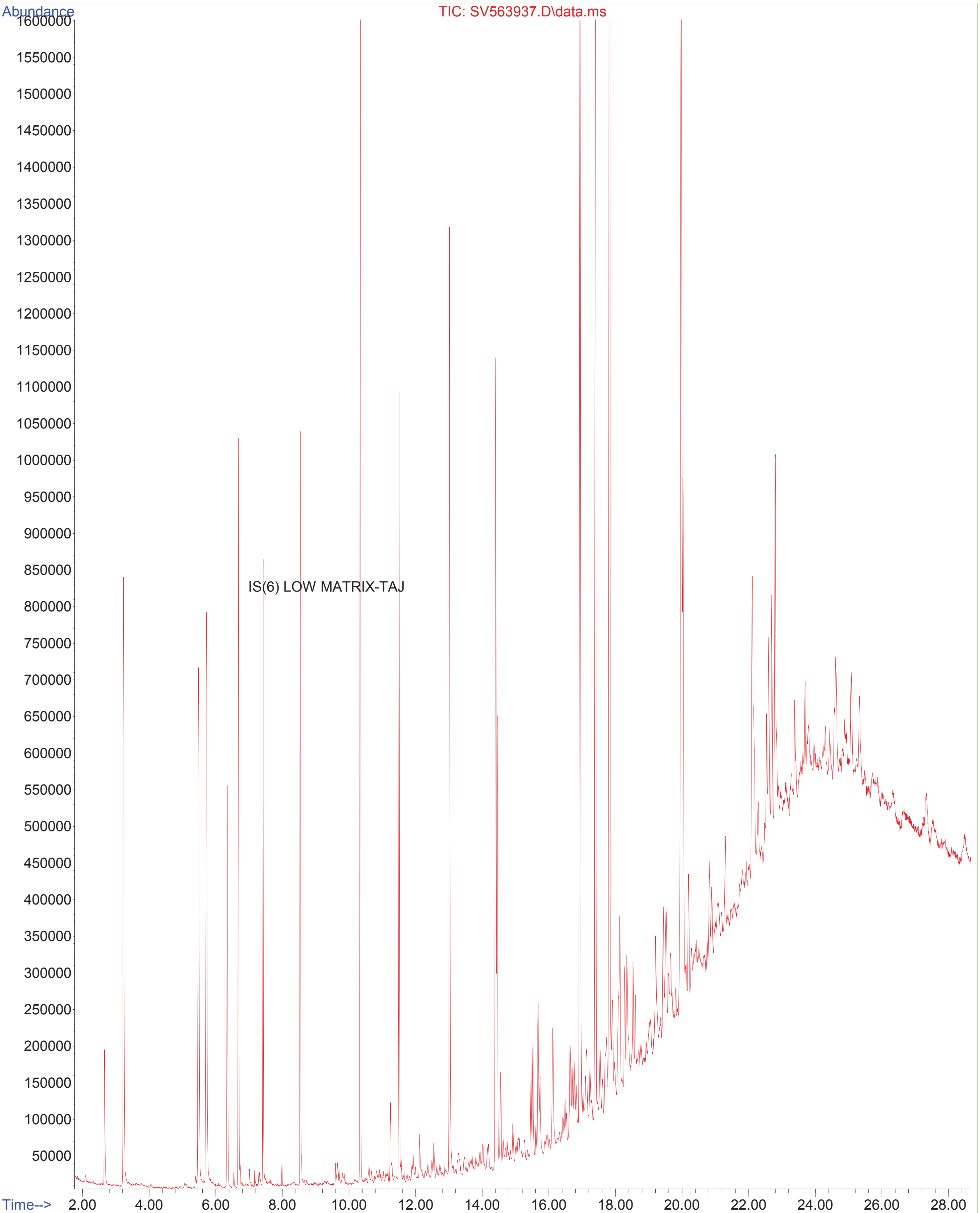

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Operator   : TJ
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Instrument :   SVOAMS5
Sample Name: 1610112-09
Misc Info  :
Vial Number: 20
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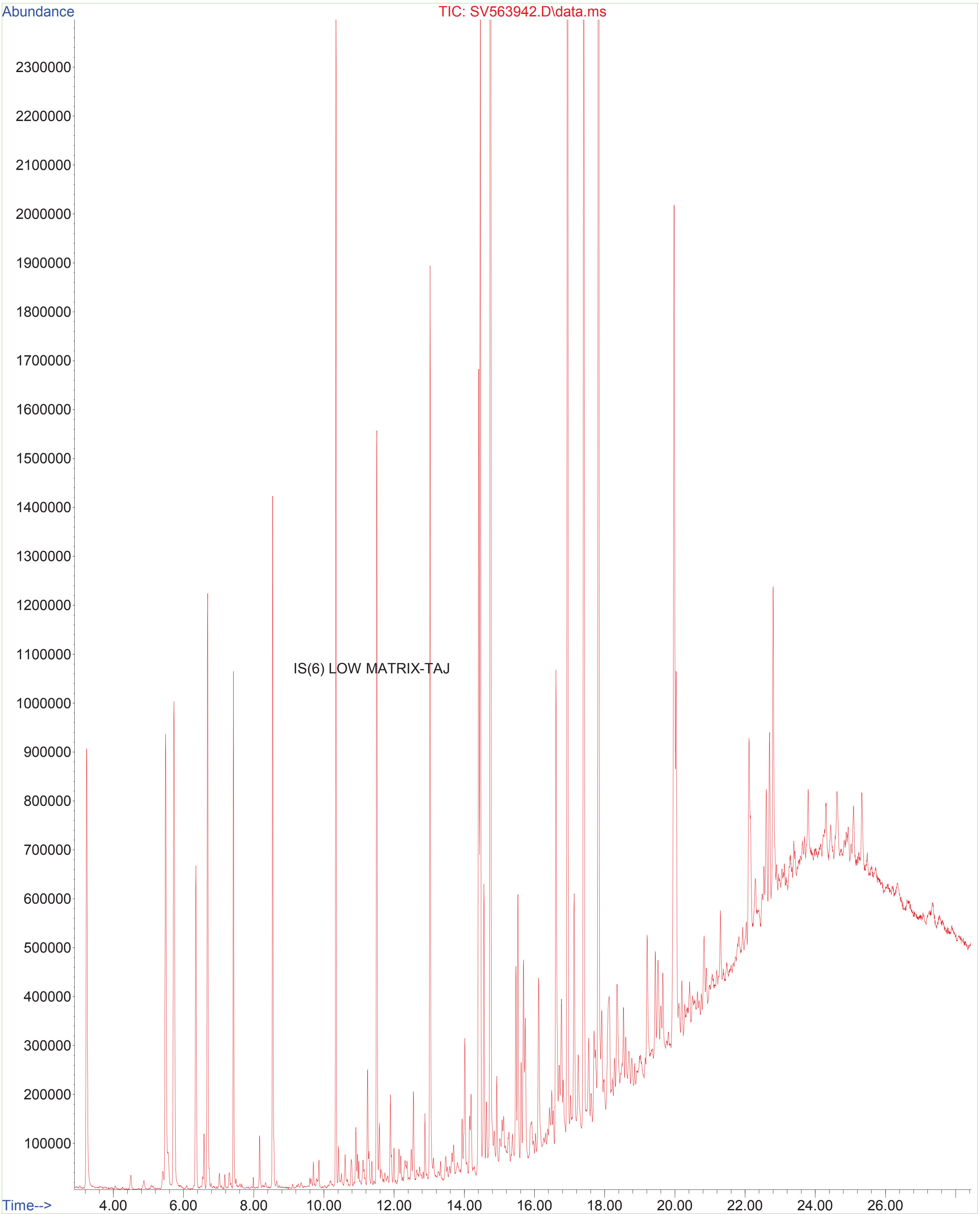

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File       :Q:\SVOA\MS5\MS5-1016\101116\SV563977.D
Operator   : TJ
Acquired   : 11 Oct 2016   6:59 pm using AcqMethod SV5A.M
Instrument :   SVOAMS5
Sample Name: 1610112-13
Misc Info  :
Vial Number: 12
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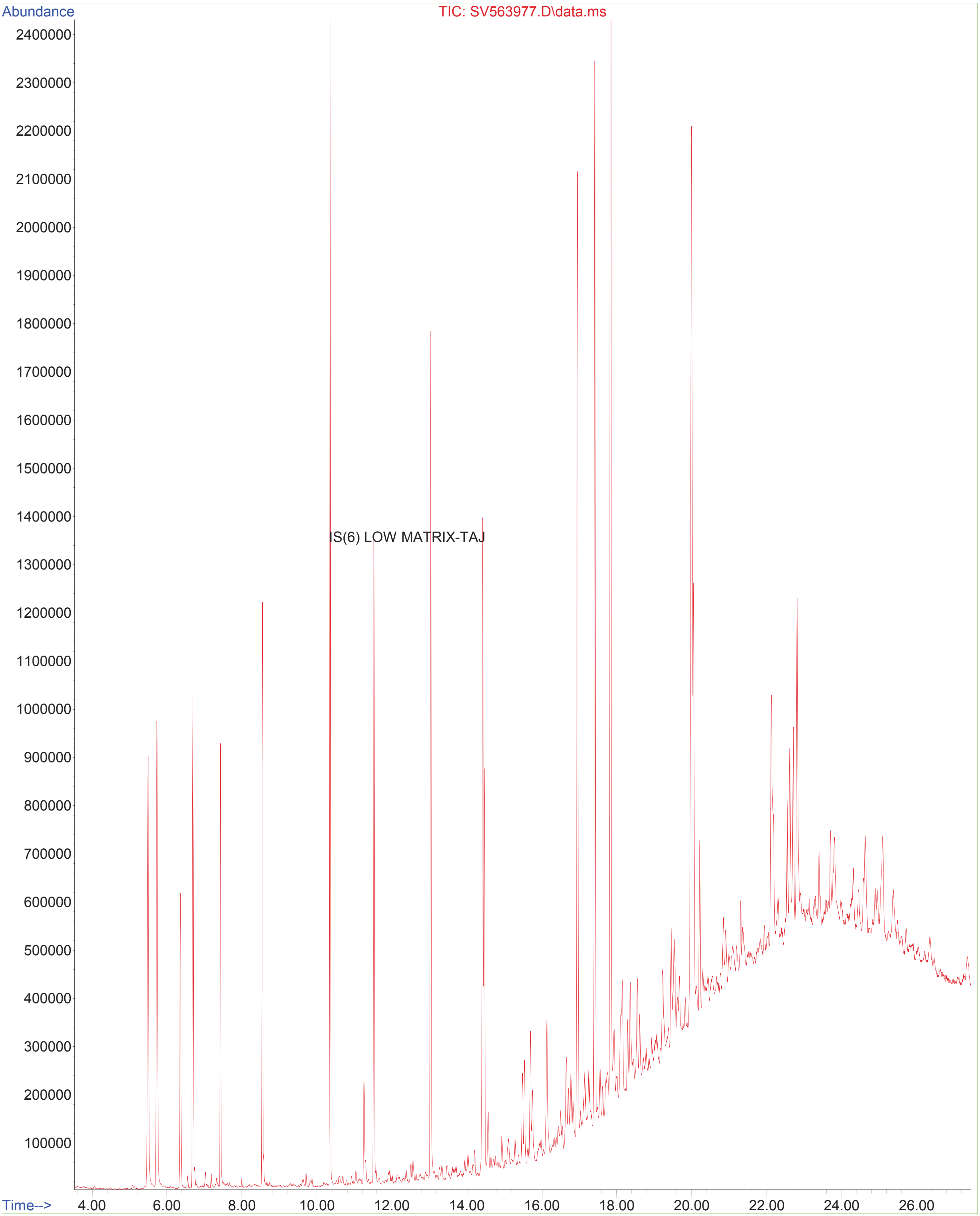

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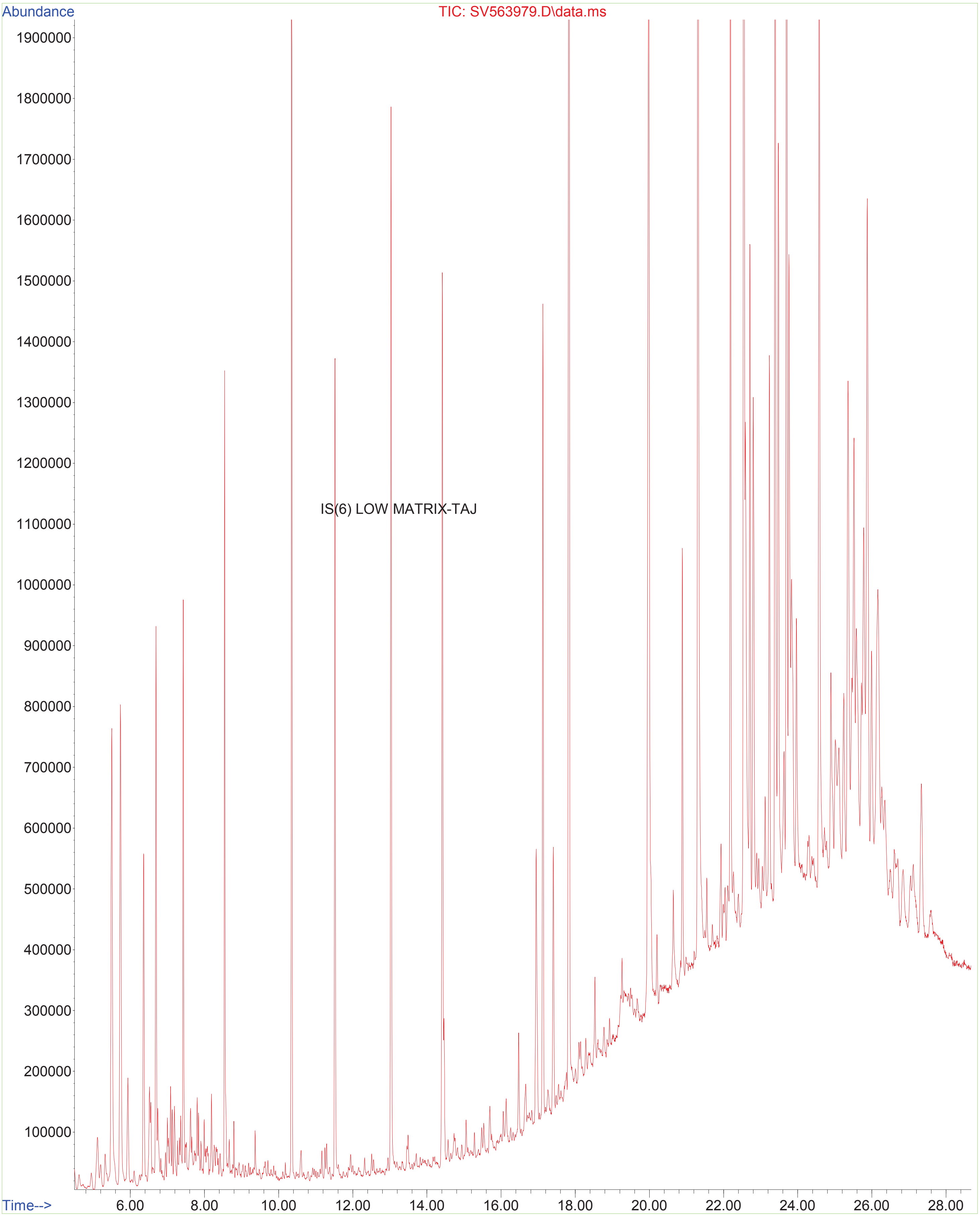
Operator   : TJ
Acquired   : 11 Oct 2016   8:13 pm using AcqMethod SV5A.M
Instrument :   SVOAMS5
Sample Name: 1610112-15
Misc Info :
Vial Number: 14



ESS Laboratory Sample and Cooler Receipt Checklist

Client: Weston & Sampson Engineers, Inc - TB/CMT

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1610112
Date Received: 10/6/2016
Project Due Date: 10/14/2016
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about <u>short holds & rushes</u>?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:

12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 10/6/16 Time: 1945 By: JC JC 10/7/16

Sample Receiving Notes:

① rec'd one DI water vial for B-9, S-3, B-13, S-3; B-14 S-4

② B-12 S-1 preserved with $NaHSO_4$ not DI water WS 10/6/16

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	72115	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	72131	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	72162	Yes	NA	Yes	VOA Vial - Other	Other	
01	72163	Yes	NA	Yes	VOA Vial - Other	Other	
02	72114	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	72130	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	72160	Yes	NA	Yes	VOA Vial - Other	Other	
02	72161	Yes	NA	Yes	VOA Vial - Other	Other	
03	72113	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	72129	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	72158	Yes	NA	Yes	VOA Vial - Other	Other	
03	72159	Yes	NA	Yes	VOA Vial - Other	Other	
04	72112	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	72128	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	72156	Yes	NA	Yes	VOA Vial - Other	Other	
04	72157	Yes	NA	Yes	VOA Vial - Other	Other	
05	72111	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	72127	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	72154	Yes	NA	Yes	VOA Vial - Other	Other	
05	72155	Yes	NA	Yes	VOA Vial - Other	Other	
06	72110	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	72126	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	72152	Yes	NA	Yes	VOA Vial - Other	Other	
06	72153	Yes	NA	Yes	VOA Vial - Other	Other	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Weston & Sampson Engineers, Inc - TB/CMT

ESS Project ID: 1610112

Date Received: 10/6/2016

07	72109	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	72125	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	72150	Yes	NA	Yes	VOA Vial - Other	Other
07	72151	Yes	NA	Yes	VOA Vial - Other	Other
08	72108	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	72124	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	72148	Yes	NA	Yes	VOA Vial - Other	Other
08	72149	Yes	NA	Yes	VOA Vial - Other	Other
09	72107	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	72123	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	72147	Yes	NA	Yes	VOA Vial - Other	Other
10	72106	Yes	NA	Yes	8 oz. Jar - Unpres	NP
10	72122	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	72144	Yes	NA	Yes	VOA Vial - Other	Other
10	72145	Yes	NA	Yes	VOA Vial - Other	Other
11	72105	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	72121	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	72142	Yes	NA	Yes	VOA Vial - Other	Other
11	72143	Yes	NA	Yes	VOA Vial - Other	Other
12	72104	Yes	NA	Yes	8 oz. Jar - Unpres	NP
12	72120	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	72140	Yes	NA	Yes	VOA Vial - NaHSO4	NaHSO4
12	72141	Yes	NA	Yes	VOA Vial - NaHSO4	NaHSO4
13	72103	Yes	NA	Yes	8 oz. Jar - Unpres	NP
13	72119	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	72138	Yes	NA	Yes	VOA Vial - Other	Other
14	72102	Yes	NA	Yes	8 oz. Jar - Unpres	NP
14	72118	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	72136	Yes	NA	Yes	VOA Vial - Other	Other
15	72101	Yes	NA	Yes	8 oz. Jar - Unpres	NP
15	72117	Yes	NA	Yes	VOA Vial - Methanol	MeOH
15	72134	Yes	NA	Yes	VOA Vial - Other	Other
15	72135	Yes	NA	Yes	VOA Vial - Other	Other
16	72100	Yes	NA	Yes	8 oz. Jar - Unpres	NP
16	72116	Yes	NA	Yes	VOA Vial - Methanol	MeOH
16	72132	Yes	NA	Yes	VOA Vial - Other	Other
16	72133	Yes	NA	Yes	VOA Vial - Other	Other

2nd Review

Are barcode labels on correct containers? Yes No

Completed By: [signature] Date & Time: 10/6/16 1930

Reviewed By: [signature] Date & Time: 10/6/16 1945

Delivered By: [signature] 10/6/16 1945

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF COFUSTODY

ESS Lab # 1610112

Turn Time ✓ Standard Other

Regulatory State: MA RI CT NH NJ NY ME Other

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other

Reporting Limits -

Electonic Deliverables Excel Access PDF

Co. Name: WESTON + SAMPSON ENG.
Project #:
Project Name: RTE 33 PORTSMOUTH
Contact Person: KEN GENDRON
Address: 5 CENTENNIAL DRIVE
City: PEABODY
State: MA
Zip: 01960
PO #:
Tel. 978 532 1900
Fax:
email: gendronk@wseinc.com

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	TPH	8270	8260	PCB	RCRA8
1	9/27/16	1200	G	S	B-1 S-1	9\6+5	1\1+2	A\V		X	X	X	X	X
2	9/28/16	8:10			B-2 S-2		1\1+2							
3	9/27/16	13:25			B-3 S-4		1\1+2							
4	9/27/16	15:25			B-4 S-3		1\1+2							
5	9/28/16	14:15			B-5 S-4		1\1+2							
6	9/28/16	12:20			B-6 S-3		1\1+2							
7	9/28/16	12:00			B-7 S-4		1\1+2							
8	9/28/16	14:40			B-8 S-2		1\1+2							
9	9/27/16	11:20			B-9 S-3		1\1+1							
10	9/29/16	14:10			B-10 S-3		1\1+2							

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ___ No

Seals Intact ___ Yes ___ No NA: ✓

Cooler Temperature: 1.2 Iced

Internal Use Only
[✓] Pickup
[ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9- ICE
sodium bisulfate

Sampled by: Julie A. Eaton

Comments:

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
10/5/16 1400	10/6/16 13:36	10/6/16 18:34	10/6/16 1839
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt

ESS Laboratory	CHAIN OF CUSTODY	ESS Lab # 1610112

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1610112

Turn Time ✓ Standard Other

Regulatory State: MA RI CT NH NJ NY ME Other

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other

Reporting Limits -

Electonic Deliverables Excel Access PDF

Co. Name	Project #	Project Name
WESTON + SAMPSON ENG		RT 33 PORTSMOUTH

Contact Person	Address
KEN GENDRON	5 CENTENNIAL DRIVE

City	State	Zip	PO #
PEABODY	MA	01960	

Tel.	Fax.	email:
1 978 532 1900		gendronk@wseinc.com

Analysis

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	TPH	8270	8260	PCBs	RCRA8
11	9/29/16	1445	G	S	B-11 S-2	A\V	1\1+2	9\6+5		X	X	X	X	X
12	9/21/16	1505	↓	↓	B-12 S-1	↓	1\1+2	↓		↓	↓	↓	↓	↓
13	9/28/16	1450	↓	↓	B13 S-3	↓	1\1+1	↓		↓	↓	↓	↓	↓
14	9/29/16	1225	↓	↓	B-14 S-4	↓	1\1+1	↓		↓	↓	↓	↓	↓
15	9/29/16	1005	↓	↓	B-15 S-3	↓	1\1+2	↓		↓	↓	↓	↓	↓
16	9/29/16	9:20	↓	↓	B-16 S-2	↓	1\1+2	↓		↓	↓	↓	↓	↓

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No

Seals Intact ____ Yes ____ No NA:____

Cooler Temperature: 1.2

Internal Use Only

[✓] Pickup

[ ] Technician____

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9- ICE
A-Sodium bisulfate

Sampled by: Julie A Eaton

Comments:

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
10/5/16 1408	10/6/16 13:36	10/6/16 18:34	10/6/16 1839

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt

100 International Drive, Suite 152, Portsmouth, NH 03801
Tel: 603.431.3937

MEMORANDUM

TO: Brandon Kunkel, RLA

FROM: Jeffrey Santacruce, PE PTOE

DATE: 1/23/2023

SUBJECT: Skate Park – 305 Greenland Road, Portsmouth, New Hampshire

---

Introduction

This project consists of the construction of a new skate park on a vacant parcel of land at 305 Greenland Road in Portsmouth, NH. Site improvements include the skate park, walkways, and a 25-space parking lot.

Existing Conditions

Site

This existing site is located at 305 Greenland Road and is approximately five acres in size. The lot is bounded by Greenland Road to the south, residential lots to the east and north, and the old railroad Right-of-Way to the west. The site is currently vacant lot and consist mainly of a large gravel that was once used as a contractor lay down area. The lot does contain some existing stormwater basins and pipes but does not contain any existing structures. The lot has an existing driveway curb cut onto Greenland Road. See Figure 1.

Roadway

Greenland Road is classified as an urban minor arterial under the jurisdiction of the City of Portsmouth. The roadway consists of two 12-foot-wide travel lanes in the westbound direction that merge into one lane west of the existing site and there is one 12-foot-wide exclusive left-turn lane and one 12-foot-wide travel lane in the eastbound direction. There are shoulders on both sides of the roadway that are approximately 3 feet wide. There is a sidewalk along the north side of the roadway that extends along Greenland Road east to the intersection of Peverly Hill Road and west to the intersection of Griffin Road. There are no existing striped bicycle lanes along Greenland Road. The posted speed along Greenland Road is 30 mph and the average observed speed (via following car method) is approximately 40 mph. There is an existing bus stop at the intersection of Greenland Road and Peverly Hill Road less than ¼ mile from the existing site.

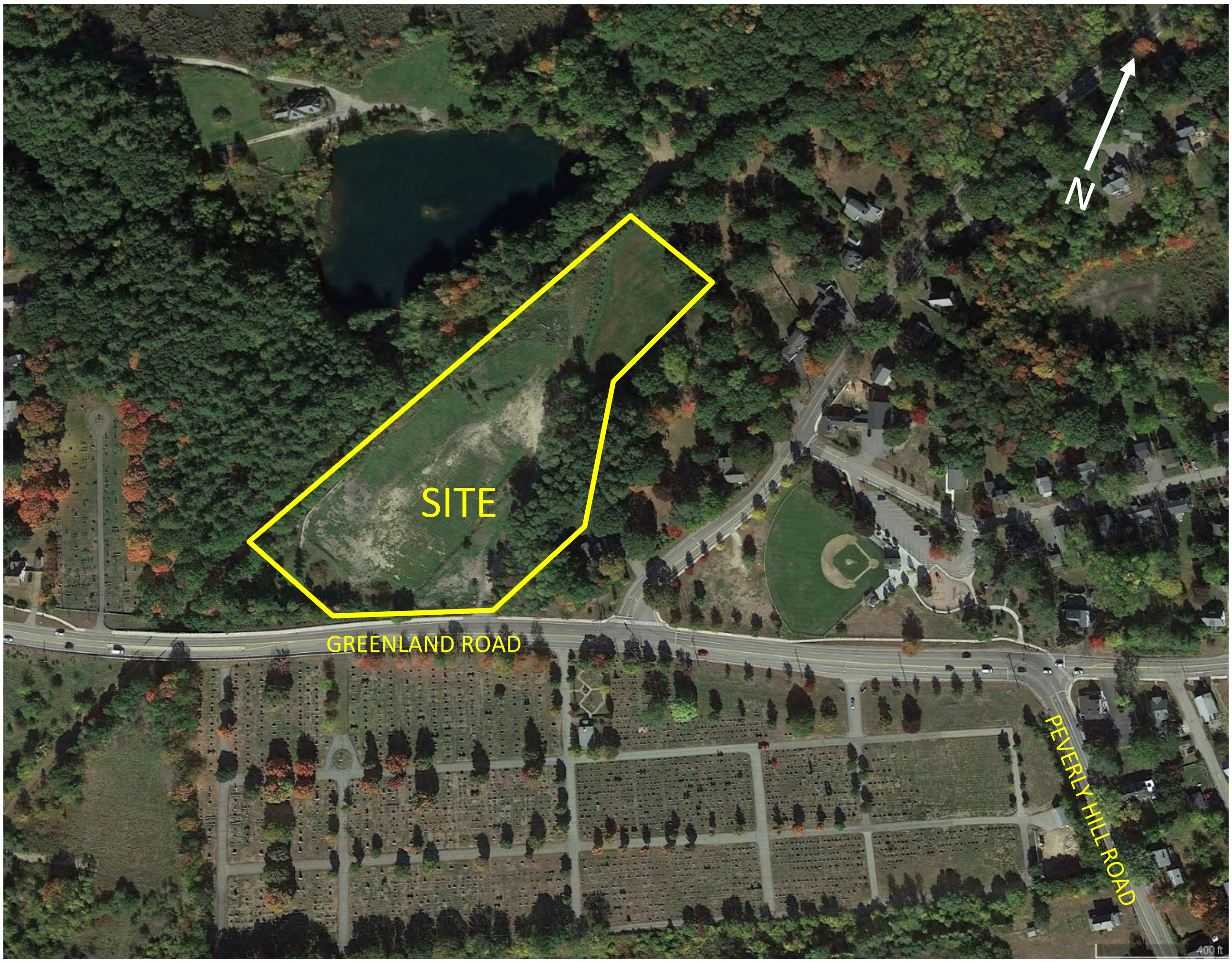


Figure 1 – Location Map

Proposed Conditions

The proposed development consists of the construction of a 0.45 acres (19,500 sq ft) skate park with walkways and a 25-space parking lot which includes two ADA Accessible spaces. The proposed development proposes to utilize the existing curb cut on Greenland Road. A new connection from the existing sidewalk along Greenland Road into the site will be provided. The existing ramps at the driveway will be reconstructed to meet current ADA Accessible standards.

Sight Distance

To identify potential safety concerns associated with site egress, sight distances have been evaluated at the site driveway location to determine if the available sight distances for vehicles entering/exiting the site meet or exceed the minimum distances required for approaching vehicles along Water Street to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO)[1].

Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in the road. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from a driver's eye height of 3.5 feet to an object height of 2 feet above street level.

Intersection sight distance (ISD) is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. Intersection sight distance is measured from a driver's eye height of 3.5 feet to an object height of 3.5 feet above street level.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. The available SSD and ISD at the proposed site drive location was measured and compared to minimum requirements as established by AASHTO as shown in Table 3.

As indicated in Table 1, the available sight distance at the existing site driveway currently meets the minimum required SSD and ISD requirements.

Table 1 – Sight Distance

	Stopping Sight Distance (feet)			Intersection Sight Distance (feet)			
Location/Direction	Measured	Minimum Required[a]	Desirable[b]	Measured	Minimum Required[c]	Desirable (Posted)[a]	Desirable[b]
Existing							
West of driveway	>400	250	305	450	250	335	445
East of driveway	>400	250	305	450	250	335	445

[a] Values based on AASHTO requirements for posted speed limit of 30 mph on Greenland Road
[b] Values based on AASHTO requirements for observed speeds of 40 mph on Greenland Road.
[c] Values based on minimum SSD requirements.

Trip Generation

Traffic to be generated by a proposed project is typically generated by rates provided in the Institute of Transportation Engineers *Trip Generation*[2] manual. Research of the ITE Trip Generation Manual determined that there are no land use codes for this specific type of development. Since there are no existing skate parks within the area that are stand alone are a stand along use and usually part of a larger public park, it was determined that the closest land use code LUC411 Public Park was the most appropriate. Since the majority of the uses of the proposed skate park would be adolescents and teenagers the trip generation during the AM and PM peak hours were determined based on the peal hour of the generator and not the adjacent street traffic. In addition, it should be noted that the majority of the users of this type of facility will most likely get to/from the existing site utilizing non-vehicular means (walking or biking) or by utilizing the existing bus stop on Borthwick Ave approximately one mile west of

[1] "*A Policy on the Geometric Design of Highways and Street*" American Association of State Highway Officials (AASHTO), Washington, DC 2018
[2] "Trip Generation Manual, 11th edition, Institute of Transportation Engineers, Washington, SC 2022.

the site. Since LUC 411 Public Park only contains data for vehicular trips it is consider conservative (worse case). Since LUC411 utilizes acres as the independent variable in the calculation of trip generation the size of the entire parcel was utilized since it is all public land. The trip generation data are summarized in Table 2 below. Trip Generation data are included at the end of the memorandum.

Therefore, it is anticipated that the proposed site would generate approximately 13 trips (8 trips entering and 5 exiting) during the AM peak hour of the generator, 16 trips (10 trips entering and 6 trips exiting) during the PM peak hour of the generator, and 27 trips (15 trips entering and 12 trips exiting) during the Saturday peak hour of the generator. The results of the trip generation for the proposed facility are shown below in Table 2.

Table 2 - Trip Generation

Site Driveway	Proposed Trips LUC 411 – Public Park
AM Peak Hour	
In	8
Out	5
Total	13
PM Peak Hour	
In	10
Out	6
Total	16
SAT Peak Hour	
In	15
Out	12
Total	27

Trip Distribution

The distribution of the proposed new site traffic on the area roadways and intersections is based on the existing travel patterns observed and location of the site in relation to population density. This site is located on the western side of the city. It is easily accessible by car to the downtown area by either Middle Road or Islington Street both of which are located to the east of the site. Therefore, it is anticipated that approximately 70% of all vehicle traffic will be destined to/from the east along Greenland Road.

Parking Generation

Parking needs by a proposed project are typically determined based on local regulations. The City of Portsmouth Zoning Ordinance Section 10.1112.321 states that for *Municipally owned and operated park and related activities* that there is no parking requirement. Therefore, the ITE Parking Generation Manual[3], was researched to determine the parking generation for the site. Similar to the Trip Generation information, there are no land use codes for this specific type of development. Since there are no existing skate parks within the area that are stand alone are a stand along use and usually part of a larger public park, it was determined that the closest land use code LUC411 Public Park was the most

[3] Parking Generation Manual, 5th edition, Institute of Transportation Engineers, Washington, DC 2019

appropriate. Unfortunately the data provided is limited and only contains information for a Saturday. Since this lines up with the highest trip generation information it appeared this would be reasonable to use. Based on the overall size of the site, 5 acres, the parking requirements for this site would be five (5 vehicles). Since this number seemed quite low we also considered the trip generation estimates for a Saturday and assumed that if up to 75% of the cars entering/exiting the site during the Saturday peak hour would need to park on site, there would be a need for approximately 21 spaces. Since the proposed lot will contain 25 spaces it is believed that the site will have adequate parking to meet the need.

Conclusion

The proposed skate park will mostly be utilized by adolescents and teenagers who will use non-vehicular means to get to the site. If the users come by car, the trip generation estimated provided in this memorandum are small and are oriented mostly to/from the east along Greenland Road. Therefore, the majority of the entering traffic will be right turns into the site which should not impede traffic flow and left turns out where any queues are contained on site while vehicles wait for a gap in the traffic flow. For the traffic turning left into the site there is an existing left-turn lane along Greenland Road where vehicles can safely wait for a gap in the westbound traffic to enter the site. Therefore, it is anticipated that the proposed use will not significantly impact the existing traffic operations along Greenland Road.

STATE OF NEW HAMPSHIRE
JAMES I. PEARSON
No. 14212
LICENSED
PROFESSIONAL ENGINEER
1/23/2023

ROUTE 33

SKATE PARK

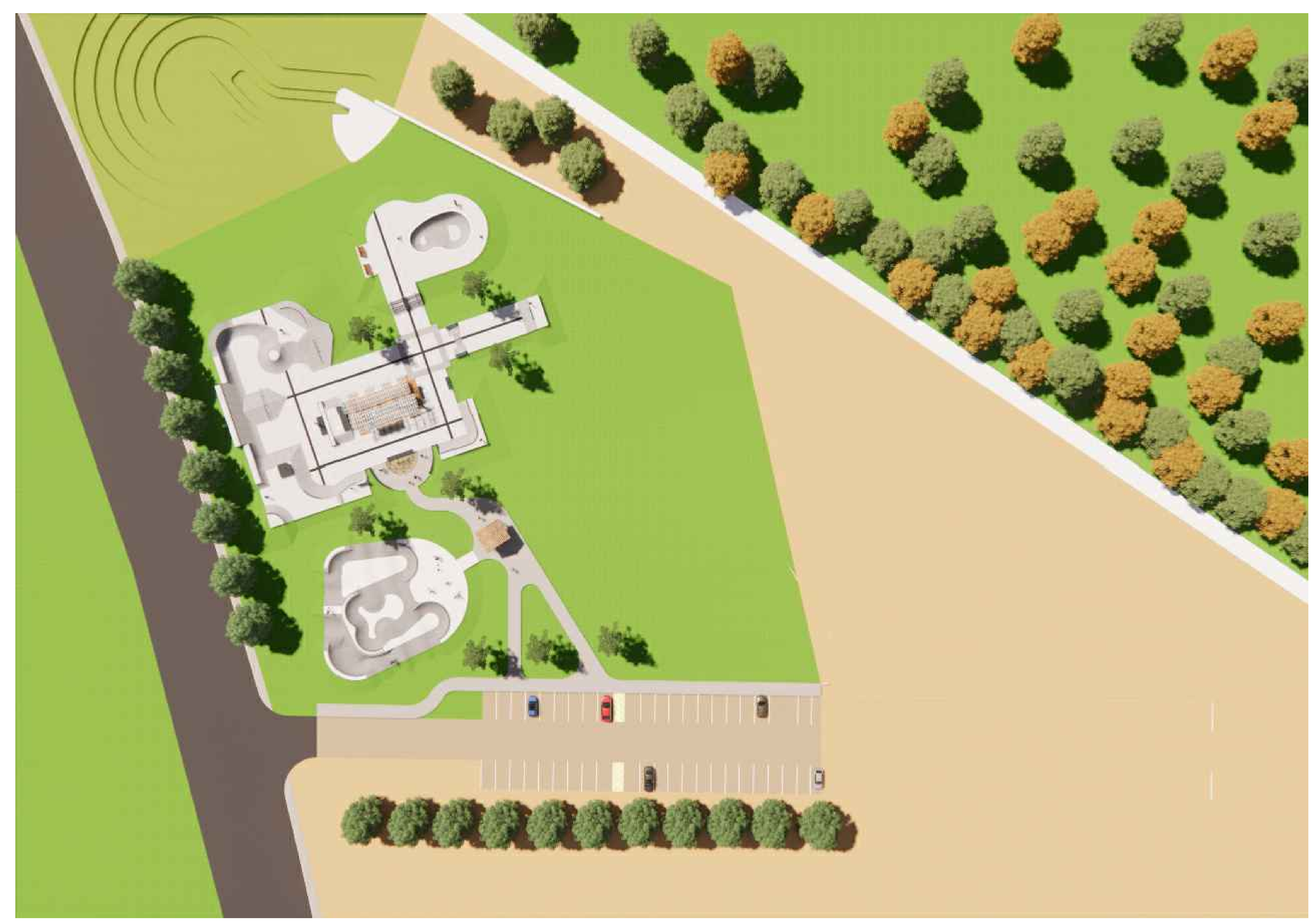
305 GREENLAND RD
PORTSMOUTH, NH.

WSE PROJECT ENG22-0627

CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH. 03801

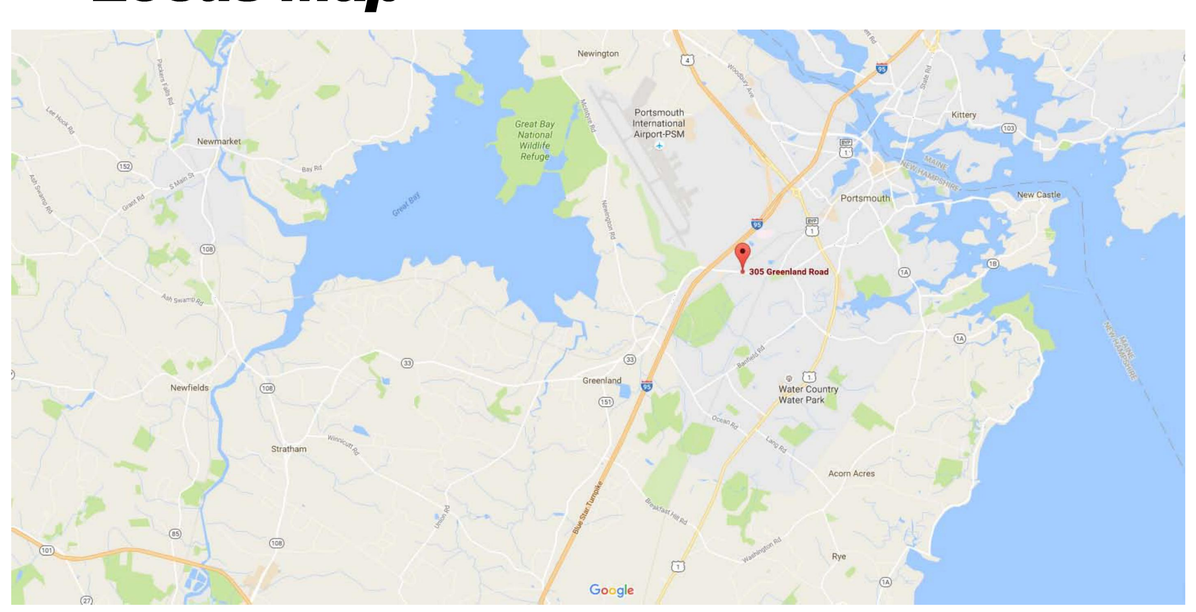
(603) 766-1755
ATTN: CHRISTINE SPROVIERO

WESTON & SAMPSON ENGINEERS, INC.
85 DEVONSHIRE STREET, 3RD FLOOR
BOSTON, MA 02109
(617)412-4480
ATTN: BRANDON KUNKEL

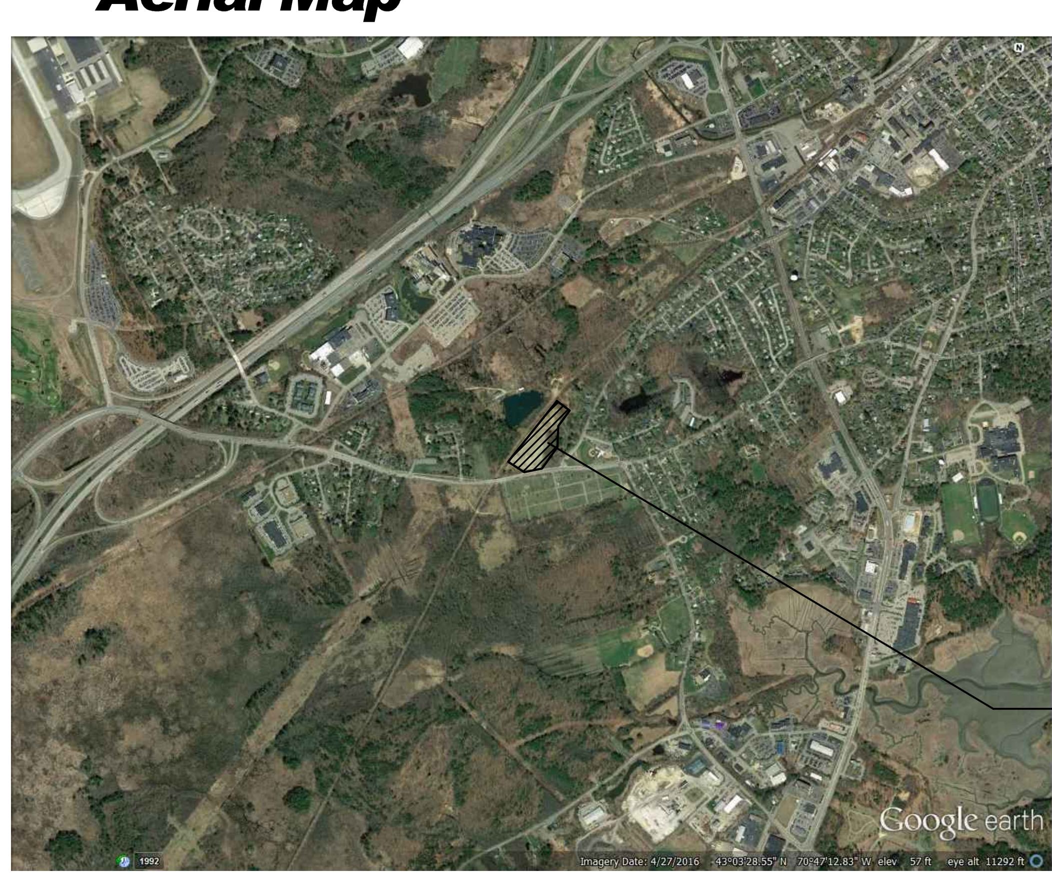


January 2023

Locus Map



Aerial Map



ROUTE 33. RECREATION FIELD
305 GREENLAND RD.

Prepared By

Weston & Sampson

85 Devonshire Street, 3rd Floor, Boston, MA 02109
www.westonandsampson.com

SHEET INDEX

SITE PERMIT APPLICATION,
NOT FOR CONSTRUCTION

ADD ALTERNATE | SKATEPARK SHADE STRUCTURE
UNDER ADD ALTERNATE THE CONTRACTOR SHALL PURCHASE AND INSTALL SHADE STRUCTURE IN ACCORDANCE WITH THE SPECIFICATIONS, PLANS AND DETAILS.

ZONING INFORMATION:

OWNER: CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH. 03801

ZONE: M

TAX MAP: 241, LOT 18

ZONING REQUIREMENTS: LOTS AND BUILDINGS IN THE MUNICIPAL DISTRICT ARE EXEMPT FROM ALL DIMENSIONAL AND INTENSITY REGULATIONS.SEE SECTION 10.560 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE.

ABUTTER INFORMATION:

MAP 165 LOT 14
N/F
BOSTON AND MAINE
CORPORATION
IRON HORSE PARK
HIGH STREET
NORTH BILLERICA, MA 01862

MAP 242 LOT 5
N/F
ROMAN CATHOLIC BISHOP
OF MANCHESTER
CHURCH OF IMMAC
CONCEPTION
98 SUMMER STREET
PORTSMOUTH, NH 03801

MAP 242 LOT 1
N/F
STATE OF NEW HAMPSHIRE
FISH AND GAME
DEPARTMENT
11 HAZEN DRIVE
CONCORD, NH 03301
RCRD BK.#5248 PG.#739

MAP 241 LOT 20
N/F
ANDREW H. SHERBURNE
REVOCABLE TRUST
24 TONGA DRIVE
BOW, NH 03304
RCRD BK.#5289 PG.#138

SURVEY PREPARED BY:

TFM MSC A division of TFMoran, Inc.

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.mscengineers.com

CONTROL POINT ASSOCIATES INC.

L000

ROUTE 33. SKATE PARK | PERMIT DOCUMENTS
ENG22-0627 | Portsmouth, NH |

GENERAL NOTES

1. PROPERTY LINES, SITE SURVEY AND TOPOGRAPHICAL INFORMATION BASED ON THE GROUND SURVEY PERFORMED BY TFM/ MSC, 170 COMMERCE WAY, SUITE 102, PORTSMOUTH, NH, 03801, (603) 431-2222 ON OCTOBER 16, 2016 AND SUPPLEMENTED BY CONTROL POINT ASSOCIATES, 352 TURNPIKE RD., SUITE 320, SOUTHBOROUGH, MA 01772, 508-948-3000 ON AUGUST 22,2022.
2. ALL BIDDERS ARE REQUIRED TO INSPECT THE PROJECT SITE IN ITS ENTIRETY PRIOR TO SUBMITTING THEIR BID, AND BECOME FAMILIAR WITH ALL CONDITIONS AS THEY MAY AFFECT THEIR BID. CONTRACTOR AND SUB-CONTRACTOR SHALL BE FAMILIAR WITH ALL DRAWINGS AND SPECIFICATIONS PRIOR TO COMMENCING THE CONSTRUCTION.
3. LOCATIONS OF ANY UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF SUCH UTILITIES, PROTECTING ALL EXISTING UTILITIES AND REPAIRING ANY DAMAGE DONE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE COORDINATION WITH UTILITY COMPANIES AND PUBLIC AGENCIES AND FOR OBTAINING ALL REQUIRED PERMITS AND PAYING ALL REQUIRED FEES. IN ACCORDANCE WITH THE CITY OF PORTSMOUTH AND THE STATE OF NEW HAMPSHIRE, INCLUDING AMENDMENTS, CONTRACTORS SHALL NOTIFY ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES IN WRITING PRIOR TO EXCAVATION. CONTRACTOR SHALL ALSO CALL "DIG SAFE" AT (888) 344-7233 NO LESS THAN 72 HOURS, (EXCLUSIVE OF WEEKENDS AND HOLIDAYS), PRIOR TO SUCH EXCAVATION. DOCUMENTATION OF REQUESTS SHALL BE PROVIDED TO PROJECT REPRESENTATIVE PRIOR TO EXCAVATION WORK.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ELECTRIC AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY OWNER AT NO ADDITIONAL COST TO THE CITY OF PORTSMOUTH.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ALL DRAWINGS AND SPECIFICATIONS TO DETERMINE THE EXTENT OF EXCAVATION AND DEMOLITION REQUIRED TO RECEIVE SITE IMPROVEMENTS.
7. ANY DISCREPANCIES OR CONFLICTS BETWEEN THE DRAWINGS AND EXISTING CONDITIONS, EXISTING CONDITIONS TO REMAIN, TEMPORARY CONSTRUCTION, PERMANENT CONSTRUCTION AND WORK OF ADJACENT CONTRACTS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER BEFORE PROCEEDING. ITEMS ENCOUNTERED IN AREAS OF EXCAVATION THAT ARE NOT INDICATED ON THE DRAWINGS, BUT ARE VISIBLE ON SURFACE, SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE REMOVED AT NO ADDITIONAL COST TO THE OWNER.
8. ANY ALTERATIONS TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE GENERAL CONTRACTOR ON THE "AS-BUILT" DRAWINGS.
9. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS OUTSIDE THE PROJECT LIMITS, SHALL BE RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST AND TO THE SATISFACTION OF THE OWNER.
10. ALL WORK SHOWN ON THE PLANS AS BOLD SHALL REPRESENT PROPOSED WORK. THE TERM "PROPOSED (PROP)" INDICATES WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND SALVAGE (R&S)", OR REMOVE, RELOCATE, SALVAGE, (R,R&S).
11. ALL KNOWN EXISTING STATE, COUNTY AND CITY LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND ARE INDICATED ON THE PLANS.
12. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT HIS EMPLOYEES, AS WELL AS PUBLIC USERS FROM INJURY DURING THE ENTIRE CONSTRUCTION PERIOD USING ALL NECESSARY SAFEGUARDS, INCLUDING BUT NOT LIMITED TO, THE ERECTION OF TEMPORARY WALKS, STRUCTURES, PROTECTIVE BARRIERS, COVERING, OR FENCES AS NEEDED.
13. THE CONTRACTOR SHALL SUPPLY THE OWNER WITH THE NAME OF THE OSHA "COMPETENT PERSON" PRIOR TO CONSTRUCTION.
14. FILLING OF EXCAVATED AREAS SHALL NOT TAKE PLACE WITHOUT THE PRESENCE OR PERMISSION OF THE OWNER.
15. EXISTING TREES TO REMAIN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES. NO STOCKPILING OF MATERIAL, EQUIPMENT OR VEHICULAR TRAFFIC SHALL BE ALLOWED WITHIN THE DRIP LINE OF TREES TO REMAIN. NO GUYS SHALL BE ATTACHED TO ANY TREE TO REMAIN. WHEN NECESSARY OR AS DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL ERECT TEMPORARY BARRIERS FOR THE PROTECTION OF EXISTING TREES DURING CONSTRUCTION.
16. TREES AND SHRUBS WITHIN THE LIMITS OF WORK SHALL BE REMOVED ONLY UPON THE APPROVAL OF THE LANDSCAPE ARCHITECT OR AS NOTED ON THE PLANS.
17. NO FILLING SHALL OCCUR AROUND EXISTING TREES TO REMAIN WITHOUT THE APPROVAL OF THE OWNER OR OWNER REPRESENTATIVE.
18. THE CONTRACTOR SHALL REMOVE ALL SURFACE VEGETATION PRIOR TO GRADING THE SITE. TREES AND STUMPS SHALL BE REMOVED AND DISPOSED COMPLETE BY CONTRACTOR. TEMPORARY EROSION CONTROL MEASURES SHOWN ON THE DRAWINGS (INCLUDING SILT FENCE, STRAW WATTLES, OR SILT SOCKS) SHALL BE INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THESE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE PROJECT WHICH COST SHALL BE INCIDENTAL TO THE PROJECT.
19.
20. ALL UNSUITABLE UNCONTAMINATED EXCESS SOIL FROM CONSTRUCTION ACTIVITIES SHALL BE DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY. REMOVAL ACTIVITIES SHALL BE IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS AT NO ADDITIONAL COST TO THE CITY. SUITABLE SOIL EXCAVATION AS PART OF THE PROJECT MUST MEET ONE OR MORE OF THE MATERIAL REQUIREMENTS SPECIFIED. ON-SITE FILL MATERIALS, WHICH DO NOT CONFORM TO THE SPECIFICATIONS, SHALL NOT BE USED BELOW ANY STRUCTURES. IF THE CONTRACTOR PROPOSES TO USE THE EXISTING FILL ON SITE BELOW PAVEMENT AREAS, HE MUST DEMONSTRATE THAT THE FILL MEETS THE REQUIREMENTS PER THE SPECIFICATIONS. ALL EXCAVATED FILL MATERIAL WHICH DOES NOT MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL BE REMOVED AND DISPOSED OF OFF-SITE AT NO ADDITIONAL COST.
21. CONTRACTOR IS RESPONSIBLE FOR STAKING CONSTRUCTION BASELINES IN FIELD WITH A NEW HAMPSHIRE REGISTERED PROFESSIONAL LAND SURVEYOR. NO CONSTRUCTION WILL BE PERFORMED WITHOUT THE PROPOSED BASELINES AND LAYOUTS APPROVED BY THE ENGINEER.
22. NO FILL SHALL CONTAIN HAZARDOUS MATERIALS.
23. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AROUND PERIMETER OF WORK AREA (LIMIT OF WORK). FENCE SHALL NOT IMPEDE TRAVEL WAYS.
24. ANY QUANTITIES SHOWN ON PLANS ARE FOR COMPARATIVE BIDDING PURPOSES ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE PROJECT SITE TO VERIFY ALL QUANTITIES AND CONDITIONS PRIOR TO SUBMITTING BID.
25. ALL EXISTING DRAINAGE FACILITIES TO REMAIN SHALL BE MAINTAINED FREE OF DEBRIS, SOIL, SEDIMENT, AND FOREIGN MATERIAL AND OPERATIONAL THROUGHOUT THE LIFE OF THE CONTRACT. REMOVE ALL SOIL, SEDIMENT, DEBRIS AND FOREIGN MATERIAL FROM ALL DRAINAGE STRUCTURES, INCLUDING BUT NOT LIMITED TO, DRAINAGE INLETS, MANHOLES AND CATCH BASINS WITHIN THE LIMIT OF WORK AND DRAINAGE STRUCTURES OUTSIDE THE LIMIT OF WORK THAT ARE IMPACTED BY THE WORK FOR THE ENTIRE DURATION OF CONSTRUCTION.
26. CONTRACTOR'S STAGING AREA MUST BE WITHIN THE CONTRACT LIMIT LINE AND IN AREAS APPROVED BY OWNER. ANY OTHER AREAS THAT THE CONTRACTOR MAY WISH TO USE FOR STAGING MUST BE COORDINATED WITH THE OWNER.
27. THE CONTRACTOR SHALL KEEP ALL STREETS, PARKING LOTS AND WALKS THAT ARE NOT RESTRICTED FROM PUBLIC USE DURING CONSTRUCTION BROOM CLEAN AT ALL TIMES. THE CONTRACTOR SHALL USE ACCEPTABLE METHODS AND MATERIALS TO MAINTAIN ADEQUATE DUST CONTROL THROUGHOUT CONSTRUCTION.
28. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER.
29. CONTRACTOR SHALL DEWATER AS NECESSARY TO PERFORM THE PROPOSED WORK. CONTRACTOR SHALL BE AWARE OF ANY PERCHED GROUNDWATER.
30. THE LIMIT OF WORK SHALL BE DELINEATED IN THE FIELD PRIOR TO THE START OF SITE CLEARING OR CONSTRUCTION AND AGREED UPON WITH THE OWNER.
31. DEEP SUMP CATCH BASINS AND STORMWATER BASIN SHALL BE CLEANED FOLLOWING CONSTRUCTION AND SHALL FOLLOW THE OPERATION AND MAINTENANCE PLAN THEREAFTER.
32. HAULING OF EARTH MATERIALS TO AND FROM THE SITE SHALL BE RESTRICTED TO THE HOURS OF 7 AM TO 5 PM.
33.
34. ANY BOULDERS 3 CU. YDS. OR SMALLER SHALL BE CONSIDERED UNDOCUMENTED FILL AND SHALL BE DISPOSED OF AT NO ADDITIONAL COST TO THE CITY.
35. WORK ON SATURDAYS SHALL ONLY BE CONDUCTED IF PRIOR WRITTEN PERMISSION IS PROVIDED BY THE CITY.
36. NO TRUCKS LEFT IDLING ON CITY STREETS DURING CONSTRUCTION. CONSTRUCTION TRAFFIC AT NO TIME SHALL IMPEDE FLOW OF RESIDENT TRAFFIC.

EROSION AND SEDIMENT CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE PUT INTO PLACE PRIOR TO BEGINNING ANY CONSTRUCTION OR DEMOLITION. REFER TO PLANS FOR APPROXIMATE LOCATION OF EROSION AND SEDIMENT CONTROL. REFER TO SPECS AND DETAILS FOR TYPE OF EROSION AND SEDIMENT CONTROL.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUAL MAINTENANCE OF ALL CONTROL DEVICES THROUGHOUT THE DURATION OF THE PROJECT.
3. CONTRACTOR SHALL MEET ALL OF THE STATE OF NEW HAMPSHIRE D.E.P. AND THE CITY OF PORTSMOUTH REGULATIONS FOR SEDIMENT AND EROSION CONTROL.
4. EXCAVATED MATERIAL STOCKPILED ON THE SITE SHALL BE SURROUNDED BY A RING OF UNBROKEN SEDIMENT AND EROSION CONTROL FENCE. THE LIMITS OF ALL GRADING AND DISTURBANCE SHALL BE KEPT TO A MINIMUM WITHIN THE APPROVED AREA OF CONSTRUCTION. ALL AREAS OUTSIDE OF THE LIMIT OF CONTRACT SHALL REMAIN TOTALLY UNDISTURBED UNLESS OTHERWISE APPROVED BY OWNER'S REPRESENTATIVE.
5. ALL CATCH BASINS AND DRAIN GRATES WITHIN LIMIT OF CONTRACT SHALL BE PROTECTED WITH SILT SACKS DURING THE ENTIRE DURATION OF CONSTRUCTION.
6. EROSION CONTROL BARRIERS TO BE INSTALLED AT THE TOE OF SLOPES. SEE GRADING & DRAINAGE PLANS, NOTES, DETAILS AND SPECIFICATIONS.
7. THE CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY OWNER.
8. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ON TO PUBLIC/PRIVATE ROADS.

DEMOLITION & SITE PREPARATION NOTES

1. REMOVING ANY EXISTING SITE FEATURES AND APPURTENANCES NECESSARY TO ACCOMPLISH THE CONSTRUCTION OF THE PROPOSED SITE IMPROVEMENTS. THE CONTRACTOR SHALL ALSO INCLUDE IN THE BID THE COST NECESSARY TO RESTORE SUCH ITEMS IF THEY ARE SCHEDULED TO REMAIN AS PART OF THE FINAL SITE IMPROVEMENTS. REFER TO PLANS TO DETERMINE EXCAVATION, DEMOLITION AND TO DETERMINE THE LOCATION OF THE PROPOSED SITE IMPROVEMENTS.
2. THE OWNER RESERVES THE RIGHT TO REVIEW ALL MATERIALS DESIGNATED FOR REMOVAL AND TO RETAIN OWNERSHIP OF SUCH MATERIALS. IF THE OWNER RETAINS ANY MATERIAL THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OWNER TO HAVE THOSE MATERIALS REMOVED OFF SITE AT NO ADDITIONAL COST.
3. UNLESS SPECIFICALLY NOTED TO BE REMOVED / SALVAGED (R&S), ALL SITE FEATURES CALLED FOR REMOVAL (REM) SHALL BE REMOVED WITH THEIR FOOTINGS, ATTACHMENTS, BASE MATERIAL, ETC, TRANSPORTED FROM THE SITE TO BE DISPOSED OF IN A LAWFUL MANNER AT AN ACCEPTABLE DISPOSAL SITE AND AT NO ADDITIONAL COST TO THE OWNER.
4. ALL EXISTING SITE FEATURES TO REMAIN SHALL BE PROTECTED THROUGHOUT THE CONSTRUCTION PERIOD. ANY FEATURES DAMAGED DURING CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT NO ADDITIONAL COST.
5. DURING EARTHWORK OPERATIONS, CONTRACTOR SHALL TAKE CARE TO NOT DISTURB EXISTING MATERIALS TO REMAIN, OUTSIDE THE LIMITS OF EXCAVATION AND BACKFILL AND SHALL TAKE WHATEVER MEASURES NECESSARY, AT THE CONTRACTOR'S EXPENSE, TO PREVENT ANY EXCAVATED MATERIAL FROM COLLAPSING. ALL BACKFILL MATERIALS SHALL BE PLACED AND COMPACTED AS SPECIFIED TO THE SUBGRADE REQUIRED FOR THE INSTALLATION OF THE REMAINDER OF THE CONTRACT WORK.
6. IT SHALL BE THE CONTRACTOR'S OPTION, WITH CONCURRENCE OF THE OWNER, TO REUSE EXISTING GRAVEL IF IT MEETS THE REQUIREMENTS OF THE SPECIFICATIONS FOR GRAVEL BORROW.
7. 'CLEAR AND GRUB VEGETATION' SHALL INCLUDE REMOVAL OF GRASS, SHRUBS, UNDERBRUSH, AND ALL VEGETATION, REMOVAL OF ROOTS, ROUGH GRADING, INSTALLATION OF LOAM (IF APPLICABLE), FINE GRADING, SEEDING AND TURF ESTABLISHMENT BY THE CONTRACTOR.
8. TREES DESIGNATED FOR REMOVAL SHALL BE TAGGED BY CONTRACTOR AND APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
9. THE STORAGE OF MATERIALS AND EQUIPMENT WILL BE PERMITTED AT LOCATIONS DESIGNATED BY OWNER OR OWNER'S REPRESENTATIVE. PROTECTION OF STORED MATERIALS AND EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. LOAM / TOP SOIL DESIGNATED FOR REUSE AS GENERAL FILL SHALL BE BLENDED WITH SUITABLE BORROW MATERIAL AS SPECIFIED.
11. THE CONTRACTOR SHALL PROTECT EXISTING TREES TO REMAIN, CONTRACTOR SHALL INSTALL TREE PROTECTION BARRIERS AFTER CLEARING UNDERBRUSH AND TAKE DUE CARE TO PREVENT INJURY TO TREES DURING CLEARING OPERATIONS.

Project Team:

Weston & Sampson Engineers, Inc:
85 Devonshire Street, 3rd Floor
Boston, MA 02109
(617) 412-4480

Project Manager: Brandon Kunkel, RLA
Site Designer: Kelly Clifford

Civil Engineer: James Pearson, PE
Project Engineer: Aaron Guazzaloca

Geotechnical Engineer: Daniel Dwyer, PE

Licensed Site Professional: Todd Bridgeo, PE, LSP

Environmental Scientist / Permitting: Devin Herrick, CWS

Pillar Design Studios / Pillar Skateparks
1960 W. Hawk Court
Chandler, AZ 85286
888.880.5112

Brad Siedlecki, President

LAYOUT & MATERIALS NOTES

1. REFER TO EXISTING CONDITIONS PLANS FOR SURVEY INFORMATION (SHEET L1.00).
2. COORDINATE ALL LAYOUT ACTIVITIES WITH THE SCOPE OF WORK CALLED FOR BY DEMOLITION, GRADING AND UTILITIES OPERATIONS ENCOMPASSED BY THIS CONTRACT. SET, PROTECT AND REPLACE REFERENCE STAKES AS NECESSARY OR AS REQUIRED BY THE OWNER'S REPRESENTATIVE.
3. ALL WORK SHALL BE PERFORMED BY CONTRACTOR UNLESS SPECIFICALLY INDICATED THAT THE WORK WILL BE PERFORMED "BY OTHERS" OR "UNDER SEPARATE CONTRACT".
4. TO FACILITATE LAYOUT OF PROPOSED SITE FEATURES AND FACILITIES, LAYOUT INFORMATION FOR CERTAIN FUTURE WORK, WHICH IS NOT INCLUDED WITHIN THE SCOPE OF THIS CONTRACT HAS BEEN PROVIDED ON THE LAYOUT AND MATERIALS PLAN FOR INFORMATION ONLY. SOME ITEMS ARE "NOT IN CONTRACT" (NIC) AND SHOWN FOR REFERENCE ONLY.
5. THE LAYOUT OF SITE AMENITIES AND FENCES MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. THE LAYOUT OF ALL NEW PATHWAYS / WALKWAYS AND THE GRADING OF ALL SLOPES AND CROSS SLOPES SHALL CONFORM TO THE NEW HAMPSHIRE RULES AND REGULATIONS FOR HANDICAP ACCESS CMR 521, AND THE AMERICANS WITH DISABILITIES ACT (ADA), TITLE 3. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE REQUIRED.
7. ALL LAYOUT LINES, OFFSETS, OR REFERENCES TO LOCATING OBJECTS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE DESIGNATED WITH ANGLE OFFSETS NOTED.
8. ALL PROPOSED SITE FEATURES SHALL BE LAID OUT AND STAKED FOR REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF INSTALLATION. ANY REQUIRED ADJUSTMENTS TO THE LAYOUT SHALL BE UNDERTAKEN AS DIRECTED, AT NO ADDITIONAL COST TO THE OWNER. ALL LAYOUT SHALL BE PERFORMED BY A NH. REGISTERED PROFESSIONAL LAND SURVEYOR.
9. ALL PROPOSED PAVEMENTS SHALL MEET THE LINE AND GRADE OF EXISTING ADJACENT PAVEMENT SURFACES. ALL BITUMINOUS CONCRETE SHALL BE TREATED WITH AN RS-1 TACK COAT AT POINT OF CONNECTION. ALL PATHWAY WIDTHS SHALL BE AS NOTED ON THE LAYOUT AND MATERIALS PLAN.
10. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD MEASUREMENT OF ALL PROPOSED FENCES AND GATES.
12. THE DEPTH OF LOAM BORROW FOR ALL PROPOSED LAWN AREAS SHALL BE 6" MINIMUM. ALL DISTURBED AREAS SHALL BE RESTORED WITH LOAM AND SEED UNLESS OTHERWISE NOTED
13. REFER TO DETAIL DRAWINGS FOR CONSTRUCTION DETAILS.
14. SURVEY CONTROL POINTS AND COORDINATES ARE INDICATED ON THE PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT OR CREATE HIS OWN PROTECTED CONTROL POINTS FROM THIS INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL LAYOUT POINTS ARE CONSISTENT WITH CONTROL INFORMATION. RESETTING OF DAMAGED OR MISSING LAYOUT MARKERS AS NECESSARY IS AT NO ADDITIONAL COST TO THE OWNER.

GRADING, UTILITIES & DRAINAGE NOTES

1. ALL WORK RELATING TO INSTALLATION, RENOVATION OR MODIFICATION OF WATER, DRAINAGE AND/OR SEWER SERVICES SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS OF THE CITY OF PORTSMOUTH DPW AND SHALL BE INSPECTED BY DPW PRIOR TO BACKFILL.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER.
3. ALL GRADING IS TO BE SMOOTH AND CONTINUOUS WHERE PROPOSED SURFACES MEET EXISTING SURFACES, ELIMINATE ROUGH SPOTS AND ABRUPT GRADE CHANGES AND MEET LINE AND GRADE OF EXISTING CONDITIONS WITH NEW IMPROVEMENTS.
4. CONTRACTOR SHALL ENSURE ALL AREAS ARE PROPERLY PITCHED TO DRAIN, WITH NO SURFACE WATER PONDING OR PUDDLING.
5. MINIMUM CROSS SLOPE ON ALL WALKWAYS WILL BE 1:100 OR A MAXIMUM OF 1.5% TO PROVIDE POSITIVE DRAINAGE. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE OWNER PRIOR TO CONTINUING WORK.
6. ALL UTILITY GRATES, COVERS OR OTHER SURFACE ELEMENTS INTENDED TO BE EXPOSED AT GRADE SHALL BE FLUSH WITH THE ADJACENT FINISHED GRADE AND ADJUSTED TO PROVIDE A SMOOTH TRANSITION AT ALL EDGES. ALL UTILITY GRATES WITHIN PLAYING FIELDS OR INDICATED TO BE "BURIED" SHALL BE 4" BELOW FINISH GRADE AND COVERED WITH FINISH MATERIAL INDICATED ON PLANS.
7. THE CONTRACTOR SHALL SET SUBGRADE ELEVATIONS TO ALLOW FOR POSITIVE DRAINAGE AND PROVIDE EROSION CONTROL DEVICES, STRUCTURES, MATERIALS AND CONSTRUCTION METHODS TO DIRECT SILT MIGRATION AWAY FROM DRAINAGE AND OTHER UTILITY SYSTEMS, PUBLIC/PRIVATE STREETS AND WORK AREAS. CLEAN BASINS REGULARLY AS NEEDED AND AT THE END OF THE PROJECT.
8. EXCAVATION REQUIRED WITHIN PROXIMITY OF KNOWN EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
9. WHERE NEW EARTHWORK MEETS EXISTING GRADE, CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY INTO EXISTING, PROVIDING VERTICAL CURVES OR ROUNDS AT ALL TOP AND BOTTOM OF SLOPES.
10. WHERE A SPECIFIC LIMIT OF WORK LINE IS NOT OBVIOUS OR IMPLIED, BLEND GRADES TO EXISTING CONDITIONS WITHIN 5 FEET OF PROPOSED CONTOURS.
11. RESTORE ALL DISTURBED AREAS AND LIMITS OF ALL REMOVALS TO LOAM AND SEED (L&S) UNLESS OTHERWISE NOTED.
12. SEE EARTHWORK SECTION OF SPECIFICATIONS FOR SPECIFIC EXCAVATION AND FILLING PROCEDURES.
13. FOR STRUCTURE REMODELING (REMOD), CONSTRUCTION METHODS SHALL FOLLOW NEW HAMPSHIRE DOT STANDARD SPEC. LATEST EDITION.
14. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL UTILITY SERVICE CONNECTIONS WITH EVERSOURCE ENERGY, PORTSMOUTH, NH, EASTERN DIVISION (603) 519-0924

SPECIAL NOTE:
1. ALL CONDITIONS ON THESE PLANS SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
2. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
3. ALL IMPROVEMENTS SHOW ON THIS SITE PLANS SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLANS BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS.
NO CHANGES SHALL BE MADE TO THIS PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.

DIG SAFE
MA ME NH RI VT
CALL 811 TOLL FREE
UTILITIES UNDER GROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

PROP	PROPOSED
ADJ	ADJUST
BIT. CONC.	BITUMINOUS CONCRETE
CEM. CONC.	CEMENT CONCRETE
B	BASELINE
N.T.S.	NOT TO SCALE
BVCL	BLACK VINYL CHAIN LINK
B.M.	BENCH MARK
ABAN	ABANDON
MB	MAIL BOX
GRAN. CURB	GRANITE CURB
EXIST. (OR EX.)	EXISTING
FDN	FOUNDATION
F.L. (OR F)	FLOW LINE
P	PROPERTY LINE
PVMT	PAVEMENT
P.W.W.	PAVED WATERWAY
RC	REINFORCED CONCRETE
M.H.B.	NEW HAMPSHIRE HIGHWAY BOUND
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
R.O.W.	RIGHT-OF-WAY
R&S	REMOVE AND SALVAGE
R,R&S	REMOVE, RELOCATED AND SALVAGE
R&S	REMOVE AND STACK
R&D	REMOVE AND DISPOSE
SB	STONE BOUND
NIC	NOT IN CONTRACT
H.C.	HANDICAP
WCR	WHEELCHAIR RAMP
FF	FINISHED FLOOR
HMA	HOT MIX ASPHALT
G.C.	GENERAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
SWEL	SOLID WHITE EDGE LINE
BWLL	BROKEN WHITE LANE LINE
SYEL	SOLID YELLOW EDGE LINE
SB/DH	STONE BOUND/ DRILL HOLE
CLF	CHAIN LINK FENCE
TEMP.	TEMPORARY
TYP.	TYPICAL
EQ	EQUIPMENT
H.C.	HANDICAP
EOP	EDGE OF PAVEMENT
PROT	PROTECT
CTE	CONNECT TO EXISTING
RL	ROOF LEADER
L.O.W.	LIMIT OF WORK
VIF	VERIFY IN FIELD
BVW	BORDERING VEGETATED WETLAND

UTILITIES

GICI	GUTTER INLET W/ CURB INLET
CBCI	CATCH BASIN W/ CURB INLET
CB	CATCH BASIN
C.I.T.	CHANGE IN TYPE
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
CI	CURB INLET
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
DI	DRAIN INLET
GI	GUTTER INLET
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
HYD	HYDRANT
INV. ELEV.	INVERT ELEVATION
UP	UTILITY POLE
SMH	SEWER MANHOLE
WG	WATER GATE
DS	DOWN SPOUT
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
DMH	DRAIN MANHOLE
LB	LEACHING BASIN
LG	LEACHING GALLEY
CI	CAST IRON
OCS	OUTLET CONTROL STRUCTURE
OGT	OIL AND GRIT TRAP
VC	VITRIFIED CLAY PIPE
LP	LIGHT POLE
OHW	OVERHEAD WIRE
UPLP	UTILITY POLE WITH LIGHT
SWTU	STORM WATER TREATMENT UNIT
HH	HANDHOLE
GW	GARAGE WASTE
CO	CLEANOUT
LC	LEACHING CHAMBER
GV	GATE VALVE
CU	CONNECTION UNKNOWN

ALIGNMENT/GRADING

BW	BOTTOM OF WALL
BC	BOTTOM OF CURB
PI	POINT OF INTERSECTION
PC	POINT OF CURVATURE
PT	POINT OF TANGENCY
PRC	POINT OF REVERSE CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVC	POINT OF VERTICAL CURVATURE
PVT	POINT OF VERTICAL TANGENCY
ELEV	ELEVATION
CC	CENTER OF CURVE
H.P.	HIGH POINT
L.P.	LOW POINT
R	RADIUS OF CURVATURE
STA	STATION
S.S.D.	STOPPING SIGHT DISTANCE
TC	TOP OF CURB
TW	TOP OF WALL

STATE OF NEW HAMPSHIRE
JAMES I. PEARSON
No. 14212
LICENSED
PROFESSIONAL ENGINEER
1/23/2023

PILLAR DESIGN STUDIOS

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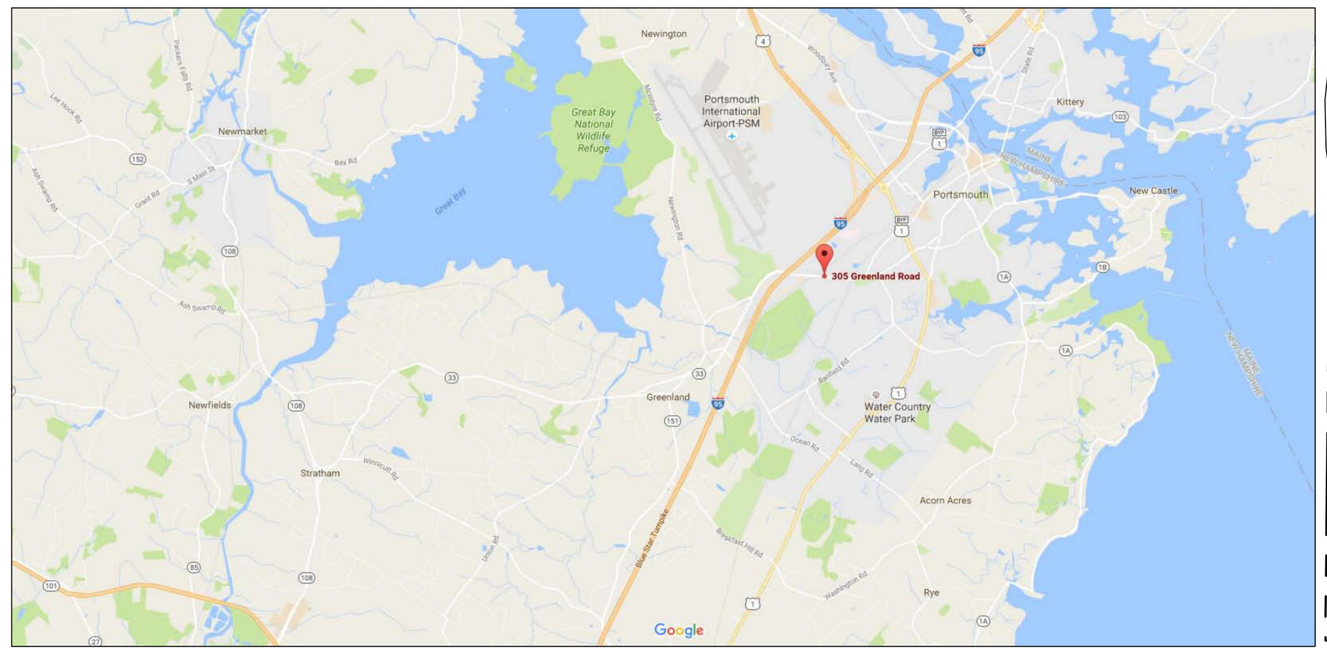
DRAWN BY:: KC
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

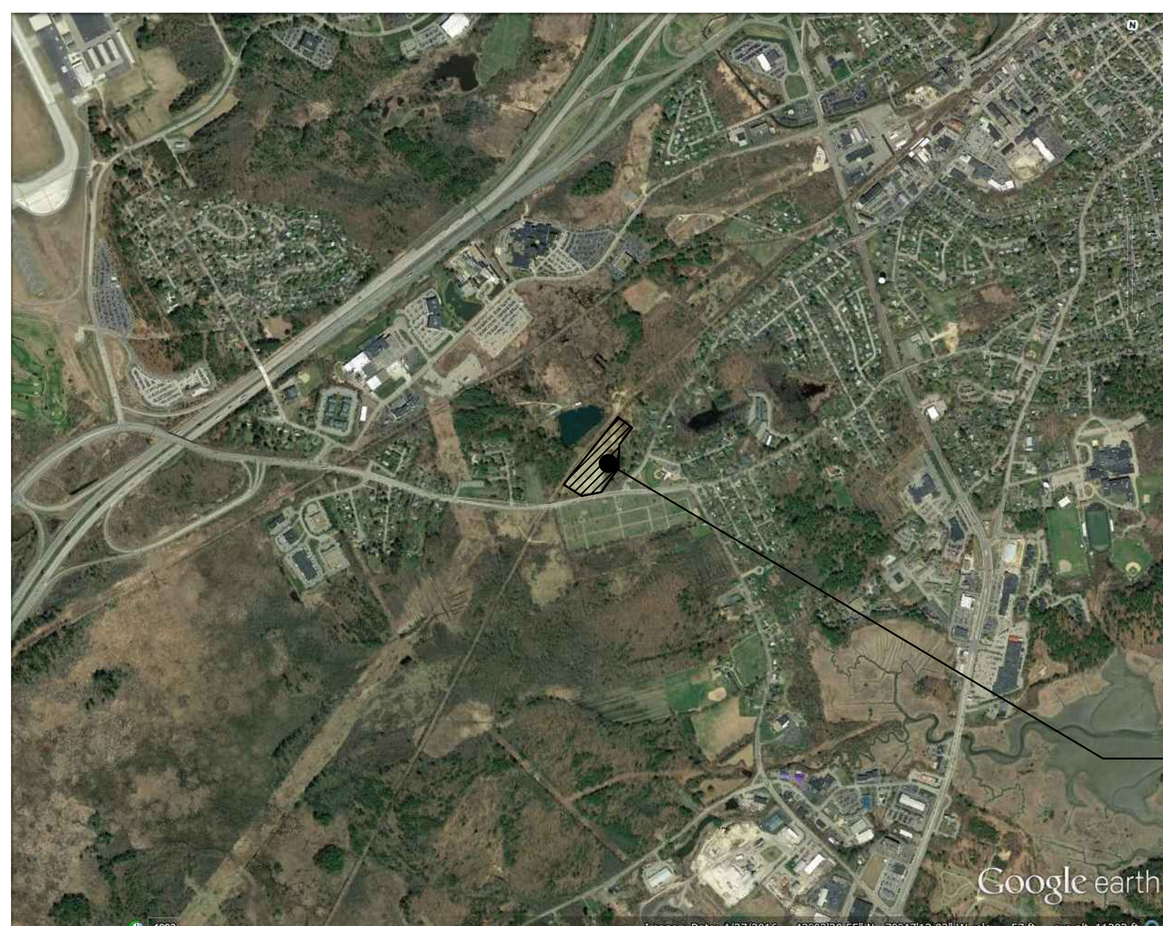
PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
GENERAL NOTES
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

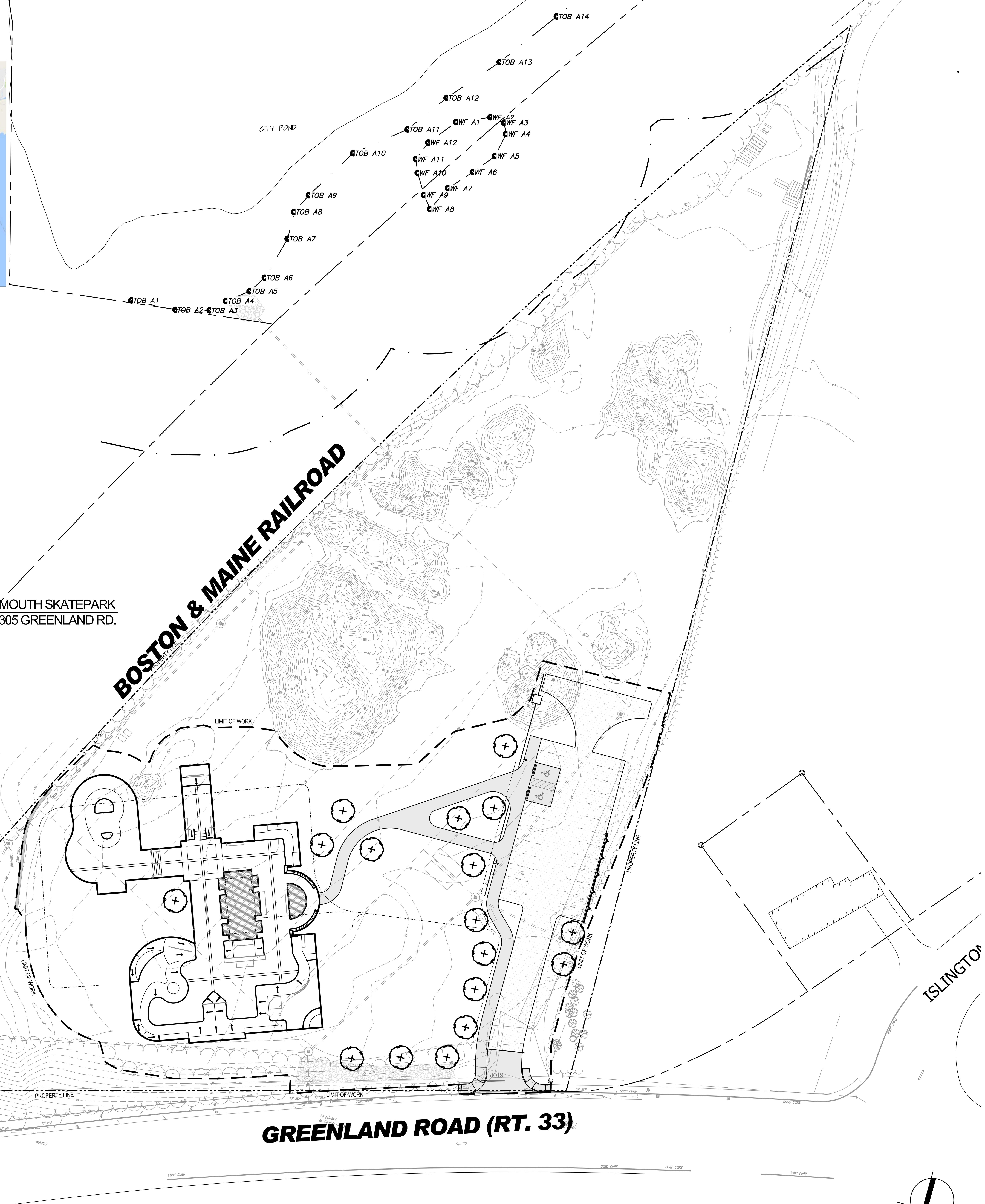
SHEET::
L001
SKATE PARK

Locus Map



Aerial Map





STATE OF NEW HAMPSHIRE
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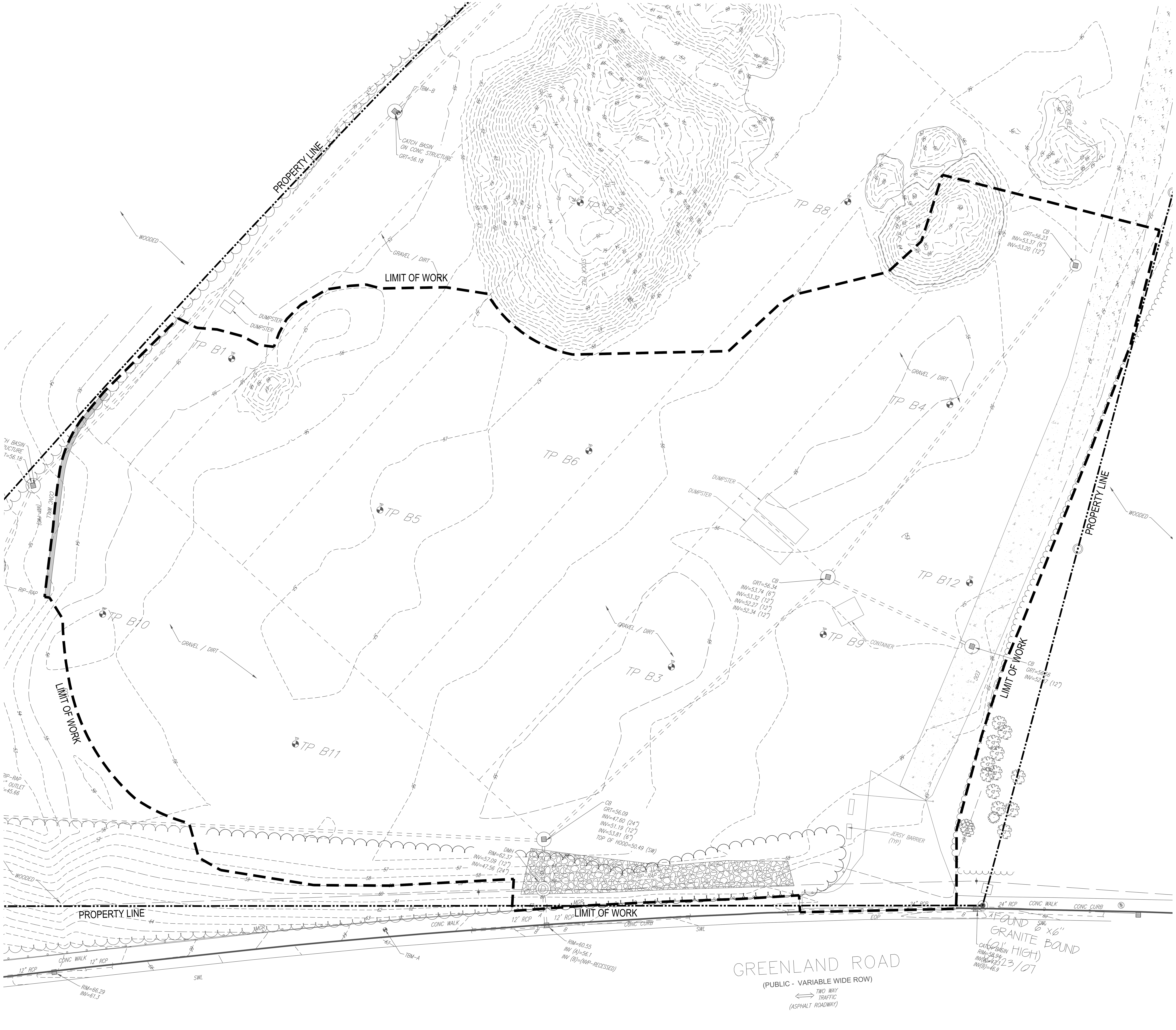
DRAWN BY:: KC
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE::
SITE PLAN
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET::
L002
SKATE PARK



LEGEND

	LIMIT OF WORK
	PROPERTY LINE
	GUARDRAIL
	EDGE OF WOODS
	OVERHEAD UTILITIES
65	EXISTING CONTOUR
	EXISTING DRAIN
	CATCH BASIN
	UTILITY POLE
	DRAIN MANHOLE
	RIPRAP
	GRAVEL
BK.2562/PG.2783	BOOK NO./PAGE NO.
CB	CATCH BASIN
CPP	CORRUGATED PLASTIC PIPE
DMH	DRAINAGE MANHOLE
EP	EDGE OF PAVEMENT
FES	FLARED END SECTION
HDPE	HIGH DENSITY POLYETHYLENE
INV.	INVERT
L	LENGTH OF CURVE
N/F	NOW OR FORMERLY
PSNH	PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
R	RADIUS
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RCP	REINFORCED CONCRETE PIPE
S.F.	SQUARE FEET
TP	TEST PIT

STATE OF NEW HAMPSHIRE
JAMES I. PEARSON
No. 14212
LICENSED
PROFESSIONAL ENGINEER
1/23/2023

NOTES

1. THE PARCEL IS LOCATED IN THE MUNICIPAL DISTRICT.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 241 AS LOT 18.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X AS SHOWN ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270E, EFFECTIVE DATE: MAY 17, 2005.
4. OWNER OF RECORD:
   CITY OF PORTSMOUTH
   C/O WATER DEPARTMENT
   DEPARTMENT OF PUBLIC WORKS
   PO BOX 628
   PORTSMOUTH, NH 03802
5. ZONING REQUIREMENTS:
   LOTS AND BUILDINGS IN THE MUNICIPAL DISTRICT ARE EXEMPT FROM ALL DIMENSIONAL AND INTENSITY REGULATIONS.
   SEE SECTION 10.560 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE.
6. VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). CONTOUR INTERVAL IS 1'.
7. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83).
8. THE UNDERGROUND SYSTEM SHOWN HEREON WAS NOT FIELD LOCATED. LOCATION TAKEN FROM "GRADING PLAN ROUTE 33 RECREATION AREA" BY UNDERWOOD ENGINEERS, DATED 12/17/2013. THIS LOCATION SHOWN HEREON IS APPROXIMATE ONLY.
9. EXISTING CONDITIONS SURVEY PERFORMED BY ________
   DATED ________

PLAN REFERENCES:

1. "LOT LINE ADJUSTMENT ISLINGTON STREET & GREENLAND ROAD, PORTSMOUTH, NEW HAMPSHIRE FOR CITY OF PORTSMOUTH" BY JAMES VERRA AND ASSOCIATES, INC. DATED 1-30-2002. PLAN NOT RECORDED.
2. "RIGHT OF WAY EASEMENT PLAN FOR THE CITY OF PORTSMOUTH, GREENLAND ROAD/MIDDLE ROAD, PORTSMOUTH, NEW HAMPSHIRE" PREPARED BY VANASSE HANGEN BRUSTLIN, INC., DATED SEPTEMBER 28, 2007, REVISED APRIL 28, 2008. RCRD PLAN #D-35481.
3. "AS BUILT PLAN OF A PORTION OF NH ROUTE 33, PORTSMOUTH, NEW HAMPSHIRE" BY AMBIT ENGINEERING, INC. DATED AUGUST 2010, REVISED 9/21/10. PLAN NOT RECORDED.
4. "EXISTING FEATURES PLAN TAX MAP 241 LOT 18 PROPERTY OF CITY OF PORTSMOUTH 305 GREENLAND ROAD PORTSMOUTH, NEW HAMPSHIRE COUNTY OF ROCKINGHAM" BY MSC CIVIL ENGINEERS & LAND SURVEYORS, DATED NOVEMBER 2, 2012 WITH REVISION 1 DATED 11/05/2012. PLAN IS NOT RECORDED.

TFM
MSC
A division of TFMoran, Inc.
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.mscengineers.com

CONTROL POINT ASSOCIATES INC.

SCALE: 1" = 20' - 0"
0 20 40 60

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DATE:: 01/23/23

PROJECT:: PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: EXISTING CONDITIONS
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION
SHEET:: L100
SKATE PARK

LEGEND

	PROPERTY LINE
	LIMIT OF WORK
	CLEAR & GRUB EX. VEGETATION
	R&D GRAVEL PAVEMENT, COMPLETE
	R&D VEGETATION, COMPLETE
	EXISTING ASPHALT PAVEMENT
	EROSION CONTROLS
	INLET SEDIMENT CONTROL, TYP.
	6' HT. CONSTRUCTION FENCE WITH WIND SCREEN, TYP.
	R&D EXISTING GATE, COMPLETE
	CONSTRUCTION ENTRANCE

TYP.	TYPICAL
EX.	EXISTING
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STORE
P&S	PROTECT AND SAVE

NOTES

1. CONTRACTOR SHALL REMOVE ALL ASPHALT, BIT. CONCRETE, RUBLE, DEBRIS, AND ALL MATERIAL WITHIN PHASE 1 LIMIT OF WORK NECESSARY AROUND ENTIRE SITE PRIOR TO CONSTRUCTION.
2. REMOVE ALL VEGETATION WITHIN THE ENTIRE CONSTRUCTION SITE AS SHOWN ON THE PLANS. AS DETERMINED BY THE ENGINEER/LANDSCAPE ARCHITECT.
3. EX. DRAINAGE SYSTEM CONNECTS TO STORMWATER FROM GREENLAND ROAD, AND MUST BE KEPT CLEAN AND OPERATIONAL THROUGHOUT THE DURATION OF THE PROJECT.

PROPOSED BORING LOCATIONS 1-16

SCALE: 1" = 20' - 0"

0 20 40 60

STATE OF NEW HAMPSHIRE
JAMES I. PEARSON No. 14212 LICENSED
PROFESSIONAL ENGINEER

1/23/2023

Weston & Sampson design studio
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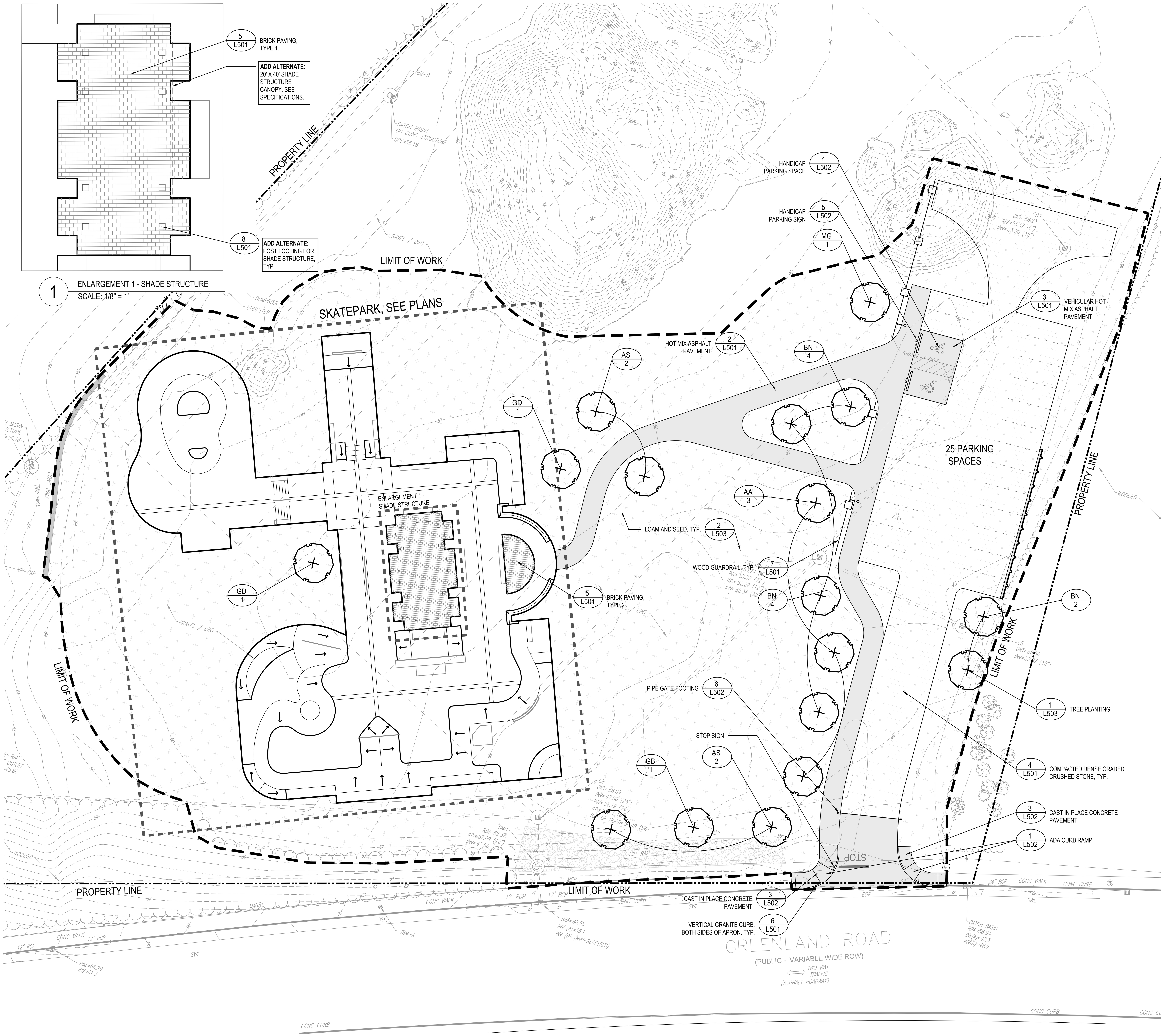
617.412.4480 800.SAMPSON
www.westonandsampson.com

DRAWN BY:: KC
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE::
SITE PREPARATION AND DEMOLITION PLAN
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET::
L110
SKATE PARK



LEGEND

- PROPERTY LINE
- LIMIT OF WORK
- ENLARGEMENT
- COMPACTED DENSE GRADED CRUSHED STONE
- LOAM AND SEED
- HOT MIX ASPHALT PAVEMENT
- BRICK PAVERS
- PROPOSED TREE

JAMES I. PEARSON No. 14212 LICENSED — STATE OF NEW HAMPSHIRE — PROFESSIONAL ENGINEER

1/23/2023

PLANT SCHEDULE - NOT IN CONTRACT

TREES

CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER	NOTES
AA	3	AMELANCHIER ARBOREA	SERVICE BERRY	2"-2.5" CAL.	B&B	
AS	4	ACER SACCHARUM	SUGAR MAPLE	2"-2.5" CAL.	B&B	MULTI-TRUNK
BN	6	BETULA NIGRA	RIVER BIRCH	12-14' HEIGHT	B&B	
GB	1	GINGKO BILOBA	GINGKO	2"-2.5" CAL.	B&B	
GD	2	GYMNOCLADUS DIOICUS	ESPRESSO COFFEETREE	2"-2.5" CAL.	B&B	
MG	1	METASEQUOIA GLYPTOSTROBOIDES	DAWN REDWOOD	2"-2.5" CAL.	B&B	

Note:
1. The tree planting schedule is for reference only. The City of Portsmouth shall install all trees at a future date. Under this contract the contractor shall loam and seed all disturbed areas complete.

SCALE: 1" = 20' - 0"
0 20 40 60

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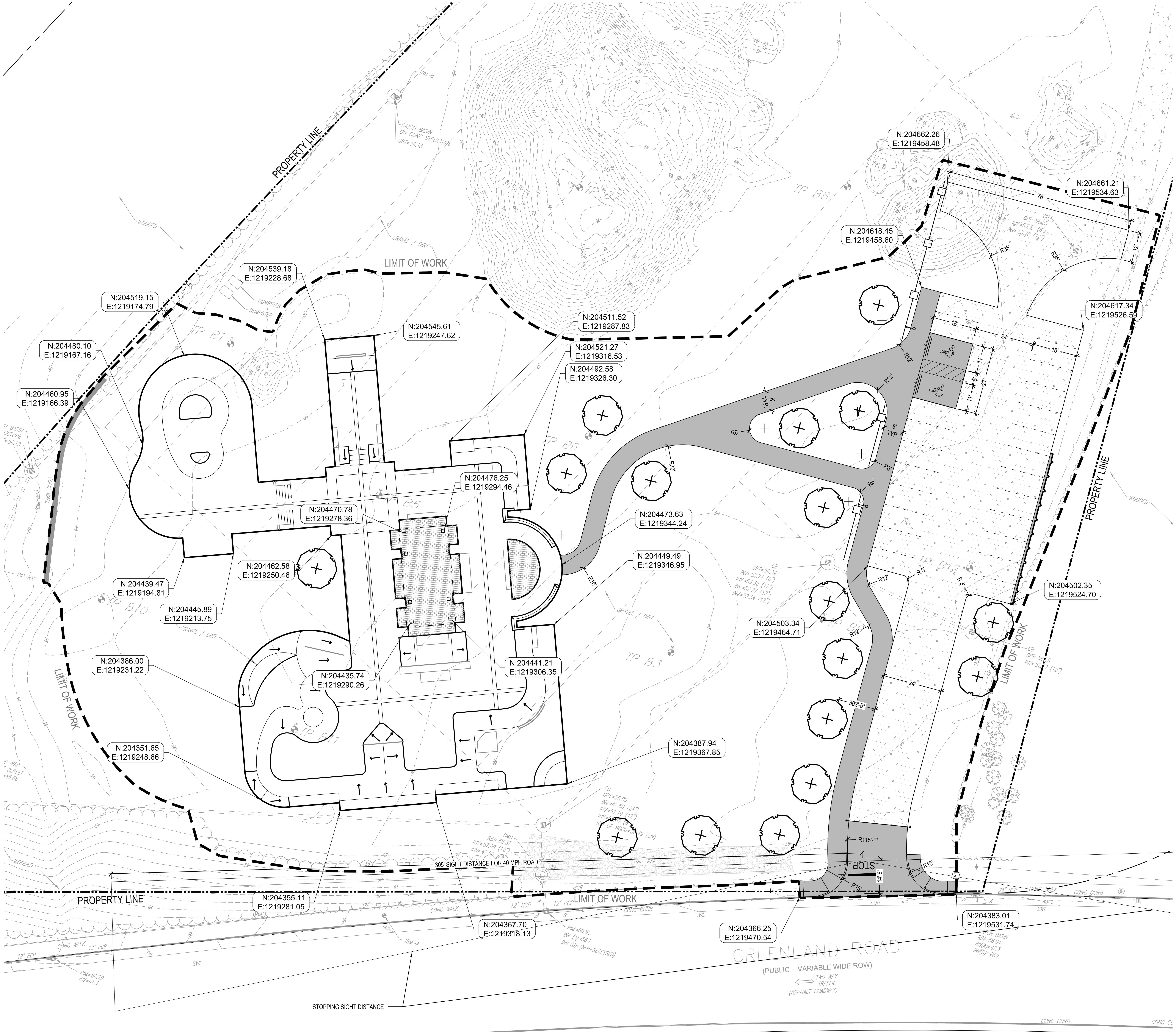
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

PROJECT:: PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: MATERIALS AND PLANTING PLAN
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET:: L120
SKATE PARK



LEGEND

- PROPERTY LINE
- LIMIT OF WORK
- TYP. DIMENSION
- TYP. ARC DIMENSION
- TYP. ANGLE DIMENSION
- TYP. RADIUS DIMENSION
- CENTER LINE
- CENTER POINT

STATE OF NEW HAMPSHIRE — JAMES I. PEARSON No. 14212 LICENSED PROFESSIONAL ENGINEER

1/23/2023

NOTES

1. REFER TO EXISTING CONDITIONS PLAN AND SURVEY NOTES FOR SURVEY INFORMATION.
2. COORDINATE ALL LAYOUT ACTIVITIES WITH THE SCOPE OF WORK CALLED FOR BY ALL OPERATIONS ENCOMPASSED BY THIS CONTRACT SET. PROTECT AND REPLACE REFERENCE STAKES AS NECESSARY OR AS REQUIRED BY THE OWNER'S REPRESENTATIVE.
3. THE CONTRACTOR SHALL PERFORM ALL WORK UNLESS SPECIFICALLY INDICATED THAT THE WORK WILL BE PERFORMED "BY OTHERS" OR "OWNER".
4. ALL PROPOSED SITE FEATURES SHALL BE LAID OUT AND STAKED FOR REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF INSTALLATION. ANY REQUIRED ADJUSTMENTS TO THE LAYOUT SHALL BE UNDERTAKEN AS DIRECTED, AT NO ADDITIONAL COST TO THE OWNER.
5. ALL PROPOSED PAVEMENTS SHALL MEET THE LINE AND GRADE OF EXISTING ADJACENT PAVEMENT SURFACES.
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD MEASUREMENT OF ALL PROPOSED SITE IMPROVEMENTS.

SCALE: 1" = 20' - 0"

0 20 40 60

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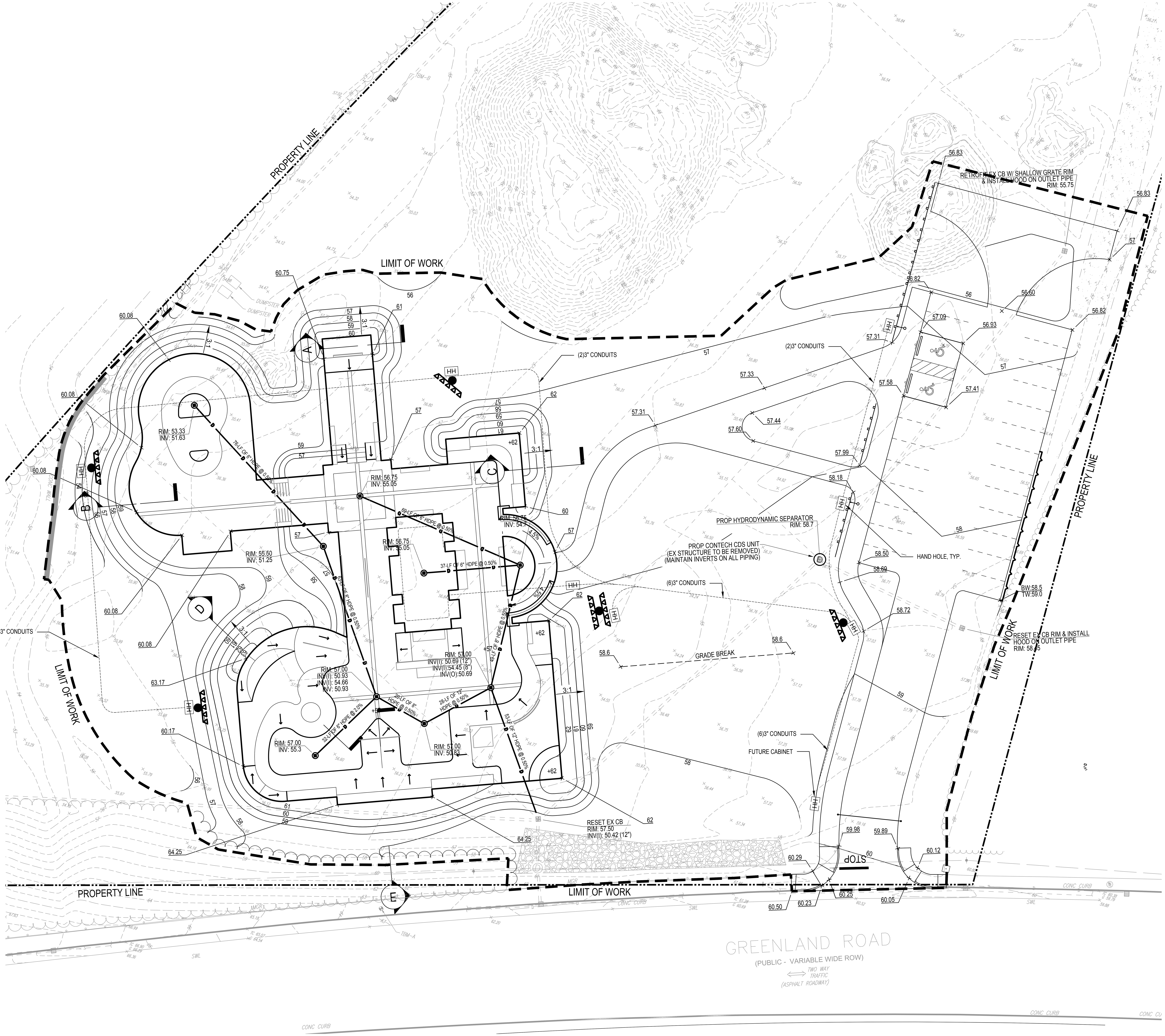
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

PROJECT:: PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: LAYOUT PLAN
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET:: L130
SKATE PARK



LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- EXISTING DRAINAGE STRUCTURE. SEE UTILITIES PLAN
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING SPOT ELEVATION
- PROPOSED SUBGRADE ELEVATION
- PROPOSED SLOPE
- PROPOSED PARK LIGHT
- PROPOSED HANDHOLD ELECTRICAL
- PROPOSED WIRED CONDUIT
- CATCH BASIN OR PVC AREA DRAIN, REFER TO PLANS
- HDPE OR PVC SOLID DRAIN PIPE, DIAMETER VARIES
- GRADE BREAK
- HP HIGH POINT
- LP LOW POINT
- TW TOP OF WALL
- BW BOTTOM OF WALL

SCALE: 1" = 20' - 0"

0 20 40 60

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1/23/2023

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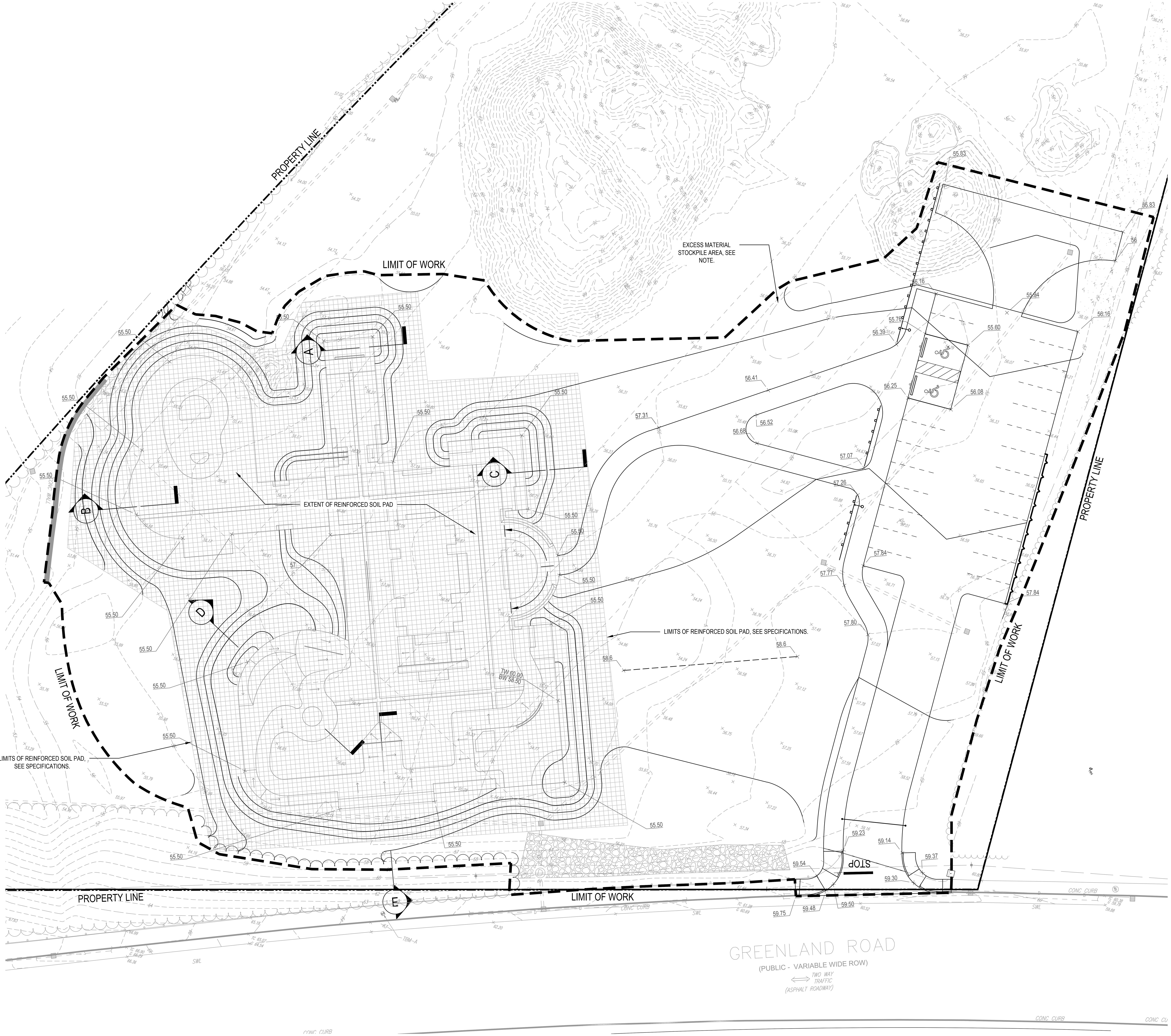
REVIEWED BY:
APPROVED BY: BK
DATE: 01/23/23

PROJECT:
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE:
GRADING, DRAINAGE AND UTILITIES PLAN
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET:
L140
SKATE PARK



LEGEND

	LIMIT OF WORK
	PROPERTY LINE
	EXISTING DRAINAGE STRUCTURE. SEE UTILITIES PLAN
12	EXISTING CONTOURS
14	PROPOSED CONTOURS
95.10	EXISTING SPOT ELEVATION
8.25	PROPOSED SUBGRADE ELEVATION
1:3	PROPOSED SLOPE
	CATCH BASIN OR PVC AREA DRAIN, REFER TO PLANS
D	HDPE OR PVC SOLID DRAIN PIPE, DIAMETER VARIES
	GRADE BREAK
HP	HIGH POINT
LP	LOW POINT
TW	TOP OF WALL
BW	BOTTOM OF WALL
	REINFORCED SOIL PAD

STATE OF NEW HAMPSHIRE
JAMES L. PEARSON
No. 14212
LICENSED
PROFESSIONAL ENGINEER
1/23/2023

NOTES:

1. USE EXISTING ON-SITE SOIL WITHIN THE EXTENTS OF THE REINFORCED SOIL PAD AREA TO PROVIDE CONSISTENT GRADE OF EL/ 56. EXCESS MATERIAL GENERATED DURING THIS WORK SHALL BE SEPARATED AND STOCKPILED ON-SITE AT THE LOCATION SHOWN ON THIS PLAN.

SCALE: 1" = 20' - 0"
0 20 40 60

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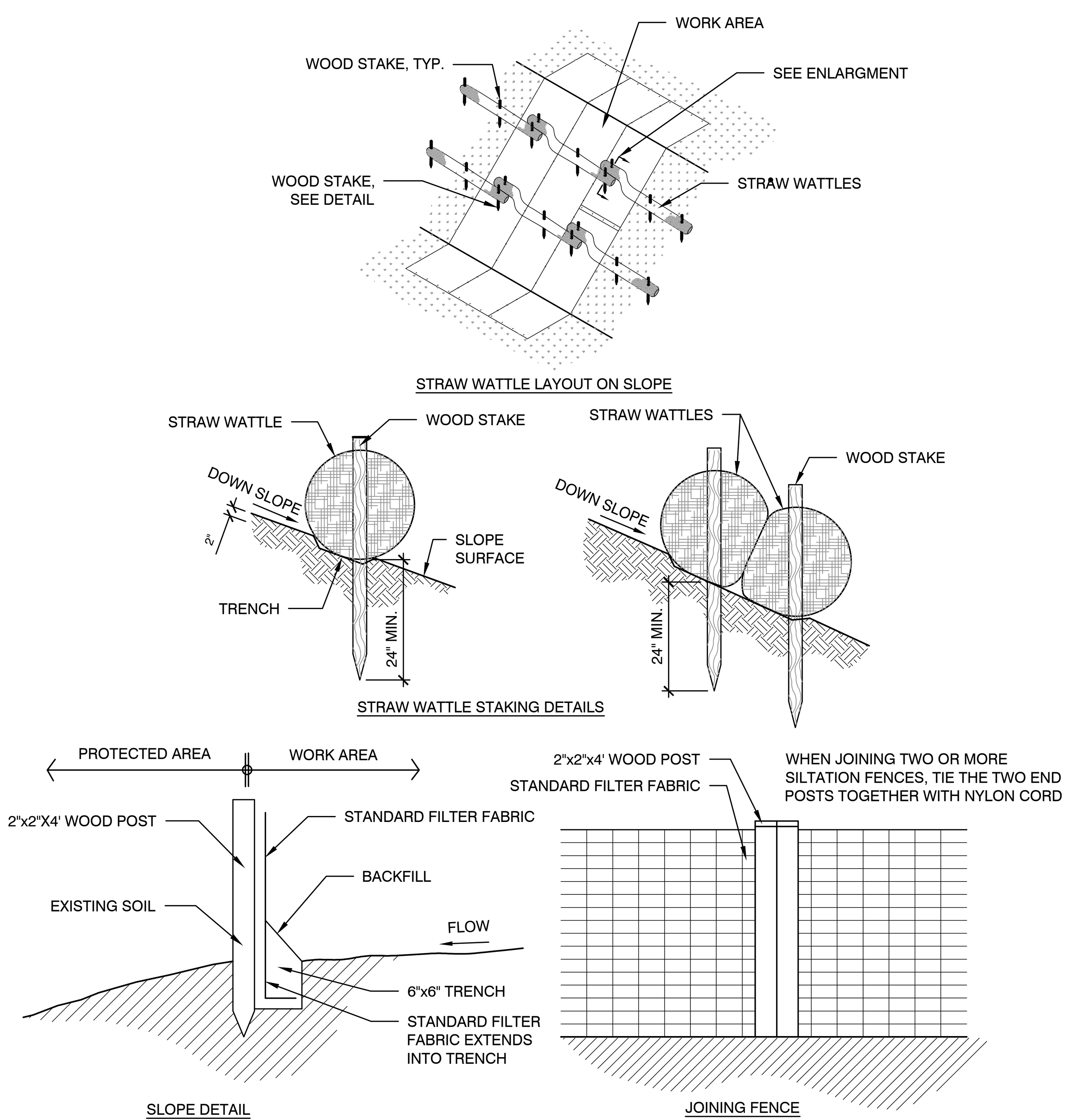
APPROVED BY:
DATE: 01/23/23

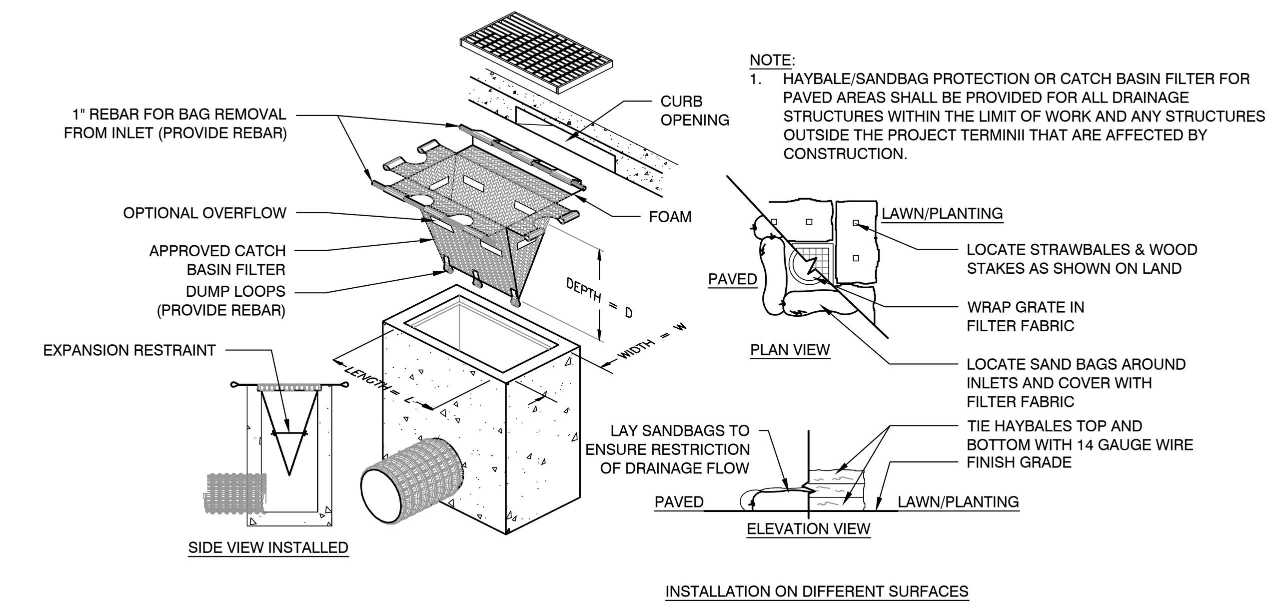
PROJECT:
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE:
SUBGRADE ELEVATION PLAN
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

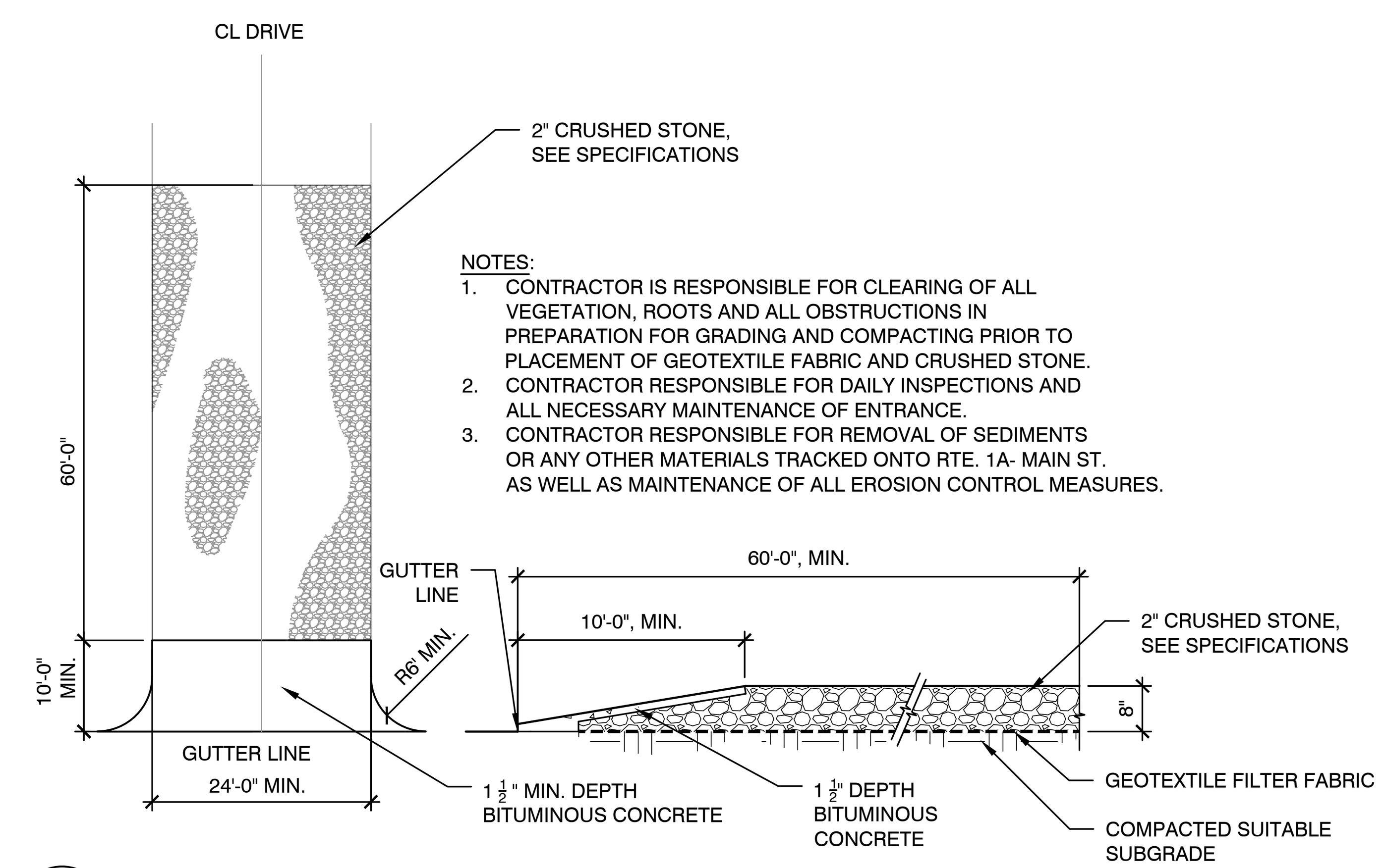
SHEET:
L141
SKATE PARK



1 EROSION CONTROLS- STRAW WATTLES AND FILTER FABRIC
SCALE: NTS

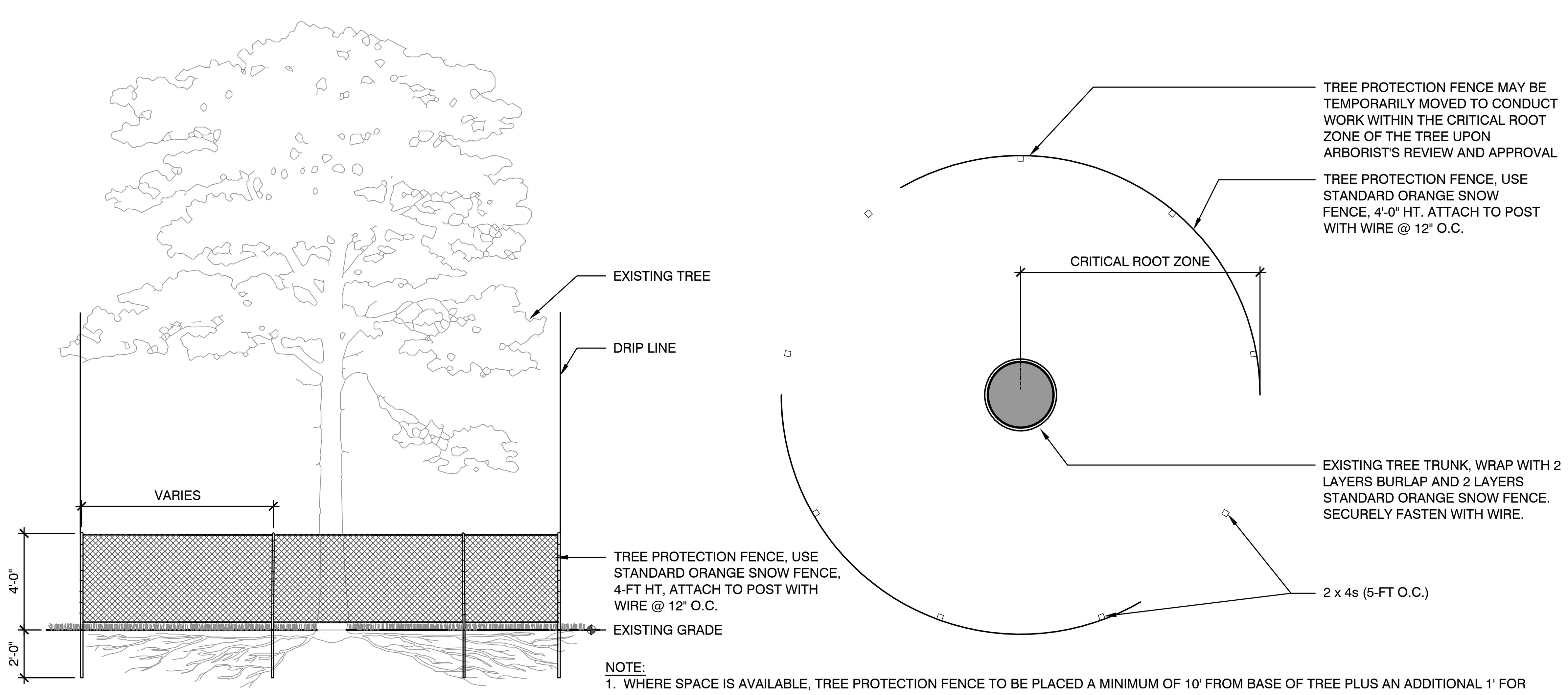


2 CATCH BASIN/ INLET SEDIMENT CONTROL PROTECTION
SCALE: NTS



NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR CLEARING OF ALL VEGETATION, ROOTS AND ALL OBSTRUCTIONS IN PREPARATION FOR GRADING AND COMPACTING PRIOR TO PLACEMENT OF GEOTEXTILE FABRIC AND CRUSHED STONE.
2. CONTRACTOR RESPONSIBLE FOR DAILY INSPECTIONS AND ALL NECESSARY MAINTENANCE OF ENTRANCE.
3. CONTRACTOR RESPONSIBLE FOR REMOVAL OF SEDIMENTS OR ANY OTHER MATERIALS TRACKED ONTO RTE. 1A- MAIN ST. AS WELL AS MAINTENANCE OF ALL EROSION CONTROL MEASURES.

3 CONSTRUCTION ENTRANCE
SCALE: NTS

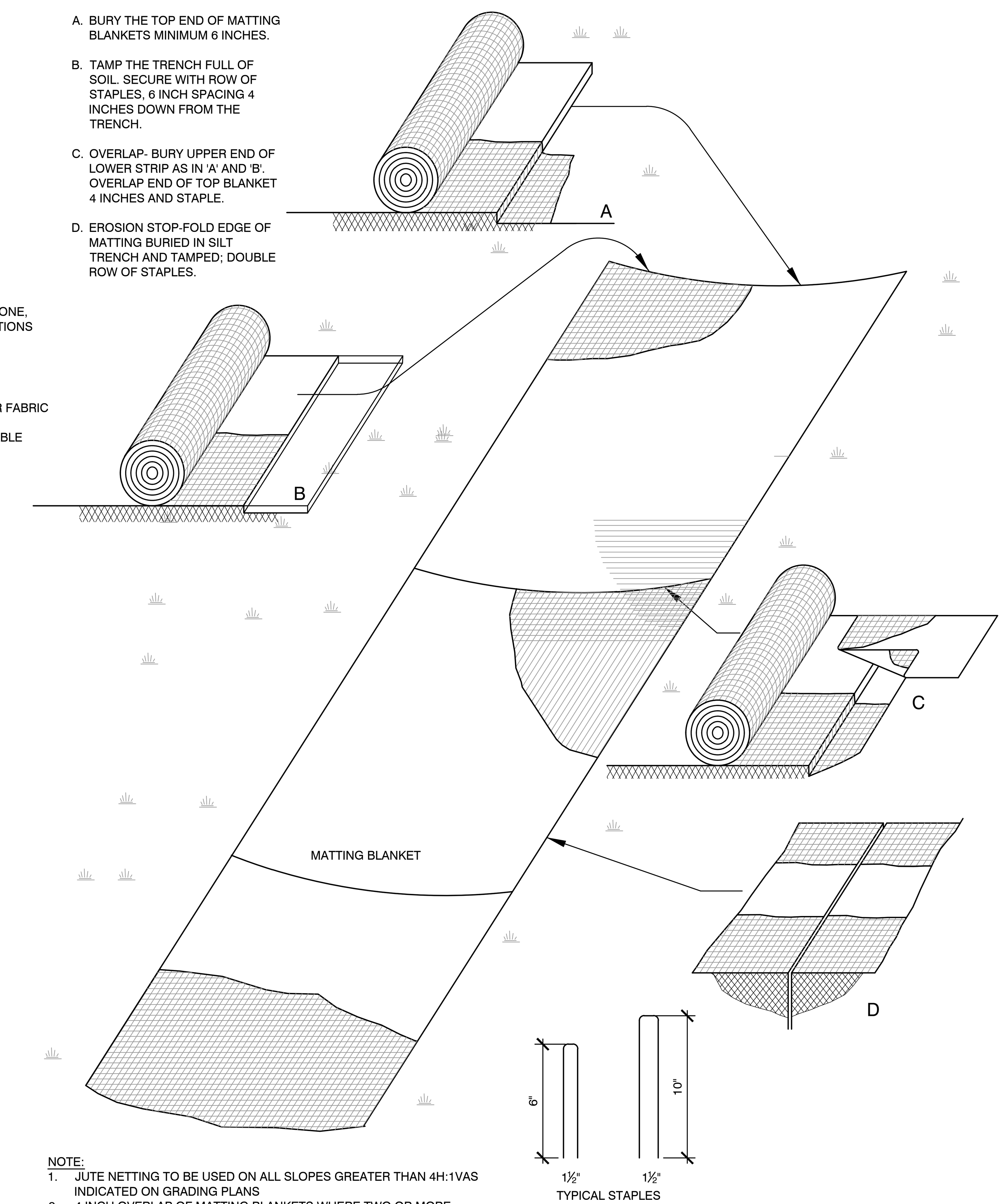


CRITICAL ROOT ZONE TO BE PROTECTED. ALL WORK NECESSARY WITHIN THE CRITICAL ROOT ZONE SHALL BE PERFORMED BY HAND.

NOTE:
1. WHERE SPACE IS AVAILABLE, TREE PROTECTION FENCE TO BE PLACED A MINIMUM OF 10' FROM BASE OF TREE PLUS AN ADDITIONAL 1' FOR EACH ADDITIONAL DBH FOR TREES GREATER THAN 10" DBH (DIA. AT BREAST HT.)
2. ALL WORK DONE WITHIN TREE PROTECTION FENCE IS TO BE DONE BY HAND AND LIGHT EQUIPMENT.
3. ROOTS EXPOSED DURING EXCAVATION SHALL BE NEATLY CUT AND COVERED WITH SOIL IMMEDIATELY.
4. FOR TREES THAT OCCUR IN GROUPS PROVIDE TREE PROTECTION FENCE AROUND ENTIRE AREA. SEE PLAN FOR LOCATIONS.
5. MAINTAIN FENCE PROTECTION IN SOUND CONDITION UNTIL FENCE COMPLETION
6. A CERTIFIED ARBORIST SHALL DELINEATE LIMIT OF TREE PROTECTION FENCE AS THEY RELATE TO THE LIMITS OF THE CRITICAL ROOT ZONE.

4 TREE PROTECTION
SCALE: NTS

A. BURY THE TOP END OF MATTING BLANKETS MINIMUM 6 INCHES.
B. TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 6 INCH SPACING 4 INCHES DOWN FROM THE TRENCH.
C. OVERLAP- BURY UPPER END OF LOWER STRIP AS IN 'A' AND 'B'. OVERLAP END OF TOP BLANKET 4 INCHES AND STAPLE.
D. EROSION STOP-FOLD EDGE OF MATTING BURIED IN SILT TRENCH AND TAMPED; DOUBLE ROW OF STAPLES.



NOTE:
1. JUTE NETTING TO BE USED ON ALL SLOPES GREATER THAN 4H:1VAS INDICATED ON GRADING PLANS
2. 4 INCH OVERLAP OF MATTING BLANKETS WHERE TWO OR MORE BLANKET WIDTHS ARE REQUIRED. STAPLES ON 1'-6" CENTERS.
3. STAPLE OUTSIDE EDGE ON 2'-0" CENTERS.

5 EROSION CONTROL BLANKET
SCALE: NTS

STATE OF NEW HAMPSHIRE
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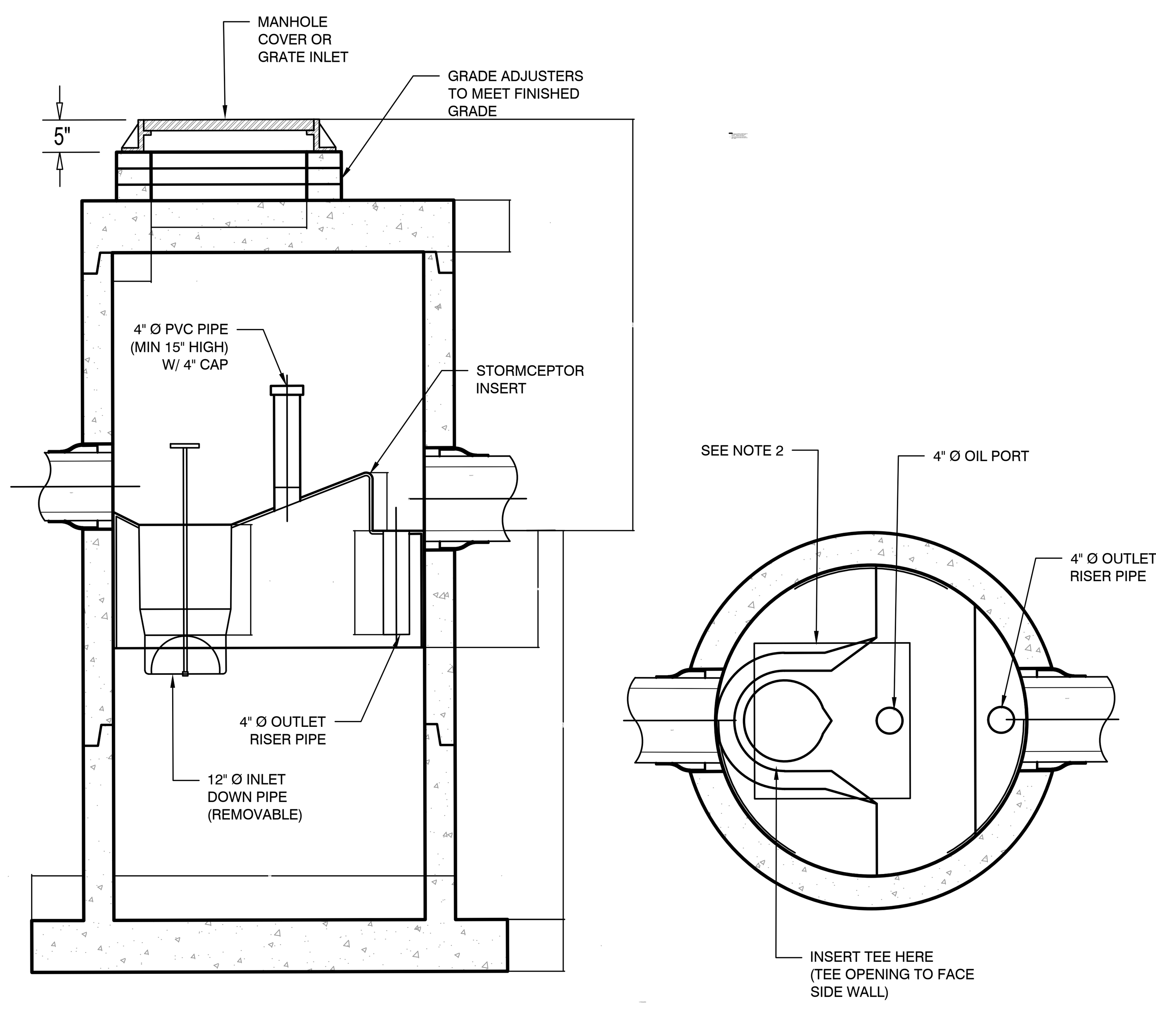
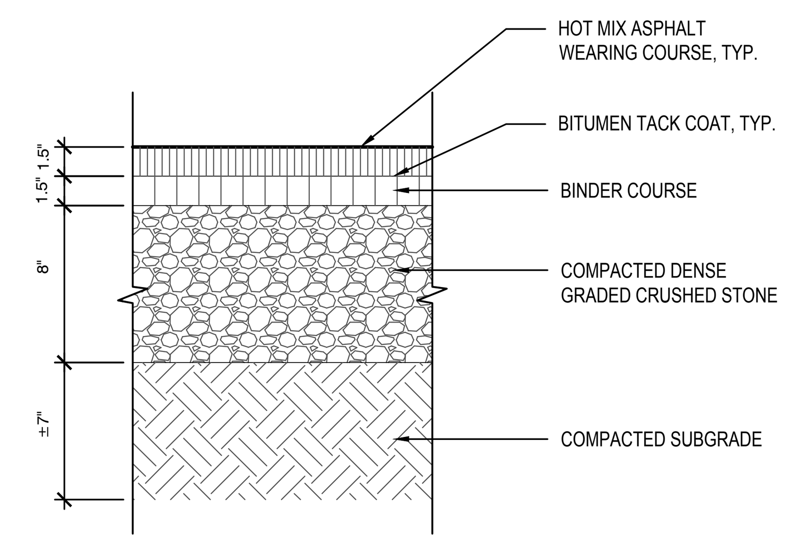
DRAWN BY:: KC
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
CONSTRUCTION DETAILS
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET::
L500
SKATE PARK

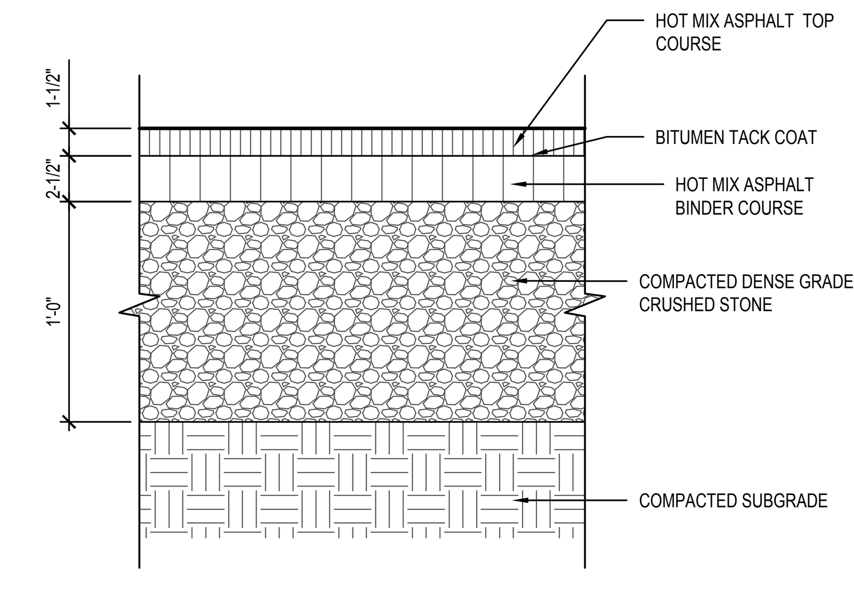


1 DRAIN MANHOLE
SCALE: NTS



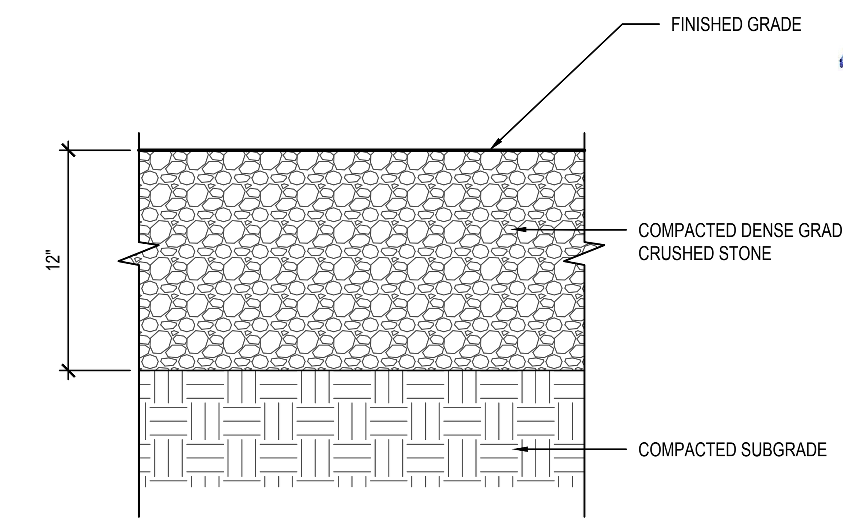
NOTES:
1. CONTRACTOR TO PROVIDE SMOOTH TRANSITION WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT

2 HOT MIX ASPHALT PAVEMENT SIDEWALK
SCALE: NTS

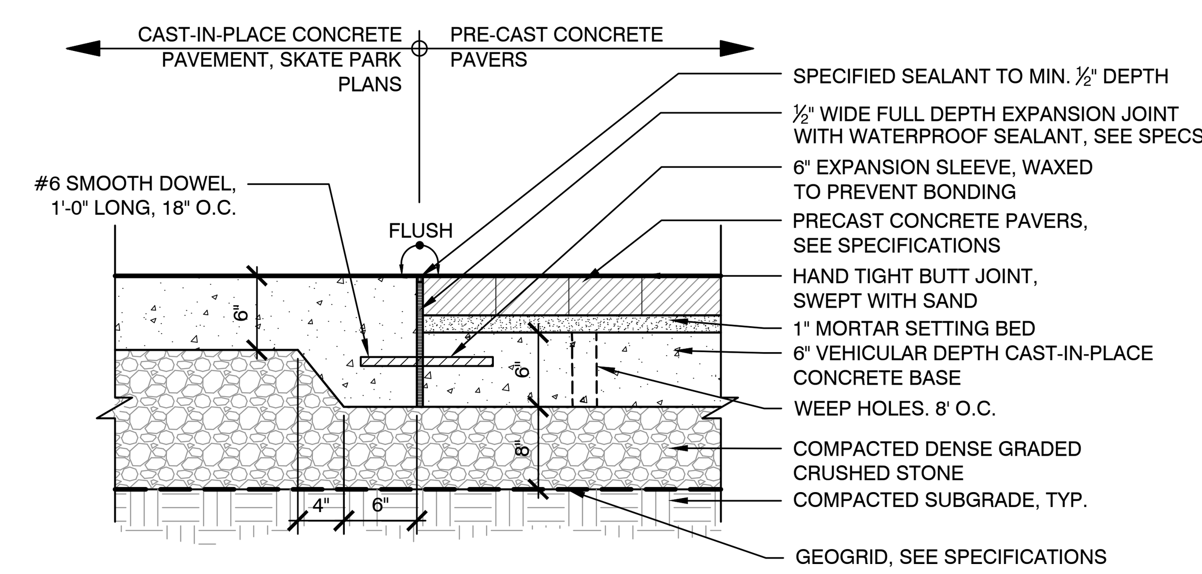


NOTES:
1. CONTRACTOR TO PROVIDE SMOOTH TRANSITION WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT.

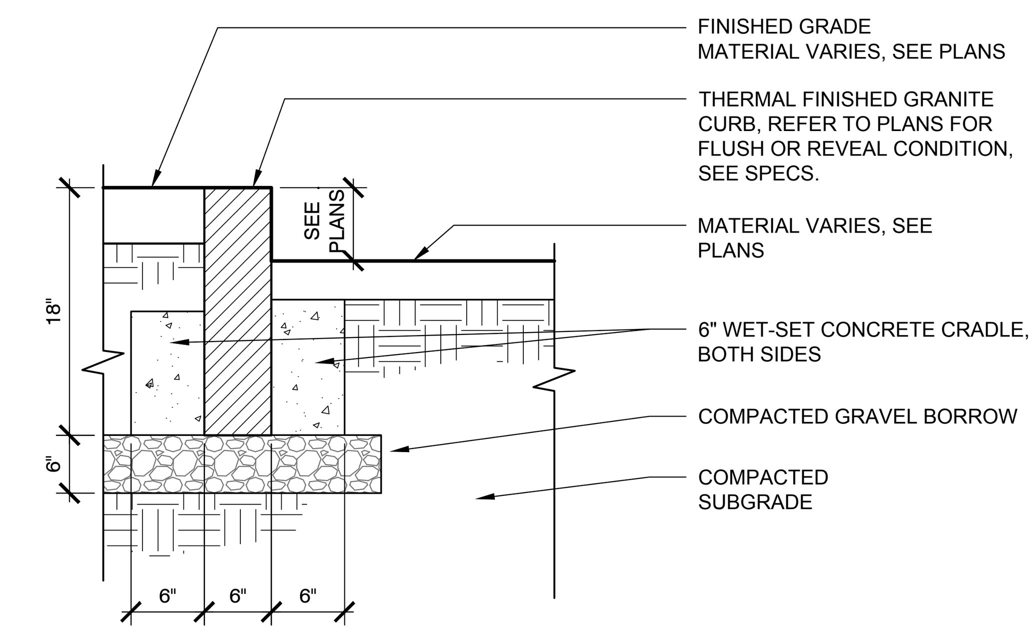
3 VEHICULAR HOT MIX ASPHALT PAVEMENT
SCALE: NTS



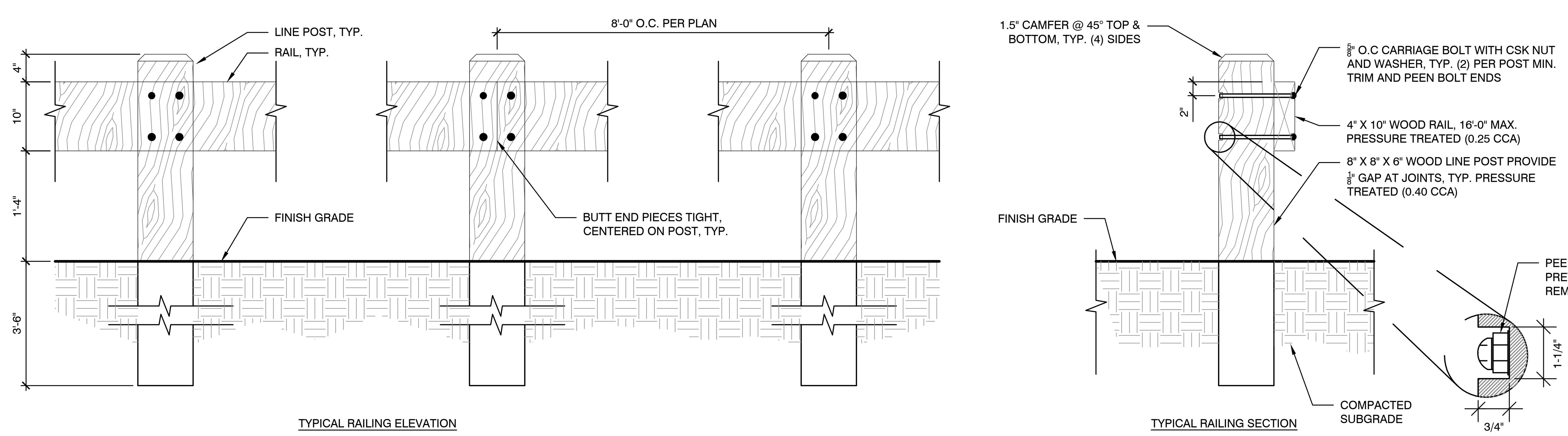
4 COMPACTED DENSE GRADE PAVEMENT
SCALE: NTS



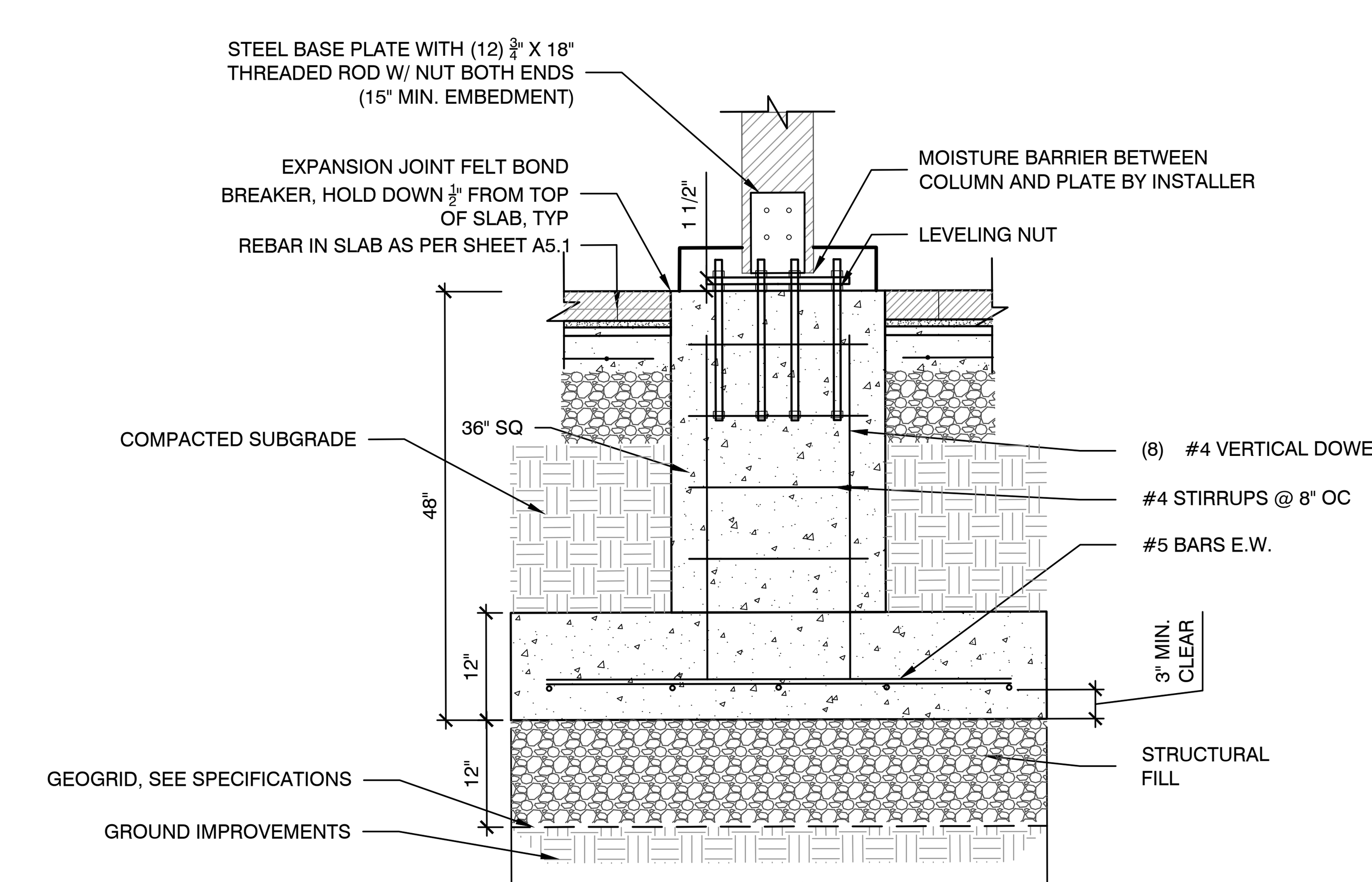
5 PRE-CAST CONCRETE PAVERS - TYPE 1
SCALE: NTS



6 VERTICAL GRANITE CURB
SCALE: NTS



7 WOOD GUARDRAIL
SCALE: NTS



8 POST FOOTING FOR SHADE STRUCTURE
SCALE: NTS

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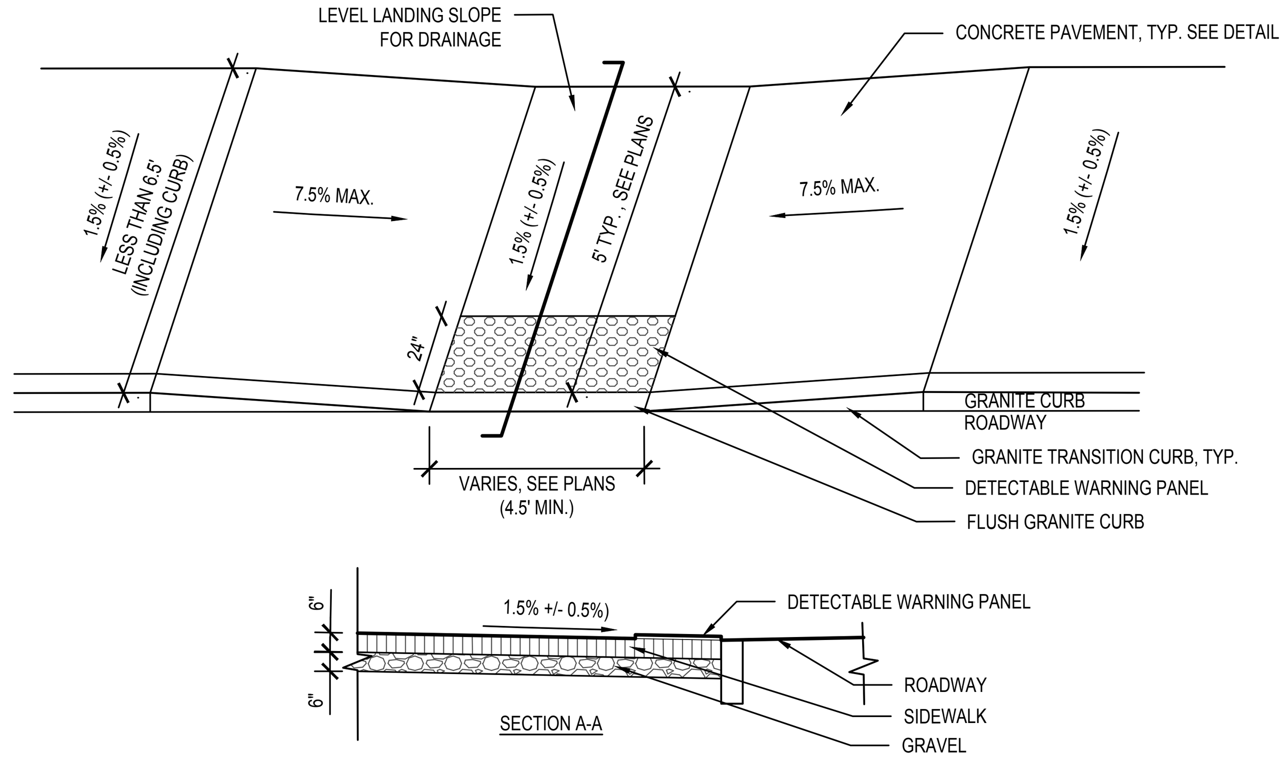
APPROVED BY::
DATE:: 01/23/23

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

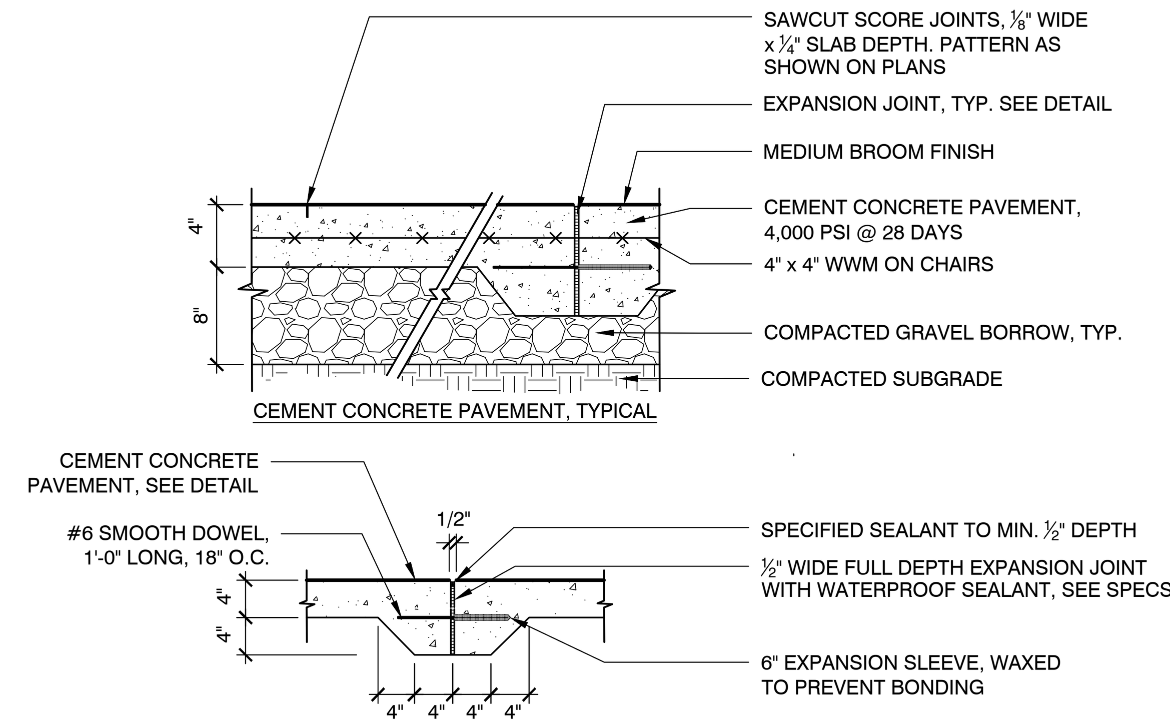
SHEET TITLE::
CONSTRUCTION DETAILS
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET::
L501
SKATE PARK



NOTES:
1. CONTRACTOR SHALL REMOVE AND REPLACE ASPHALT PAVEMENT, GRAVEL BORROW, AND SUBGRADE NECESSARY TO CONSTRUCT A CLEAN, SMOOTH TRANSITION AT ADA CURB CUT.

1 ADA CURB RAMP
SCALE: NTS

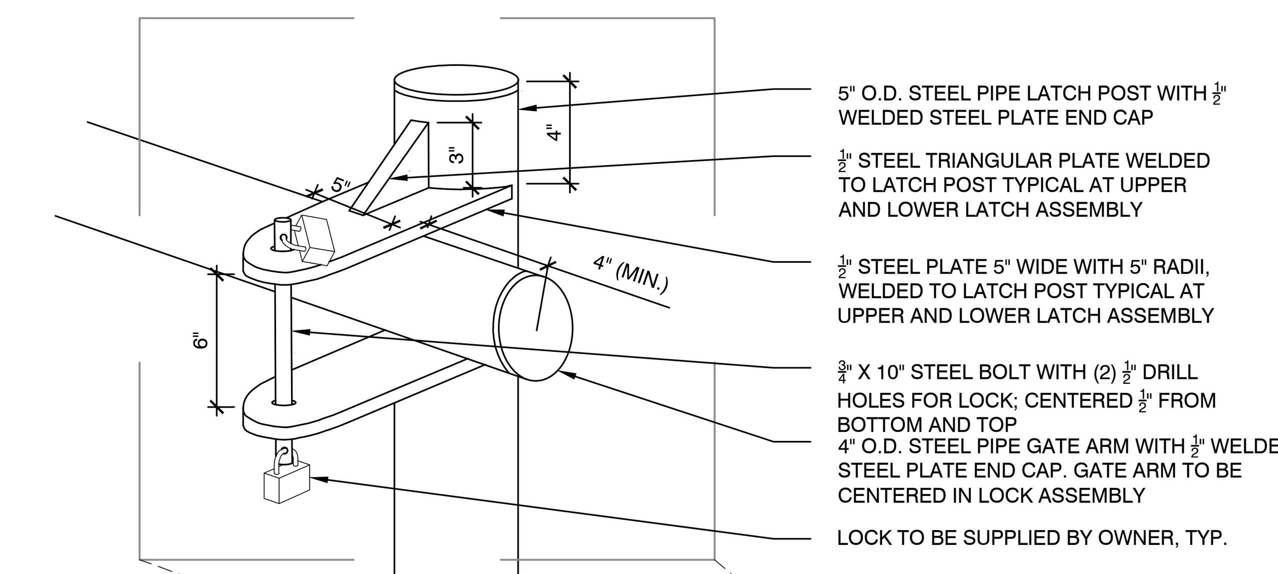


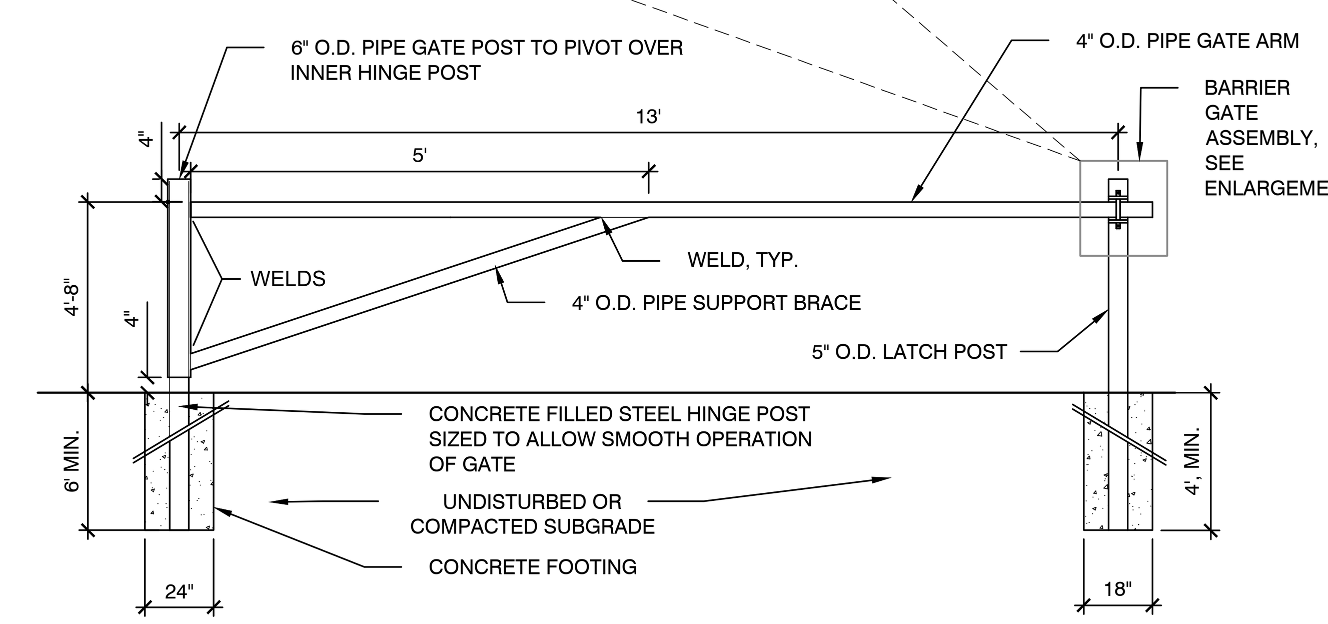
EXPANSION JOINT INSTALLATION NOTES:

1. DOWEL IS TYPICAL AT ALL EXPANSION JOINTS (18" O.C.) WITHIN CONCRETE PAVING AND BETWEEN NEW CONCRETE PAVING AND EXISTING CONCRETE PAVING TO REMAIN.
2. DELETE EXPANSION SLEEVE AND DOWEL WHERE JOINT ABUTS WALL, CURBS, OR OTHER VERTICAL SURFACES, UNLESS OTHERWISE NOTED.
3. EXPANSION JOINTS MAX. 25'-0" O.C. UNLESS SHOWN OTHERWISE.
4. EXPANSIONS JOINTS SHALL BE PLACED WHERE NEW CEMENT CONCRETE PAVEMENT MEETS EXISTING PAVEMENT OR WALLS TO REMAIN.

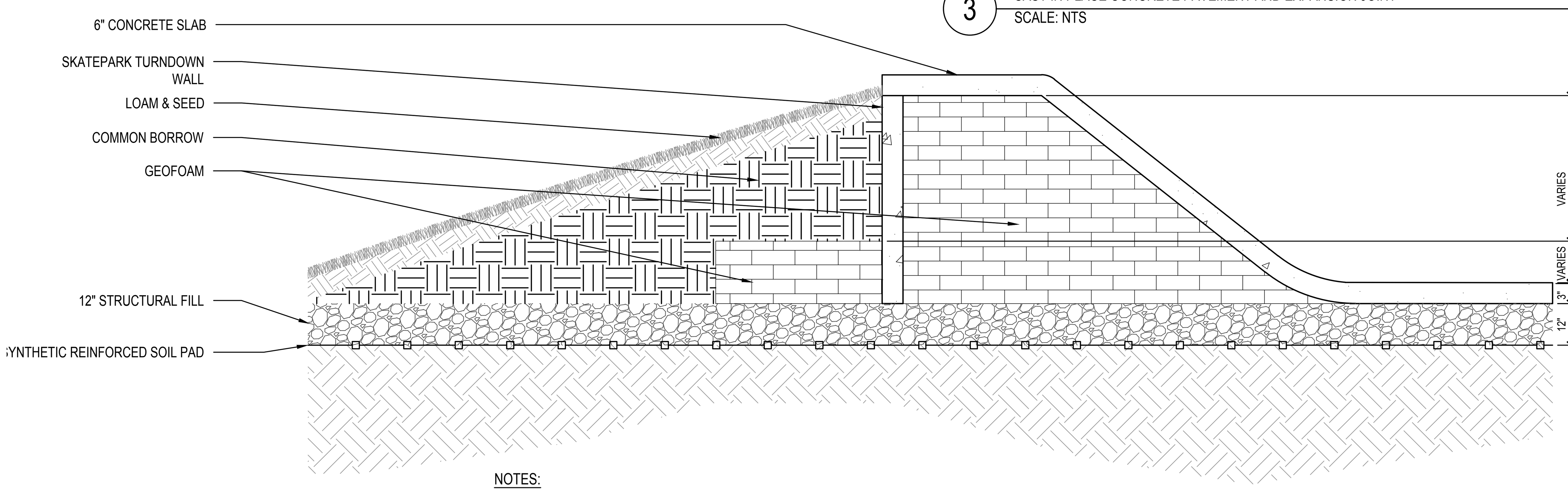
EXPANSION JOINT, TYPICAL

3 CAST IN PLACE CONCRETE PAVEMENT AND EXPANSION JOINT
SCALE: NTS



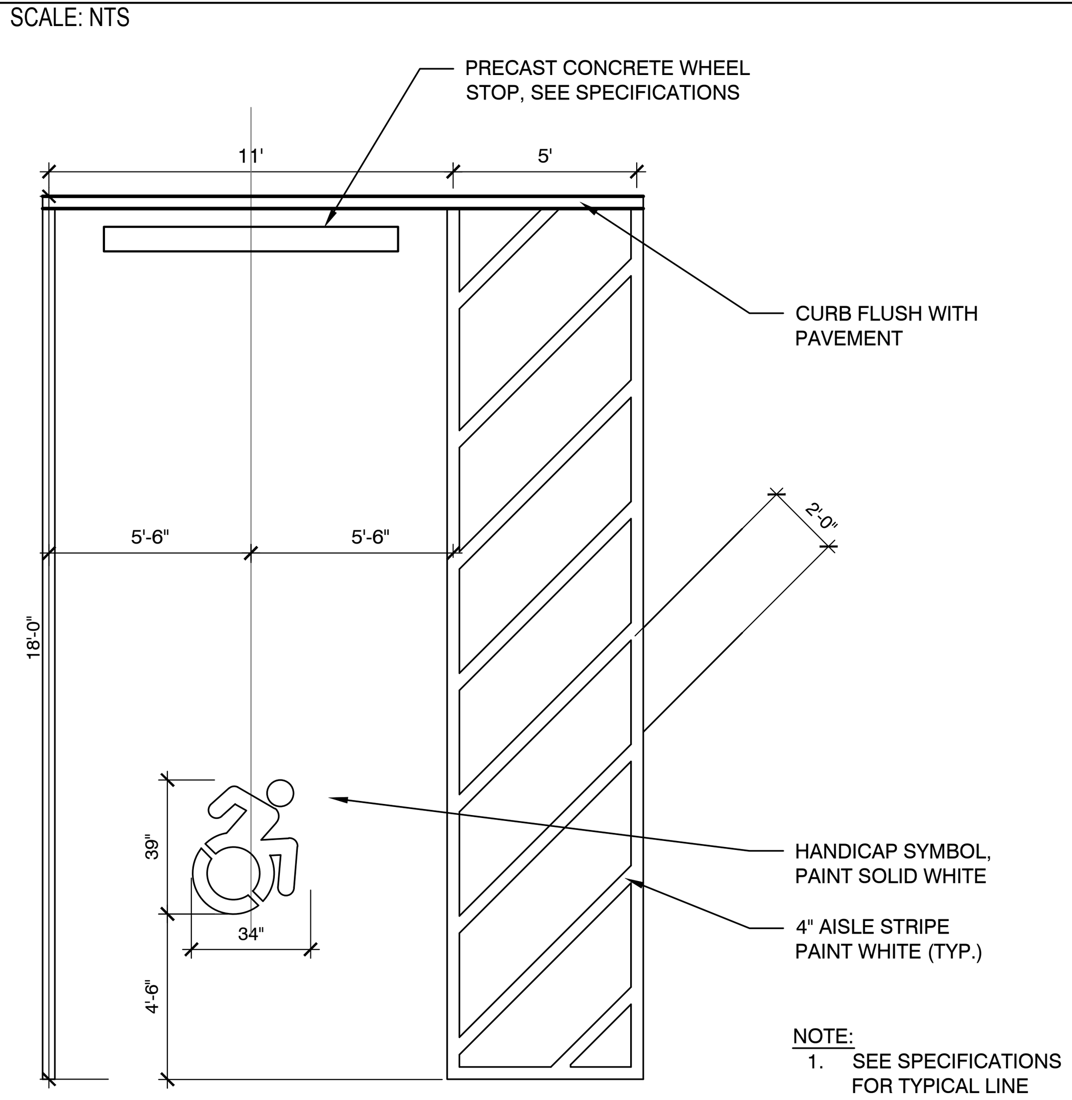


NOTES:
1. SEE SPECIFICATIONS. CONTRACTOR TO PROVIDE COMPLETE SHOP DRAWINGS PRIOR TO FABRICATION.
2. ALL STEEL PIPE SHALL BE SCHEDULE 40.
3. ALL STEEL SHALL BE FABRICATED WITH WELDS GROUND SMOOTH, AND EACH COMPONENT HOT-DIPPED GALVANIZED.
4. PROVIDE TWO LATCH POST, ONE IN OPEN POSITION, AND ONE IN CLOSED POSITION.



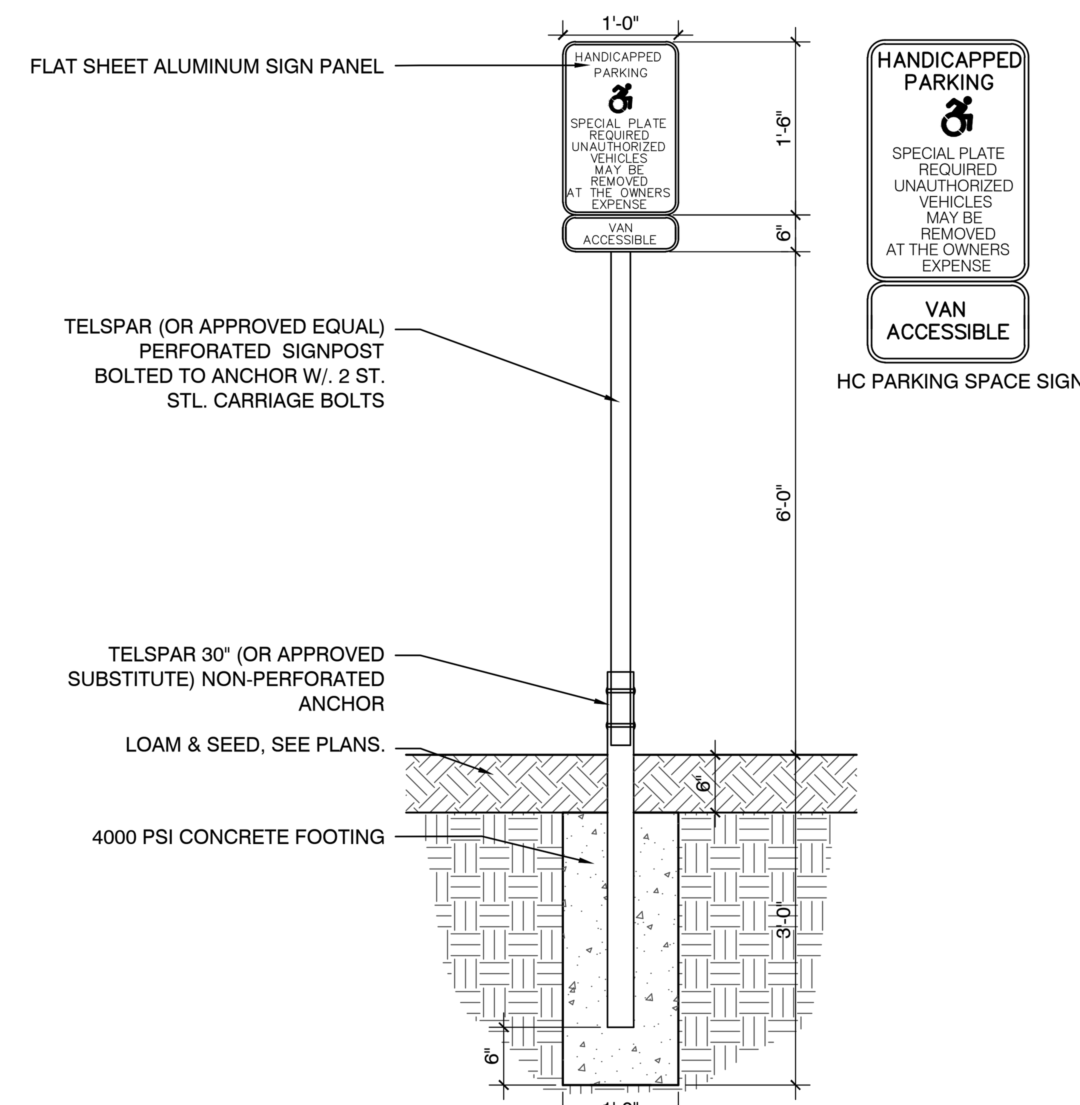
NOTES:
1. THE GEOSYNTHETIC REINFORCED SOIL PAD SHALL EXTEND TO THE LIMITS SHOWN ON DWG L141.
2. GEOGRID SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 31 23 00.
3. SUBGRADE SHALL BE OBSERVED BY GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF GEOGRID PER SPECIFICATION SECTION 31 23 00.

2 GEOSYNTHETIC REINFORCED SOIL PAD DETAIL
SCALE: NTS

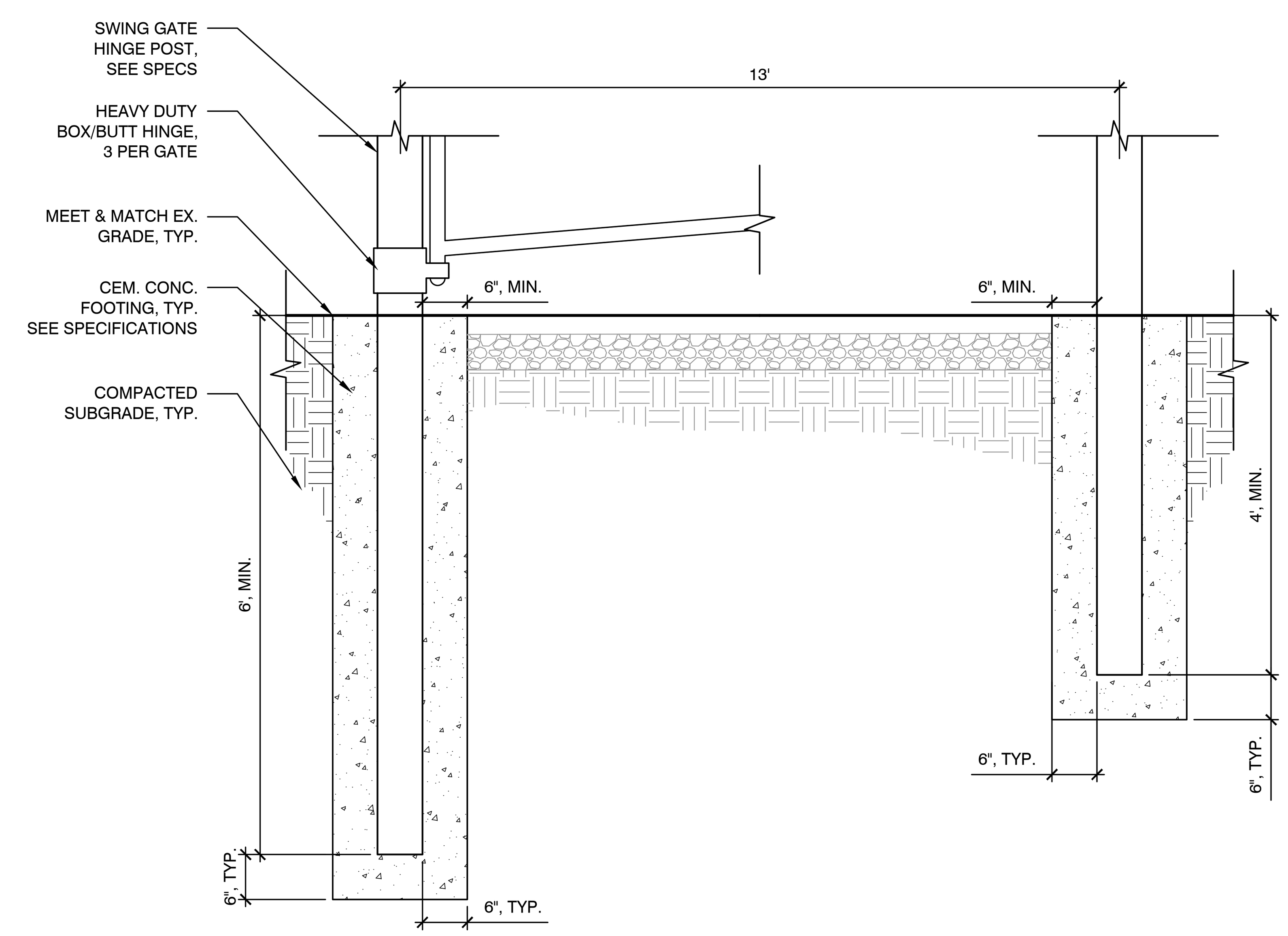


NOTE:
1. SEE SPECIFICATIONS FOR TYPICAL LINE PAINT FOR ALL PAVEMENT MARKINGS.

4 HANDICAP PARKING SPACE LAYOUT DETAIL
SCALE: NTS



5 HANDICAP PARKING SIGN
SCALE: NTS



6 PIPE GATE FOOTING
SCALE: NTS

NOTE:
1.) PROVIDE EXPANDED POLYSTYRENE FILL ("GEOFOAM") TO THE LINES AND GRADES SHOWN HEREIN AND AS SPECIFIED IN SECTION 31 23 23 - EXPANDED POLYSTYRENE FILL (GEOFOAM).

2.) GEOFOAM SHALL MEET THE MINIMUM REQUIREMENTS FOR EPS15 GEOFOAM BLOCKS

3.) EPS BLOCKS SHALL BE PLACED SO THAT ALL VERTICAL AND HORIZONTAL JOINTS BETWEEN BLOCKS ARE TIGHT. AVOID CONTINUOUS VERTICAL JOINTS BY LAYING BLOCKS IN A RUNNING BOND PATTERN AND ORIENTING THE LONG AXIS OF THE BLOCKS IN EACH SUCCESSIVE LAYER PERPENDICULAR TO THE LONG AXIS OF THE BLOCKS IN THE UNDERLYING LAYER.

4.) THREE FEET HIGH GEOFOAM BLOCK SHALL BE PLACED WITHIN ALL THE 3:1 GRASSED SLOPES ON OUTSIDE EDGES OF SKATEPARK TURNDOWN WALL.

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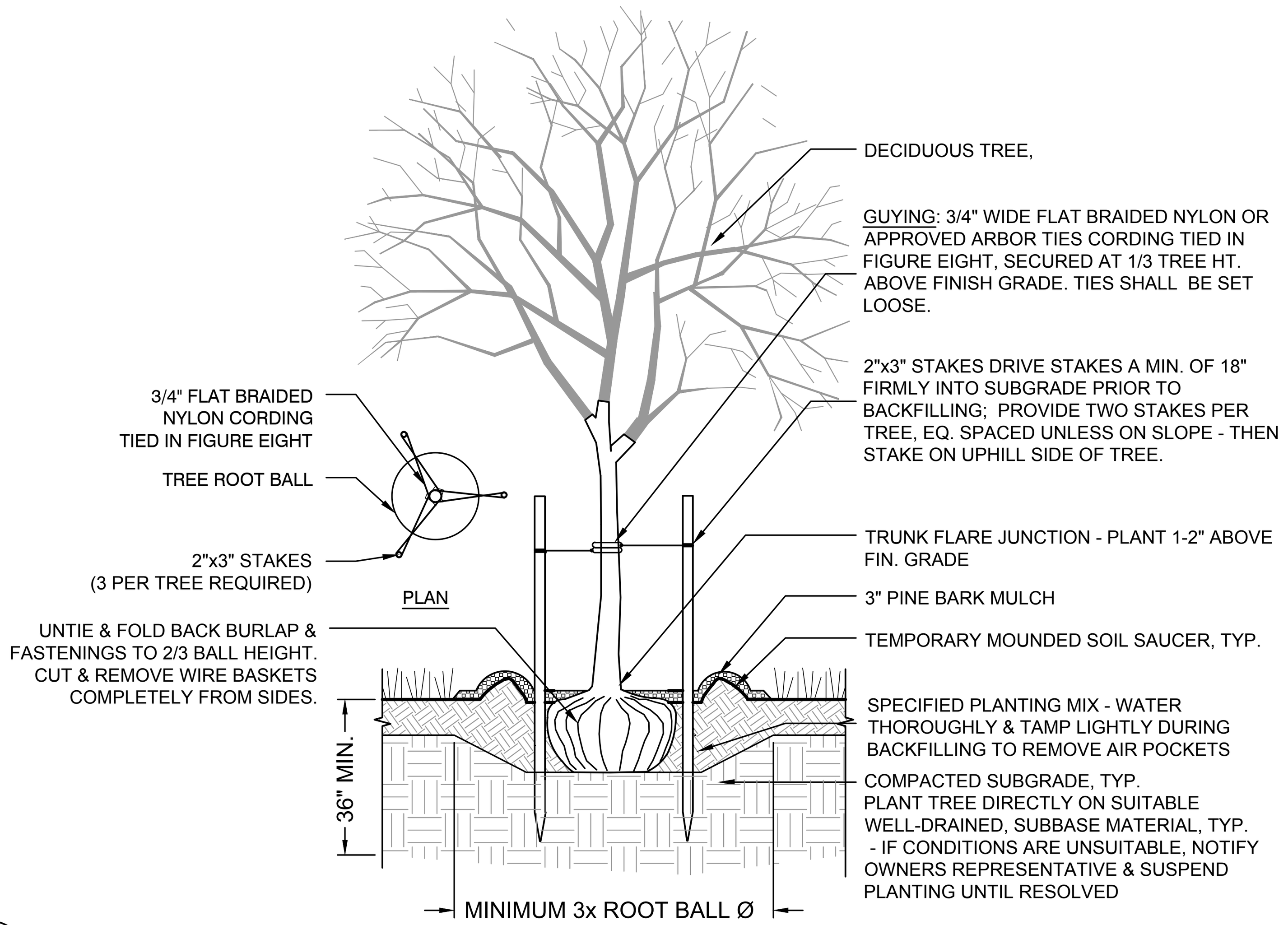
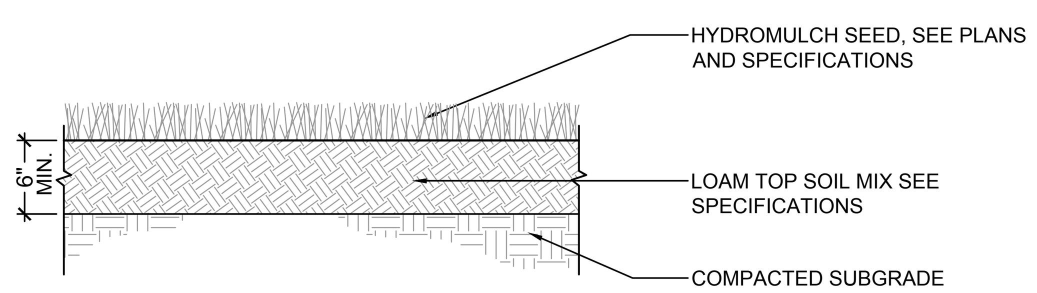
REVIEWED BY:: BK
APPROVED BY::
DATE:: 01/23/23

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
CONSTRUCTION DETAILS
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET::
L502
SKATE PARK



1 TREE PLANTING - NOT IN CONTRACT
SCALE: NTS



2 LOAM AND SEED
SCALE: NTS

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PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
CONSTRUCTION DETAILS
SITE PLAN APPLICATION - NOT FOR CONSTRUCTION

SHEET::
L503
SKATE PARK

PORTSMOUTH SKATEPARK

PORTSMOUTH, NEW HAMPSHIRE

90% SUBMITTAL

GENERAL NOTES

1. NOTIFY THE ACTION SPORTS DESIGNER IMMEDIATELY OF ANY DISCREPANCIES WITHIN TEH CONSTYRUCTION DOCUMENTS AND/OR WRITTEN SPECIFICATIONS.

2. THE METRIC EQUIVALENT "[ ]" DIMENSIONS ARE SHOWN FOR REFERNCE ONLY.

3. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL QUANTITIES.

4. PERFORM ALL WORK IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND/OR NATIONAL BUILDING CODES AND REQUIREMENTS.

5. THE ACTIONS SPORTS DESIGNER SHALL HAVE NO CONTROL OR CHARGE OF, NOR BE RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, SAFETY PRECAUTIONS OR PROHRAMS IN CONNECTION WITH THE WORK, THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY PERSONS PERFORMING ANY OF THE WORK OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.

6. PROVIDE SPECIAL INSPECTION AS REQUIRED BY BUILDING CODES FOR THE FOLLOWING ITEMS:
   -TAKING OF TEST SPECIMENS OF ALL CONCRETE AND SHOTCRETE.

7. THE CONTRACTOR SHALL WARRANTY ALL OF THEIR WORK DURING CONSTRUCTION AND A MINIMUM OF ONE YEAR AFTER THE PROJECT IS COMPLETED.

8. CONCRETE MIXES SHALL BE DESIGNED BY A TESTING LABRATORY APPROVED BY THE ACTION SPORTS DESIGNER PRIOR TO USE.

STEEL SHAPES CHART

ROUND		SQUARE		RECTANGULAR	
NOMINAL	HSS	NOMINAL	HSS	NOMINAL	HSS
2"	2.375 x 0.1875 6.03cm x 4.76mm	2"x2"	2.00 x 2.00 x 0.1875 5.08cm x 5.08cm x 4.76mm	2"x6"	2.00 x 6.00 x 0.1875 5.08cm x 15.24cm x 4.76mm
2-1/2"	2.875 x 0.1875 7.30cm x 4.76mm	2-1/2"x2-1/2"	2.50 x 2.50 x 0.1875 7.30cm x 7.30cm x 4.76mm	2"x8"	2.00 x 8.00 x 0.1875 5.08cm x 20.32cm x 4.76mm
3"	3.50 x 0.1875 8.89cm x 4.76mm	3"x3"	3.00 x 3.00 x 0.1875 7.62cm x 7.62cm x 4.76mm	2-1/2"x4"	2.50 x 4.00 x 0.1875 6.35cm x 10.16cm x 4.76mm
3-1/2"	4.00 x 0.1875 10.16cm x 4.76mm	3-1/2"x3-1/2"	3.50 x 3.50 x 0.1875 8.89cm x 8.89cm x 4.76mm	2-1/2"x5"	2.50 x 5.00 x 0.1875 6.35cm x 12.70cm x 4.76mm
4"	4.50 x 0.1875 11.43cm x 4.76mm	4"x4"	4.00 x 4.00 x 0.1875 10.16cm x 10.16cm x 4.76mm	3"x5"	3.00 x 5.00 x 0.1875 7.62cm x 12.70cm x 4.76mm

NOTES:

1. ALL HOLLOW STRUCTURAL SECTIONS (HSS) TO BE ASTM A-500 GRADE B STEEL.

REBAR DEVELOPMENT LENGTHS

NORMAL WEIGHT CONCRETE							
REBAR SIZE		3000 P.S.I.			4000 P.S.I.		
ENGLISH	METRIC	TOP BARS ld	BOT. BARS ld	ldh	TOP BARS ld	BOT. BARS ld	ldh
#3	#10	21" [53.34cm]	16" [40.64cm]	8" [20.32cm]	18" [45.72cm]	14" [35.56cm]	7" [17.78cm]
#4	#13	28" [71.12cm]	22" [55.88cm]	11" [27.94cm]	25" [63.50cm]	19" [48.26cm]	9" [22.86cm]
#5	#16	36" [91.44cm]	27" [68.58cm]	14" [35.56cm]	31" [78.74cm]	24" [60.96cm]	12" [30.48cm]
#6	#19	43" [109.22cm]	33" [83.82cm]	16" [40.64cm]	37" [93.98cm]	28" [71.12cm]	14" [35.56cm]
#7	#22	62" [157.48cm]	48" [121.92cm]	19" [48.26cm]	54" [137.16cm]	42" [106.68cm]	17" [43.18cm]
#8	#25	71" [180.34cm]	55" [139.70cm]	22" [55.88cm]	62" [157.48cm]	47" [119.38cm]	19" [48.26cm]
#9	#29	80" [203.20cm]	62" [157.48cm]	25" [63.50cm]	69" [175.26cm]	53" [134.62cm]	21" [53.34cm]
#10	#32	89" [226.06cm]	68" [172.72cm]	27" [68.58cm]	77" [195.58cm]	59" [149.86cm]	24" [60.96cm]
#11	#36	98" [248.92cm]	75" [190.50cm]	30" [76.20cm]	85" [215.90cm]	65" [165.10cm]	26" [66.04cm]

NOTES:

1. THESE LENGTHS APPLY TYPICALLY UNLESS OTHERWISE NOTED.
2. CLEAR SPACING BETWEEN PARALLEL BARS MUST BE AT LEAST ONE BAR DIAMETER BUT NOT LESS THAN 1" [2.54cm].
3. TOP BARS: HORIZONTAL BARS SO PLACED THAT MORE THAN 12" [30.48cm] OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW.
4. LIGHTWEIGHT CONCRETE: MULTIPLY VALUES IN TABLE BY 1.3.
5. CLASS B SPLICE: LD X 1.3 LAP LENGTH. STAGGER SPLICES MIN. OF 24" [60.96cm].

CONSTRUCTION DISCLAIMER

ALL MEASUREMENTS, DISTANCES AND RADII TO BE VERIFIED IN THE FIELD.

STRUCTURAL NOTES

REINFORCING STEEL:

1. REINFORCING STEEL SHALL CONFORM TO ASTM A615 (Fy = 60 KSI) DEFORMED BARS FOR ALL BARS #3 AND LARGER. ALL REINFORCING TO BE WELDED SHALL BE ASTM A706. WELDED WIRE FABRIC PER ASTM A185, WIRE PER ASTM A82. LATEST ACI CODE AND DETAILING MANUAL APPLY.

2. ACCURATELY PLACE OR SUPPORT ALL REINFORCING, INCLUDING WELDED WIRE FABRIC, WITH GALVANIZED METAL CHAIRS, SPACERS OR HANGERS FOR THE FOLLOWING CLEAR CONCRETE COVERAGES:
   CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ------- 3"
   EXPOSED TO EARTH OR WEATHER
   #6 OR LARGER ----------------------------------- 2"
   #5 AND SMALLER -------------------------------- 1 1/2"
   COLUMNS (TO TIES) ---------------------------------- 1 1/2"
   BEAMS (TO STIRRUPS) -------------------------------- 1 1/2"
   FLAT SLAB -- 3/4"
   ALL OTHER PER LATEST EDITION OF ACI 318.

3. REINFORCING BAR SPACING GIVEN ARE MAXIMUM ON CENTERS. ALL BARS PER CRSI SPECIFICATIONS AND HANDBOOK. DOWEL ALL VERTICAL REINFORCING TO FOUNDATION WITH STANDARD 90 DEGREE HOOKS UNLESS NOTED OTHERWISE. SKEW HOOKS AS REQUIRED TO MAINTAIN CONCRETE COVER. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. CONCRETE COLUMN DOWEL EMBEDMENT SHALL BE A STANDARD COMPRESSION DOWEL WITH EMBEDMENT LENGTH ACCORDING TO THE LATEST EDITION OF THE ACI 318.

STRUCTURAL STEEL:

1. ALL STEEL CONSTRUCTION SHALL CONFORM WITH THE LATEST AISC HANDBOOK. ALL RECTANGULAR TS/HSS SHALL BE ASTM A500, GRADE B (Fy = 46 KSI). ALL PIPE STEEL SHALL BE ASTM A53, GRADE B (Fy = 35 KSI). ALL OTHER STRUCTURAL SHAPES AND PLATES SHALL BE ASTM A36 (Fy = 36 KSI). PAINT ALL STEEL SURFACES WITH FABRICATOR'S STANDARD RUST-INHIBITING PRIMER EXCEPT AT SURFACES ENCASED IN CONCRETE.

2. ALL WELDING PER LATEST AMERICAN WELDING SOCIETY STANDARDS, (EXCEPT STEEL JOISTS AND JOIST GIRDERS SHALL COMPLY WITH SJI STANDARDS). ALL WELDING DONE BY E70 SERIES LOW HYDROGEN RODS UNLESS NOTED OTHERWISE. FOR GRADE 60 REINFORCING BARS, USE E90 SERIES. THESE DRAWINGS DO NOT DISTINGUISH BETWEEN SHOP AND FIELD WELDS; THE CONTRACTOR MAY SHOP WELD OR FIELD WELD AT HIS DISCRETION.

3. NON-SHRINK GROUT SHALL BE 5,000 PSI, FIVE STAR, SIKA 212 OR EQUIVALENT. INSTALL NON-SHRINK GROUT UNDER BEARING PLATES BEFORE FRAMING MEMBER IS INSTALLED.

POST-INSTALLED ANCHORS:

1. EPOXY BOLTS OR DOWELS SHALL BE A THREADED ROD OR REINFORCING STEEL INSTALLED WITH THE ONE OF THE FOLLOWING APPROVED PRODUCTS SATISFYING CRACKED CONCRETE REQUIREMENTS IN ACCORDANCE WITH ACI APPENDIX D.

   SIMPSON "SET-XP" ICC REPORT ESR-2508
   HILTI "RE-500 SD" ICC REPORT ESR-2322
   POWERS "PE1000+" ICC REPORT ESR-2583

2. THE CONTRACTOR MAY NOT USE SUBSTITUTES FOR EPOXY OR EXPANSION ANCHORS WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.

3. FOR MINIMUM EMBEDMENT LENGTH SEE DETAILS. INSTALL ALL BOLTS AS OUTLINED IN MANUFACTURER'S SPECIFICATIONS, UTILIZING PROPER SIZE AND TYPE OF DRILL, CLEANING HOLE, DRIVING AND TIGHTENING BOLT.

CONSTRUCTION DETAIL NOTES

1. "BASE COURSE" SHALL CONSIST OF A 4" [10.16cm] LAYER OF COMPACTED 1" [2.54cm] CRUSHED ROCK; "COMPACTED SUBGRADE" SHALL CONSIST OF THE UPPER MOST 1'-0" [30.48cm] OF NATIVE SOIL AND/OR ENGINEERED FILL COMPACTED TO 95% STANDARD PROCTOR. IF THESE GUIDELINES CONFLICT WITH THE GEO-TECHNICAL REPORT, THE CONTRACTOR TO FOLLOW THE MORE STRINGENT OF THE TWO GUIDELINES
2. GRIND SMOOTH ALL EXPOSED COPING AND RAIL WELDS. APPLY END CAPS TO ALL EXPOSED COPING AND RAIL ENDS, OPEN STEEL ENDS OR CONCRETE FILLED CAPS ARE UNACCEPTABLE.
3. HOOK ANCHORS OR HEX BOLTS MAY BE USED IN-LIEU OF NELSON STUDS TO SECURE COPING AND PROTECTIVE PLATES IN PLACE PROVIDED THEY ARE THE SAME NOMINAL SIZE.
4. ALL RAIL POSTS SHALL BE PLACED 3" [7.62cm] MINIMUM CLEAR OF ALL CONCRETE AND/OR SHOTCRETE FACES.
5. SOME REINFORCEMENT MEMBERS MAY BE SHOWN OUT OF SCALE AND/OR POSITION FOR CLARITY ONLY. AT A MINIMUM ALL REINFORCEMENT SHALL BE PLACED CLEAR OF ALL CONCRETE AND/OR SHOTCRETE FACES AS NOTED BELOW:
   - WELDED WIRE FABRIC: 2" [5.08cm]
   - SPEED DOWELS: 3" [7.62cm]
   - REBAR IN FLATWORK, BANKS, BOWLS, WATERFALLS AND TURNDOWN WALLS: 2" [5.08cm] OR 3" [7.62cm] IF PERMANENTLY EXPOSED TO EARTH
   - REBAR IN FORMED LEDGES, EXTENSIONS AND RETAINING WALLS: 3" [7.62cm]
6. ALL SHOTCRETE SHALL BE CUT, SCREEDED AND INSPECTED WITH TEMPLATES CUT TO THE SPECIFIED HEIGHT, WIDTH, RADIUS AND/OR ANGLE. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH DIMENSIONS, MATERIAL AND LOCATION OF USED FOR ALL TEMPLATES FOR APPROVAL BY THE OWNER'S REPRESENTATIVE AND THE ACTION SPORTS DESIGNER.
7. ALL CONCRETE AND SHOTCRETE SHALL HAVE A SMOOTH TROWEL FINISH UNLESS OTHERWISE NOTED.
8. ALL EXPOSED OUTSIDE CONCRETE CORNERS SHALL RECEIVE A 1/2" [12.70mm] CHAMFER UNLESS OTHERWISE NOTED.
9. THE FENCE SHALL MATCH THE PROFILE AND CONTOUR OF THE PARK PERIMETER. RAILS SHALL BE ROLLED TO MATCH RADII. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING ALL FENCE PROFILES.
10. CAP ALL EXPOSED ENDS, FILL ALL VOIDS AND GRIND ALL WELDS SMOOTH.
11. ALL FENCE METAL WORK SHALL BE WARRANTED BY THE CONTRACTOR AGAINST DEFECTS, RUST, PAINT CHIPPING, ETC. FOR A PERIOD OF FIVE YEARS.

STRUCTURAL NOTES

1. DESIGN CRITERIA
   DESIGN CRITERIA:

   2015 EDITION OF THE INTERNATIONAL BUILDING CODE, WITH LOCAL AMENDMENTS.

   LOADS:

   WIND DESIGN: BASIC WIND SPEED = 90 MPH (3 SECOND GUST). Iw = 1.0. EXPOSURE C.

   SEISMIC DESIGN: Ie = 1.0. Ss = 0.172 S1 = 0.051 SEISMIC SITE CLASS = D.
   Sds = 0.183 SD1 = 0.081 SEISMIC DESIGN CATEGORY B.

GENERAL:

1. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA.

2. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT. FOR BIDDING PURPOSES, WHERE ANY MEMBER IS SHOWN BUT NOT CALLED OUT, THE LARGEST SIMILAR MEMBER SHALL BE UTILIZED.

3. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER REQUIREMENTS SHALL GOVERN.

4. ANY ENGINEERING DESIGN, PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF AN ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT OCCURS.

CONCRETE AND SHOTCRETE:

1. ALL CONCRETE WORK SHALL CONFORM WITH THE REQUIREMENTS OF ACI 301 AND ACI 318. CEMENT PER ASTM C150, TYPE II. AGGREGATE PER ASTM C33. LIGHTWEIGHT AGGREGATE PER ASTM C330. CONCRETE SHALL BE READY MIXED IN ACCORDANCE WITH ASTM C94 AND SHALL BE DESIGNED FOR A MINIMUM 28 DAY COMPRESSIVE STRENGTH AS FOLLOWS:

   FLAT SLABS, WALLS ------------------------------------4,000 PSI
   SLABS ON GRADE ---------------------------------------4,000 PSI
   FOUNDATIONS ---4,000 PSI

2. ALL SHOTCRETE WORK SHALL CONFORM WITH THE REQUIREMENTS OF ACI 506, LATEST EDITION, "SPECIFICATION FOR MATERIALS, PROPORTIONING AND APPLICATION OF SHOTCRETE" AND ACI 506.2, LATEST EDITION, "RECOMMENDED PRACTICES FOR SHOTCRETE." AGGREGATE PER ASTM C33.

3. SHOTCRETE MIX DESIGNS SHALL BE DESIGNED FOR A MINIMUM 28 DAY COMPRESSIVE STRENGTH AS FOLLOWS:

   FLAT SLABS, WALLS ------------------------------------4,000 PSI
   SLABS ON GRADE ---------------------------------------4,000 PSI

4. SHOTCRETE SURFACE PREPARATION: EXPOSED EXISTING CONCRETE SHALL BE SANDBLASTED CLEAN. SURFACES SHALL BE FOLLOWED BY WETTING AND DAMP DRYING JUST PRIOR TO SHOTCRETE APPLICATION.

5. ANY REBOUND OR ACCUMULATED LOOSE AGGREGATE SHALL BE REMOVED FROM THE SURFACES TO BE COVERED PRIOR TO PLACING THE INITIAL OR ANY SUCCEEDING LAYERS OF SHOTCRETE, REBOUND SHALL NOT BE REUSED AS AGGREGATE.

6. JOINTS IN WALL POURS ARE PERMISSIBLE. AT JOINTS, SHOTCRETE SHALL BE SLOPED TO A THIN EDGE. BEFORE PLACING ADDITIONAL MATERIAL, ALL SURFACES SHALL BE THOROUGHLY CLEANED AND WETTED AND ALL REINFORCING STEEL SHALL BE BRUSHED FREE OF LATENT SHOTCRETE MATERIAL.

7. ANY IN-PLACE SHOTCRETE MATERIAL WHICH EXHIBITS SAGS OR SLOUGHS, SEGREGATION, HONEY COMBING, SAND POCKETS OF OTHER OBVIOUS DEFECTS SHALL BE REMOVED AND REPLACED.

8. TESTING AND INSPECTION OF IN-PLACE SHOTCRETE SHALL BE IN ACCORDANCE WITH 2015 IBC.

9. CONCRETE SHALL BE PLACED WITHIN 90 MINUTES OF BATCHING AND SHALL NOT EXCEED A TEMPERATURE OF 90 DEGREES F UNLESS PRE-APPROVED BY THE ACTION SPORTS DESIGNER.

10. DURING THE CURING PERIOD, CONCRETE SHALL BE MAINTAINED AT A TEMPERATURE ABOVE 40 DEGREES F AND IN MOIST CONDITION. FOR INITIAL CURING, CONCRETE SHALL BE KEPT CONTINUOUSLY MOIST FOR 24 HOURS AFTER PLACEMENT IS COMPLETE. FINAL CURING SHALL CONTINUE FOR SEVEN DAYS AFTER PLACEMENT AND SHALL CONSIST OF APPLICATION OF CURING COMPOUND PER ASTM C309. APPLY AT A RATE SUFFICIENT TO RETAIN MOISTURE, BUT NOT LESS THAN 1 GALLON PER 200 SQUARE FEET. COVER CONCRETE WITH POLYETHYLENE PLASTIC TO MAINTAIN TEMPERATURE IF NECESSARY. LAP SEAMS IN THE PLASTIC 6" AND TAPE, WEIGHT DOWN THE PLASTIC AS NEEDED.

11. THE CONTRACTOR SHALL FIX ALL CRACKS AND DISPLACEMENTS LARGER THAN 1/8".

12. CONDUITS, PIPES, AND SLEEVES EMBEDDED IN CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF IBC SECTION 1906.

13. TESTING OF COMPRESSIVE STRENGTH AND SLUMP PER ASTM C31, C39 AND C143. PROVIDE A MINIMUM OF 3 CYLINDERS FOR EACH DAY'S PLACEMENT U.N.O. A QUALIFIED TESTING LABORATORY SHALL TEST ONE CYLINDER AT 7 DAYS AND TWO AT 28 DAYS.

CONTACTS

CLIENT	CITY OF PORTSMOUTH PETER RICE, DIRECTOR OF PUBLIC WORKS 680 PEVERLY HILL RD PORTSMOUTH, NH 03801 [t] 603.4276.1530 [f] 603.427.1539
SKATEPARK DESIGNER	PILLAR DESIGN STUDIOS BRAD SIEDLECKI 1960 W. HAWK CT. CHANDLER, ARIZONA 85286 [t] 888.880.5112 [f] 888.841.2569
CIVIL	WESTON & SAMPSON BRANDON KUNKEL, RLA 85 DEVONSHIRE ST, 3RD FLOOR BOSTON, MA 02109 [t] 617.412.4480 X 7705
SPECIALTY CONTRACTOR	ARTISAN SKATEPARKS ANDY DUCK 4600 TAMARACK DRIVE KITTY HAWK, NORTH CAROLINA 27949 [t] 252.202.1333

SHEET INDEX

DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT:: PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: COVER SHEET

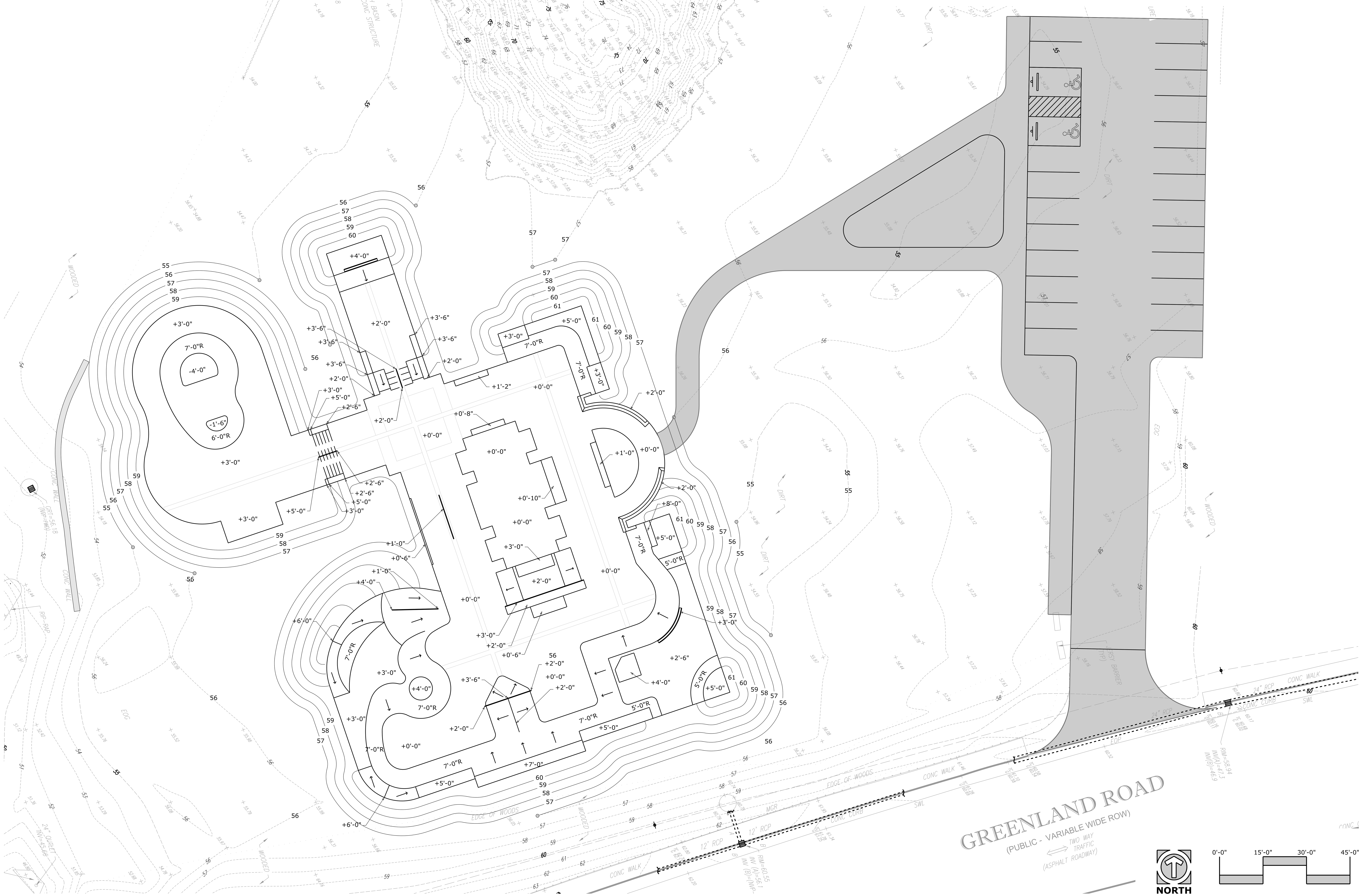
SHEET:: AS-01
01 OF 16
SKATE PARK

NOTES

1. ALL ELEVATIONS ARE BASED ON AN ASSUMED ELEVATION OF 0'-0", AND ARE USED TO DEMONSTRATE OVERALL TERRAIN ELEVATIONS ONLY. REFER TO SURFACE GRADING & DRAINAGE PLAN FOR ACTUAL ELEVATIONS.

LEGEND

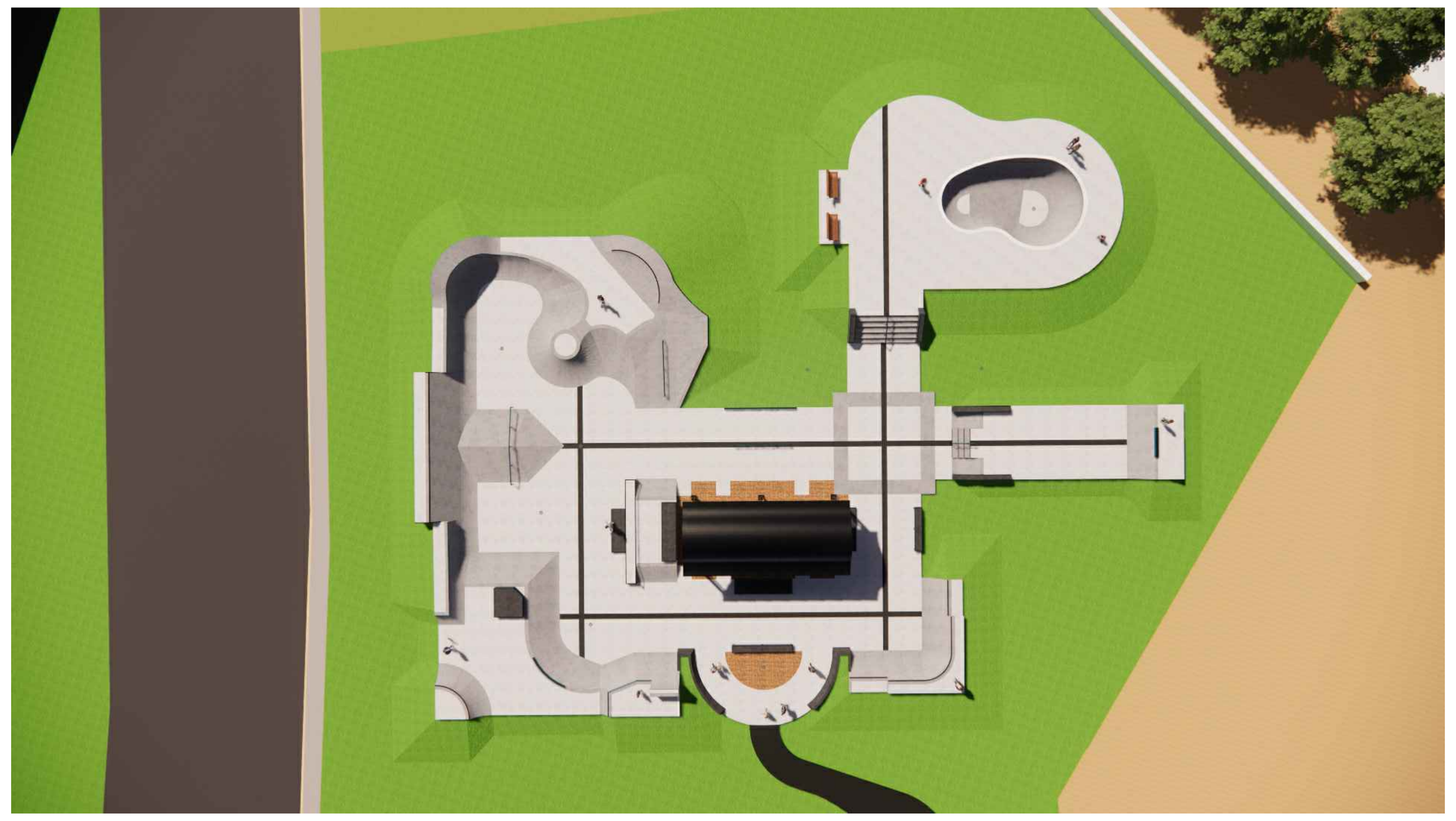
SYMBOL	DESCRIPTION	DETAIL(S)	QUANTITY
?'-?"R	RADIUS OF THE TRANSITION	AS-14 / 1	N/A
→	BANK	AS-14 / 2	N/A
———	FINISH GRADE CONTOUR	AS-06	N/A
	BY OTHERS - SEE SHEETS 0 - 0		

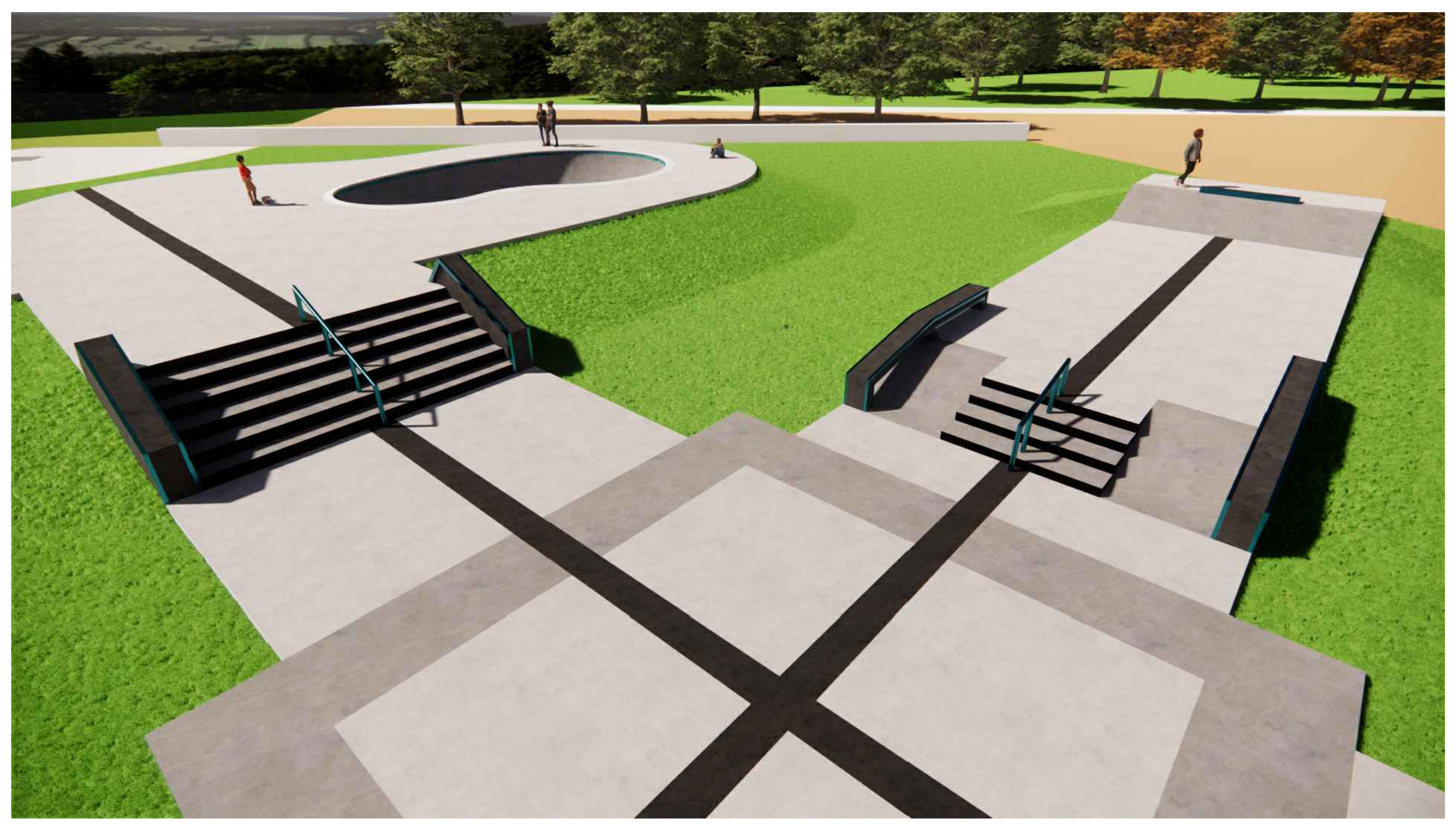


DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT:: **PORTSMOUTH SKATEPARK**
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: MASTER PLAN

SHEET:: **AS-02** 02 OF 16
SKATE PARK





◌3D GRAPHICS ARE FOR REFERENCE ONLY.

DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE::
3D IMAGES

SHEET:: 03 OF 16
AS-03
SKATE PARK

LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)
- - - - - - - - -	COLD JOINT (C.J.)	AS-12
⌖	DRAIN INLET	AS-08

NOTES

1. COORDINATE VALUES SHOWN ARE INTENDED FOR HORIZONTAL POSITIONING AND DIMENSION CLARIFICATION ONLY. ALL POINTS SET IN THE FIELD FROM THESE VALUES SHALL FIRST BE CHECKED BY THE CONTRACTOR TO ENSURE THAT THE LOCATION IS CONSISTENT WITH THE DIMENSIONS AND GRAPHIC LOCATIONS SHOWN WITHIN THE APPROVED CONSTRUCTION DOCUMENTS. IN THE CASE OF A DISCREPANCY WITH ANY COORDINATE VALUE SHOWN, THE CONTRACTOR SHALL BE RESPONSIBLE TO NOTIFY THE ACTION SPORTS DESIGNER PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITY THAT MAY BE AFFECTED.

2. UPON REQUEST PILLAR DESIGN STUDIOS WILL PROVIDE THE CONTRACTOR/ SURVEYOR WITH A DIGITAL FILE CONTAINING THE POINT INFORMATION FOR THIS PROJECT.

3. ALL COORDINATES SHOWN AT THE BOTTOM OF ALL BANKS/ TRANSITIONS ARE LOCATED AT THE COLD JOINT.

4. BECAUSE OF THE SCALE OF THIS DRAWING AND PROXIMITY OF FEATURES TO EACH OTHER, THE LOCATION OF SOME OF THE POINTS MAY BE OBSCURED. REFER TO THE POINT TABLE(S) FOR THE ACTUAL LOCATIONS FOR ALL POINTS.

PROGRESS SUBMITTAL

THIS PLAN IS INCOMPLETE AND SHALL BE FINALIZED FOR THE NEXT SUBMITTAL.

NORTH

0'-0" 10'-0" 20'-0" 30'-0"

SCALE: 1" = 10'-0"

DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
HORIZONTAL CONTROL PLAN

PROGRESS SUBMITTAL

THIS PLAN IS INCOMPLETE AND SHALL BE FINALIZED FOR THE NEXT SUBMITTAL.

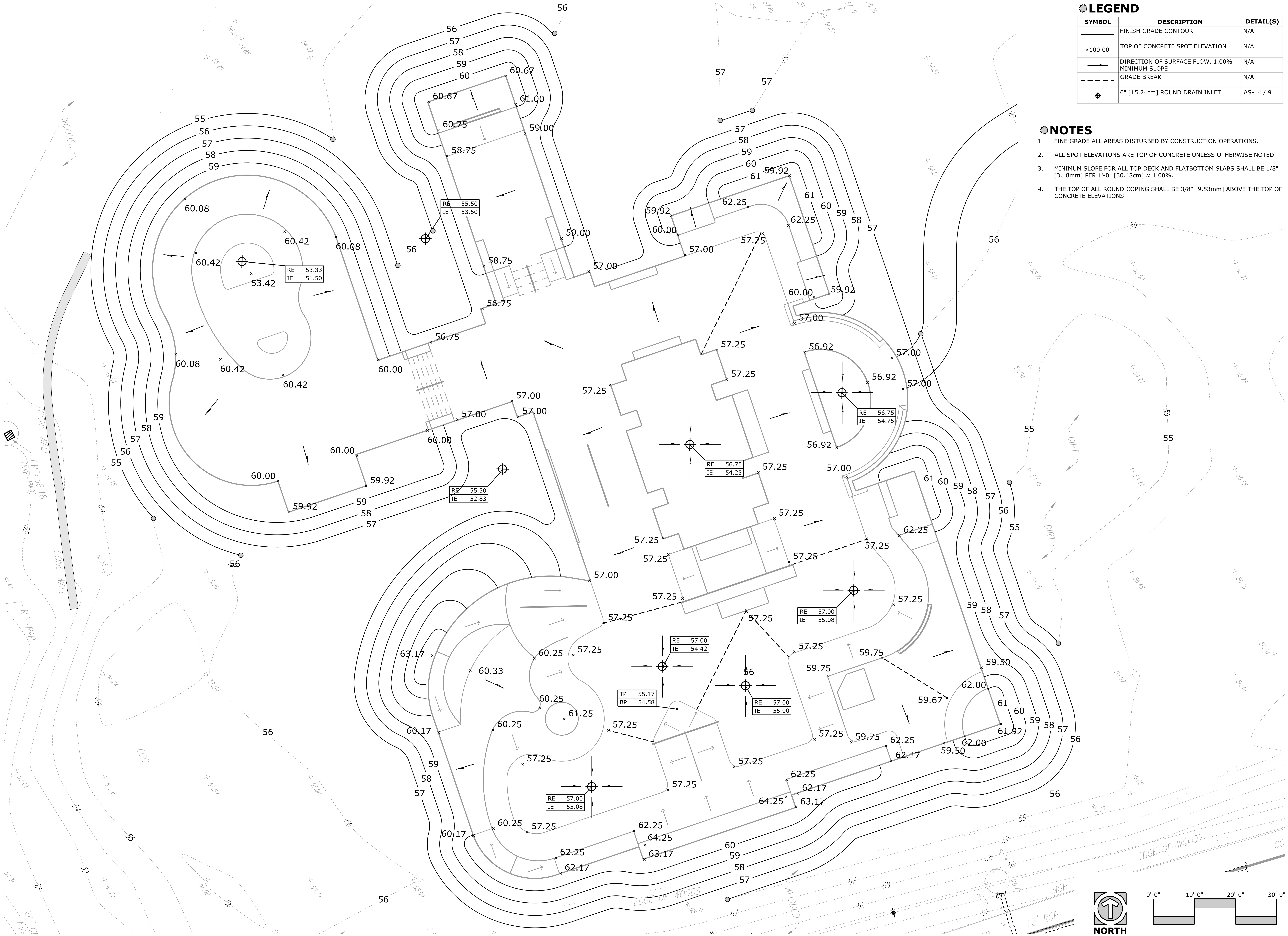
DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE::
HORIZONTAL CONTROL PLAN

SHEET::

AS-05
SKATE PARK



LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)
	FINISH GRADE CONTOUR	N/A
×100.00	TOP OF CONCRETE SPOT ELEVATION	N/A
	DIRECTION OF SURFACE FLOW, 1.00% MINIMUM SLOPE	N/A
	GRADE BREAK	N/A
	6" [15.24cm] ROUND DRAIN INLET	AS-14 / 9

NOTES

1. FINE GRADE ALL AREAS DISTURBED BY CONSTRUCTION OPERATIONS.
2. ALL SPOT ELEVATIONS ARE TOP OF CONCRETE UNLESS OTHERWISE NOTED.
3. MINIMUM SLOPE FOR ALL TOP DECK AND FLATBOTTOM SLABS SHALL BE 1/8" [3.18mm] PER 1'-0" [30.48cm] ≈ 1.00%.
4. THE TOP OF ALL ROUND COPING SHALL BE 3/8" [9.53mm] ABOVE THE TOP OF CONCRETE ELEVATIONS.

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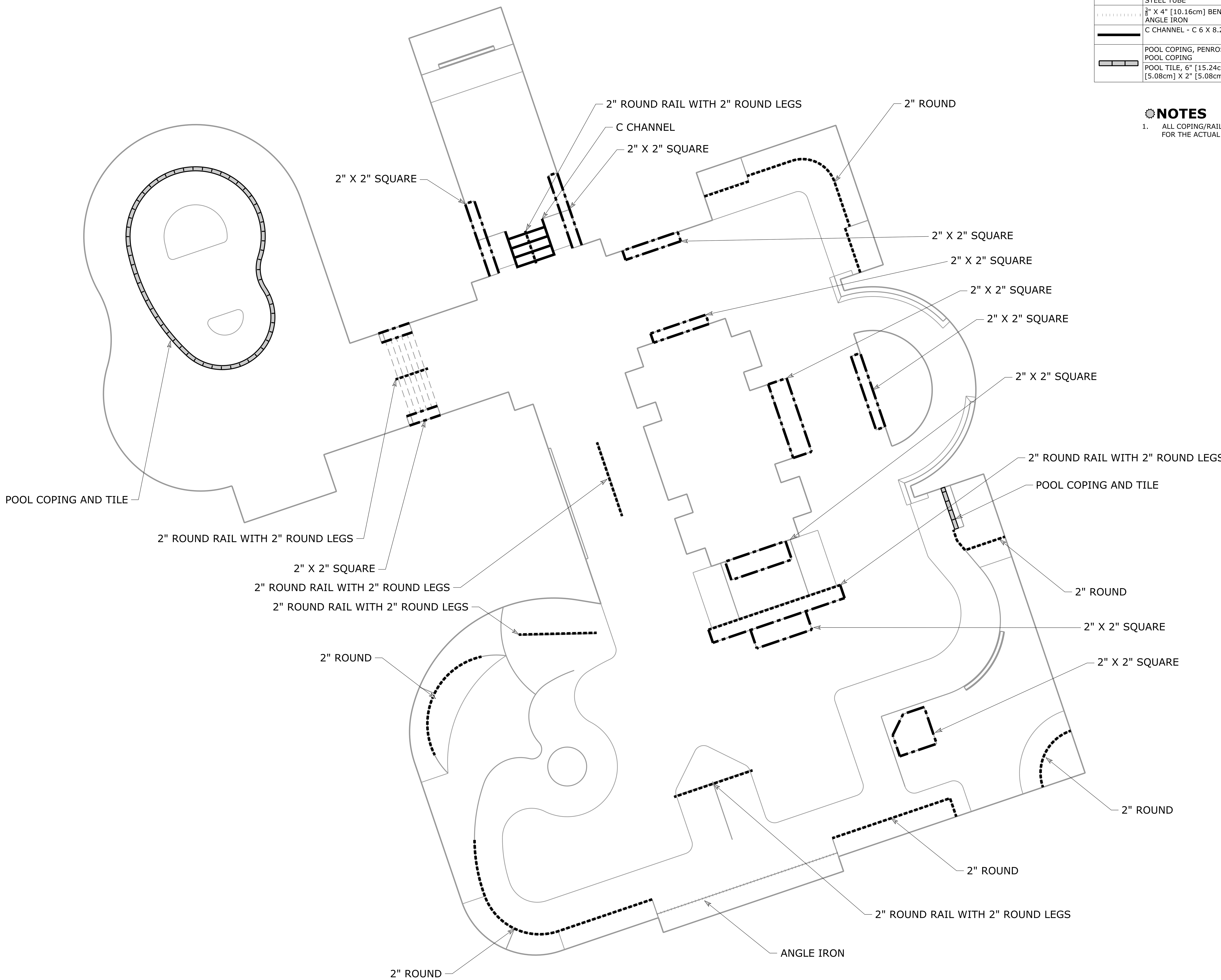
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE::
SURFACE GRADING & DRAINAGE PLAN

SHEET::
AS-06
06 OF 16

SKATE PARK

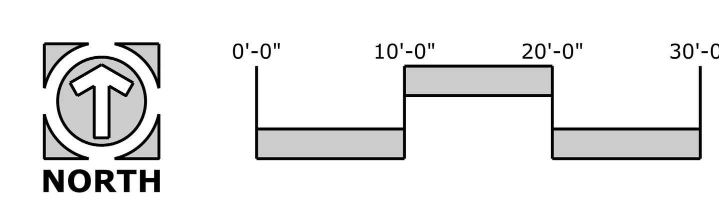


LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)	COLOR	FINISH
	2" [6.03cm] ROUND STEEL PIPE	AS-13 / 1	T.B.D.	PAINTED
	2" [5.08cm] X 2" [5.08cm] SQUARE STEEL TUBE	AS-13 / 3 & 4	T.B.D.	PAINTED
	$\frac{3}{8}$" X 4" [10.16cm] BENT STEEL PLATE - ANGLE IRON	AS-13 / 9	T.B.D.	PAINTED
	C CHANNEL - C 6 X 8.2	AS-15 / 4	T.B.D.	PAINTED
	POOL COPING, PENROSE BULLNOSE POOL COPING	AS-13 / 8	NATURAL GRAY	N/A
	POOL TILE, 6" [15.24cm] BAND OF 2" [5.08cm] X 2" [5.08cm] TILES	AS-13 / 8	T.B.D.	N/A

NOTES

1. ALL COPING/RAIL SIZES ARE NOMINAL, REFER TO THE STEEL SHAPES CHART FOR THE ACTUAL DIMENSIONS.

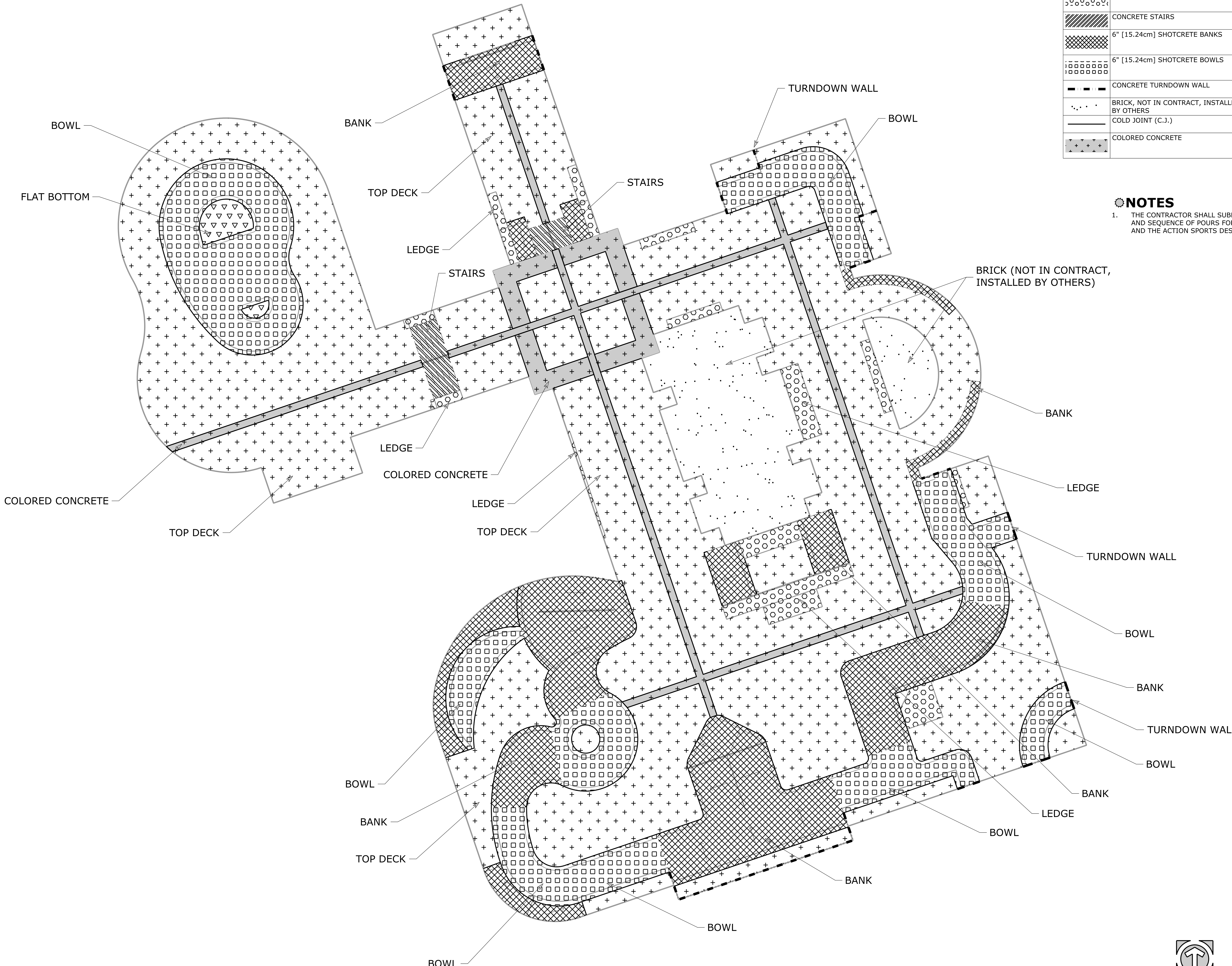


DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT:: **PORTSMOUTH SKATEPARK**
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: COPING PLAN

SHEET:: **AS-07**

SKATE PARK

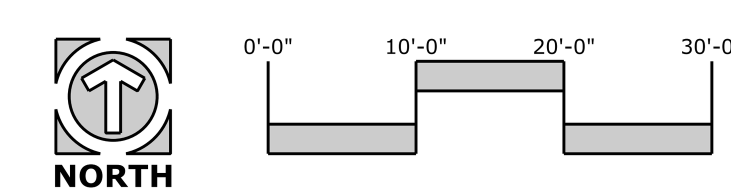


LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)	COLOR	FINISH
	4" [10.16cm] CONCRETE TOP DECK	AS-14 / 4	NATURAL GRAY	SMOOTH TROWEL
	6" [15.24cm] CONCRETE FLATBOTTOM	AS-14 / 5	NATURAL GRAY	SMOOTH TROWEL
	CONCRETE GRIND LEDGES	AS-15 / 2 & 3	DAVIS COLORS - GRAPHITE	SMOOTH TROWEL
	CONCRETE STAIRS	AS-14 / 7	NATURAL GRAY	LIGHT BROOM
	6" [15.24cm] SHOTCRETE BANKS	AS-14 / 2	DAVIS COLORS - DARK GRAY	SMOOTH TROWEL
	6" [15.24cm] SHOTCRETE BOWLS	AS-14 / 1	DAVIS COLORS - DARK GRAY	SMOOTH TROWEL
	CONCRETE TURNDOWN WALL	AS-15 / 1	NATURAL GRAY	SMOOTH TROWEL
	BRICK, NOT IN CONTRACT, INSTALLED BY OTHERS	SEE CIVIL PLANS	N/A	N/A
	COLD JOINT (C.J.)	AS-16	N/A	N/A
	COLORED CONCRETE	N/A	DAVIS COLORS - GRAPHITE	SMOOTH TROWEL

NOTES

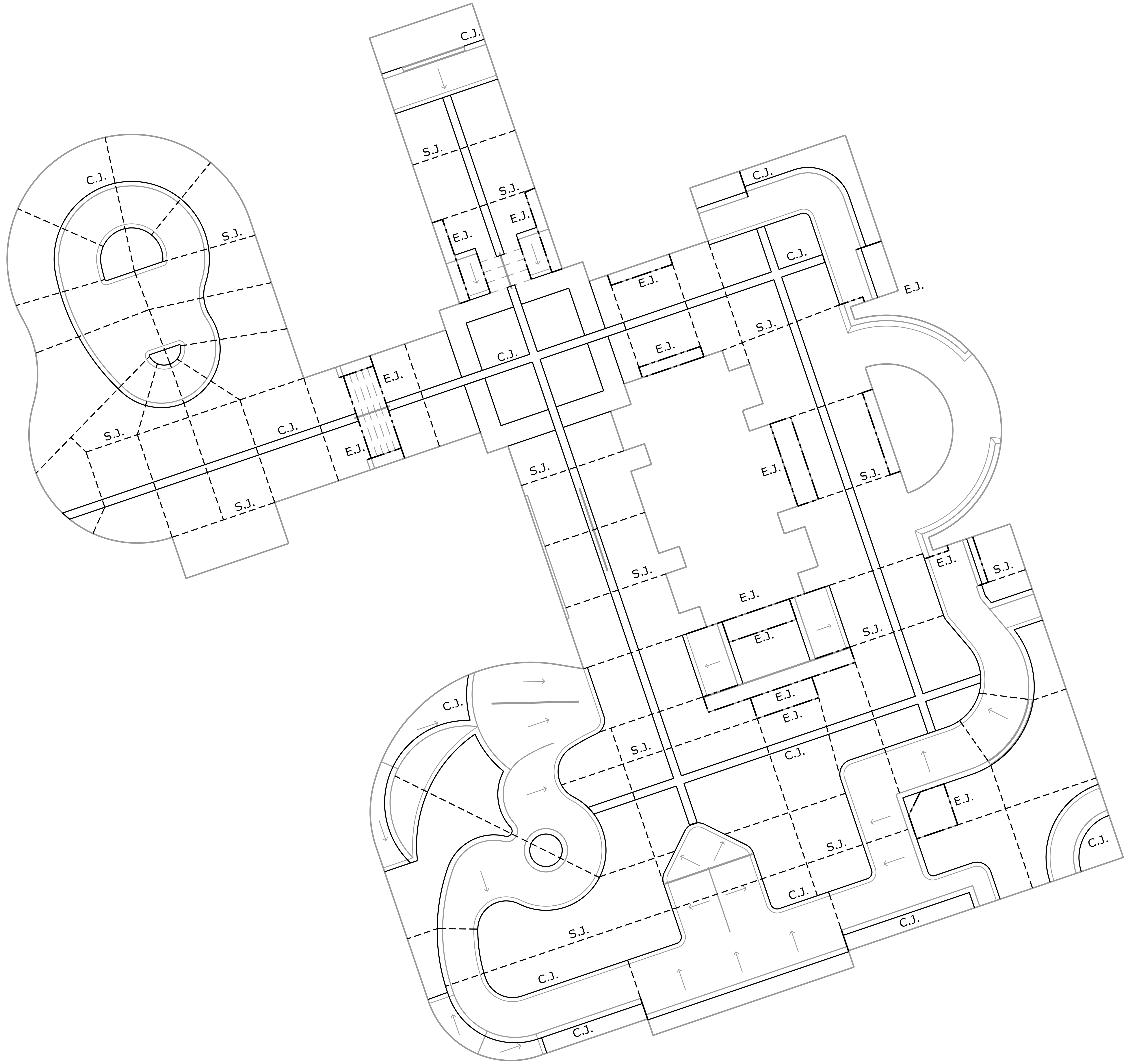
1. THE CONTRACTOR SHALL SUBMIT A POUR SCHEDULE DEPICTING LOCATION AND SEQUENCE OF POURS FOR REVIEW BY THE OWNER'S REPRESENTATIVE AND THE ACTION SPORTS DESIGNER.



DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
CONCRETE PLAN

SHEET::
AS-08
08 OF 16
SKATE PARK

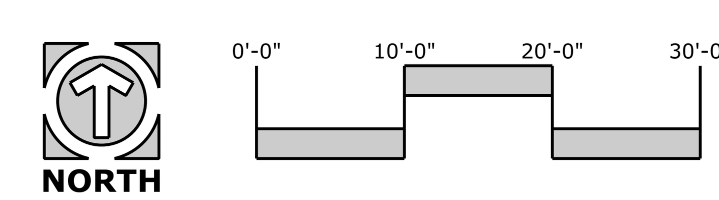


LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)	QUANTITY
———	COLD JOINT (C.J.)	AS-16 / 1, 2, 3 & 4	0 L.F.
— · —	EXPANSION JOINT (E.J.)	AS-16 / 5 & 6	0 L.F.
- - - -	SAWCUT JOINT (S.J.)	AS-16 / 7 & 8	0 L.F.
⊕	DRAIN INLET	AS-06	N/A

NOTES

1. THE JOINTING PLAN IS DIAGRAMMATIC ONLY.
2. CONTRACTOR SHALL SNAP CHALK LINES FOR ALL SAW-CUT JOINTS FOR REVIEW BY THE ACTION SPORTS DESIGNER PRIOR TO CUTTING JOINTS.

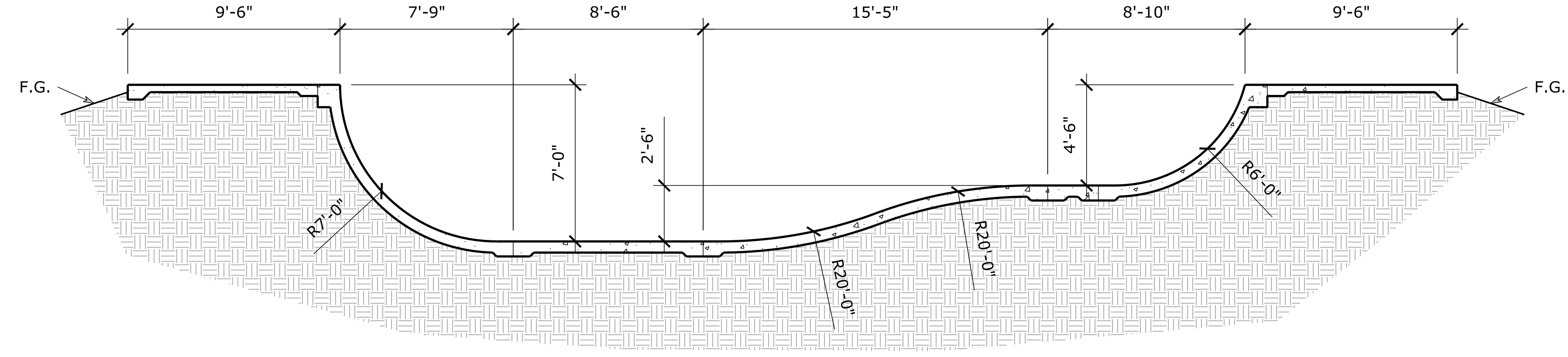


DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

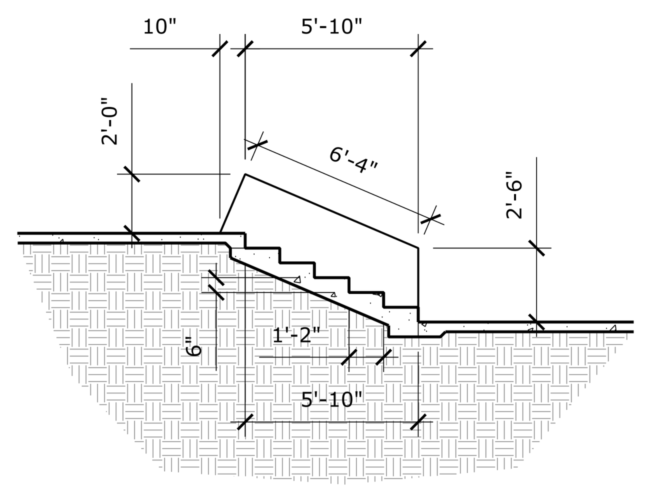
PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE

SHEET TITLE::
JOINTING PLAN

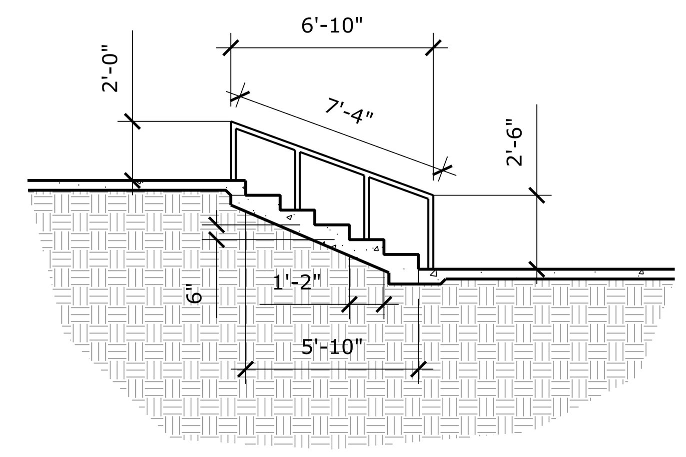
SHEET::
AS-09
SKATE PARK



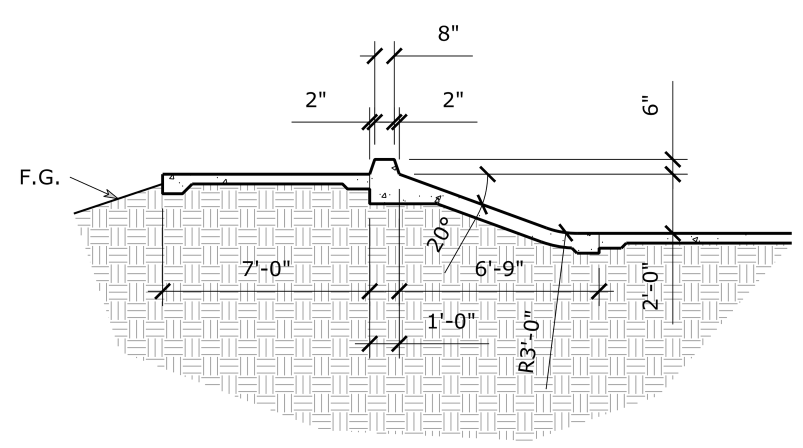
SECTION 1



SECTION 2



SECTION 3



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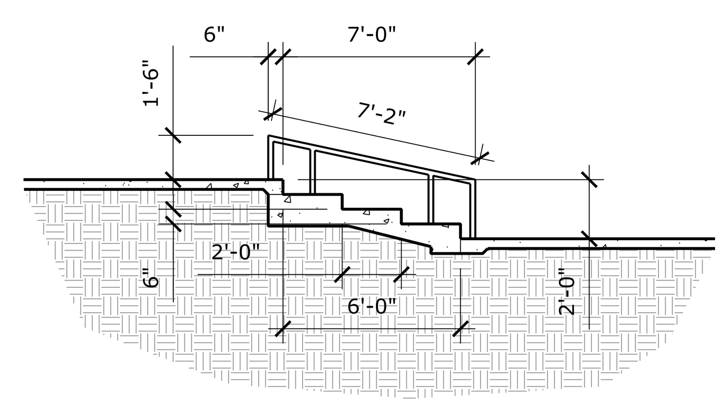
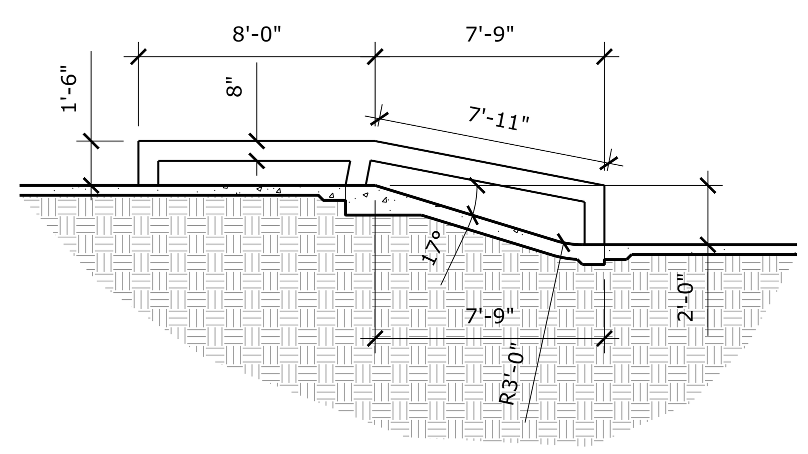


SECTION 5



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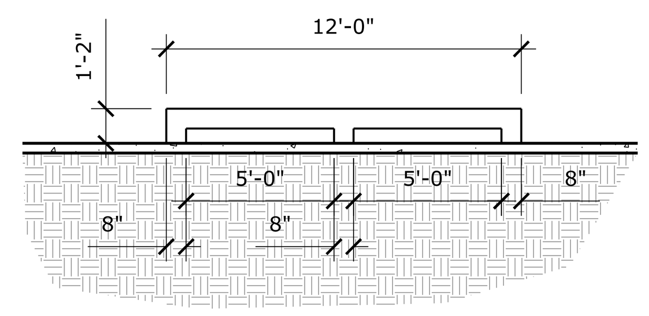
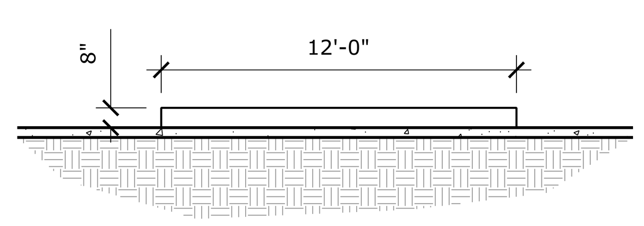


SECTION 7



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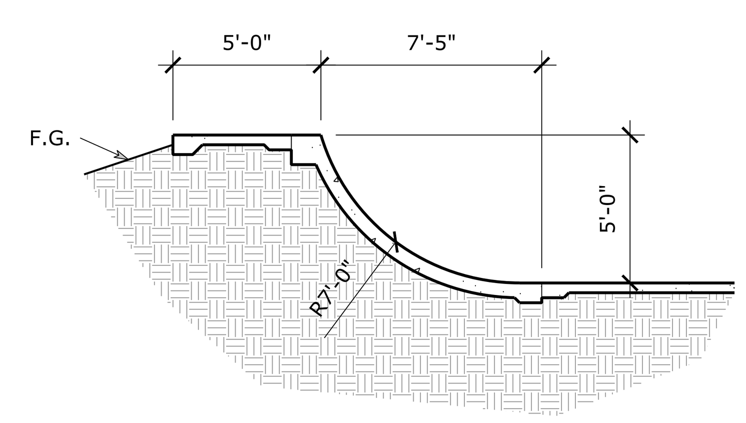


SECTION 9

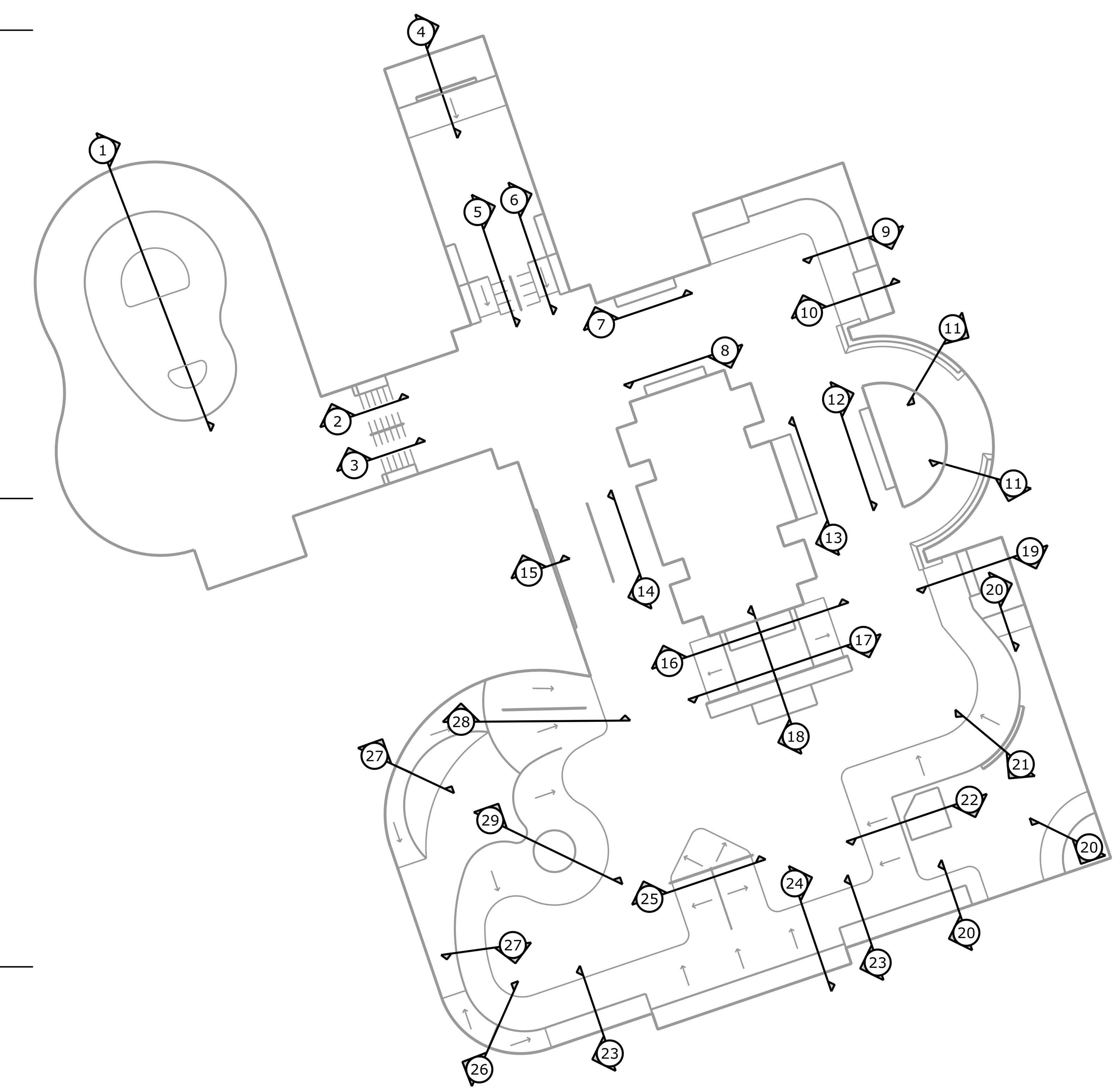
LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)
	CONCRETE/SHOTCRETE	N/A
	SUBGRADE	N/A
F.G.	FINISH GRADE	N/A

NOTES

1. REFER TO THE COPING PLAN FOR EDGE TREATMENT LOCATION AND TYPE
2. REFER TO THE HORIZONTAL CONTROL PLAN FOR ACTUAL HORIZONTAL LOCATIONS.
3. REFER TO THE SURFACE GRADING AND DRAINAGE PLAN FOR ACTUAL VERTICAL ELEVATIONS.

KEY MAP



NORTH

0'-0" 20'-0" 40'-0" 60'-0"

DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
CROSS SECTIONS

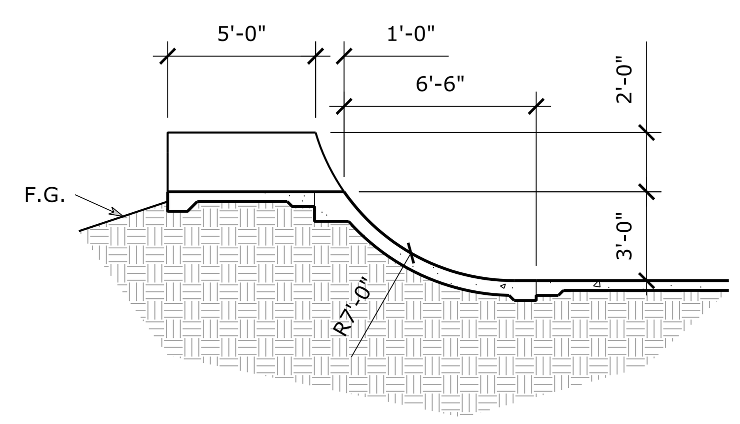
SHEET::
10 OF 16
AS-10
SKATE PARK

LEGEND

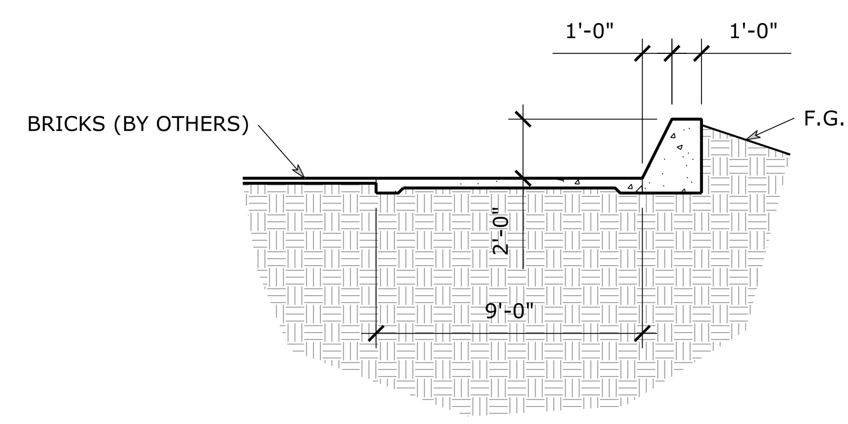
SYMBOL	DESCRIPTION	DETAIL(S)
	CONCRETE/SHOTCRETE	N/A
	SUBGRADE	N/A
F.G.	FINISH GRADE	N/A

NOTES

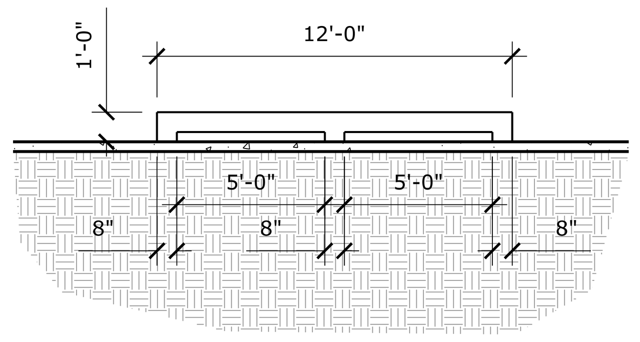
1. REFER TO THE COPING PLAN FOR EDGE TREATMENT LOCATION AND TYPE
2. REFER TO THE HORIZONTAL CONTROL PLAN FOR ACTUAL HORIZONTAL LOCATIONS.
3. REFER TO THE SURFACE GRADING AND DRAINAGE PLAN FOR ACTUAL VERTICAL ELEVATIONS.



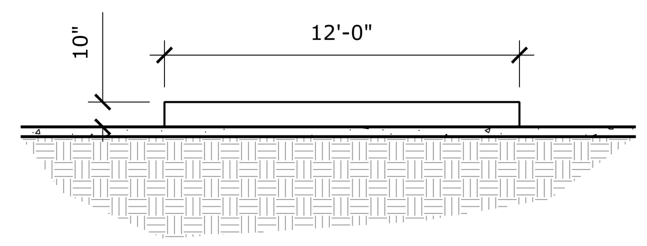
SECTION 10



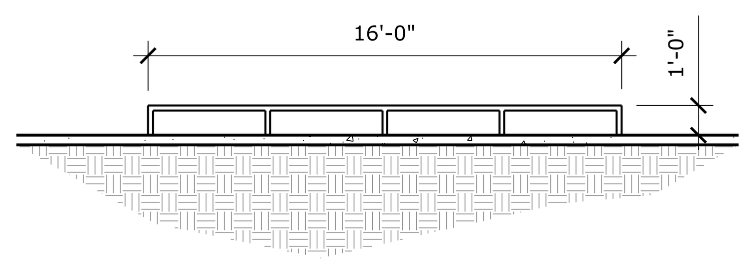
SECTION 11



SECTION 12



SECTION 13



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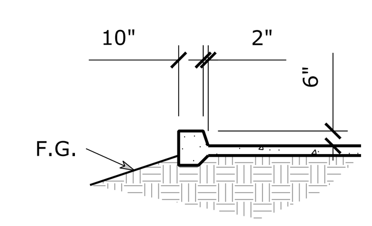

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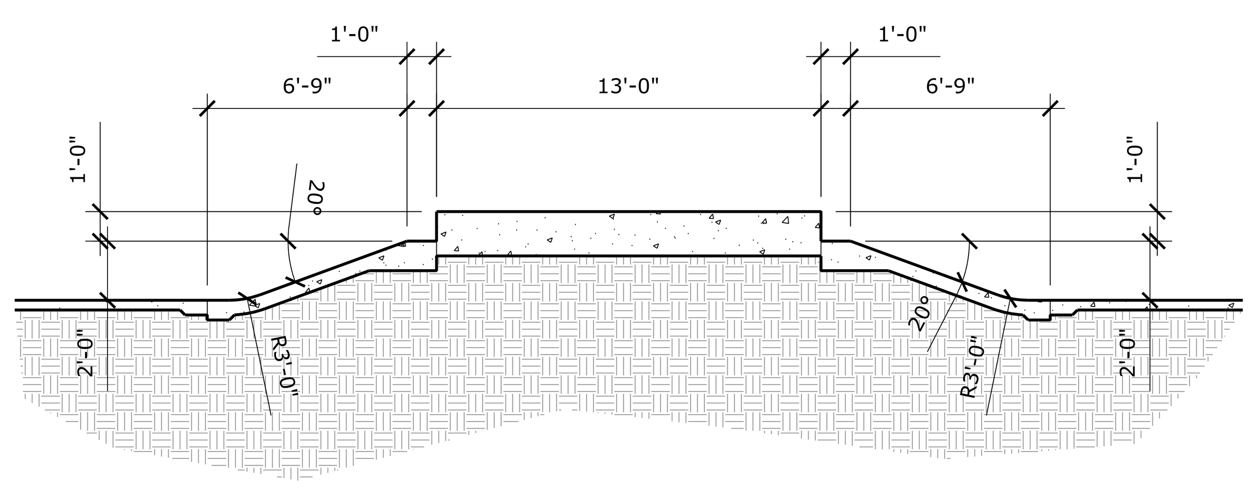

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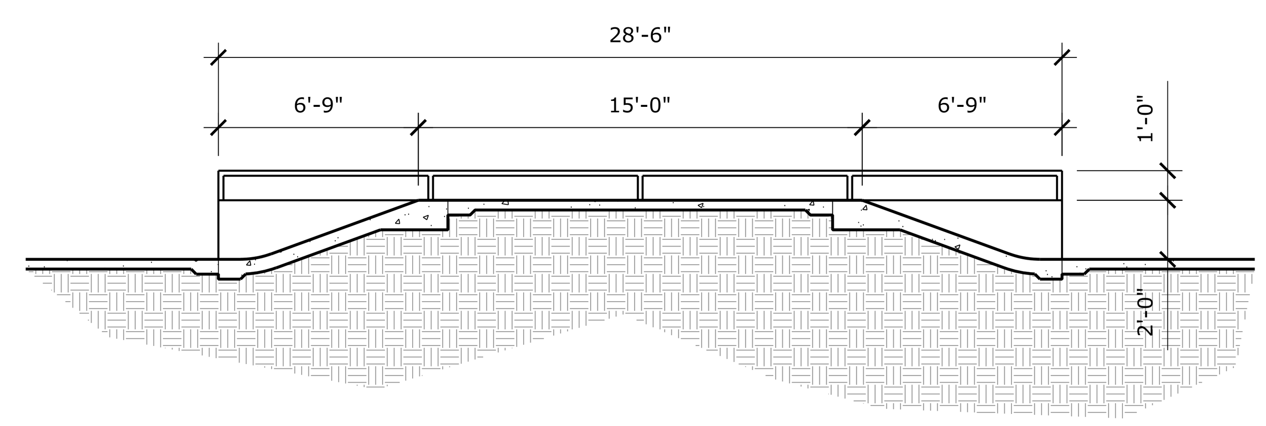

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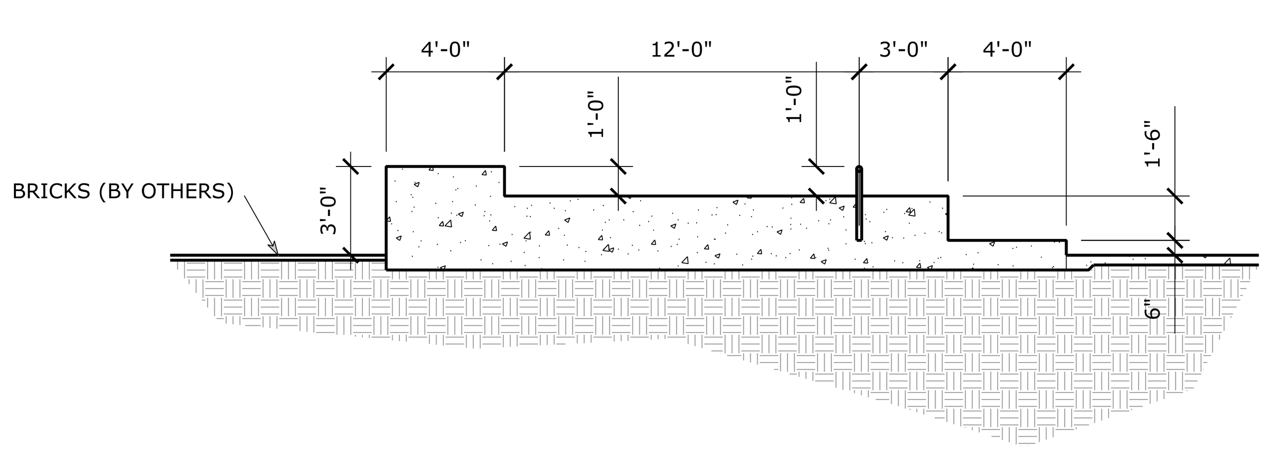

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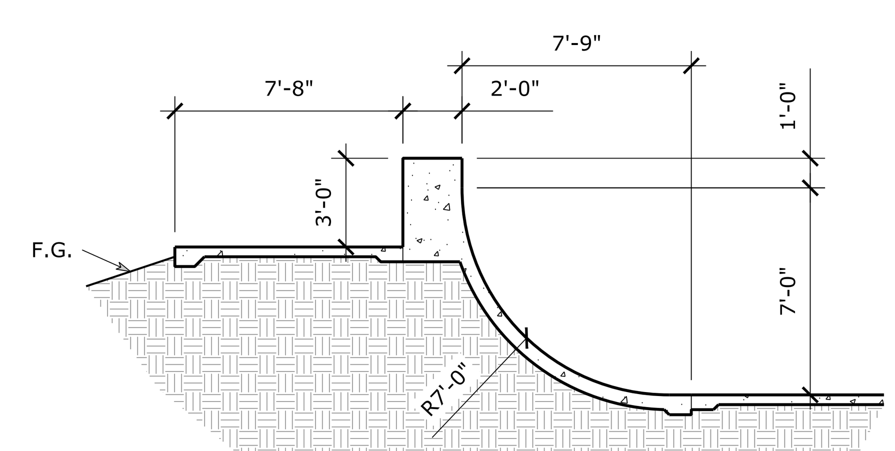
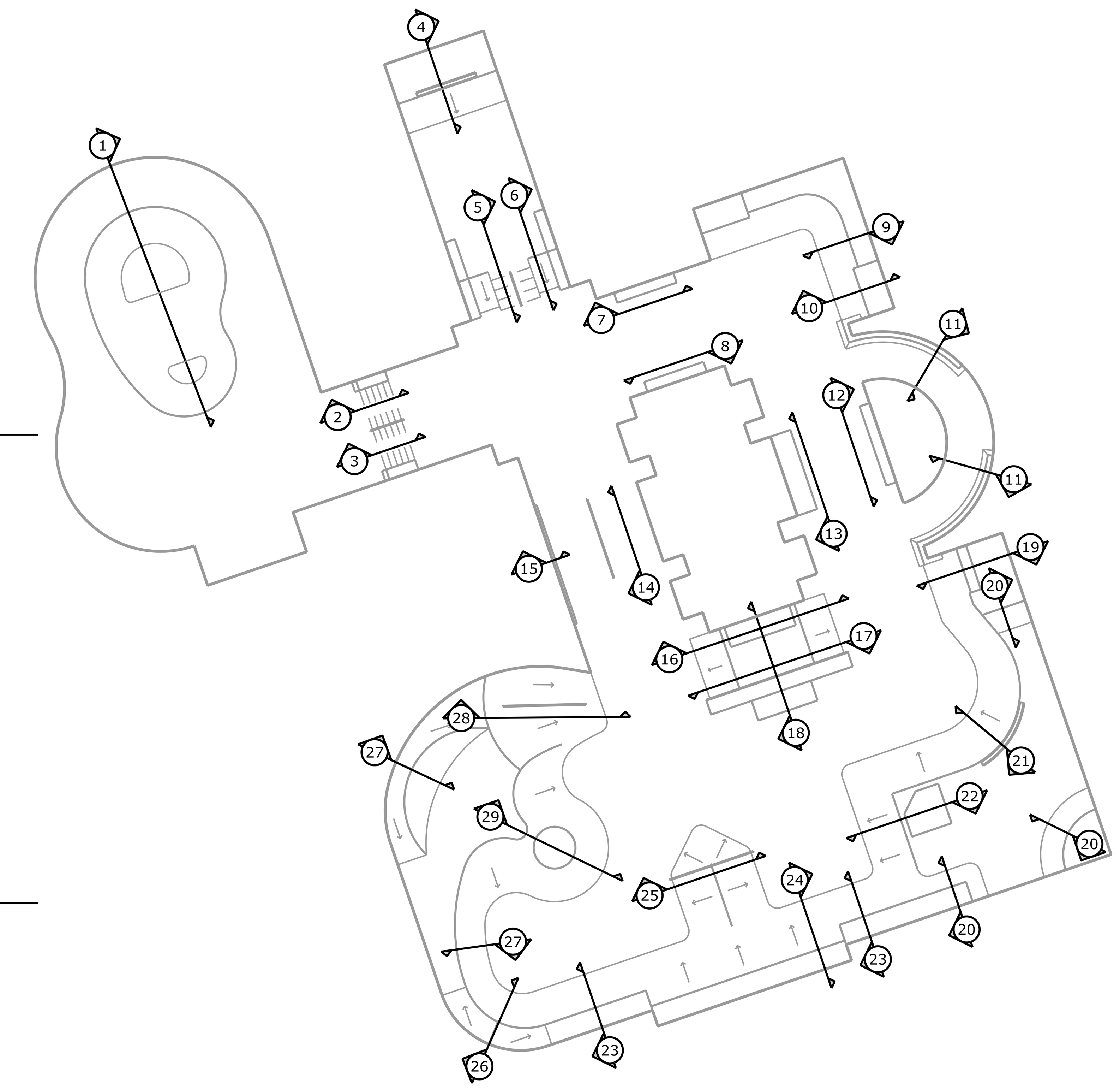


SECTION 19

KEY MAP

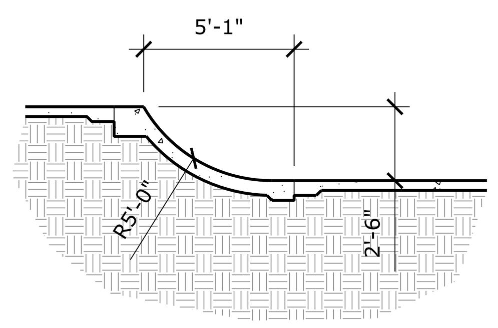


NORTH

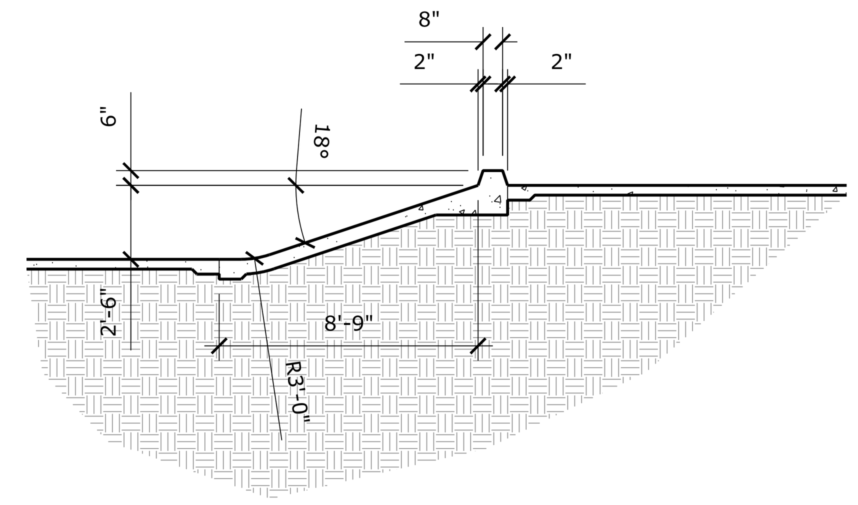
0'-0" 20'-0" 40'-0" 60'-0"

DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT:: PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: CROSS SECTIONS



SECTION 20



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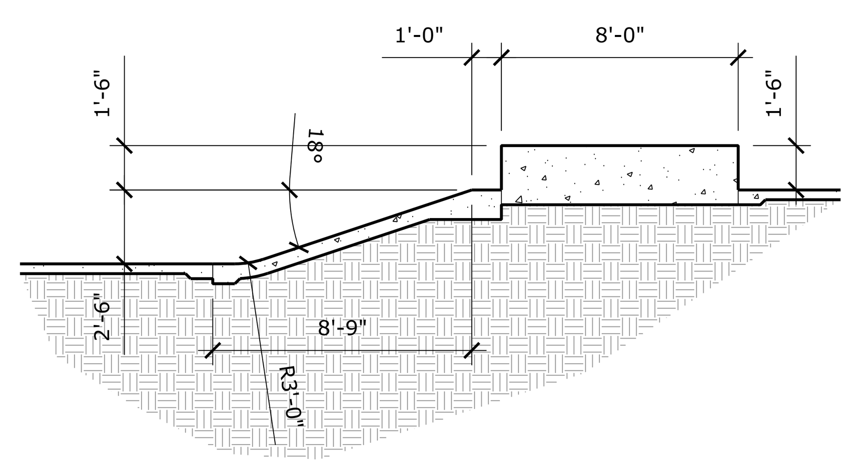
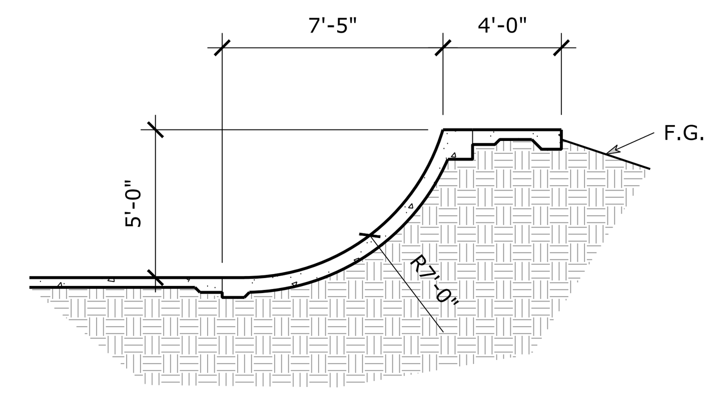
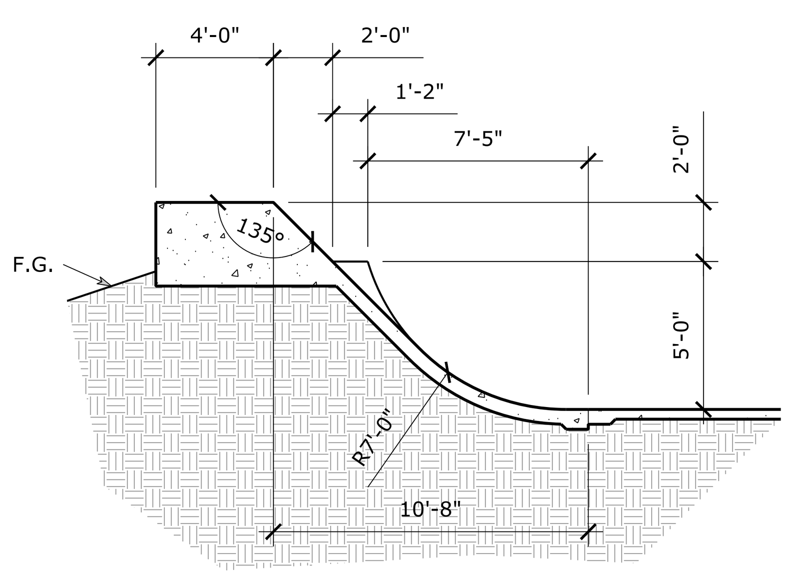


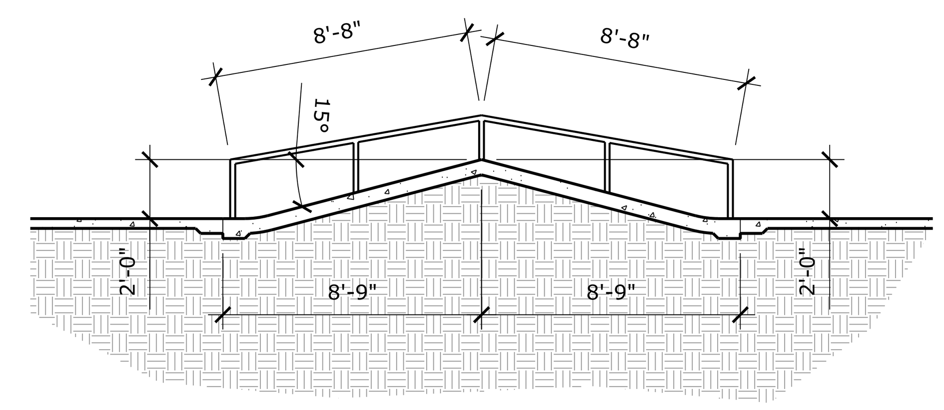
SECTION 22



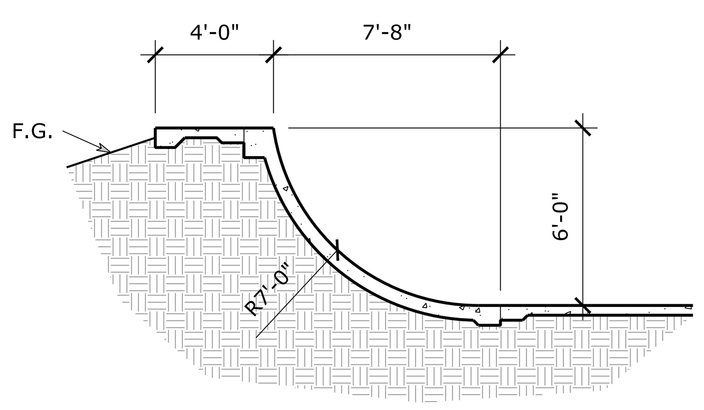
SECTION 23



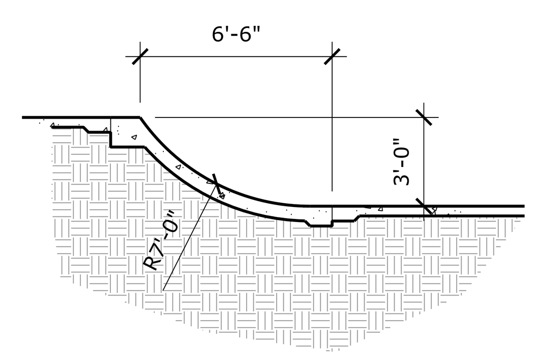
SECTION 24



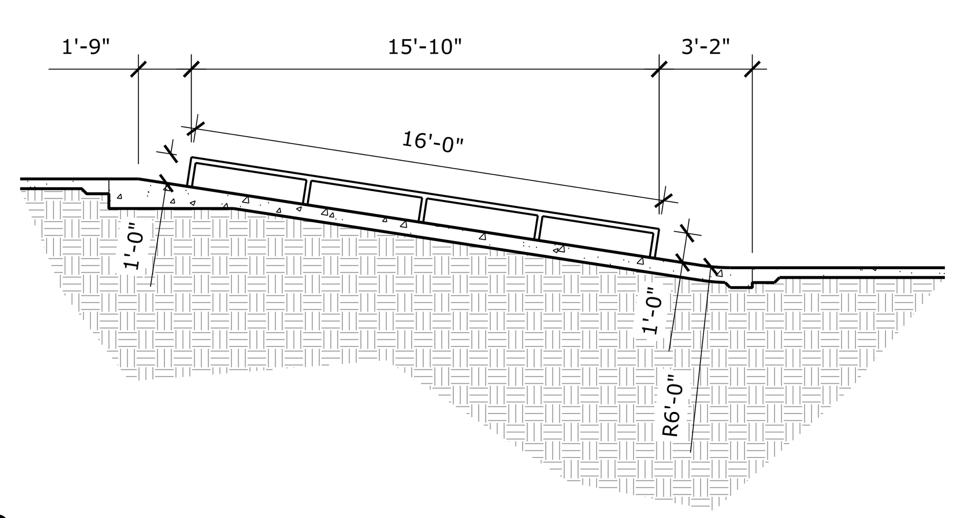
SECTION 25



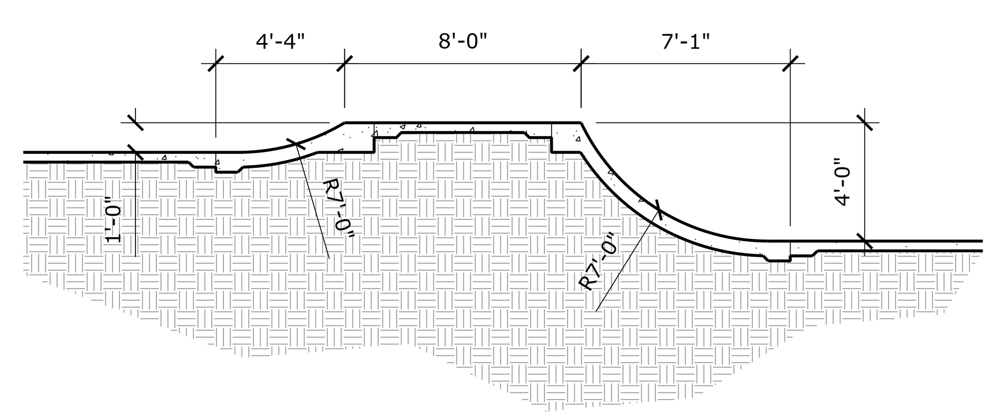
SECTION 26



SECTION 27



SECTION 28



SECTION 29

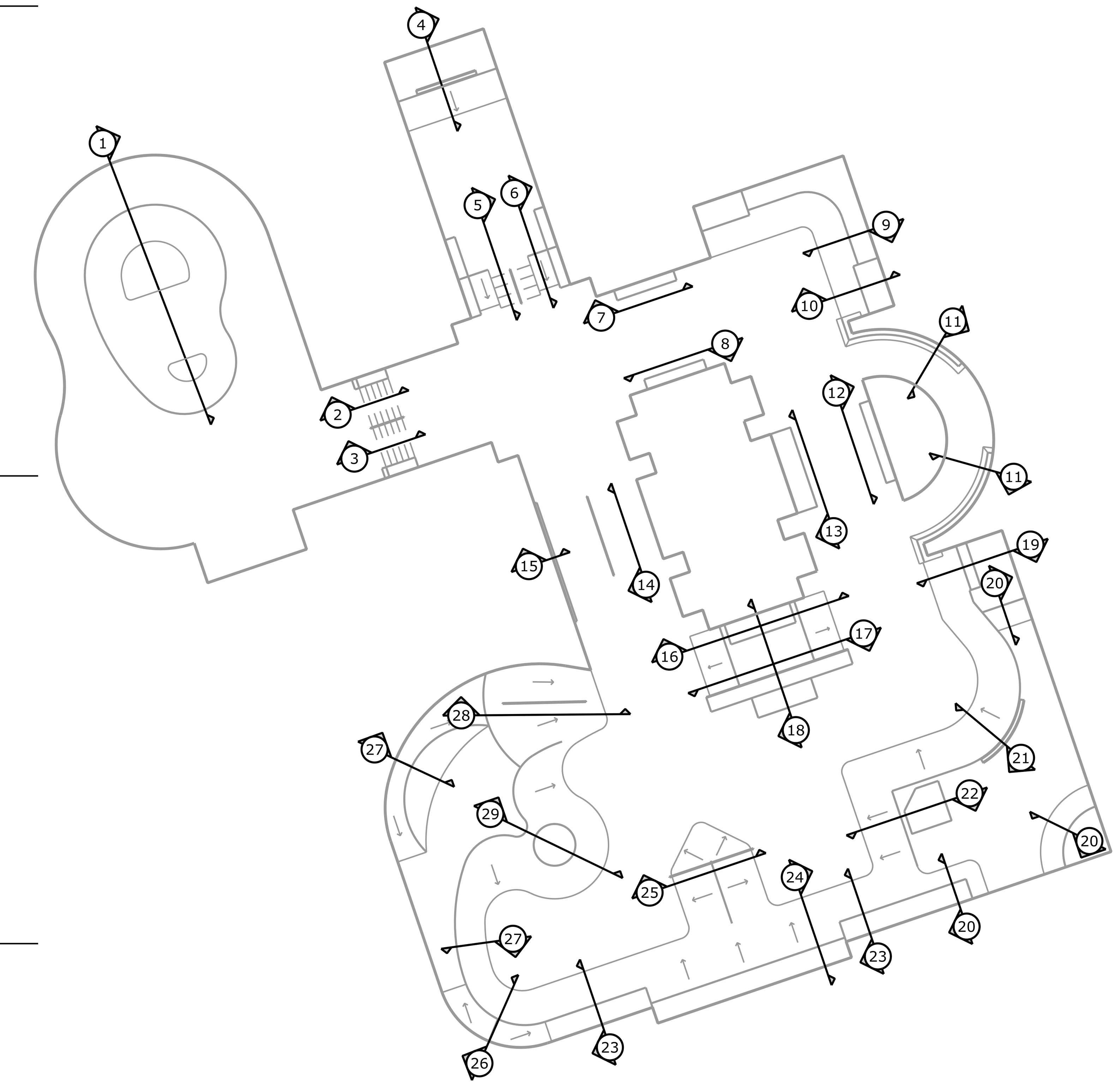
LEGEND

SYMBOL	DESCRIPTION	DETAIL(S)
	CONCRETE/SHOTCRETE	N/A
	SUBGRADE	N/A
F.G.	FINISH GRADE	N/A

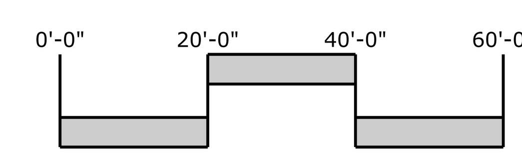
NOTES

1. REFER TO THE COPING PLAN FOR EDGE TREATMENT LOCATION AND TYPE
2. REFER TO THE HORIZONTAL CONTROL PLAN FOR ACTUAL HORIZONTAL LOCATIONS.
3. REFER TO THE SURFACE GRADING AND DRAINAGE PLAN FOR ACTUAL VERTICAL ELEVATIONS.

KEY MAP



NORTH

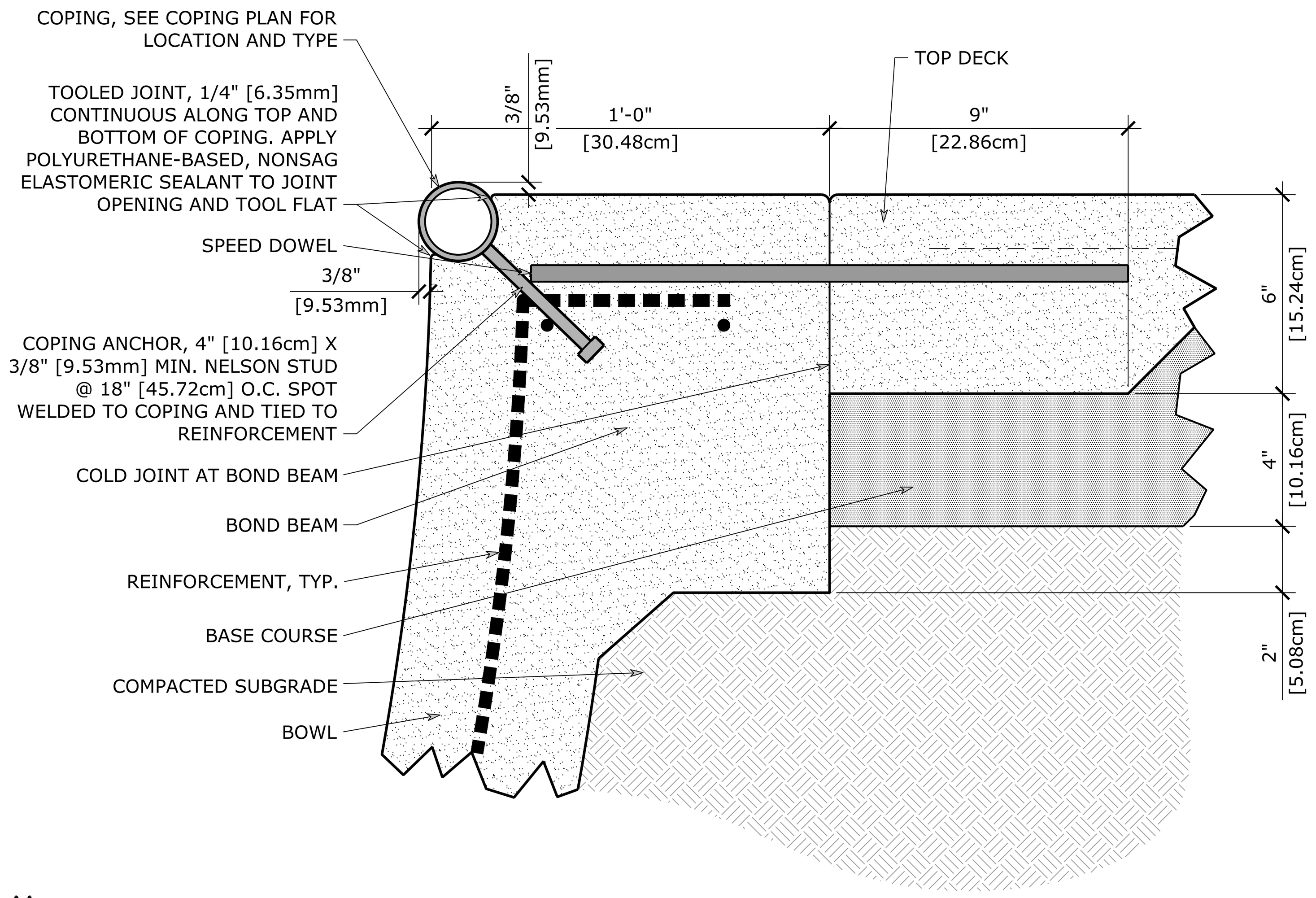


DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

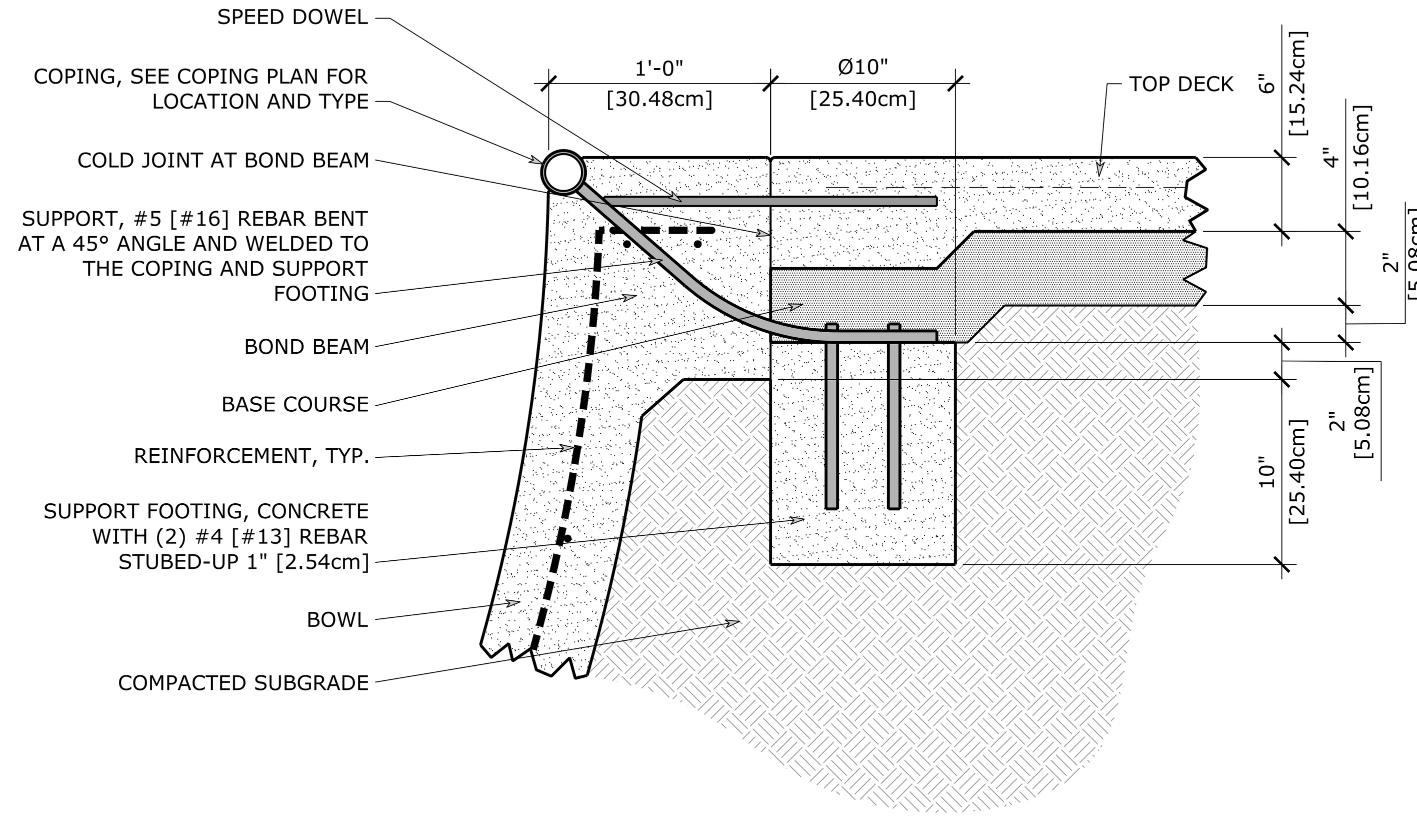
PROJECT::
PORTSMOUTH SKATEPARK
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE::
CROSS SECTIONS

SHEET::

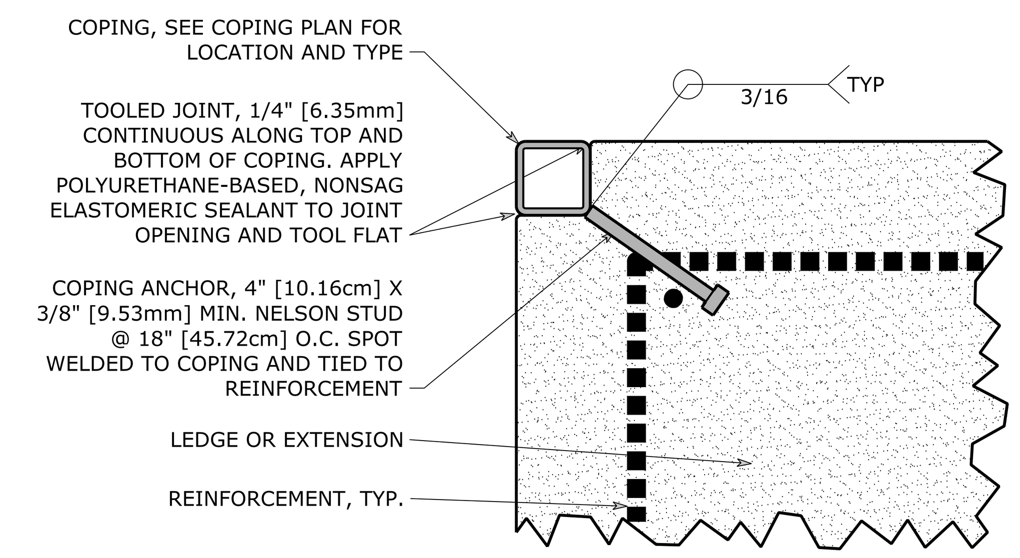
AS-12
SKATE PARK



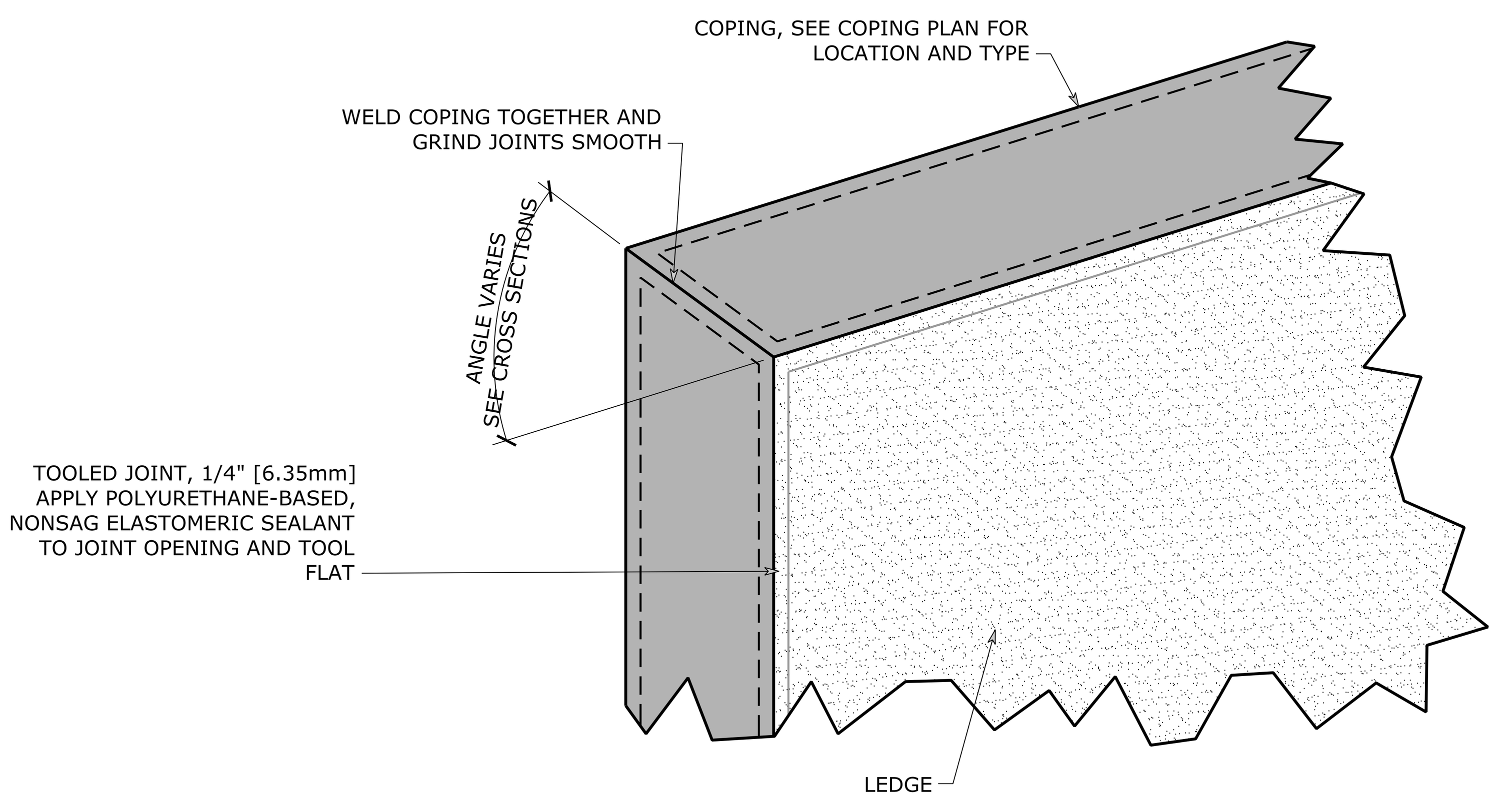
1 STEEL COPING - ROUND
SCALE: 3" = 1'-0"



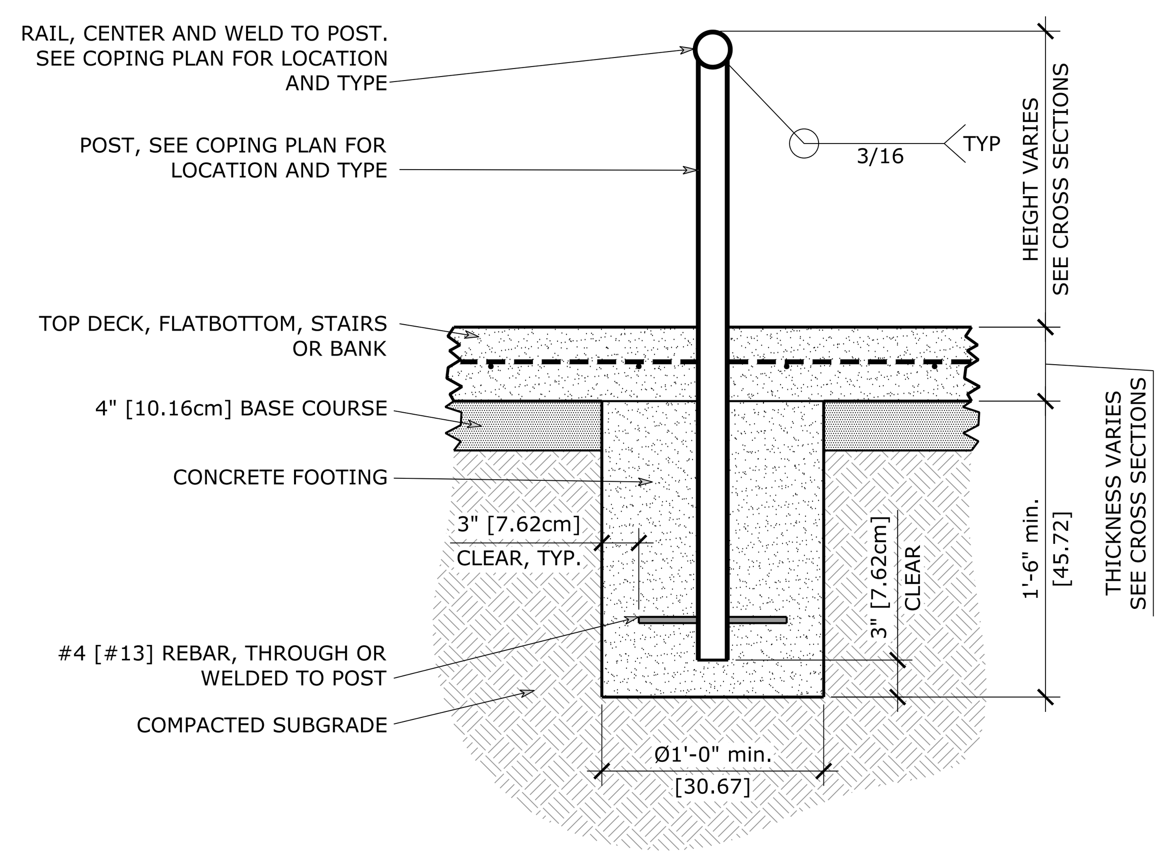
2 COPING CONSTRUCTION SUPPORT
SCALE: 1-1/2" = 1'-0"



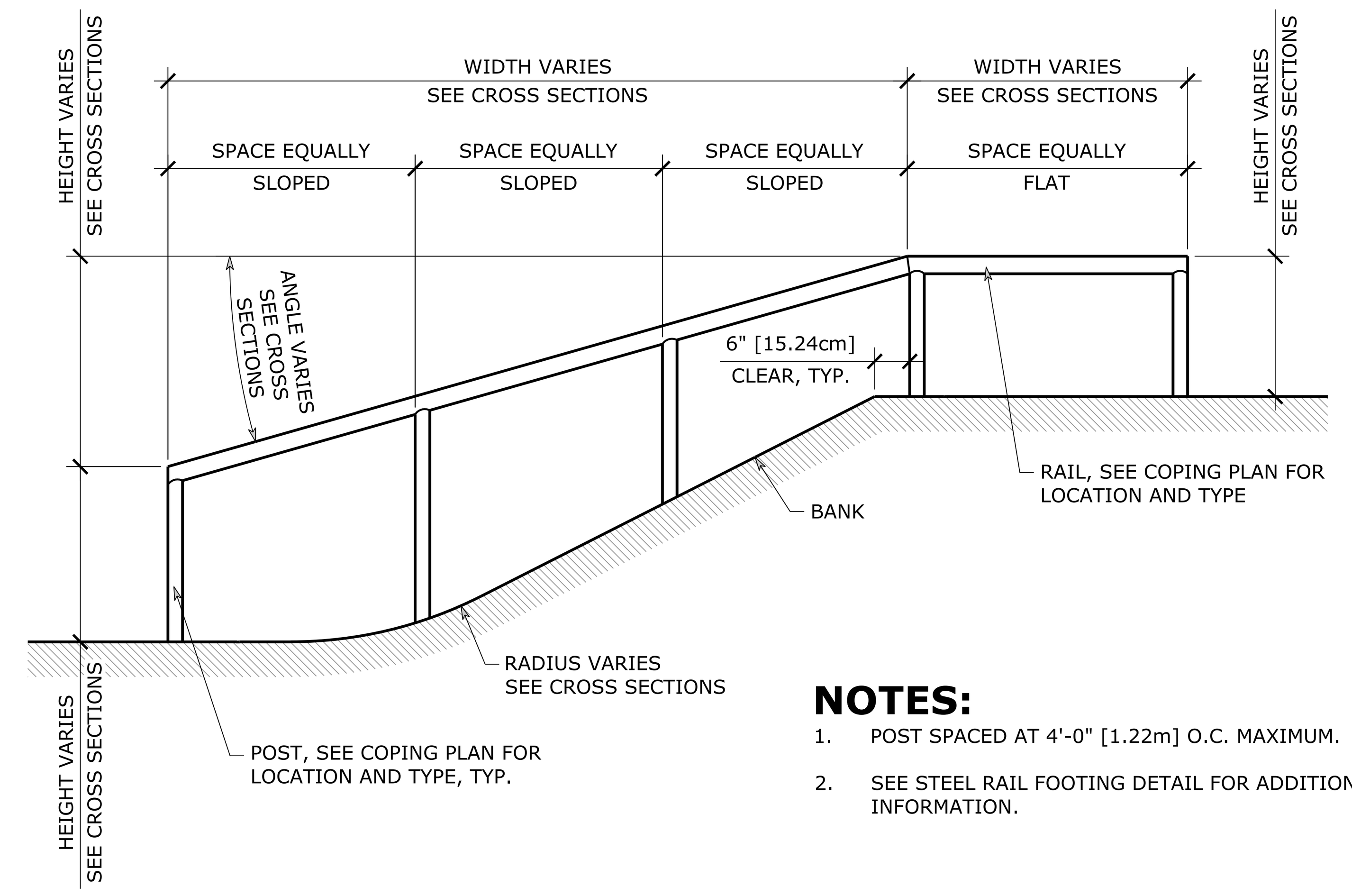
3 STEEL COPING - SQUARE
SCALE: 3" = 1'-0"



4 HUBBA LEDGE COPING
SCALE: 6" = 1'-0"



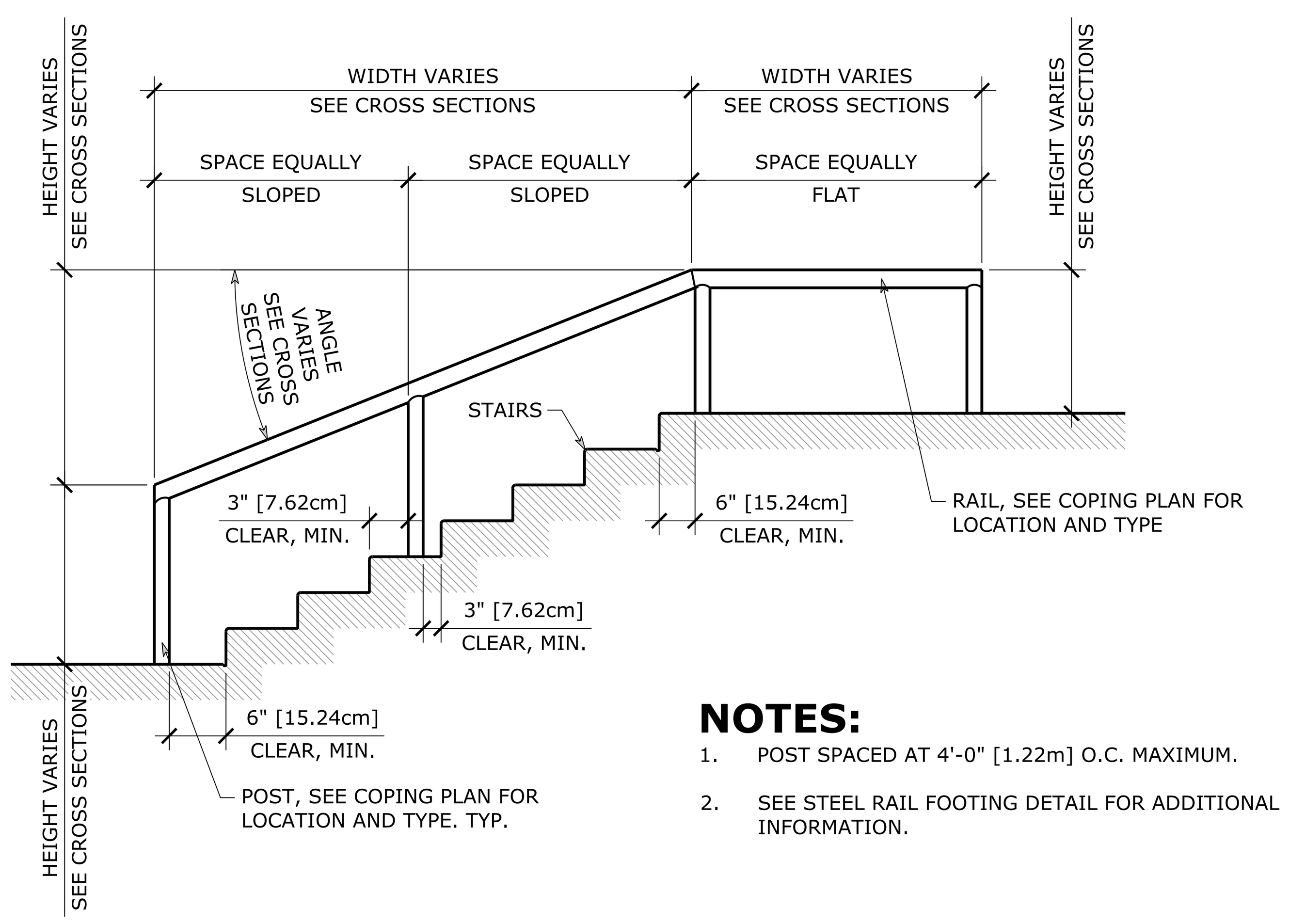
5 STEEL RAIL FOOTING
SCALE: 1" = 1'-0"



NOTES:

1. POST SPACED AT 4'-0" [1.22m] O.C. MAXIMUM.
2. SEE STEEL RAIL FOOTING DETAIL FOR ADDITIONAL INFORMATION.

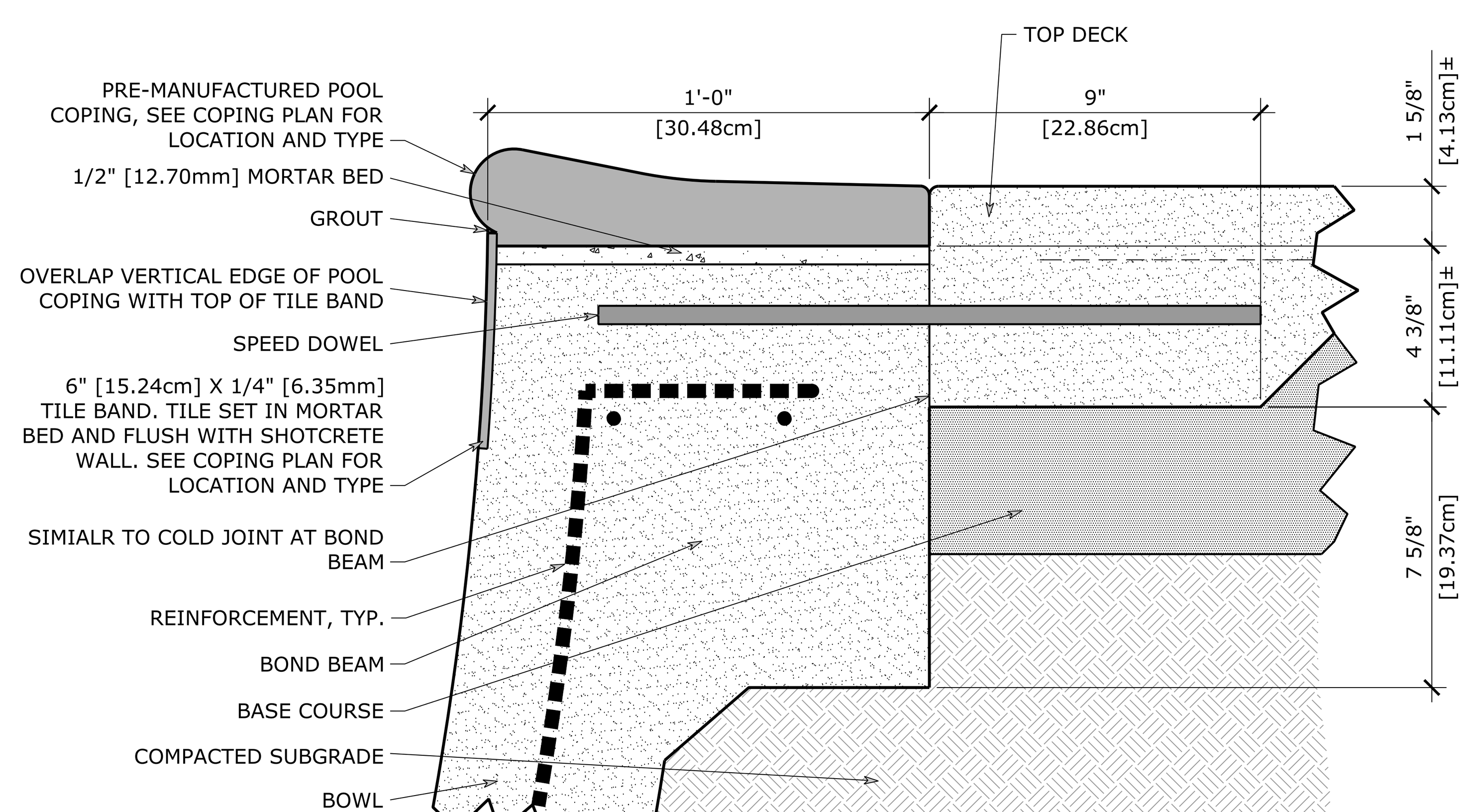
6 STEEL RAIL IN BANK
SCALE: 1/2" = 1'-0"



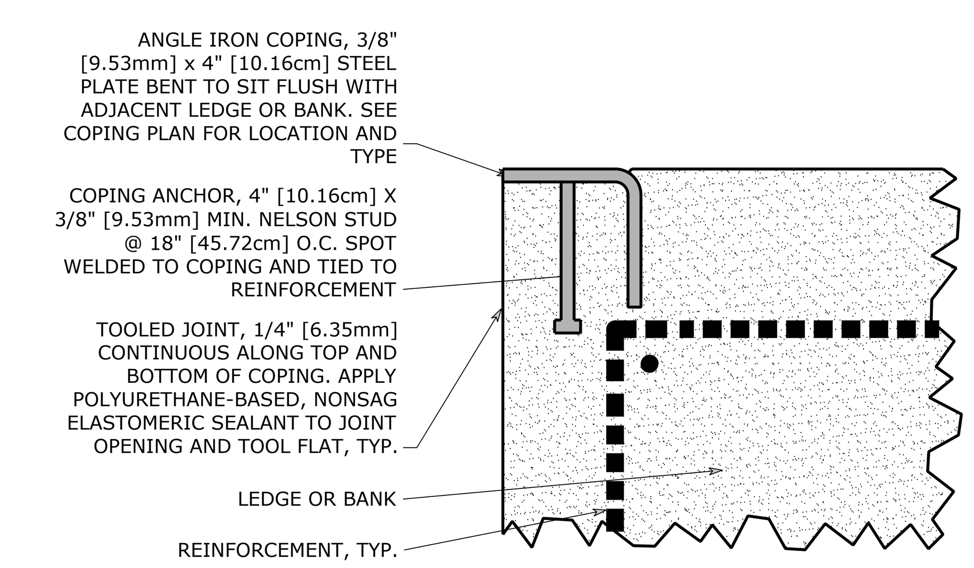
NOTES:

1. POST SPACED AT 4'-0" [1.22m] O.C. MAXIMUM.
2. SEE STEEL RAIL FOOTING DETAIL FOR ADDITIONAL INFORMATION.

7 STEEL RAIL IN STAIRS
SCALE: 1/2" = 1'-0"



8 POOL COPING AND TILE
SCALE: 3" = 1'-0"

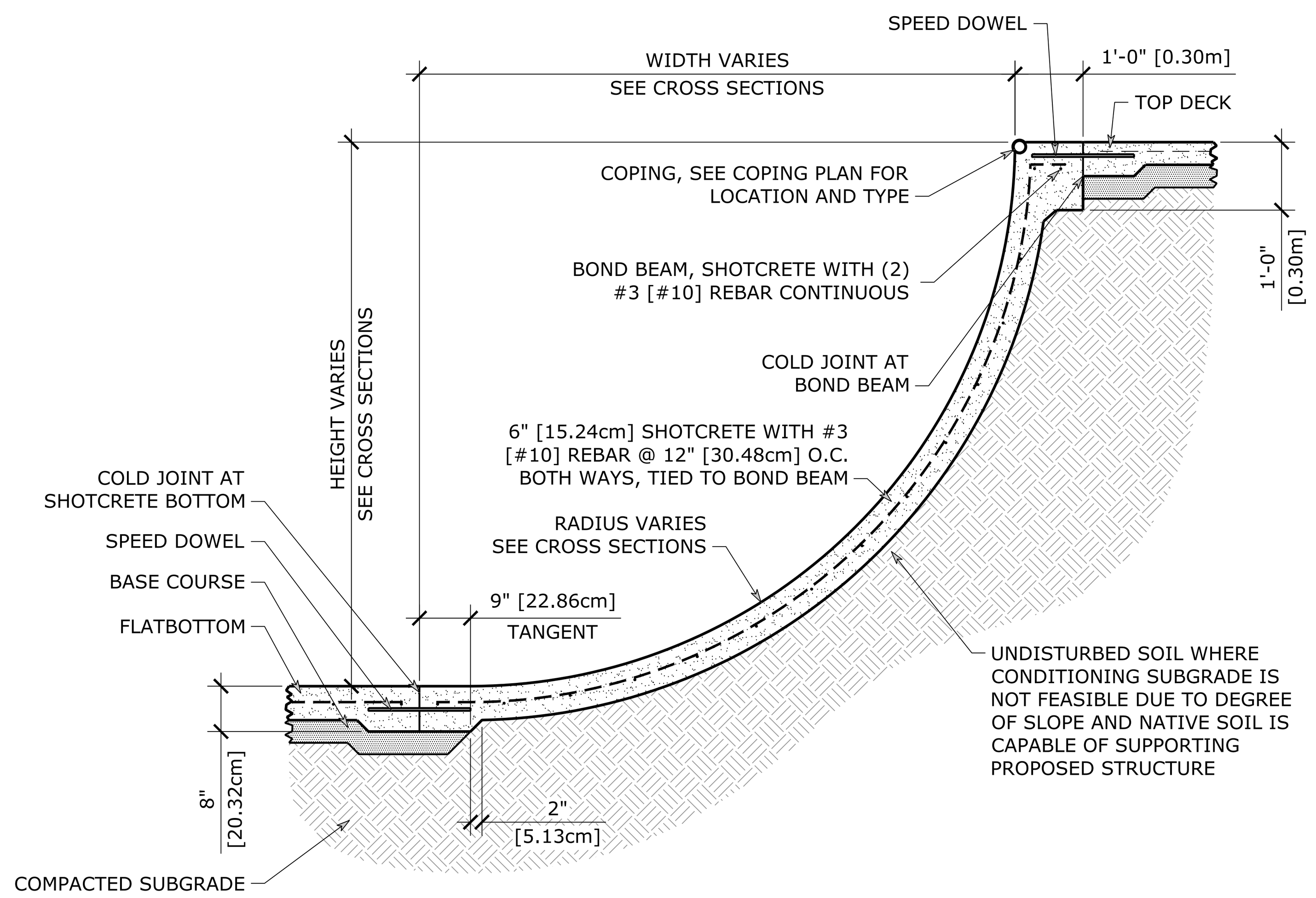


9 COPING - ANGLE IRON
SCALE: N.T.S.

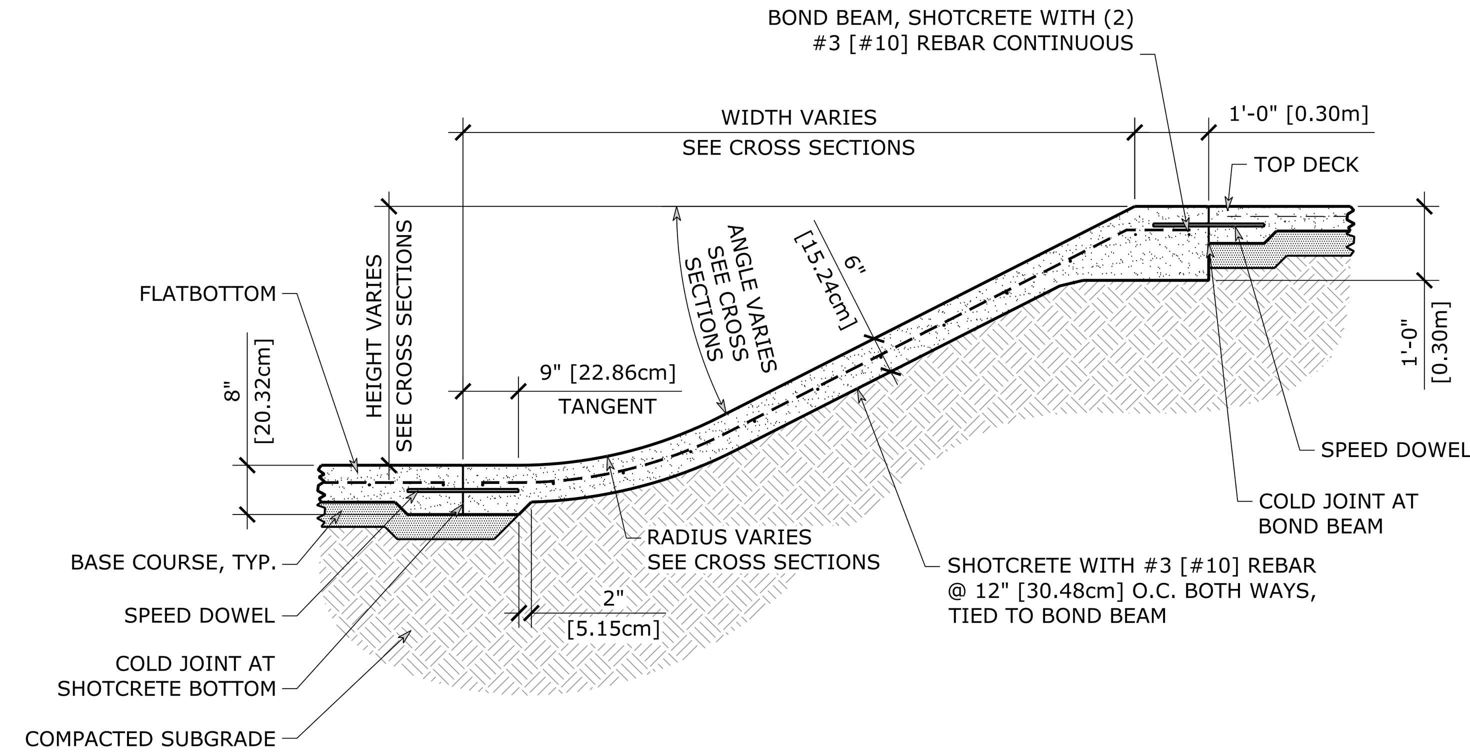
DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT:: **PORTSMOUTH SKATEPARK**
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: CONSTRUCTION DETAILS

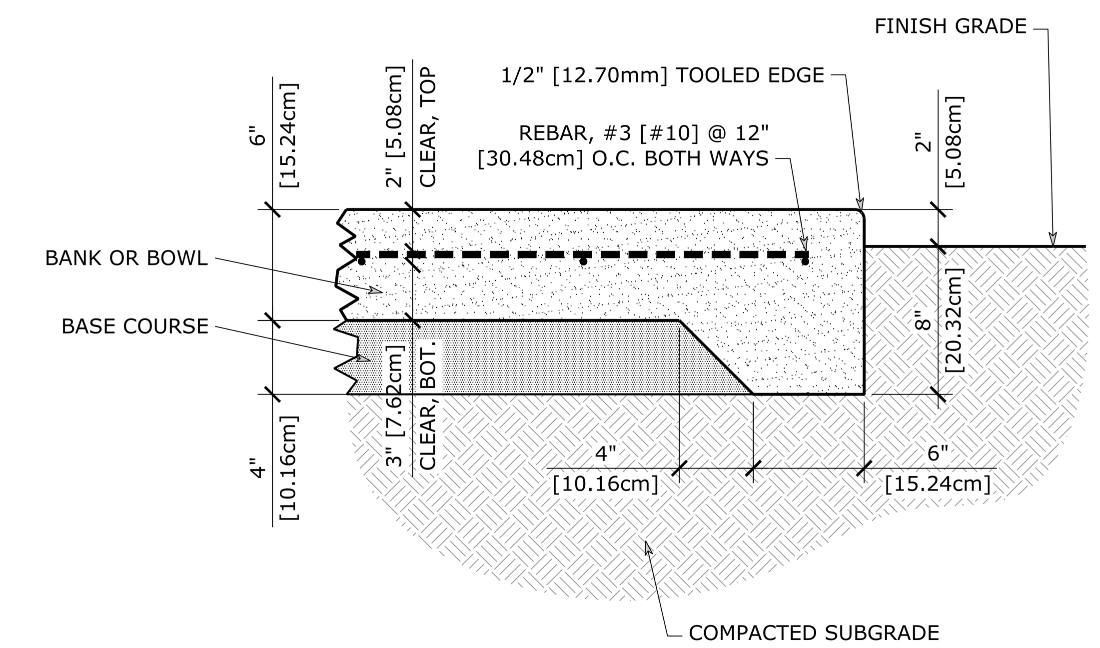
SHEET:: **AS-13**
13 OF 16
SKATE PARK



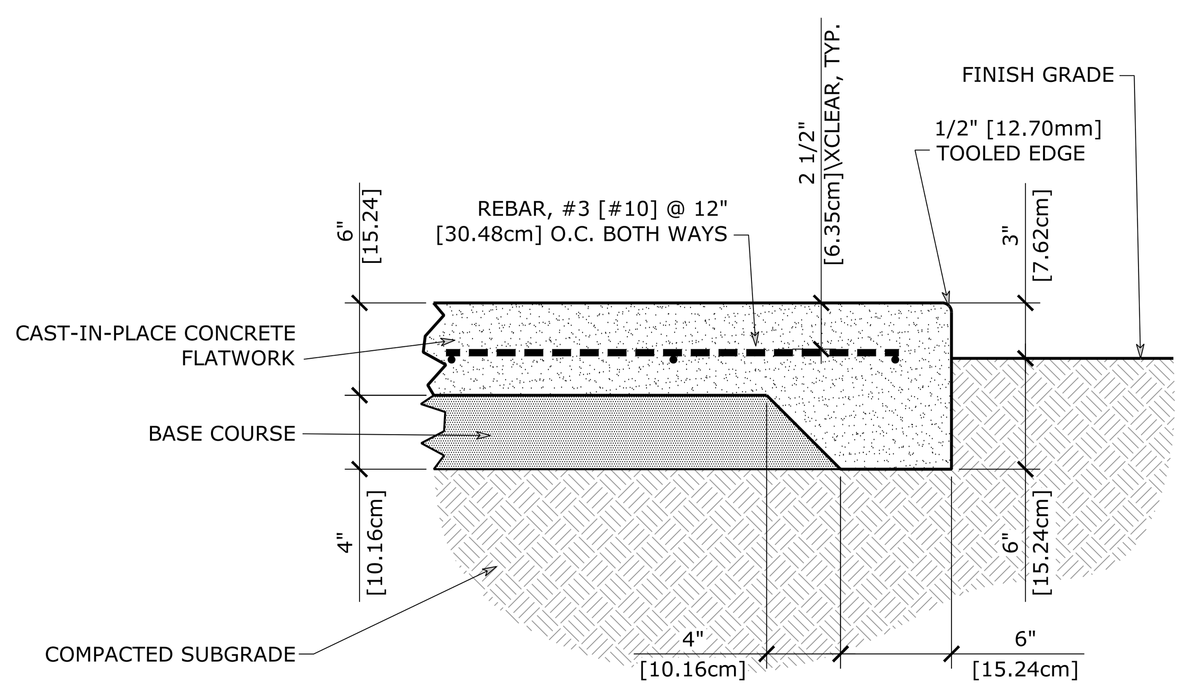
1 SHOTCRETE BOWL
SCALE: 1/2" = 1'-0"



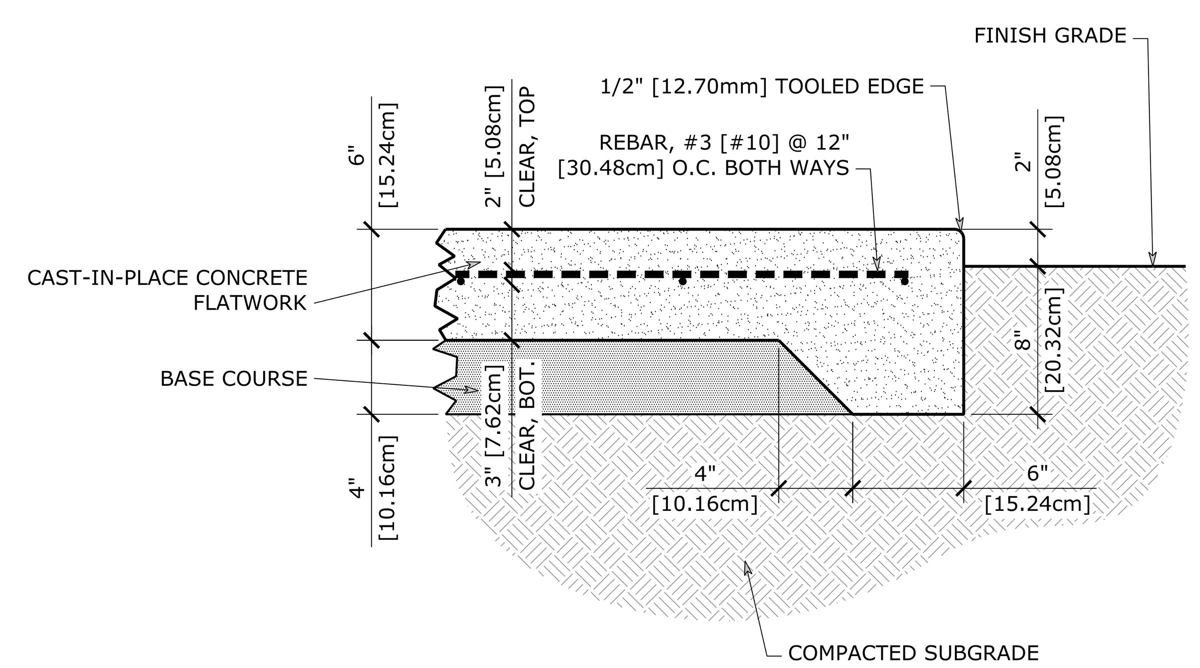
2 SHOTCRETE BANK
SCALE: 1/2" = 1'-0"



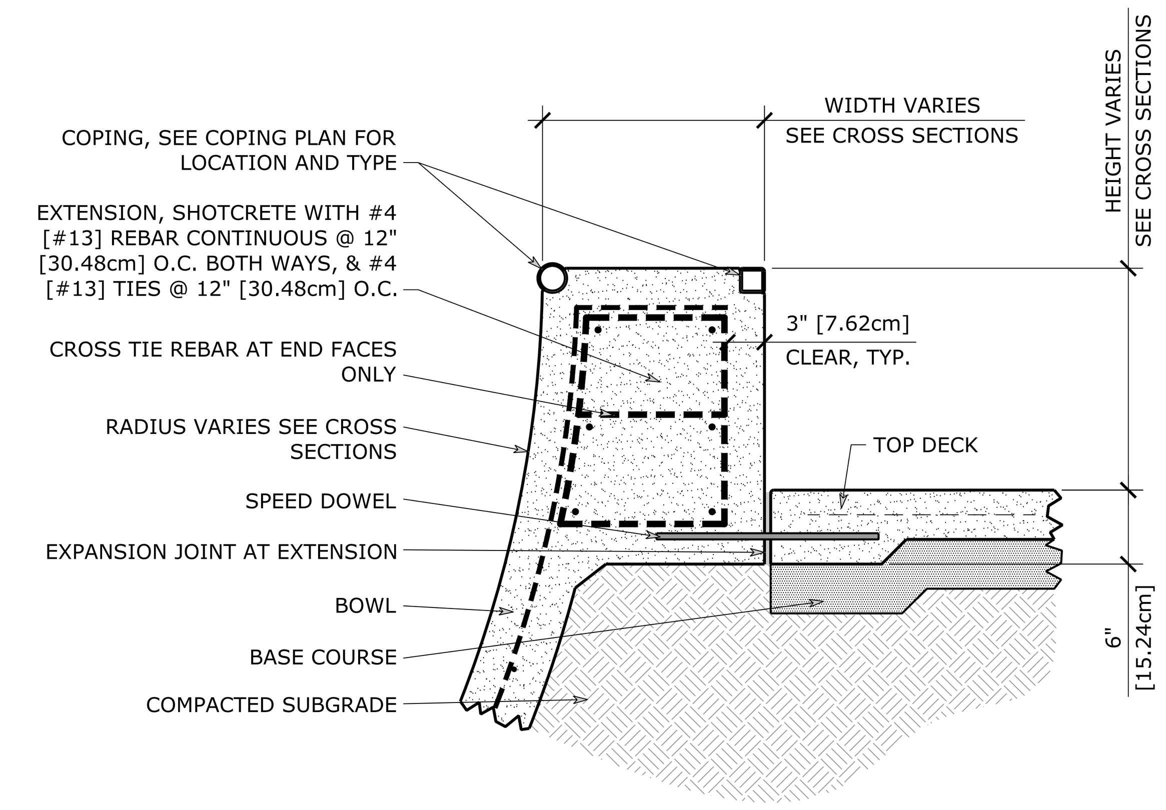
3 SHOTCRETE SECTION
SCALE: 1-1/2" = 1'-0"



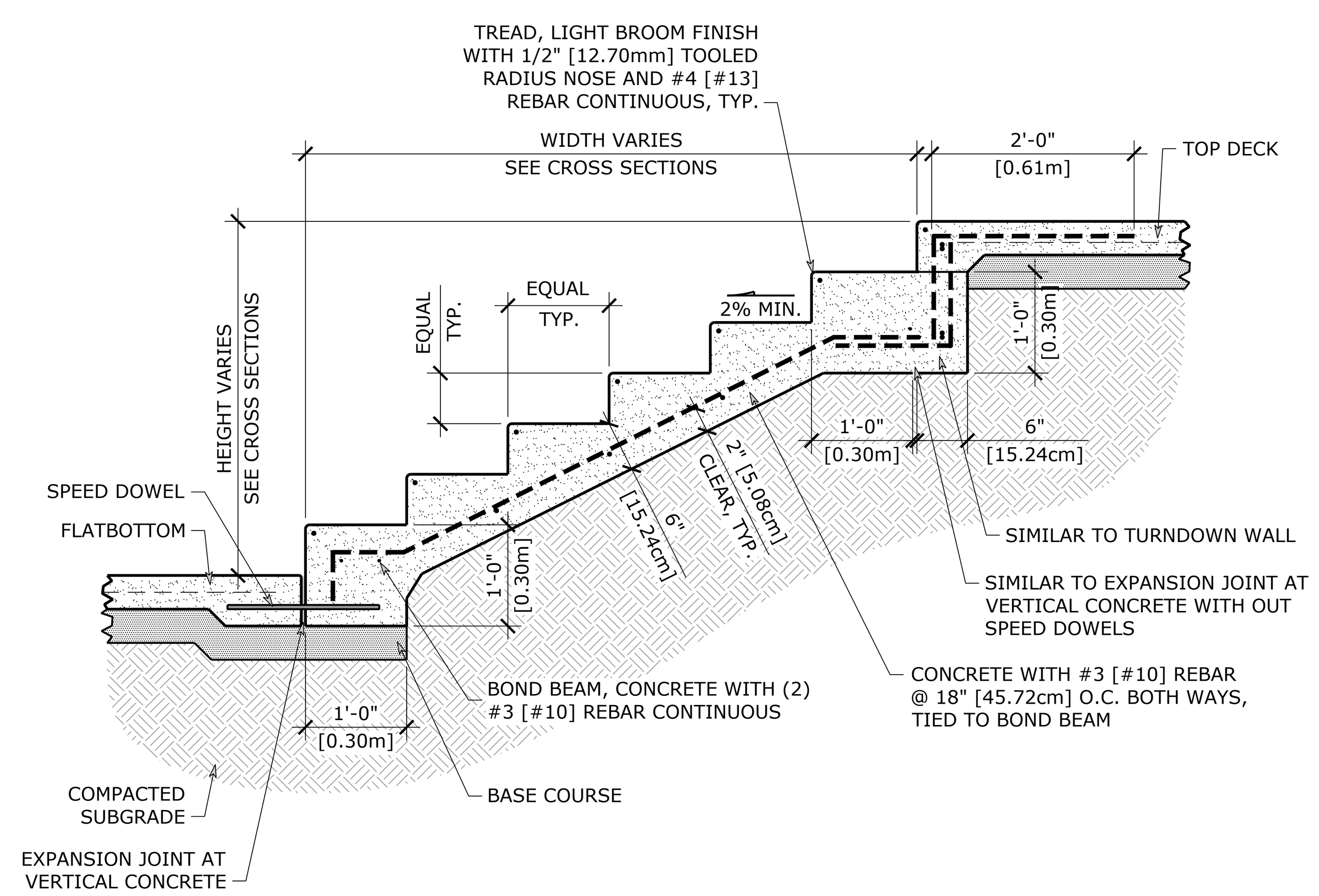
4 CONCRETE TOP DECK SECTION
SCALE: 1-1/2" = 1'-0"



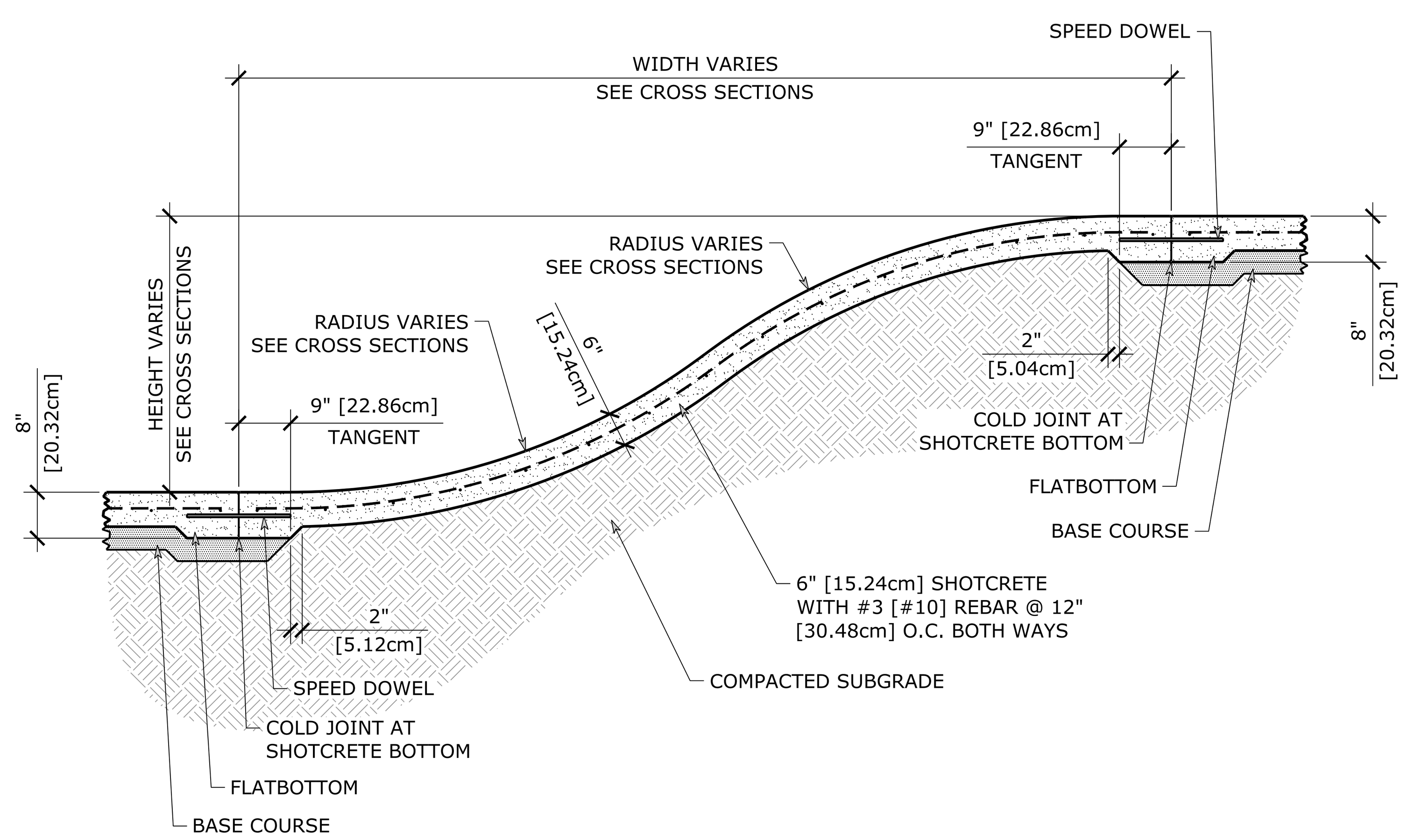
5 CONCRETE FLATBOTTOM SECTION
SCALE: 1-1/2" = 1'-0"



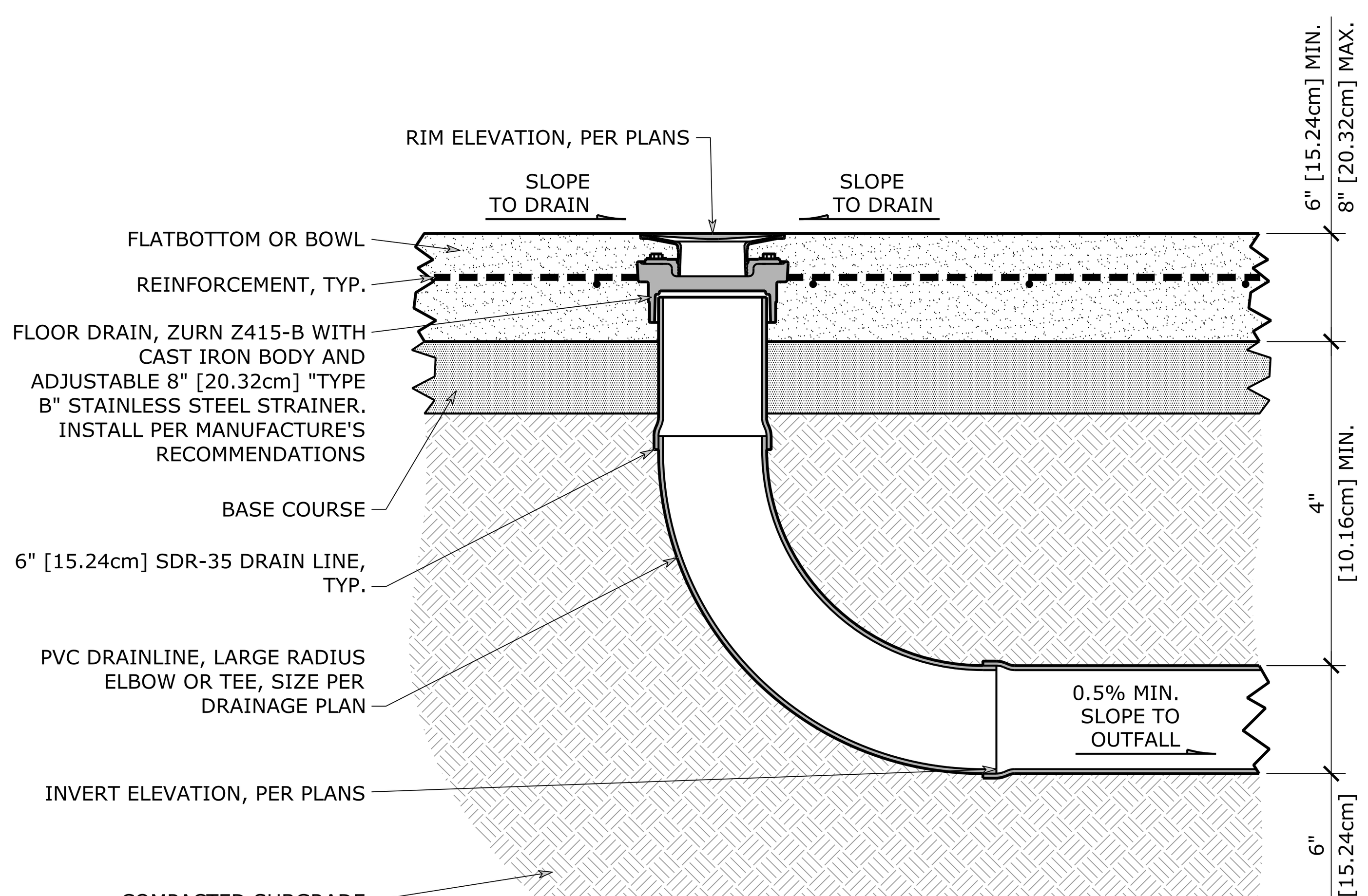
6 SHOTCRETE EXTENSION
SCALE: 1" = 1'-0"



7 CONCRETE STAIRS
SCALE: 1" = 1'-0"



8 SHOTCRETE WATERFALL
SCALE: 1" = 1'-0"

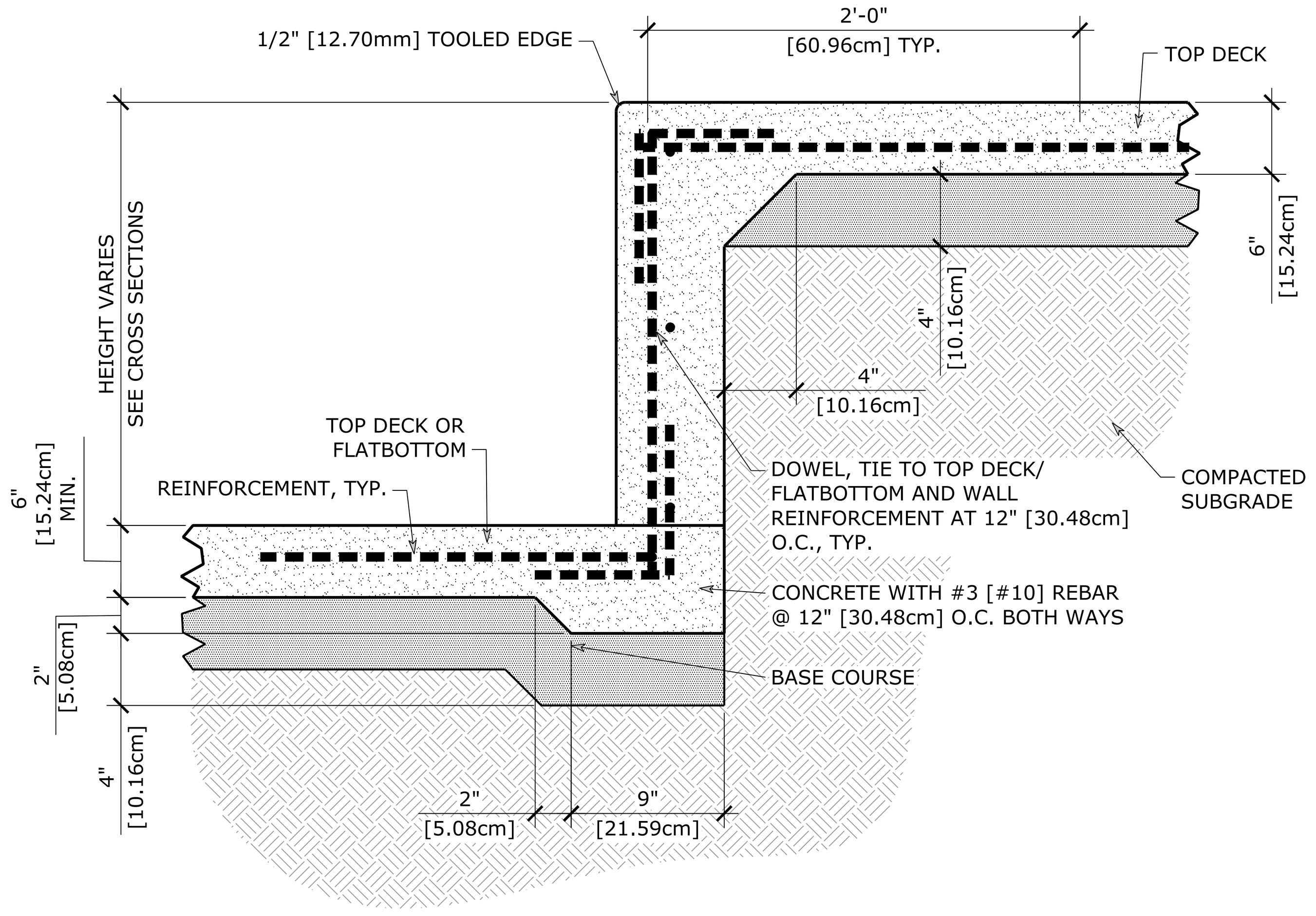


9 DRAINLINE INLET
SCALE: 1-1/2" = 1'-0"

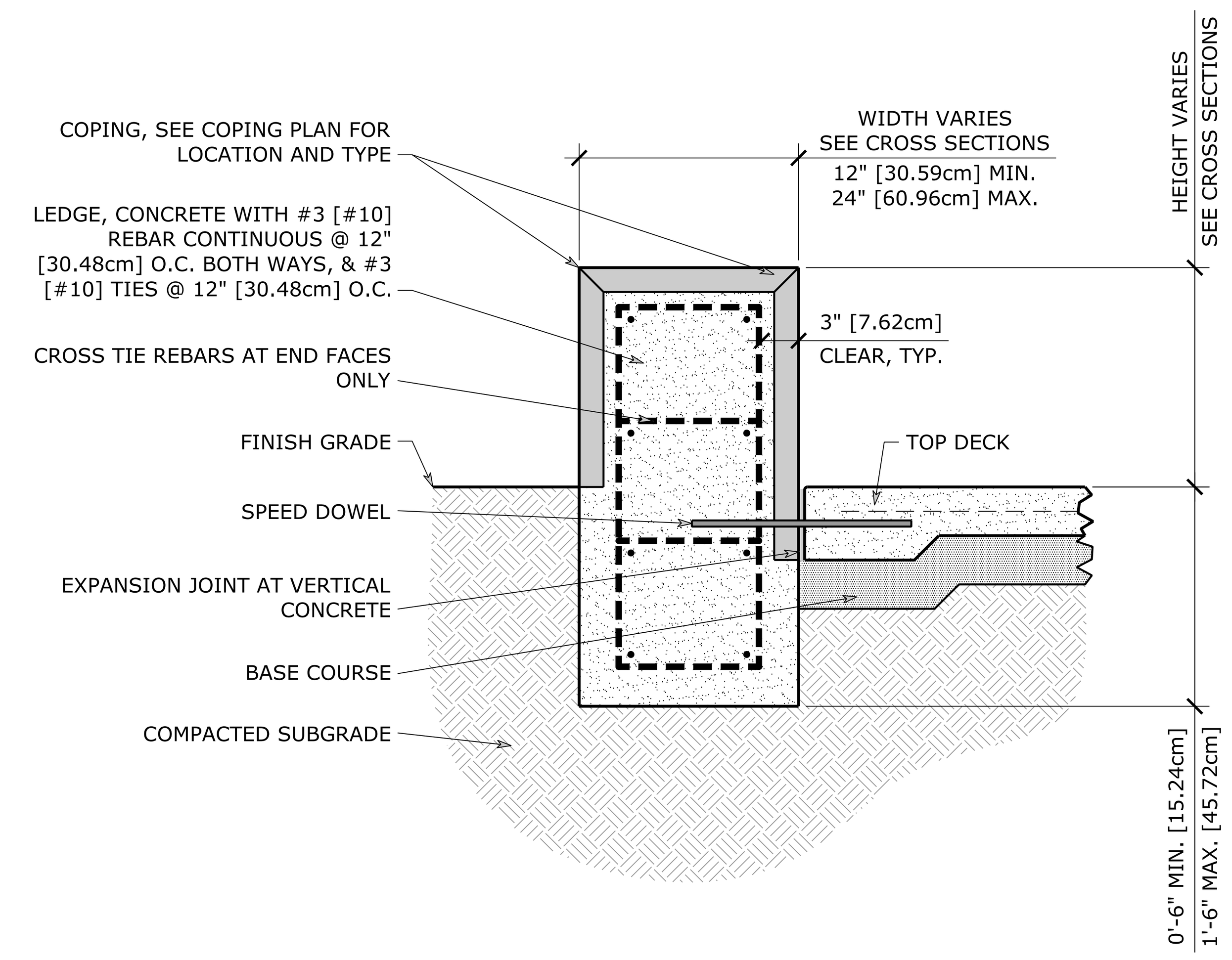
DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
DATE:: 12/07/22

PROJECT:: **PORTSMOUTH SKATEPARK**
PORTSMOUTH, NEW HAMPSHIRE
SHEET TITLE:: CONSTRUCTION DETAILS

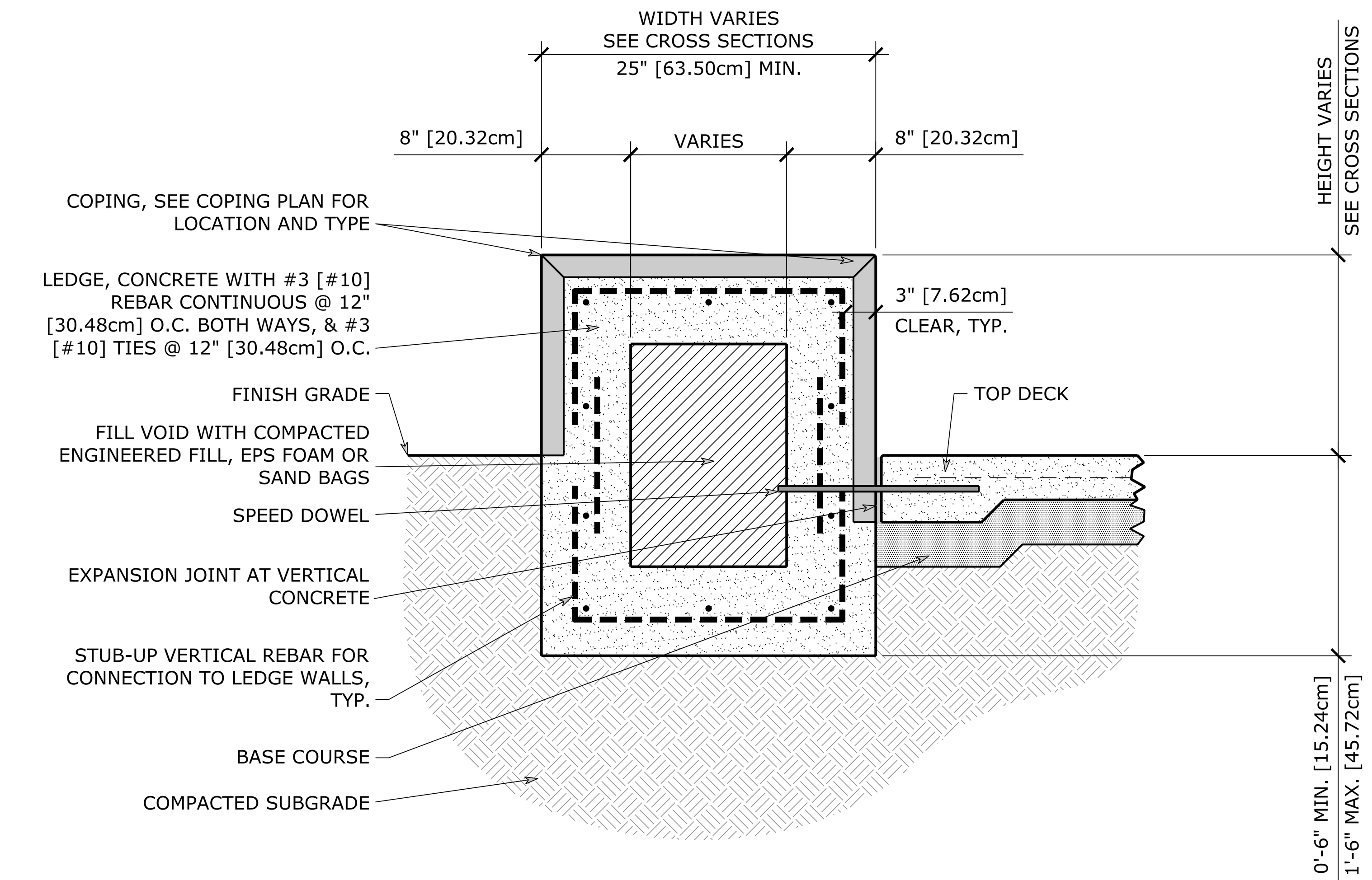
SHEET:: **AS-14** 14 OF 16
SKATE PARK



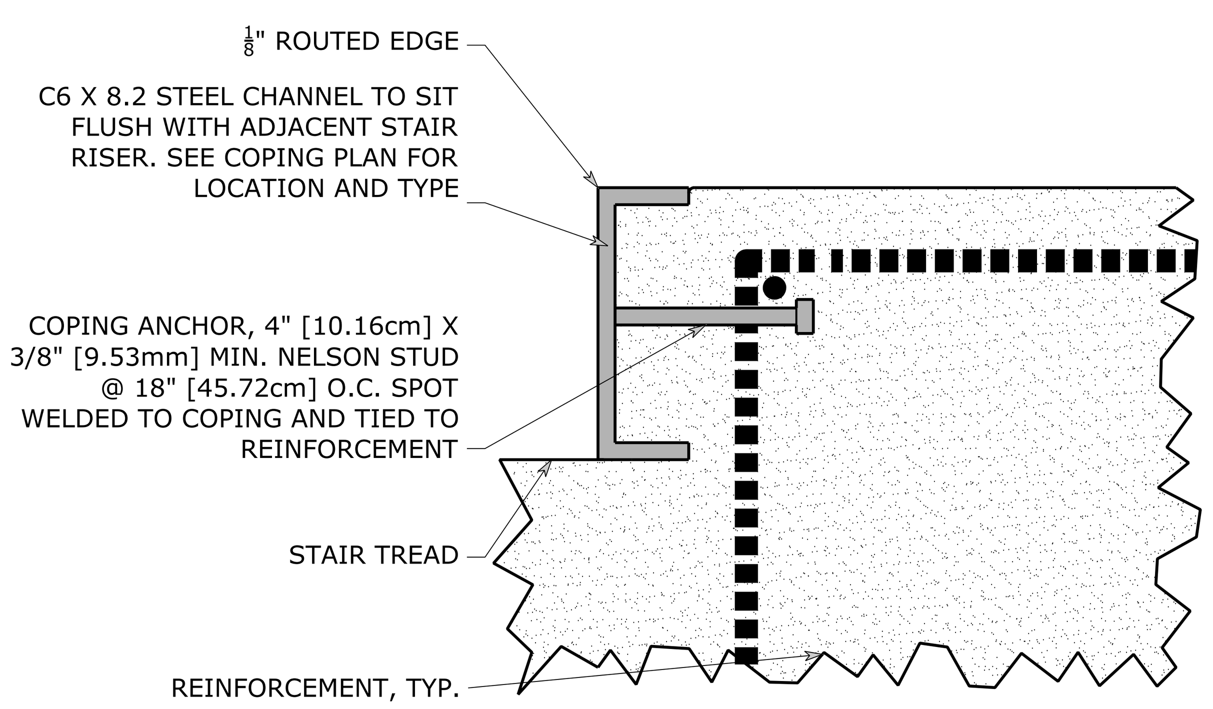
1 CONCRETE TURNDOWN WALL
SCALE: 1-1/2" = 1'-0"



2 CONCRETE GRIND LEDGE - MEDIUM
SCALE: 1" = 1'-0"



3 CONCRETE GRIND LEDGE - LARGE
SCALE: 1" = 1'-0"



4 STAIR COPING - C6 X 8.2 STEEL CHANNEL
SCALE: 3" = 1'-0"

DESIGNED:: PILLAR TEAM
DRAWN:: PILLAR TEAM
PROJECT #:: 20-024
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PROJECT::
PORTSMOUTH SKATEPARK
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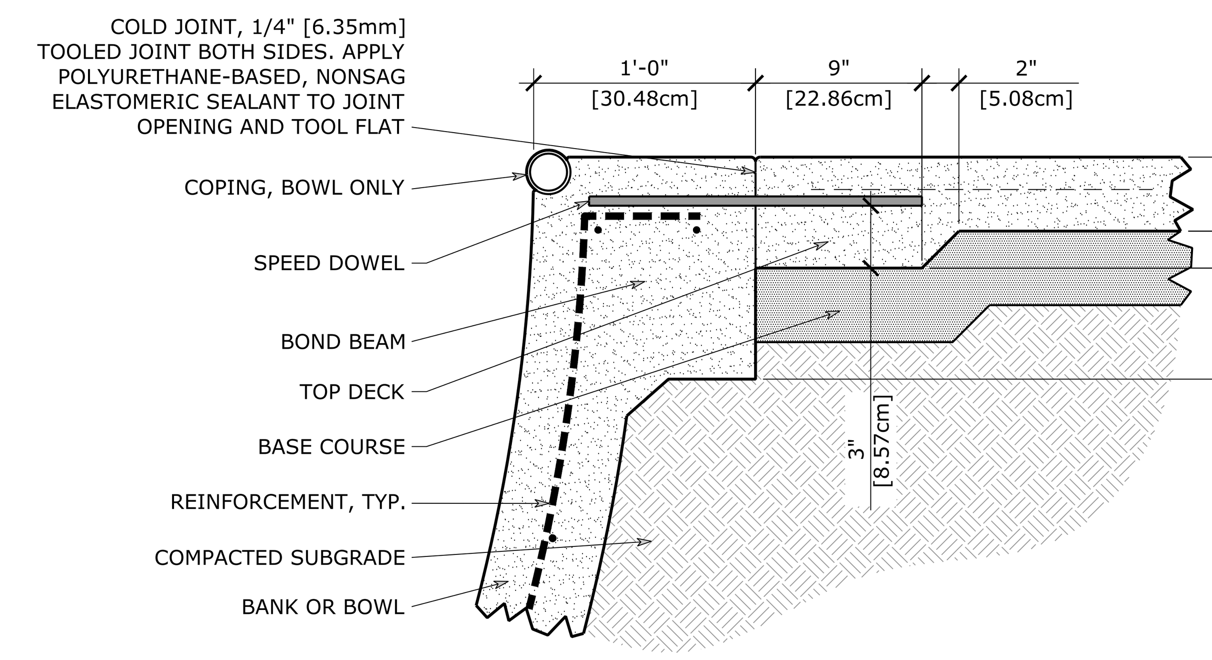
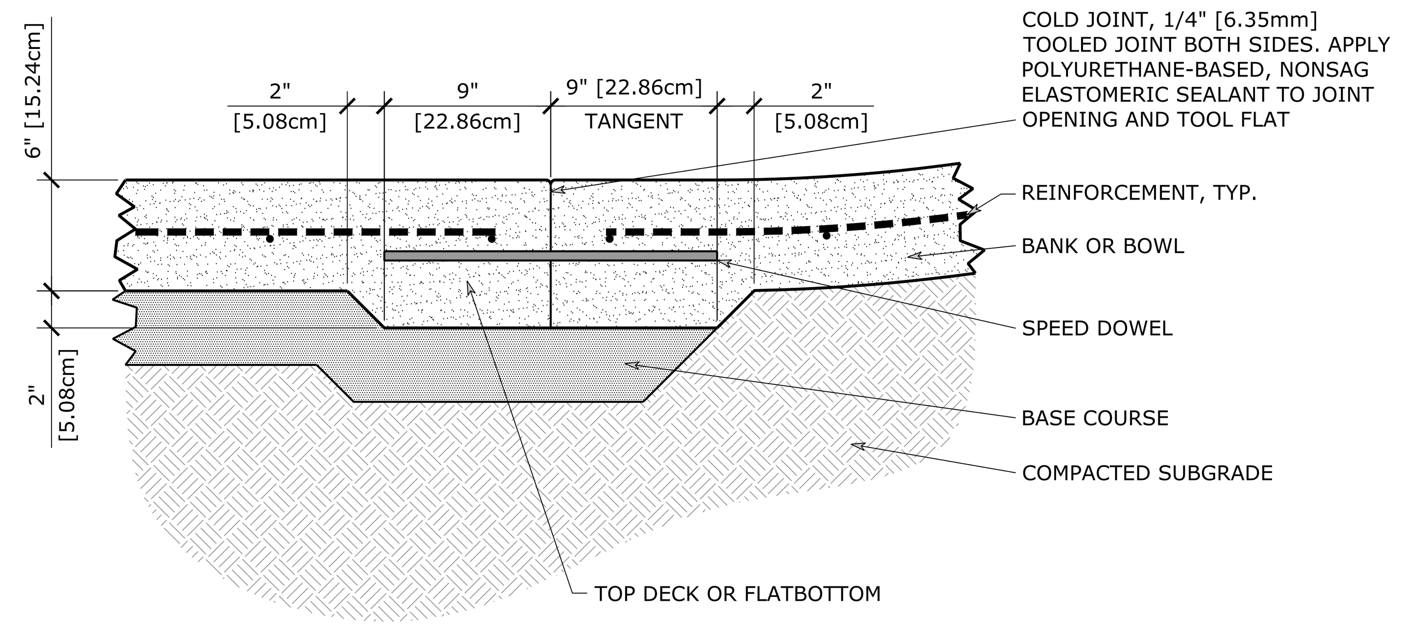
SHEET TITLE::
CONSTRUCTION DETAILS

SHEET::
AS-15

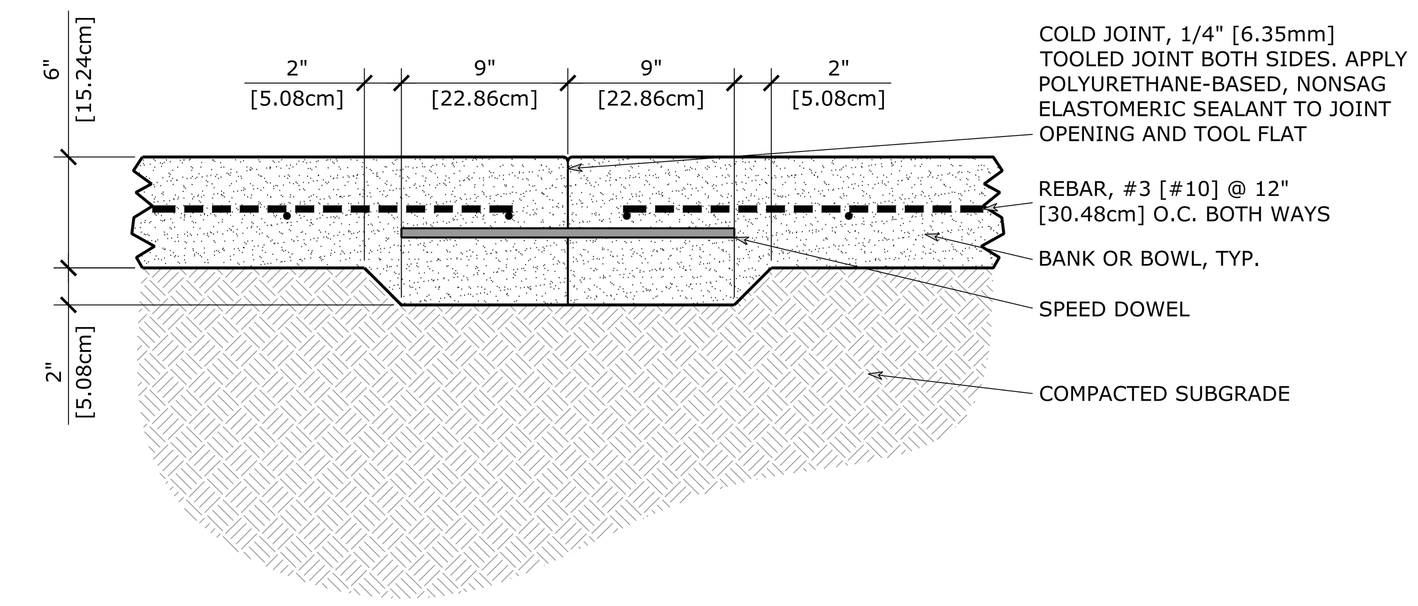
SKATE PARK



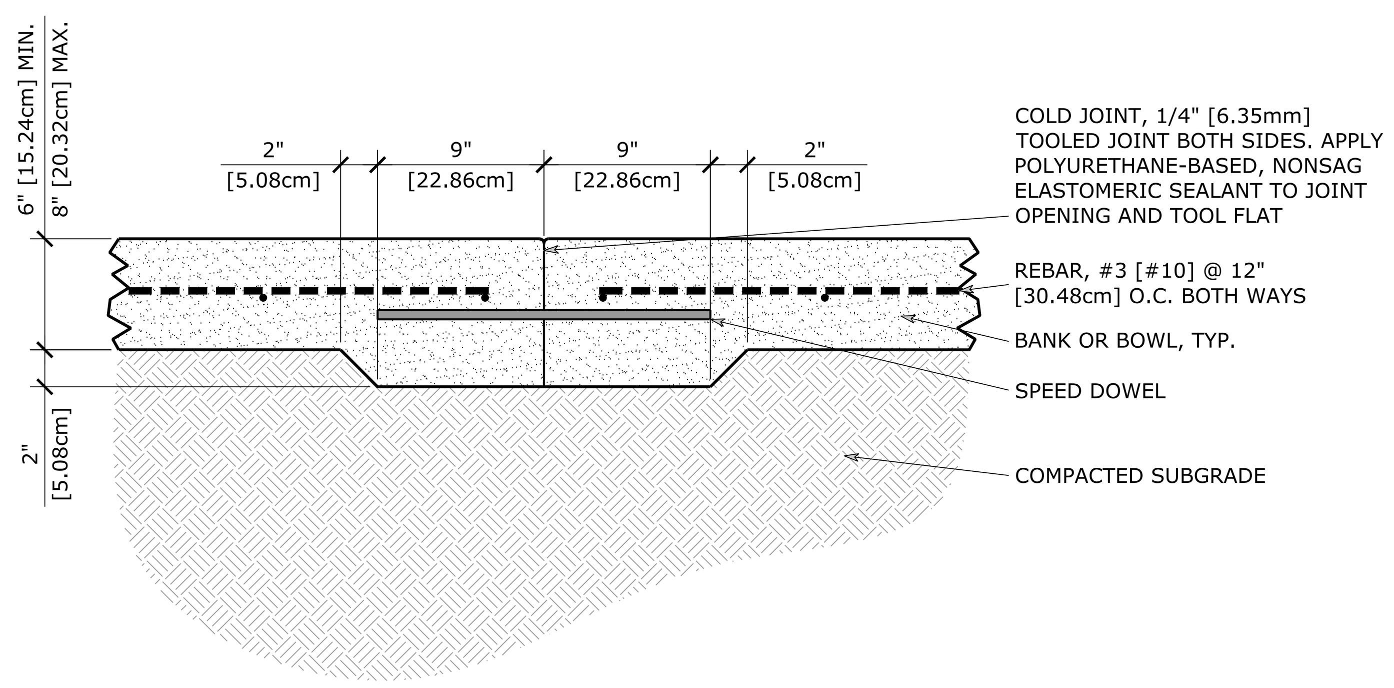
1 COLD JOINT AT BOND BEAM
SCALE: 1-1/2" = 1'-0"



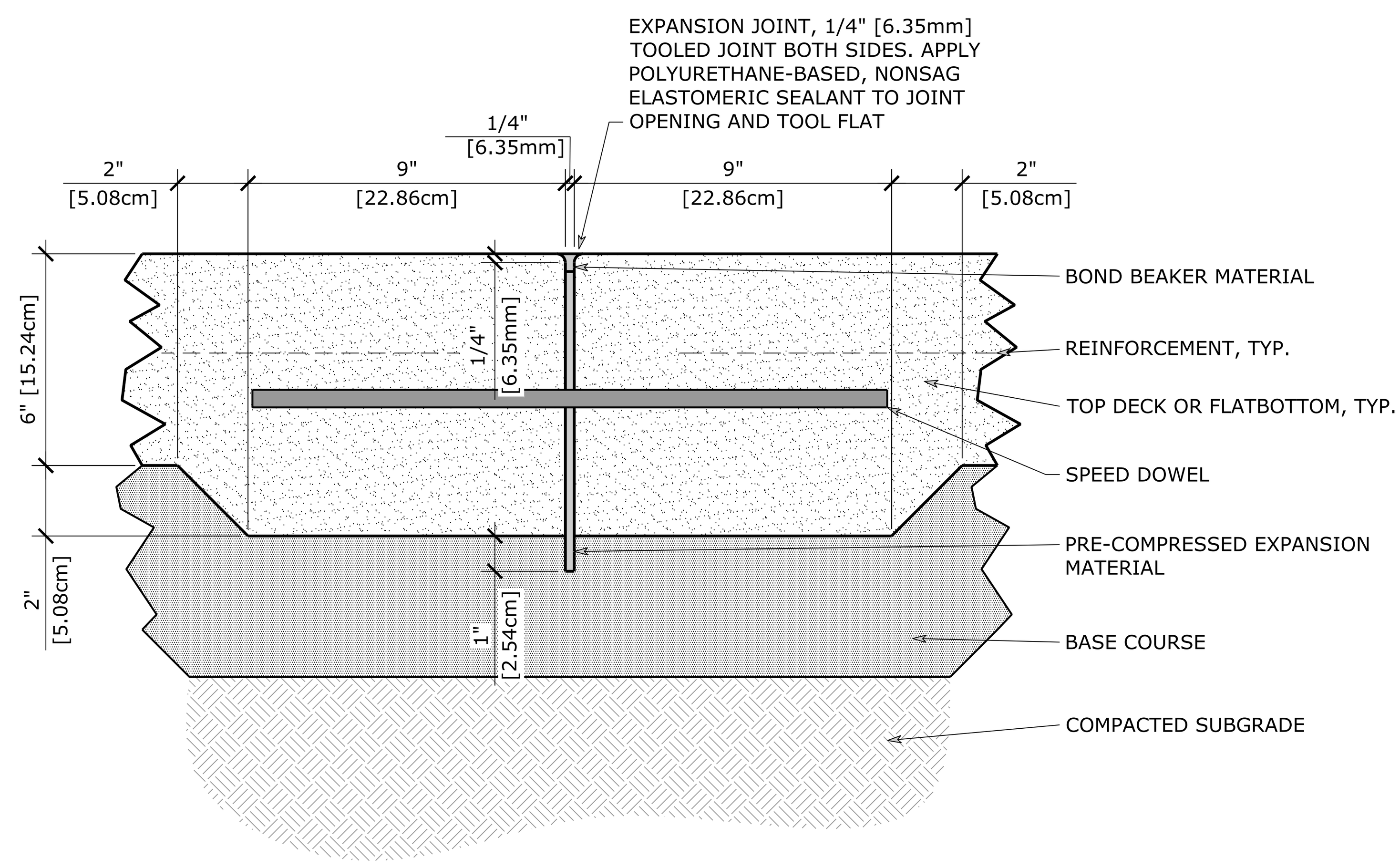
2 COLD JOINT AT SHOTCRETE BOTTOM
SCALE: 1-1/2" = 1'-0"



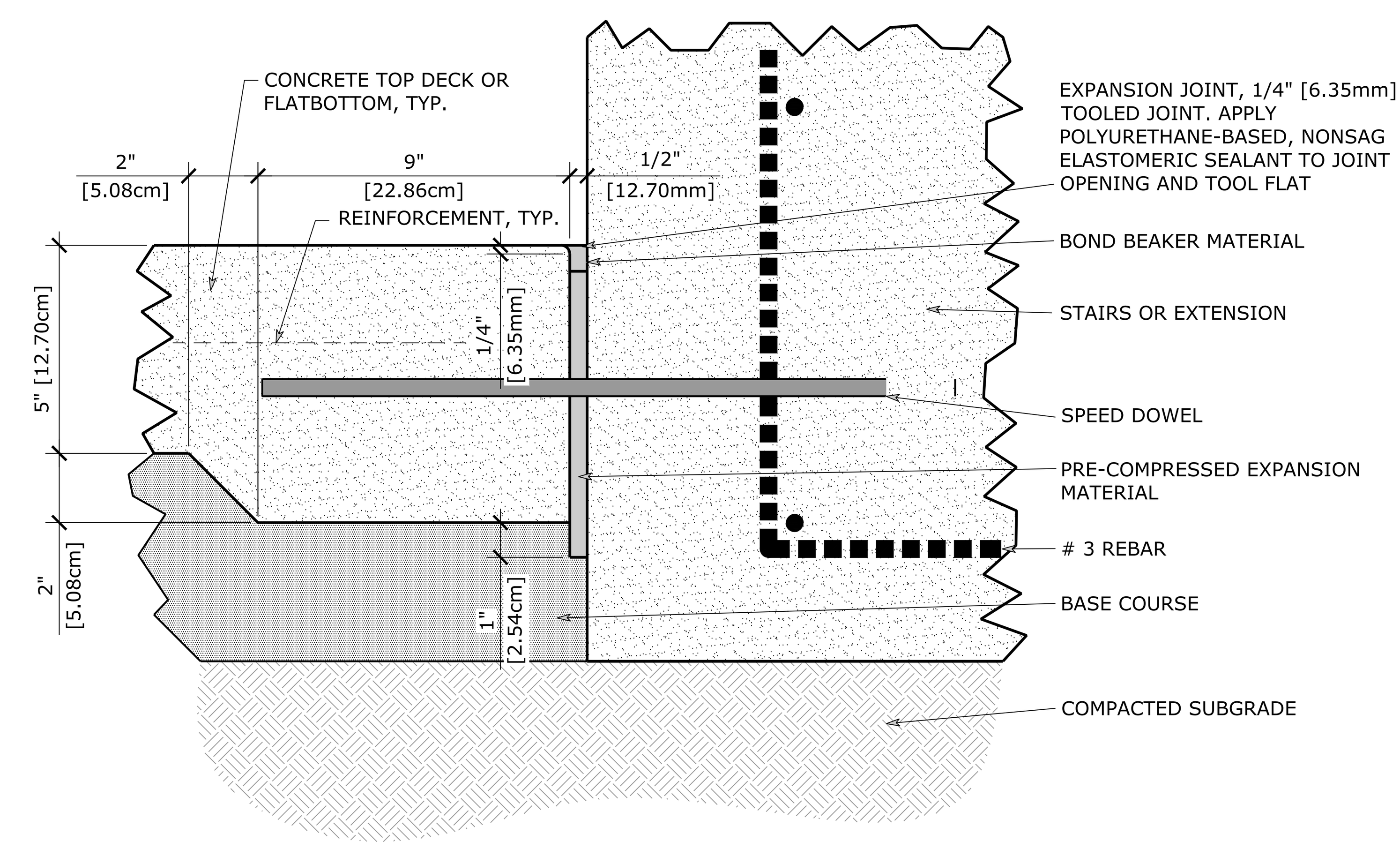
3 COLD JOINT AT MID CONCRETE
SCALE: 1-1/2" = 1'-0"



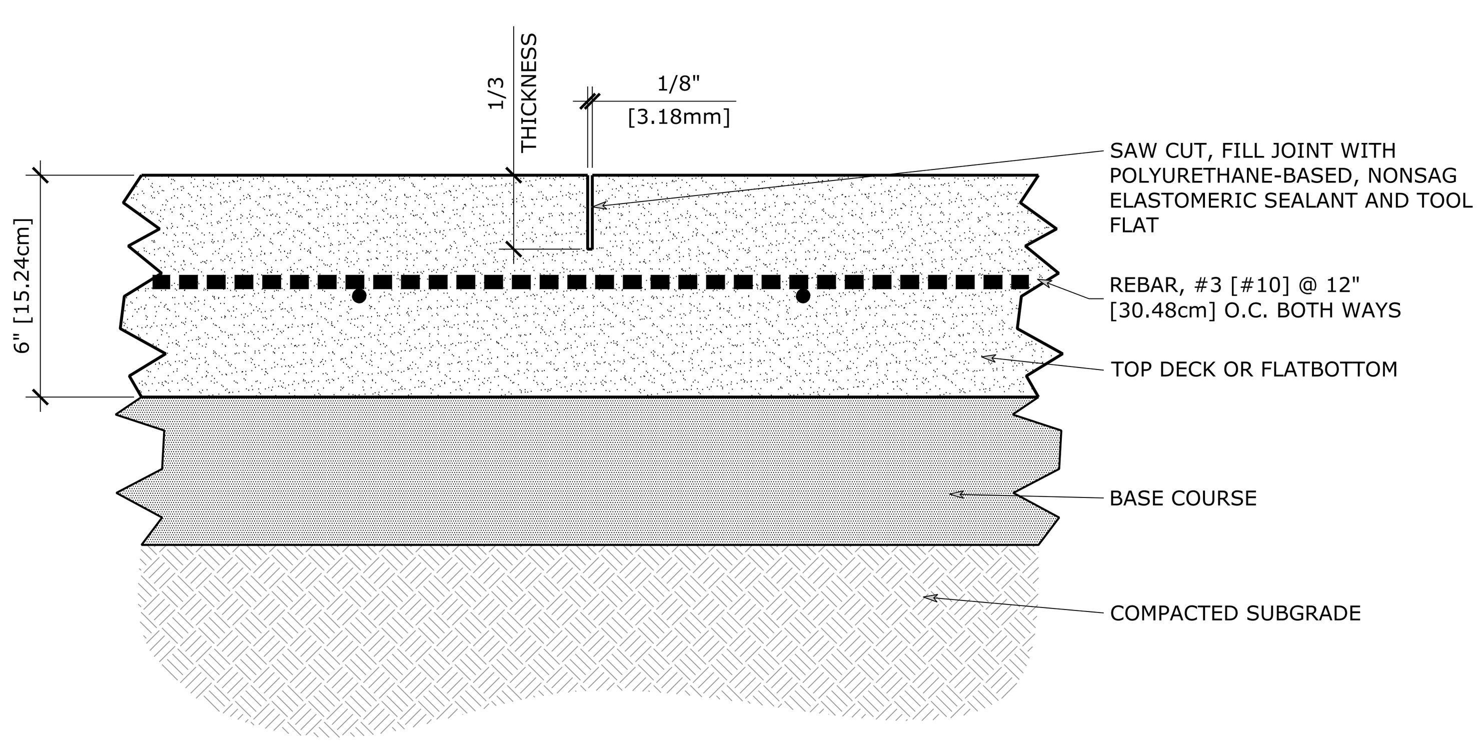
4 COLD JOINT AT MID SHOTCRETE
SCALE: 1-1/2" = 1'-0"



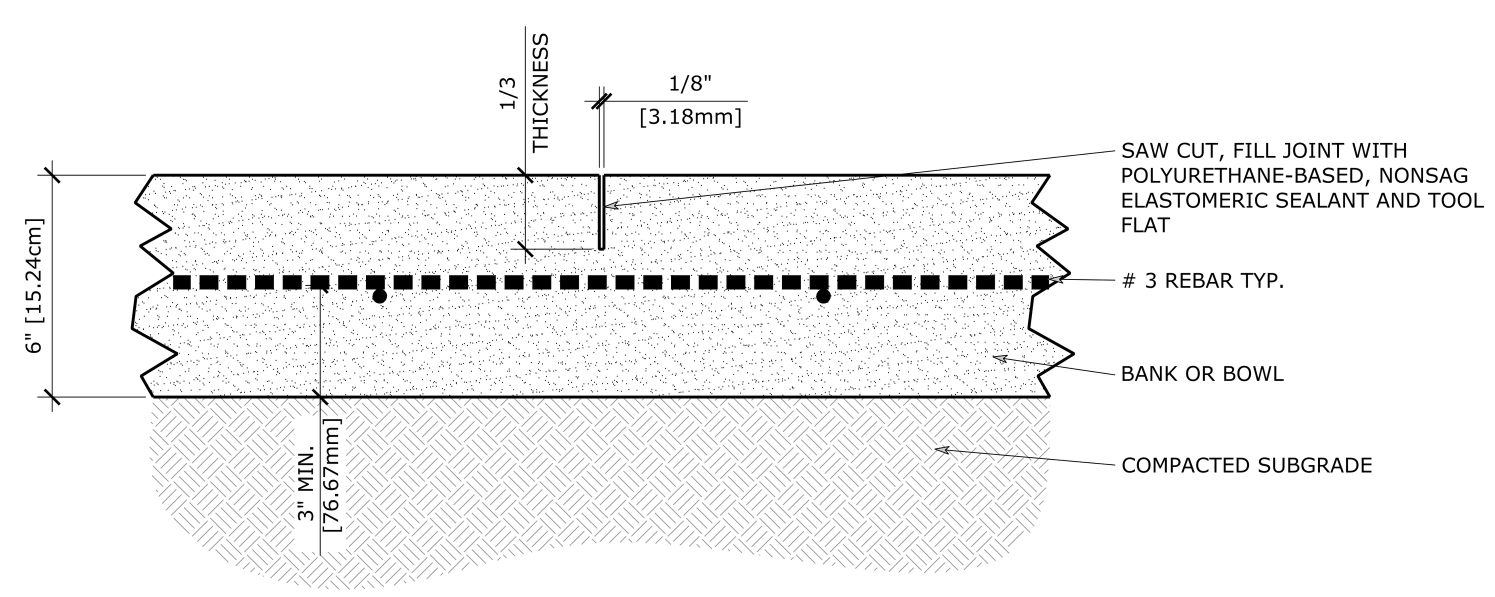
5 EXPANSION JOINT AT MID CONCRETE
SCALE: 3" = 1'-0"



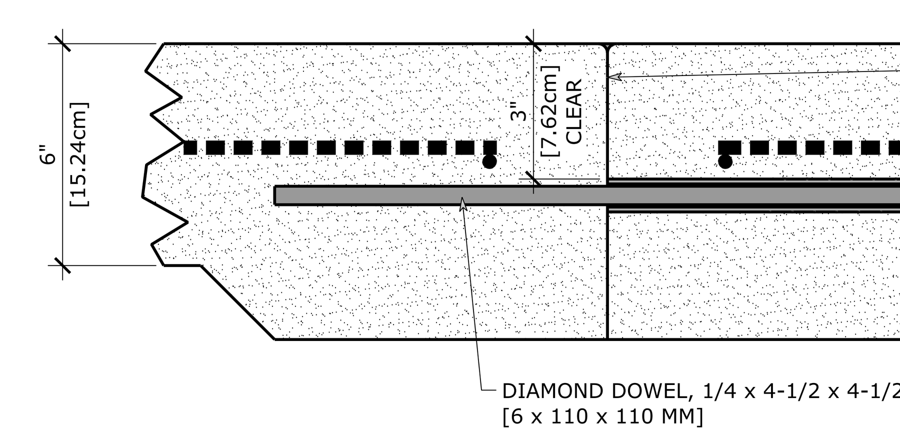
6 EXPANSION JOINT AT VERTICAL CONCRETE
SCALE: 3" = 1'-0"



7 SAWCUT JOINT AT MID CONCRETE
SCALE: 3" = 1'-0"



8 SAWCUT JOINT AT MID SHOTCRETE
SCALE: 3" = 1'-0"



9 SPEED DOWEL
SCALE: 3" = 1'-0"

NOTES:
1. SPEED DOWELS SHALL BE LOCATED AT 1'-6" [0.46m] O.C. ALONG JOINT.

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PROJECT::
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SHEET TITLE::
CONSTRUCTION DETAILS

SHEET::
AS-16
SKATE PARK