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 **June 7, 2022**

AGENDA

I. APPROVAL OF MINUTES

A. Approval of minutes from the May 3, 2022 Site Plan Review Technical Advisory Committee Meeting.

II. OLD BUSINESS

A. 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. (LU-20-259)

B. The request of **The Sagamore Group, LLC, (Owner)** for properties located at **1169 Sagamore Avenue and 1171 Sagamore Avenue** requesting Site Plan Review approval for the demolition of 3 existing principal structures (3 single family units) and 3 existing accessory structures to be replaced with 6 single family structures and 2 2 family structures to total 10 living units and 22 parking spaces where 15 is required. Said properties are shown on Assessor Map 224 Lot 14 and Assessor Map 224 Lot 15 and lie within the Mixed Residential Office (MRO) District. (LU-21-167)

C. The request of **HCA Realty Inc. (Owner),** and **Portsmouth Regional Hospital (Applicant),** for property located at **0 Borthwick Avenue** requesting Site Plan Review Approval for the construction of a satellite parking lot consisting of 520 spaces and associated sit improvements to support the existing hospital facilities currently serviced by 783 parking spaces. Said property is shown on Assessor Map 234 Lot7-4A and is located in the Office Research (OR) District. (LU-22-47)

D. The request of **North Church of Portsmouth (Owner),** for property located at **355 Spinney Road** requesting Preliminary and Final Subdivision approval to subdivide one existing lot with 146,666 square feet of lot area and 10,429.68 feet of frontage into two lots as follows: Proposed Lot 1 with 17,817 square feet of lot area and 117.6 feet of frontage, and Proposed Lot 2 with 128,849 square feet of lot area and 360.62 feet of lot frontage. Said property is located on Assessor Map 169 Lot 1 and lies within the Single Residence B (SRB) District. (LU-22-49)

III. NEW BUSINESS

A. The request of **230 Commerce Way LLC (Owner and Applicant),** for Property located at **230 Commerce Way** requesting **Amended Site Plan Review Approval** to construct a new two-story building with a 12,500 square foot footprint and totaling 25,000 square feet with associated site improvements including lighting, utilities and stormwater treatment/management systems. Said property is located on Assessor Map 216 Lot 1-5 and lies within the Office Research (OR) District. (LU-22-14)

B. The request of **Port Harbor Land, LLC (Owner and Applicant)** for property located at **2 Russell Street** requesting Lot Line Revision Approval to adjust the boundary lines on three lots to create one lot with 18,237 square feet (0.418 acres) of lot area, one lot with 52,651 square feet (1.209 acres) of lot area, and one lot with 19,141 square feet (0.429 acres) of lot area. Said properties are located on Assessor Map 118 Lot 28, Map 124 Lot 12, and Map 125 Lot 21 and lie within the Character District 5 (CD5), North End Incentive Overlay District, Historic District, and the Downtown Overlay District. (LU-22-111)

C. The request of **Port Harbor Land, LLC (Owner and Applicant)** for property located at **2 Russell Street** requesting Site Plan Approval for the construction of 84 residential units, commercial space, and parking in three buildings with associated community space, paving, utilizes, landscaping, and other site improvements including three proposed land transfers to allow for the realignment of the Russell Street & Deer Street intersection and for the City's future construction of a roundabout at Russell Street and Market Street (Land transfer area 1 is proposed from Map 119 Lot 4 to the City of Portsmouth. Land transfer areas 2 and 3 are from Map 119 Lot 1-1C to the City of Portsmouth); Conditional Use Permit Approval to provide 343 parking spaces on separate lots where 341 spaces are required as permitted under Section 10.1112.62 of the Zoning Ordinance; and Conditional Use Permit Approval to allow a 40,000 square foot building footprint within the CD5 as permitted under 10.5A43.43 of the Zoning Ordinance. Said properties are located on Assessor Map 118 Lot 28, Map 124 Lot 12, Map 125 Lot 21, Map 119 Lot 4, and Map 119 Lot 1-1C and lie within the Character District 5 (CD5), North End Incentive Overlay District, Historic District, and the Downtown Overlay District. (LU-22-111)

D. The request of **HCA Health Service of NH IINC (Owner),** for property located at **333 Borthwick Avenue** requesting Amended Site Plan Approval for an 8,700 square foot addition to the existing building with associated landscaping, utilities, sidewalk connectivity, and other related site work. Said property is located on Assessor Map 240 Lot 2-1 and lies within the Office Research (OR) District. (LU-22-35)

IV. OTHER BUSINESS

V. ADJOURNMENT

https://us06web.zoom.us/webinar/register/WN_-Pc8G21cTS2IyeJc4Ych7w

SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

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

2:00 PM **May 3, 2022**

MINUTES

MEMBERS PRESENT: Peter Stith, Chairperson, Principle Planner; David Desfosses, Construction Technician Supervisor; Patrick Howe, Deputy Fire Chief; Shanti Wolph, Chief Building Inspector; Zachary Cronin, Assistant City Engineer, Eric Eby, Parking and Transportation Engineer;

MEMBERS ABSENT: Nicholas Cracknell, Principal Planner; Peter Britz, Environmental Planner;

ADDITIONAL STAFF PRESENT: Stefanie Casella, Planner 1; Beverly Mesa Zendt; Planning Director

I. APPROVAL OF MINUTES

A. Approval of minutes from the April 5, 2022 Site Plan Review Technical Advisory Committee Meeting.

Mr. Eby moved to approve the minutes from the April 5, 2022, Site Plan Review Technical Advisory Committee Meeting, seconded by Mr. Cronin. The motion passed unanimously.

II. OLD BUSINESS

A. **POSTPONED** 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. **POSTPONED** (LU-20-259)

DISCUSSION AND DECISION OF THE BOARD

Mr. Stith noted that this would be postponed to the June 7, 2022, Technical Advisory Meeting.

B. The request of **The Sagamore Group, LLC, (Owner)** for properties located at **1169 Sagamore Avenue and 1171 Sagamore Avenue** requesting Site Plan Review approval for the demolition of 3 existing principal structures (3 single family units) and 3 existing accessory structures to be replaced with 6 single family structures and 2 2 family structures to total 10 living units and 22 parking spaces where 15 is required. Said properties are shown on Assessor Map 224 Lot 14 and Assessor Map 224 Lot 15 and lie within the Mixed Residential Office (MRO) District. (LU-21-167)

SPEAKING TO THE APPLICATION

Joe Coranati and Mike Garrepy spoke to the application. Mr. Coranati commented that they received the comments from TAC and a letter from both Altus Engineering and Ambit Engineering. They only had a couple of questions regarding those. At the last meeting TAC suggested they add a culvert at Sagamore Ave. They talked about not needing a CUP because the work would be in the City's right of way. Mr. Coranati questioned if a CUP would be required for the other side of the road. Mr. Stith confirmed that a CUP would be required for anything out of the right of way that was in the buffer.

Mr. Coranati noted that there was another request for the jellyfish filter, and he assumed that was for the culvert crossing Sagamore Ave. The water is already being treated on site. It would be good to discuss if they could either not add the jellyfish or reduce the treatment on site. Mr. Coranati questioned if the City would maintain the jellyfish filter. It would be good to meet offline with Altus and DPW to discuss this.

Mr. Garappey commented that they would have to come back another time. The hope is that when they are done the technical aspects this can be advanced even if there were some outstanding items that are outside TAC's purview. Ms. Zendt noted that Staff has envisioned that once this cleared TAC they can go to the Conservation Commission and Council. After that it can go to the Planning Board.

Ms. Zendt questioned if Mr. Desfosses agreed with the plan to have an offline meeting with DPW and Altus. Mr. Desfosses confirmed he did. Mr. Garappey commented that part of the treatment would be for the runoff from the sidewalk. It will be good to figure out how to handle that.

TAC Comments:

1. We assume all the prior comments were addressed, as there was no list of prior comments submitted.

   Items to be addressed prior to Planning Board approval:

2. The culvert across Sagamore will need treatment before being discharged. DPW recommend a Jellyfish style filter.
3. Add existing force main to drawing showing cross Sagamore culvert and add note regarding insulation of force main required near culvert.
4. The proposed culvert will need a temporary construction easement, permanent flowage easement, and permanent easement for the installation and placement of materials.
5. The proposed culvert will need City Council approval.
6. The proposed culvert will require review by the Conservation Commission.
7. Please show that the proposed culvert and flowage meets the conservation restrictions of parcel 201/26.
8. Staff are still waiting for the third party review of the project.

PUBLIC HEARING

Bill Bowen, President of the Sea Star Cove HOA noted that they own the property to the north and the west. They would like to see this area developed; however, 10 units is too intense and will impact the drainage. The culvert answers the immediate problem. They are concerned about the landscaping around their property. They have had discussions about adding a row of trees along the west boundary between these properties and running it around the corner on the north side. John Chagnon reviewed this and sent his recommendations via a letter to TAC. The drainage should be designed properly. They have an easement that they inherited from Consolidated Communications. It runs through the Sea Star property and connects to the pole that this project is proposing to relocate. Mr. Bowen was not sure whose responsibility it was to resolve any issues with that. Mr. Bowen's final concern was about the construction period. This setting will have a lot of blasting. Mr. Bowen questioned if the construction equipment would come in off Sagamore Rd. They have had people coming onto the Sea Star property without notification in the past. They just want to be sure no one is putting equipment on their land.

Ms. Zendt noted that the questioned how far the landscaping should be extended around the corner. Mr. Bowen responded that it should be 10-15 yards. Mr. Garappey confirmed that would not be an issue to add that in. They will stop the landscaping at the oak tree. They will add a note to the plan.

The Chair asked if anyone was else present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to postpone consideration to the June 7, 2022, Technical Advisory Meeting, seconded by Mr. Eby. The motion passed unanimously.

C. The request of **Mastoran Restaurants Inc. (Owner) and Granite State Convenience (Applicant),** for property located at **2255 Lafayette Road** requesting Site Plan review and Conditional Use Approval for use 19.40 under Section 10.440 to allow a drive-thru

facility as an accessory use to a permitted principal use in the Gateway Corridor Zone. Said property is shown on Assessor Map 272 Lot 3 and lies within the Gateway Corridor (G1) District. (LU-22-13)

SPEAKING TO THE APPLICATION

Nicole Doucette from GPI, Attorney John Bosen, and Brad Pernaw from the Common Man spoke to the application.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Add note in plain sight near sewer connections that all work regarding the City sewer is to be witnessed by DPW staff, provide 48 hours' notice.
    a. Ms. Doucette responded that they were fine with adding that note.
2. If existing water service is not reused then show note abandoning it at the water main.
    a. Ms. Doucette responded that they do have a note about discontinuing the water main. It is on the demo plan and the utility plan.
3. Please use porous pavement for any new pavement that will be installed in the wetland buffer.
    a. Ms. Doucette responded that they were requesting to remove that sidewalk. Right now, there is no connection and no crosswalk to the multi-use path. They are asking to remove the connecting sidewalk for now until there is a need for it. They will add a sidewalk in the future if there is a connection to the multi-use path in the future.

Post Construction

4. After connections are terminated and created, the applicant will video inspect the two spots to confirm that no groundwater is infiltrating.
    a. Ms. Doucette responded that they had no problem with this comment.

Mr. Eby commented that he was concerned about removing the sidewalk because people will be coming from the Water Country across the street. Ms. Doucette responded that they were removing it because of the buffer issue. They could put the sidewalk on the other side. Mr. Eby confirmed that would work.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Ms. Zendt noted that the only outstanding comment was to relocate the sidewalk to the northwest side of the side of the site to create a connection to the multi-use path.

Mr. Desfosses moved to recommend approval to the Planning Board, seconded by Mr. Howe with the following stipulations:

Items to be addressed before Planning Board approval:

1. A note is added to the planset (near the sewer connections) that states all work regarding to the City sewer is to be witnessed by DPW staff, provided 48 hours' notice.

2. The sidewalk proposed onsite will be moved to the northwest side of the site and removed from the wetland buffer area in the southwest corner.

Post Construction:

3. After connections are terminated and created, the applicant will video inspect the two spots to confirm that no groundwater is infiltrating.

The motion passed unanimously.

D. The request of **HCA Realty Inc. (Owner),** and **Portsmouth Regional Hospital (Applicant),** for property located at **0 Borthwick Avenue** requesting Site Plan Review Approval for the construction of a satellite parking lot consisting of 520 spaces and associated sit improvements to support the existing hospital facilities currently serviced by 783 parking spaces. Said property is shown on Assessor Map 234 Lot7-4A and is located in the Office Research (OR) District. (LU-22-47)

SPEAKING TO THE APPLICATION

Patrick Crimmins spoke to the application. They submitted a revised package with responses to the comments from the last meeting. Mr. Crimmins reviewed the new set of comments.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Please note the redirection of drainage flow may dry out the wetland in the central area of the lot.
    a. Mr. Crimmins responded that the storm water has been designed to mimic the current flow patterns. It is all going to the larger wetland complex. Mr. Desfosses noted that it looked like it was out-letting in a different spot. Some of the upper areas may get dried out. Mr. Crimmins commented that they were trying to avoid the buffer. Mr. Desfosses noted that they should try to shift it 40-50 feet.
2. There is at least 1 tree shown being planted over a subsurface drainage detention system.
    a. Mr. Crimmins responded that they tried to carefully avoid the trees, so they will shift to make sure there is separation on the plan.
3. Drainage study to be reviewed and approved including the calculations submitted for the Culvert at the intersection of Borthwick and Rt1 Bypass.

   a. Mr. Crimmins agreed. They are working with DPW on the culvert. They revised the model based on the comments and will add the calculations to the drainage study.
4. Please add a note that all work in the City ROW is subject to DPW review and approval.
   a. Mr. Crimmins agreed. They will update it.
5. Near the top of the hill on Borthwick, the applicant is showing re-grading the edge of the ROW which will kill the existing street trees. Is this necessary?
   a. Mr. Crimmins responded that they were regrading 6 inches around the trees. There will be a little regrading because of the curb.
6. Please address pavement thicknesses as the specified are insufficient for modern pavements.
   a. Mr. Crimmins confirmed they would change it.
7. The RRFB's will require a maintenance agreement for the owner to maintain in perpetuity.
   a. Mr. Crimmins confirmed that they would add a note.
8. It looks like the hydrant on Borthwick will need to get pushed back about 2'
   a. Mr. Crimmins responded that they looked at it when they laid out the path. If they need to, they will move it. They will add a note. Mr. Desfosses clarified that it was two hydrants on the path.
9. Add curb to the other side of Borthwick as well (parking lot side) to control drainage along the steep portion from elevation 46 to the driveway of the smaller lot. Add an additional catch basin just prior to the driveway to intercept the concentrated flow created by the curbing.
   a. Mr. Crimmins responded that the curb was already shown. They will add another catch basin.
10. Please address if the PJFF1 structure should be uphill of the infiltration basin to clean the flow before infiltration.
   a. Mr. Crimmins responded that they should be uphill because the infiltration basin is doing the treatment before it goes in.
11. Internal sidewalk on islands should have tip down ramps.
   a. Mr. Crimmins agreed. They will update it.
12. Aisles intersecting driveway at entrance should have stop signs and stop lines.
   a. Mr. Crimmins agreed and confirmed it would be added.
13. If possible, HP access aisles should have NO PARKING signs at front of aisle.
   a. Mr. Crimmins agreed and confirmed it would be added.
14. Driveway at EDF Avenue should have double yellow center line and stop sign and stop line.
   a. Mr. Crimmins agreed and confirmed it would be added.
15. Provide test pits for ledge and groundwater near the two stormwater detention areas. This is critical to prove the drainage design will function properly.
   a. Mr. Crimmins responded that they have performed test pits and borings. They will add it to the drainage study.
16. Staff are still waiting for the third party review of the project.
   a. Mr. Crimmins agreed.

Prior to Construction

17. There are multiple City street trees being effected, the removal of them will require permission from the Trees and Greenery Committee.

Mr. Crimmins responded that the biggest outstanding component was the peer review. All of the other comments are minor.

Mr. Eby commented that they needed a turnaround area at the end of the dead-end aisle. Mr. Crimmins confirmed that they would update the plan.

Mr. Desfosses commented that it looked like the soil had a restrictive layer 3 feet down and if there was a plan to address that. Mr. Crimmins responded that they could excavate that. The soil underneath is well drained.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Cronin moved to postpone consideration to the June 7, 2022, Technical Advisory Meeting, seconded by Mr. Howe. The motion passed unanimously.

III. NEW BUSINESS

A. The request of **404 Islington Street LLC (Owner),** for property located at **404 Islington Street** requesting a Conditional Use Permit under Section 10.1112.14 of the Zoning Ordinance to provide ten (10) parking spaced where thirteen (13) are required. Said property is shown on Assessor Map 145 Lot 33 and is located in the Historic District and the Character District 4L-2 (CD4-L2). (LU-22-74)

SPEAKING TO THE APPLICATION

John Chagnon, John Bosen, and Sarah Howard spoke to the application. Mr. Bosen commented that this was an existing inn that has 7 rooms and a caretaker suite. The only exterior renovation is a handicap ramp on the outside. There will be an indoor renovation to bring it to 10 units and they are getting rid of the caretaker suite. In respect to comment 2, it is currently owner occupied, but will not be in this proposal. They are showing 11 parking spaces on the plan. There will be one for each unit would and one overflow space. They are required to have 14 spaces, so they will be seeking a CUP. There is a comment about not meeting the dimensions. They are taking the position that they are grandfathered because they are the existing dimensions and have been like that for many years. The last comment was confusing because this is an inn

and that will be the continued use. Because it is a continuance of use, they should not need a special exception.

Mr. Stith commented that it was their understanding that the use would be expanded to increase the number of rooms. That is allowed by special exception. Ms. Zendt added that today it is owner occupied, but when this proposal converts it to an inn it would not be. The owner-occupied distinction is the change of use. When it is owner occupied there is an understanding in the neighborhood that it will be taken care of in a certain way. When the caretake mode shifts that is a change of use and should be recognized by a special exception.

Mr. Chagnon commented that there would be a minor increase in traffic by 4 trips on a weekday. The models show there is enough parking to satisfy the demand. Mr. Eby noted that ITE says one thing and the City requirements say another.

Mr. Chagnon commented that they did look at the catch basin that was mentioned at the work session. They are working to get it cleaned out. They will get the requested information soon.

Mr. Howe questioned what the current number of units in each building was and what it would be with this proposal. Mr. Bosen responded that there are 7 units now with a care takers unit. Currently there is 4 in one building and 4 in the other. The proposal will have 6 in one and 4 in the other. Mr. Howe questioned if there would be one bed per unit. Mr. Bosen confirmed that was correct.

Mr. Wolph questioned if the change of use classification was because it was going from a bed and breakfast to an inn. Ms. Zendt confirmed that was correct, but the bigger distinction was the change in owner occupation. Mr. Wolph questioned if there would be handicap access. Ms. Howard responded that they were providing a handicap ramp to the main entrance.

Mr. Bosen commented that they would prefer to get the CUP for parking before getting the special exception. Mr. Stith confirmed that was fine.

Mr. Eby commented that it was critical to have off site parking providing as per the City requirements. Ms. Zendt commented that they have seen several situations like this come to the Planning Board. They like to see if there is an opportunity to share parking. Mr. Bosen confirmed that they have had good discussions with their neighbors.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Supplied parking doesn't meet dimensional standards. Short on parking overall. Need commitment to supply off-street parking per requirements.
2. Please confirm if the existing use is currently owner occupied.
3. Please submit a special exception application per Section 10.440, Use 10.22 of the Zoning Ordinance.

PUBLIC HEARING

Elizabeth Bratter of 159 McDonough St. commented that she only counted 9 spaces on the plan. Ms. Bratter questioned how many parking spots were on site and how many would need to be provided in the neighborhood.

John Changon commented that the C2 plan shows 2 spaces off Union St. That brings the onsite parking up to 11 spaces.

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Ms. Zendt reviewed the outstanding comments. Ms. Zendt noted that it would be more transparent to go for a CUP after the special exception, or they could make a note that they were seeking that at a later date. Mr. Bosen confirmed it could be a condition of approval. Ms. Zendt confirmed that worked.

Mr. Howe commented that they have an appointment next week to go see this work will require a sprinkler system. Until they know that answer, they wouldn't know if utility work was needed for that.

Ms. Zendt encouraged the applicants to explore opportunities for outside parking and seek a special exception as condition of their approval.

Mr. Desfosses moved to recommend approval to the Planning Board, seconded by Mr. Eby with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. Applicant explores and identifies supplemental parking opportunities to meet parking requirements as defined in the ordinance and present findings to Planning Board.

Prior to Building Permit Issuance:

2. Applicant obtains special exception approval per section 10.440 of the Zoning Ordinance.

The motion passed unanimously.

B. The request of **North Church of Portsmouth (Owner),** for property located at **355 Spinney Road** requesting Preliminary and Final Subdivision approval to subdivide one existing lot with 146,666 square feet of lot area and 10,429.68 feet of frontage into two lots as follows: Proposed Lot 1 with 16,820 square feet of lot area and 117.58 feet of frontage, and Proposed Lot 2 with 129,846 square feet of lot are and 360.62 feet of lot

frontage. Said property is located on Assessor Map 169 Lot 1 and lies within the Single Residence B (SRB) District. (LU-22-49)

SPEAKING TO THE APPLICATION

Doug Woodward and Nathan Ansen spoke to the application. Mr. Woodward commented that they were looking to separate the parish house and parsonage to sell the parish house. The main purpose is to isolate the parsonage on close to a minimum lot as possible. There was a comment on the sewer coming out of the back of the parsonage. There are a lot of old sewer connections in that neighbored and they go to the City sewer on the Bypass. They rebuilt the section between the cleanout and the portion on the neighbor's property recently because the line had collapsed. It has been suggested that they move the property line back to encompass the sewer, so it stays with parsonage. Mr. Woodward confirmed they could move the property line back. TAC asked about confirming the sewer service to the parish house. It does go out of back of the building to the Bypass. They have plumbing along Spinney Rd. It was built in the 1960s but there is no plan with the City. They can put in a dye tab to confirm water is running through. It is a slab on grade structure and there are no manhole covers or cleanouts. TAC asked about the property line in the front why it did not align with the old stone wall. They wanted the minimum frontage to not burden the church with excess land maintenance and leave as much with parish house as possible for whatever purpose.

Mr. Desfosses commented that it was important to know where the sewer line is before they subdivide. They need to know if the sewer is going across the parsonage lot. They need to make sure easements aren't needed. The dye test can work to confirm it is flowing to the Bypass. It makes sense to extend the property line to the stone wall because it would be odd for someone to go around the wall to maintain lawn. Mr. Woodward responded that another option could be to put an easement on that area for the church to maintain it. Mr. Desfosses responded that either option could work.

Mr. Woodward questioned how they would set up the dye test. Mr. Desfosses responded that they could coordinate that with the sewer department.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Don't assume easement for sewer. Show it and record it.
2. Confirm location of sewer services for both the church building and the home.
3. Please adjust boundary line to align with the stone wall at the front of the property line.
4. Please adjust the back lot line to encompass the sewer line that services Proposed Lot 2.

PUBLIC HEARING

Tyler Kelly of 245 Spinney Rd. appreciated the back lot line easement. Mr. Kelly questioned what the resolution was on the land on the other side of the rock wall. Mr. Desfosses responded that it would be part of the parsonage lot or have an easement.

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to postpone consideration to the June 7, 2022, Technical Advisory Meeting, seconded by Mr. Cronin. The motion passed unanimously.

C. The request of **James** and **Gail Sanders (Owners),** for property located at **445 Marcy Street** requesting Preliminary and Final Subdivision approval to subdivide one lot with 14,947 square feet of lot area and frontage on Marcy Street, Pray Street, and Partridge Street into two lots as follows: Proposed Lot 1 with 6,127 square feet of lot area and 102.43 feet of frontage on Marcy Street and 67.83 feet of frontage on Pray Street, Proposed Lot 2 with 8,820 square feet of lot area and 802 feet of frontage on Pray street and 62.44 feet of frontage on Partridge Street. Said property is located on Assessor Map 101 Lot 3 and lies within the General Residence B (GRB) and Historic Districts. (LU-22-79)

SPEAKING TO THE APPLICATION

Eric Weinrieb, Jim Sanders, and Tracy Kozak spoke to the application. Mr. Weinrieb commented that this property was on the waterfront. The lot is .34 acres and has frontage on 3 streets. By frontage they have enough land for 3 lots, but they are 53 sf short for having the required area for 3 lots. They did not want to do a variance. This proposal is for a 2-lot subdivision. One lot will be 6,127 sf and front on Marcy St. The second lot is 8,820 sf and will front on Partridge St. and Pray St. It is as simple 2 lot division. The owners are relocating to one lot, so they went through the design process an developed a site plan. There will be a 17-foot-wide entrance with a 2-car garage. There will be a handicap accessible walkway. The walkway will go out to Pray St. They will mitigate the stormwater with a permeable driveway. Partridge St. floods now, so they created a larger storm water management area to the east of the driveway. There is an existing 6-inch discharge pipe that goes across the abutting property to a catch basin at Sanders Lobster Pound. Then it goes out to the harbor. The parcel is in the 250-foot shoreland buffer zone and a portion is in the 100 year flood zone. The set finished floor is at 13 to mitigate that.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Where does the 6" pipe go and does this lot have rights to it?
    a. Mr. Weinrieb responded that this was discussed above.
2. City sewer in Pray St is 8" pvc, cut into it and install a wye and use gasketed solid couplings on either side of the wye.
    a. Mr. Weinrieb responded that they could make adjustments.
3. 8" pipe is too small for inserta-tee both for sewer and underdrain connection to culvert.
4. 1½" water service is likely too large for this property.
    a. Mr. Weinrieb confirmed that this could be reduced to one inch.

5. Coordinate with DPW, Eversource, Consolidated Communications, and Comcast and report back on the implications of undergrounding wires as shown. Additional guying or other work may be necessary and not possible/feasible.
    a. Mr. Weinrieb confirmed that they would coordinate with everyone.
6. Driveway for lot 1 will need to be at least 30 feet from intersection with Marcy Street.
    a. Mr. Weinrieb responded that they would add a note.

Mr. Desfosses questioned what they were doing for provisions for storm water for lot 1. Mr. Weinrieb responded that they were showing an area that would allow drainage to continue to the abutting property. Whoever builds on that lot will need to balance the runoff on their site. Mr. Desfosses questioned if there would be something in the deed saying they allow lot 1 to drain onto lot 2. Mr. Weinrieb responded that they could add a note.

Mr. Howe questioned if lot 2 would have a Partridge St. address. Ms. Kozak responded that the front faces Pray St. but the driveway will be on Partridge St. Mr. Howe commented that they have had issues in the past when the street address does not match the driveway. Mr. Weinrieb commented that there was a prominent front on Pray St. Ms. Kozak added that the driveway was on Partridge St. at the back of the property to comply with HDC. Mr. Howe commented that the ambulance will want to go to the driveway. Ms. Kozak responded that they wanted the driveway to go straight through, but were told that needed a variance. The front door is on Pray St. Mr. Weinrieb added that there was a side door that faced Marcy St. Mr. Howe commented that they can discuss the misleading address later. They also need to be able to get to a door within 50 feet of the street or the house will need a sprinkler system. Ms. Kozak responded that the side door could work.

Mr. Wolph questioned if the mailbox would be on Pray St. Mr. Weinrieb confirmed it would. Most mailboxes area building mounted in this area.

Ms. Zendt questioned why the primary entrance was not with the driveway. Ms. Kozak responded that it was because of the topography. There is a 7-foot grade change from the top left to the bottom right. The bottom right floods, so they can't put the building down low. Mr. Weinrieb added that there was better street appeal when the building was not designed around the garage.

Mr. Howe commented that he was concerned about the EMS response because they have run into this issue before. Ms. Kozak questioned if they could put in an emergency access in the landscape area. Mr. Howe questioned if it was a dead-end street. Mr. Desfosses responded that technically it was, but it did go around. Mr. Howe commented that they could resolve this offline.

Ms. Zendt questioned why they didn't do a variance. Mr. Weinrieb responded that was something they could pursue in parallel paths if they decide it's needed. It would not change the subdivision plan, but they could have the walkway go through to the front. They can make this a condition that this gets resolved before getting a building permit or CO. Mr. Wolph noted that it should be prior to a building permit.

Ms. Zendt commented that this should be addressed off Partridge St. Mr. Howe questioned if that impacted zoning or anything else. Mr. Weinrieb responded that it did not. The street frontage is on Pray St., but they don't have to have the access across the minimum street frontage.

Mr. Wolph questioned what the aversion to Partridge St. address. Ms. Kozak responded that guests and deliveries will be confused. Mr. Howe commented that it made more sense to have a Partridge St. address. Mr. Weinrieb responded that they could resolve this prior to a building permit. Ms. Zendt commented that they will move forward assuming the address will be on Partridge St. unless the applicants pursue a variance.

Mr. Howe clarified that without any changes from the applicant the address will be Partridge St. Ms. Zendt confirmed that was correct. Ms. Zendt questioned if they had other sites in the City in similar situations. Mr. Howe responded that they have not seen this as much with single family homes. They have seen it downtown. Typically, a single-family home has driveway that matches the street address.

Ms. Zendt noted that all comments were still in play for the project and there was an additional note to allow for a future flowage easement for lot 1 to drain across lot 2. The recommended address is Partridge St. until a second driveway is permitted by a variance on Pray St.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Howe moved to recommend approval to the Planning Board, seconded by Mr. Cronin with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. Applicant will cut into 8" City sewer in Pray Street and install a wye and use gasketed solid couplings on either side of the wye.

2. Applicant will use a larger pipe for both inserta-tee and sewer connection to culvert than the proposed 8" pipe.

3. 1' water service will be used for property.

4. Applicant will coordinate with City DPW, Eversource, Consolidated Communications, and Comcast and report back on the implications of undergrounding wires as shown. Additional guying or other work may be necessary and not possible/feasible.

5. Driveway for Lot 1 will be at least 30 feet from the intersection of Pray Street and Marcy Street.

6. A note on the plan will be added to articulate Lot 1 has drainage rights across Lot 2.

7. Address for Lot 2 will correspond to Partridge Street until such time when a second driveway is provided on Pray Street.

The motion passed unanimously.

D. The request of **RIGZ Enterprises LLC (Owner),** for property located at **806 Route 1 Bypass** requesting Site Plan Review for construction of 400 square feet of additional commercial space and site improvements. Said property is located on Assessor Map 161 Lot 43 and lies within the Business (B) District. (LU-22-81)

SPEAKING TO THE APPLICATION

Alex Ross spoke to the application. The owner would like to make a small addition on the back to give them more space inside the store. They added a lot of landscaping so the site will be in compliance with the open space requirements.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Sewer service is not shown correctly. Correct location of sewer service.
    a. Mr. Ross responded that they looked at the GIS maps and an earlier plan that showed the surrounding lines. They will work with DPW to coordinate this.
2. Move sewer service to connect directly to sewer main on Stark. 6" service stub installed to parking lot at approximately parking space 25-26.
3. Need two HP spaces if providing more than 25 parking spaces. One HP space must be van accessible.
    a. Mr. Ross responded that they didn't need that many spaces. They only need 12 but are providing more. There is a handicap space next to the front door and they can put one on the other side of the front door or straight across from the front door. There is room to add one.
4. Consider extending landscaping and curbing to the front lot line.
    a. Mr. Ross responded that the front curb line is not on the front property line and is not parallel to it. They can meet that condition.
5. Add curbing to the proposed landscape islands.
    a. Mr. Ross confirmed they could add curbing to those locations.
6. Move space #18 next to # 17 and remove space #19. Replace removed/relocated parking spaces with landscaping and bike rack.
    a. Mr. Ross responded that there was parking on the side of the building. The owner would like to leave that parking as is. They have added enough landscaping to exceed open space. Typically, they want an attractive entrance, but the site has been developed for so long. The streetscape is the Bypass, and the owner feels that it works well.

7. Reverse the accessible aisle and the handicap space to align with the store entrance.
    a. Mr. Ross confirmed that they could work with Mr. Eby on that. Mr. Eby noted that he made that comment before he realized they needed a second space.
8. Add textured finish to entry area.
    a. Mr. Ross responded that there was asphalt in front of the front door. It is a sloped area, so it is not a slippery or icy entryway. Mr. Eby added that it would help to distinguish no parking in that area as well. Mr. Ross confirmed that they could stripe it off.
9. Extend raised side walk to connect to the front entry way to create a 36" raised sidewalk that will step down onto the textured entry area.
    a. Mr. Ross responded that they were happy to accommodate that. They can shift the parking to make room for the sidewalk.

Mr. Ross commented that they added another egress to the on the left side of the building, so they are in code compliance with egresses.

Mr. Eby questioned if they would add painting at the back of the building to make sure no one would drive along there so there would not be a conflict with the egress doors. Mr. Ross confirmed it would be a painted area. Mr. Eby commented that cars in space 19 would be backing up into a blind corner into the path of travel. Mr. Desfosses noted that he did not like spaces 18 or 19. There should be landscaping there instead. It would be safer and better for plowing.

Mr. Eby noted that there was an unmarked space next to 17. They can move 18 to the unmarked space and eliminate 19. Mr. Ross commented that the unmarked space was missed in CAD. It is a space. Ms. Zendt noted that they could rework a solution and come back or do Staff's suggestion.

Mr. Howe commented that they talked about adding a not about non-combustible mulch. Mr. Ross confirmed they would add it or do crushed stone.

PUBLIC HEARING

Colleen Zoffoli is the owner of 822 Bypass and was concerned about construction access. They have the right to pass through her property. Ms. Zoffoli questioned if they would block access at all during construction. Mr. Ross replied that they would not. They can provide the construction schedule when it is ready.

Bethany Kucharik of 507 Dennett St. was concerned about the location of the dumpster. It isright against the fence and could create noise and health issues on her property. Ms. Kucharik supported the renovations and the owners have worked well with them. Ms. Kucharik would like to avoid concerns of smell, noise, and debris. Mr. Stith commented that there should be a 20-foot setback for the dumpster. Mr. Ross responded that they did have a couple location options for the dumpster. Right now, it is 10 feet from the property line. They can shift it to spaces 23 and 24 and move it over there. Ms. Kucharik questioned if the dumpster is moved and they still find trash in their yard who should they contact. Ms. Zendt responded that they should

contact their neighbor before coming to the City. Ms. Kucharik was also concerned about the LED lights shining onto her property. Mr. Ross responded that the lights should be shielded. Mr. Desfosses questioned if the light pole was really 28 feet tall. Mr. Ross confirmed that was correct. Mr. Desfosses commented that they should lower it to 16 feet. Mr. Ross confirmed that they would look at that. Mr. Desfosses questioned what the mounting height for the wall packs was. Mr. Ross responded that it was 9 feet.

Brian (inaudible) commented that he was concerned about the lighting on the back of budling, but it sounds like that was addressed.

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Ms. Zendt summarized the outstanding comments. They resolved moving the parking spaces, will relocate the dumpster, add a note about the mulch and make updates to the lighting.

Mr. Eby moved to **recommend approval** to the Planning Board, seconded by Mr. Desfosses with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. Dumpsters will be relocated to parking spaces 24 and 23 with a 20 foot setback from rear lot line and at least 10 feet from side lot line. Applicant will request a waiver from the Planning Board for Section 9.3 of the Site Plan regulations to have the dumpsters located within 20' of the side lot line.

2. A note will be added to the plans regarding the use of non-combustible mulch.

3. Applicant will work with DPW to correct the sewer lateral connection and location.

4. Applicant will work with DPW staff (Eric Eby) to reconfigure handicap parking and accessibility (two spaces needed).

5. Applicant will extend landscaping and curbing at the front lot line.

6. Parking spaces 18 and 19 will be relocated and be replaced with landscaping and 3 bike racks.

7. Entryway will be striped.
8. Raised sidewalk will be extended to connect to front entryway.

9. Light Pole 3 (LP3) located at the rear of the building shall be limited to a height of 16' with cut off shields.

10. Lighting on the rear wall will not exceed a height of 9'. 11. Curbing is added to proposed landscape islands.

The motion passed unanimously.

E. The request of **4 Amigos LLC (Owner),** for property located at **1400 Lafayette Road** and **951 Peverly Hill Road** requesting Preliminary and Final Subdivision approval to subdivide one existing lot with 223,416 square feet of lot area and 789.91 feet of frontage on Peverly Hill Road and 576.28 feet of frontage on Lafayette Road into two lots as follows: Proposed Lot 1 with 111,415 square feet of lot area and 467.63 feet of frontage on Peverly Hill Road, Proposed Lot 2 with 137,276 square feet of lot area with 325.59 feet of frontage on Peverly Hill Road and 576.28 feet of frontage on Lafayette Rd. Said property is located on Assessor Map 252 Lot 7 and lies within the Gateway Center (G2) District. (LU-22-80)

SPEAKING TO THE APPLICATION

Chris Demoula, Rick Green, Jenna Green, and Ken Lensman spoke to the application. Mr. Demoula commented that they have formalized the subdivision plan. They are splitting the front commercial development from the rear residential development. In addition to the subdivision plan they have submitted a site plan and extension request. The front lot is 3.1 acres and addressed 1400 Lafayette Rd. The rear lot is 2.6 acres, and the address would be 951 Peverly Hill Rd. They meet the required zoning for setbacks and lot size. The got approvals for the development in 2012. At that time the property was consolidated to lot 7 and 9. In 2012 they got sign off and recorded the plan indicating the front lot is lot 9. In a follow up discussion with the assessor, they discovered there was a mix up with the recording in 2012. That is being resolved. Lot 9 is actually lot 7. They will update the plans. Lot 9.1 will be lot 5. The Peverly Hill Rd. and Lafayette Rd. addresses are correct. The subdivision is straight forward, and they included part of the site plan for an amendment.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. As stated during work session, not recommended for approval until the sewer repairs are completed.
    a. Mr. Demoula responded that the original layout was connected to the hotel property. The cross-country sewer connects through the development and goes out to Mirona Rd. They submitted agreements to the City for the main and the repairs of that line. They have a letter from the client that says if they get approval to move forward today, then the repairs will be completed within 60 days of this meeting.
2. The applicant must apply to update map/lot numbers from assessing department and addressing from the Department of Public Works.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Ms. Zendt questioned if they still needed the easement plan. Mr. Desfosses responded that they can remove that stipulation because of the sewer repair letter. They will put the letter on file. They do need a blanket easement for waterline detection. Mr. Demoula responded that the water easement was submitted previously. It should not need to be updated. Mr. Desfosses noted that it just needs to be recorded. There also needs to be a sewer easement for the residential and commercial lots. Mr. Demoula confirmed they would update that.

Mr. Desfosses moved to recommend approval to the Planning Board, seconded by Mr. Cronin with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. A sewer easement to the benefit of proposed Lot 5 will be granted across Lot 7.

The motion passed unanimously.

F. The request of **4 Amigos LLC (Owner),** for property located at **1400 Lafayette Road** and **951 Peverly Hill Road** requesting a site plan amendment and a 1-year extension for Conditional Use Permit approval for a Development Site according to the requirements of Section 10.5B40 of the Zoning Ordinance and Site Plan Review approval for the construction of a 53-unit Garden and Townhouse Style residential development consisting of 6 structures with a combined total footprint of 37,775 +/- s.f. and 122,000 +/- GFA with associated grading, lighting, utilities, stormwater management, landscape improvements and community space. Said property is located on Assessor Map 252 Lots 4, 5, and 7 and lies within the Gateway Center (G2) District. (LU-20-12)

SPEAKING TO THE APPLICATION

Chris Demoula commented that at the work session there was a discussion about adjusting the trees on Peverly Hill Rd., and that has been adjusted. They moved the sidewalk on right against the building and reduced it to 5 feet wide on the left. The stamped concrete can be removed. They added 2 trees near building D revised. They replaced the gravel walkway with porous pavers. They removed 2 spaces from the 5 parking spaces between buildings C and E.

Mr. Demoula commented that the original approval accounted for the sidewalk easement along Peverly Hill Rd., the sewer agreement out to Mirona Rd. the water easement on site, and the sidewalk connection across West Rd. Those are all still part of these current plans.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Is a crossing at West Road for pedestrians required?
    a. Mr. Demoula confirmed that was still in place.
2. Were test pits conducted in the areas where infiltration is proposed?
    a. Mr. Demoula responded that was on the grading plan.
3. Dead end of any water mains need either fire hydrant for flushing hydrant.
    a. Mr. Demoula responded that they would add it to the plan.
4. Domestic water services cannot come off of fire service. Each service must come directly from the main.
    a. Mr. Demoula responded that they would make the adjustment.
5. Each condo will need their own water service, shutoff, and meter.
    a. Mr. Demoula agreed.
6. Need easement for leak detection and access to water services and meters.
    a. Mr. Demoula responded that they still have that easement
7. SMH3 will need to be a 5' manhole to accommodate the inside drop.
    a. Mr. Demoula agreed.
8. Applicant must request a waiver from the Planning Board for Section 9.3 of Site Plan regulations to have the dumpsters located within 20' of the lot line.
    a. Mr. Demoula responded that they would submit the waiver.
9. Please eliminate visitor parking spaces to the north of the dumpster and replace with landscaping and a bike rack.
    a. Mr. Demoula responded that they would like to keep the 3 parking spaces where they are. There is a more central location with a patio area to the left side of where the 5 spaces used to be.
10. Please remove the textured area between complex E and D.
    a. Mr. Demoula confirmed that would be removed.

Mr. Desfosses commented that there was no cross water main connection but the sewer from draining from residential lot to the commercial lot will need easements. Mr. Demoula confirmed that should be part of the easement plan. They will be updating it according to the subdivision plan. Mr. Desfosses commented that it should be for both the water main and sewer connections.

Ms. Zendt commented that they were starting to request a separate easement plan to more easily locate them.

Mr. Howe commented that there should be some sort of an area in each building for the sprinkler and fire control panel. It needs to be accessible from outside. Mr. Demoula confirmed they would add them in.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Ms. Zendt reviewed the outstanding comments. Mr. Demoula questioned if a specific number of bike racks was required. They can put in 5-6. Ms. Zendt responded that they would verify the requirements and follow up.

Ms. Zendt noted that they need to add the sprinkler and fire control panel on the building plans. Mr. Howe questioned if it would be problematic if the building footprint changes. Mr. Green confirmed they would be added within the existing footprint.

Mr. Desfosses moved to **recommend approval** to the Planning Board, seconded by Mr. Cronin with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. The crossing at West Road will be included as it was part of the original approval.

2. A note to the plan will be added for any dead ended water services to include either a fire hydrant or a flushing hydrant.

3. Domestic water service will be changes to come directly from water main and not from the fire service.

4. Each condo will have individual water services, shutoffs, and meters.

5. Leak detection and access easement to the city -from the original approval will still be applicable.

6. SMH3 will be changed to a 5’ manhole to accommodate the inside drop.

7. Applicant will request a waiver from the Planning Board for Section 9.3 of the Site Plan regulations to have the dumpsters located within 20’ of lot line.

8. 7 Bike racks will be added adjacent to the southern patio area between buildings C and E. 9. Textured area between buildings E and D will be removed.

10. All easements will be identified with unique identifiers and corresponding easement table that lists all easements and their purpose.

Prior to Building Permit Issuance:

11. The sprinkler and riser room will be included in the building plans and will be incorporated within the existing footprint.

The motion passed unanimously.

G. The request of **Artwill LLC (Owner),** for property located at **437 Lafayette Road** requesting Preliminary and Final Subdivision approval to subdivide one existing lot with 65,365 square feet of lot area and 123.92 of frontage on Lafayette Road and 336.61 feet of frontage on Andrew Jarvis Drive into three lots as follows: Proposed Lot 1 with 18,434 square feet of lot area and 123.92 feet of frontage on Lafayette Road and 129.57 feet of frontage on Andrew Jarvis Drive, Proposed Lot 2 with 16,606 square feet of lot area and 102.04 feet of frontage on Andrew Jarvis Drive, and Proposed Lot 3 with 30,325 square feet of lot area and 107 feet of frontage on Andrew Jarvis Drive. Said property is located on Assessor Map 229 Lot 1 and lies within the Single Residence B (SRB) District. (LU-22-82)

SPEAKING TO THE APPLICATION

Justin Macek and Corey Cowell from TF Moran and Joe Calderola spoke to the application. Mr. Macek commented that the proposal is for a 3-lot subdivision. They incorporated the feedback from the work session. They reduced the road width to 26 feet on Artwill Ave. to remove some impervious on site and provide more snow storage. The existing road width in some areas is 35 feet. It does not need to be that wide. They did some coordination with the fire department and added a proposed sign at Lafayette Rd. for no parking on the pavement. That will provide space for emergency vehicles. The utility plan showed two proposed utility poles. TAC recommended removing them and tying into an existing utility pole. After further coordination with Eversource, they agreed to put the line underground and add a transformer between lot 1 and lot 2. The subdivision plan was added to the set. They have added an easement for electric and sewer. Lastly, they added 2 additional rain gardens in the front yard of lot 1 and lot 3. They will capture more roof runoff and some driveway runoff. There is a sub drain and outlet control structures.

TAC Comments:

Items to be addressed prior to Planning Board approval:

1. Gas line to be installed under Artwill Ave and service shall come from that side.
    a. Mr. Macek responded that the original intent was to stay close to the water lines and use the same trenching area. The existing house on lot 2 currently has this set up. Mr. Desfosses commented that nobody will look for it on the road to the high school. It should be located on the road the house is on. Mr. Macek confirmed they could connect to Artwill. Mr. Calderola commented that the existing house was an existing condition. Mr. Desfosses noted that they should ask if the gas company could go through yard around the house.
2. Ensure easements are provided for access across all proposed lots.
    a. Mr. Macek confirmed they would show the easement on the plans.
3. Provide maintenance agreement for proposed road maintenance.
    a. Mr. Macek agreed.
4. Provide an easement plan that identifies each easement with a unique identifier and corresponds to an easement table.
    a. Mr. Colwell commented that the easements are easily read on this plan. Ms. Zendt noted that there should be a table with unique identifiers and their purpose. Mr. Colwell agreed.

Prior to Construction

5. Coordinate final connections of water and sewer services with Portsmouth Water.
    a. Mr. Desfosses commented that there are two mains on Jarvis Dr. They should connect to the bigger one. Mr. Macek agreed.
6. Final connection to which main under Andrew Jarvis Dr will be determined by Portsmouth Water
    a. Mr. Macek confirmed they would coordinate that.

Ms. Zendt questioned if there were any easements to the city. Mr. Colwell responded that all of the proposed easements were private. There are existing easements to the City.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to recommend approval to the Planning Board, seconded by Mr. Cronin with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. Access easements will be will be provided to allow access across all proposed lots for travel along Artwill Ave.

2. A maintenance agreement will be provided for proposed Artwill Ave. maintenance.

3. All easements will be identified with unique identifiers and corresponding easement table that lists all easements and their purpose.

4. Gas line is to be installed under Artwill Ave and service shall come from the new line and explore feasibility of servicing the existing unit from Artwill Ave.

The motion passed unanimously.

H. The request of **Artwill LLC (Owner),** for property located at **437 Lafayette Road** requesting Site Plan Approval and Conditional Use Permit Approval as permitted under Section 10814.40 of the Zoning Ordinance to subdivide the lot and construct two new single-family dwellings (one includes an attached dwelling unit) in addition to the existing single-family dwelling. Said property is located on Assessor Map 229 Lot 1 and lies within the Single Residence B (SRB) District. (LU-22-82)

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to recommend approval to the Planning Board, seconded by Mr. Cronin with the following stipulations:

Items to be addressed prior to Planning Board approval:

1. All easements will be identified with unique identifiers and corresponding easement table that lists all easements and their purpose.

Prior to Building Permit Issuance:

2. Applicant will coordinate final water and sewer connections with Portsmouth Water.

3. The final water main connection under Andrew Jarvis Dr. will be determined by Portsmouth Water.

The motion passed unanimously.

IV. OTHER BUSINESS

A. **WITHDRAWN** The request of **Islamic Society of the Seacoast Area (Owner),** for property located at **686 Maplewood Avenue** requesting a one year extension of the Site Plan approval to construct a 2-story building for religious assembly with a footprint of 3,880 s.f. and Gross Floor Area of 5,333 s.f., with related paving, lighting, utilities, landscaping, drainage and associated site improvements, which was granted on April 18, 2019. Said property is shown on Assessor Map 220 as Lot 90 and lies within the Single Residence B (SRB) District. **WITHDRAWN** (LU-19-10)

DISCUSSION AND DECISION OF THE BOARD

Mr. Stith noted that this was withdrawn.

V. ADJOURNMENT

Mr. Wolph moved to adjourn the meeting at 5:00 p.m., seconded by Mr. Cronin. The motion passed unanimously.

Respectfully submitted,

Becky Frey
Secretary for the Technical Advisory Committee

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

May 24, 2022

Portsmouth Planning Department
Attn. Peter Stith, Principal Planner
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Response Letter – Altus & Ambit Engineering and TAC Comments
1169 and 1171 Sagamore Ave, Portsmouth, NH
Tax Map 224, Lots 14 & 15
JBE Project No. 21047

Dear Mr. Stith,

We are in receipt of comments from Eric Weinrieb, P.E., Altus Engineering dated April 29, 2022, John Chagnon, P.E., Ambit Engineering dated May 3, 2022 and TAC dated May 2, 2022. Review comments are listed below with our responses in bold.

ALTUS ENGINEERING:

GRADING AND DRAINAGE PLAN:

1. *Note 29 indicates that the units will not have basements or foundation drains. This requirement is critical to premise of the stormwater management design. As such, it is recommended that this condition be documented on the approval.*
   RESPONSE: This is agreeable to the applicant.

2. *To the east of building unit 10 is a proposed 38.0 spot grade. It appears that the required grade should be closer to elevation 39.0.*
   RESPONSE: The spot grade to the east of Unit 10 has been revised.

3. *The revised plans depict a culvert under Sagamore Avenue that will drain the runoff from west side of Sagamore Avenue where the new sidewalk with raised curbing will be installed. Changing from open drainage along the Sagamore to a closed system supports the need for the culvert.*
   RESPONSE: Agreed.

OFFSITE IMPROVEMENTS PLAN:

4. *The Designer is proposing a 24-inch diameter culvert under Sagamore Avenue. Based on the drainage computations, it appears that a significantly smaller culvert will adequately handle the projected flows. A smaller diameter culvert will also reduce the potential for utility conflicts. The Designer should comment as to why a 24-inch culvert is proposed.*
   RESPONSE: The intent was to prevent the isolated depression from overflowing during the 50-Year, 24-Hour storm while also discharging as little as possible during the 2-Year 24-Hour storm, but this same result can be achieved with a 15" HDPE pipe and an invert out 0.2 ft lower, so the design has been modified accordingly.

5. *The Designer should consider installing a Jellyfish or other approved treatment device at the culvert outfall.*
   RESPONSE: A Jellyfish filter has been added before the culvert outfall.

6. *The Designer needs to confirm that the wetlands depicted on this plan has been delineated by a licensed wetlands scientist.*
   RESPONSE: The wetlands depicted on this plan have been delineated by a licensed wetlands scientist. Note #12 on Sheet C1 lists the wetland delineation standards that were used, and the same sheet has been stamped by the certified wetland scientist who delineated the wetlands.

7. *It is understood that the applicant will need a Conditional Use Permit for the work on the city land and will need to obtain an easement to complete the work.*
   RESPONSE: We are applying for a conditional use permit and an easement will be prepared. A draft easement for the work on City land is shown on Sheet C2.

DETAIL SHEETS:

8. *The city should decide if hoods should be installed on the catch basins outlet pipes on site and in the State right-of-way.*
   RESPONSE: No response needed.

9. *The bioretention basin detail on Sheet D5 references notes 4 and 5 under design considerations. The plans are deficient note 5.*
   RESPONSE: The reference to Note 5 has been removed.

10. *Concrete galley detail on Sheet D6 indicates that there will be a 6-inch crushed stone layer above the galleys. On System B, it appears that there will not be adequate cover above the stone to support vegetation.*
    RESPONSE: The plans and detail have been revised so that the minimum grade over System B is 38.6, leaving at least 6" of loam above the stone layer as required.

DRAINAGE ANALYSIS:

11. *The Designer has addressed the increase in volume to the wetland at the northeast corner of the site by proposing a culvert that drains excess runoff towards the city land on the east side of Sagamore Avenue. It is our opinion that this culvert satisfactorily addresses the concerns regarding impacting the abutting properties to the north of the site.*
    RESPONSE: No response necessary.

STORMWATER MANAGEMENT OPERATION AND MAINTENANCE MANUAL:

12. *This document should be included in the condominium documents and should be recorded at the Registry of Deeds to ensure that the association and all owners are aware of the requirements to maintain the site.*
    RESPONSE: The Stormwater Management Operation and Maintenance Manual will be included in the condominium documents and will be recorded at the Rockingham County Registry of Deeds.

AMBIT ENGINEERING – Comments on Behalf of Sea Star Cove Condominiums:

Existing Conditions Plan:

1. *The Certified Soil Scientists should stamp the final plan.*
   RESPONSE: The final plans will be stamped by a certified soil scientist.

2. *The plan does not show benchmarks.*
   RESPONSE: A benchmark in the utility pole on the southeast corner of the subject parcel has been added to the plan.

3. *The Exposed Ledge depiction has been removed from the Legend.*
   RESPONSE: The ledge outcrop depiction has been added to the legend.

Demolition Plan DM-1:

4. *The note to save the 12" Maple in the vicinity of the new headwall should be verified.*
   RESPONSE: The tree is now noted to be removed.

5. *Note 13: We doubt that any leach field components would be able to remain given the extensive site work.*
   RESPONSE: We believe this refers to Note 12 – There is no Note 13 on Sheet DM-1 – Note 12 has been revised to state that the leach field shall be removed.

6. *The extent of old fill removal should extend beyond the property line if any fill was placed over the property line onto Sea Star Cove property.*
   RESPONSE: It is noted on Sheet DM-1 that any offsite fill shall be removed and the approximate extent of offsite fill is now shown.

7. *The plan shows a "proposed tree line / limit of clearing" along the northerly property line at the west end of the property line. Trees marked in the field vary from this representation.*
   RESPONSE: The contractor is to clear trees up to the proposed treeline.

Condominium Site Plan C2:

8. *The size of the bicycle pad should be confirmed by showing the layout of the racks.*
   RESPONSE: The layout of the bicycle racks has been added to the bicycle rack detail on Sheet D1.

9. *Coverage calculation details should be on the plan.*
   RESPONSE: Building coverage calculations have been added to Note 2 on Sheet C2.

10. *The final Condominium Site Plans should show the plan view and note that maintenance will be required.*
    RESPONSE: The final condominium site plans will show the plan view and note that maintenance will be required.

Grading and Drainage Plan C3:

11. *Show benchmarks. Clarify the intent of Note 2. Is the Contractor required to do a topographic survey of the property?*
    RESPONSE: A benchmark in the utility pole on the southeast corner of the subject parcel has been added to the plan. Note 2 has been reworded to clarify the intent.

12. *The elevation of the outlet pipe(s) from Concrete Galley Systems A and B are above the elevations of the collection system and will create a backflow in the collection piping network.*
    RESPONSE: System B is designed to infiltrate, and the outlet pipe is intended as an overflow only. The most frequent modelled storm during which this is activated is the 25-Year 24-Hour event. The underdrain on System A is at the bottom of the lined system and is intended to be the primary outflow from the system, below the collection piping network, from which detained outflow will discharge. The overflow pipe from this system is above the collection piping network, and the most frequent modelled storm during which it is activated is the 10-Year 24-Hour event.

    The systems are designed to drain in a reasonable amount of time and tailwater modelling is set to be automatic throughout the entire HydroCAD model, so the potential for temporary backflow during peak storm events is taken into account and is not an issue.

13. *The Stone Infiltration Bed overflow detail the overflow being at the gutter air brake. Note 27 indicates that locations may be adjusted, but the locations are key to the drainage analysis.*
    RESPONSE: Note 27 on Sheet C3 has been revised to instead say that final roof plans shall be reviewed by the project engineer prior to construction, so that it can be confirmed that the downspouts can still collect the water that they are intended to at the proposed locations.

14. *The removal of the old fill will occur down to elevation which resembles the wetland elevation of the Sea Star Cove property. Could the pipe from Drain Manhole 3 be shortened and the grade lowered by the introduction of a retaining wall behind units 1 and 2 to provide some runoff storage on the 1169 / 1171 property?*
RESPONSE: We have added a retaining wall and revised the proposed grading behind units 1 and 2.

15. *There is a detail provided for the ledge removal for Galley System B; there should be one provided for Galley System A, and Bioretention 1 and 2.*
RESPONSE: Ledge profiles for bioretention systems 1 & 2 have been added to Sheet D5 and a ledge profile for Galley System A has been added to D6 next to the one for Galley System B.

Landscape Plan L1:

16. *Are the 3 Ruby Spice Summer Sweet too close to run-off Gallery System B?*
RESPONSE: The 3 Ruby Spice Summer Sweet have been moved closer to Unit 4.

17. *Will there be some trees remaining near the west end of the north property line? If not, can the developer add some plantings for a buffer?*
RESPONSE: Some additional trees have been added to the northwest corner of the property.

Detail Sheet D5:

18. *Bioretention Detail Design Considerations Note 4 should align with the design requirements for elevation above ESHWT / ledge.*
RESPONSE: Note 4 has been revised to say that ledge shall be removed to a depth of at least 2' below the bottom of the system.

Detail Sheet D6:

19. *The Shea Concrete Galley System B Ledge Profile does not show the ledge under the system accurately.*
RESPONSE: Any ledge profile will be an approximation; the ledge profile was based on test pits B1 and B2 and this is the most accurate depiction possible with the available data. More importantly, the contractor is to remove ledge to a depth of at least 2' below the bottom of the stone base, as noted.

Drainage Analysis Comments:

1. *Pond 21P proposed (2P existing) is modelled after a wetland ponding area partially on the adjacent property. The pond in the proposed design receives a 0.11-foot higher peak elevation in the 2-year storm event. The other problems regarding peak volume from the last submission have been alleviated by a culvert crossing the street.*
RESPONSE: With the revisions to the design per Altus comment #4, the 2-Year 24-Hour storm peak elevation is now lower than the existing.

2. *The proposed infiltration practice at node 5P is designed to infiltrate the bulk of the stormwater volume reduction on site. While the test pit conducted at point B2 suggests a similar infiltration rate on the existing ground surface to that used in the model, the proposed infiltration device is located at least 4 feet below the ground surface. The proposed infiltration surface is within 1 inch of the ESHWT, and less than 2 feet from refusal of the test pit. If the refusal was due to the presence of ledge, then that further reduces the viability of the proposed infiltration device.*
RESPONSE: The ledge is to be removed to an elevation at least 2 feet below the bottom of the stone backfill, and underneath approximately 57% of the proposed system, refusal is more than 2 feet below the proposed bottom of the stone already. Furthermore, the stone base material has a better percolation rate than the native soil it will be replacing, and the bottom of the actual infiltration chamber is at least 3' above the seasonal high water table as required. Infiltration is viable in a way that meets NHDES AOT standards.

TAC COMMENTS:

1. *We assume all the prior comments were addressed, as there was no list of prior comments submitted.*
RESPONSE: No response necessary.

Items to be addressed prior to Planning Board approval:

2. *The culvert across Sagamore will need treatment before being discharged. DPW recommend a Jellyfish style filter.*
RESPONSE: A Jellyfish filter has been added for the cross-culvert.

3. *Add existing force main to drawing showing cross Sagamore culvert and add note regarding insulation of force main required near culvert.*
RESPONSE: The existing force main was already shown on Sheet C4. It is now noted on Sheet C4 that 2" of R-10 Foam Board insultation shall be provided between the existing forcemain and the proposed culvert.

4. *The proposed culvert will need a temporary construction easement, permanent flowage easement, and permanent easement for the installation and placement of materials.*
RESONSE: The proposed culvert will require a temporary construction easement, permanent flowage easement and permanent easement for the installation and placement of materials from the city. A draft easement is shown on Sheet C2.

5. *The proposed culvert will need City Council approval.*
RESPONSE: We will apply for City Council approval once approved by TAC.

6. *The proposed culvert will require review by the Conservation Commission.*
RESPONSE: We will apply for a Conditional Use Permit once approved by TAC.

7. *Please show that the proposed culvert and flowage meets the conservation restrictions of parcel 201/26.*
RESPONSE: There are no conservation restrictions that would prevent the proposed flowage or culvert on parcel 201/26.

8. *Staff are still waiting for the third-party review of the project.*
   RESPONSE: Responses to the third- and fourth-party review comments are included with this letter.

Included with this response letter are the following:

1. One (1) Full Size Revised Plan Set.
2. One (1) Revised Drainage Analysis.
3. Contech "Jellyfish" Maintenance Guide.
4. Conditional Use Application Cover Letter.
5. Current Deeds.
6. Letters of Authorization.

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

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Joseph Coronati
Vice President

cc: Michael Garrepy (via email)
Mick Khavari (via email)
Tim Phoenix, Hoefle, Phoenix, Gormley & Roberts (via email)
Eric Weinrieb, Altus Engineering (via email and hand delivered)
John Chagnon, Ambit Engineering (via email and U.S. Mail)

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Applicant: The Sagamore Group, LLC Date Submitted: 08/23/22

Application # (in City's online permitting): LU-21-167

Site Address: 1169 & 1171 Sagamore Ave. Map: 224 Lot: 14&15

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Included	
☒	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)**	C1 & C2	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	C1	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
X	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Application	N/A
X	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	C1 & C2	N/A
X	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
X	List of reference plans. **(2.5.3.1H)**	C1 & C2	N/A
X	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Cover Sheet	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
X	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
X	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
X	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	C1 Note #15	N/A
X	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
X	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	C1	N/A
X	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Cover Sheet	N/A
X	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All Sheets	N/A
X	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
X	Source and date of data displayed on the plan. **(2.5.4.2D)**	C1	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	C1	
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Architectural Plans	
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	C2 T1-T4	
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	C2	
☒	**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).	C1 & C5	
☒	**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.	C1, C5, P1	

☒	**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.	C1 & C5	
☒	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	C2 Note #22	
☒	**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.	C3 C2 C2 Note #35	
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	L2	
☒	**11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)**	L2	
☒	**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.	L2 C5	
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	C1 & C3	
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	C2	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	C1 & C2	
☐	**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)**	Previously Submitted	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	C3	
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	Not in Either	
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	Included	
☒	Inspection and Maintenance Plan **(7.6.5)**	Included	

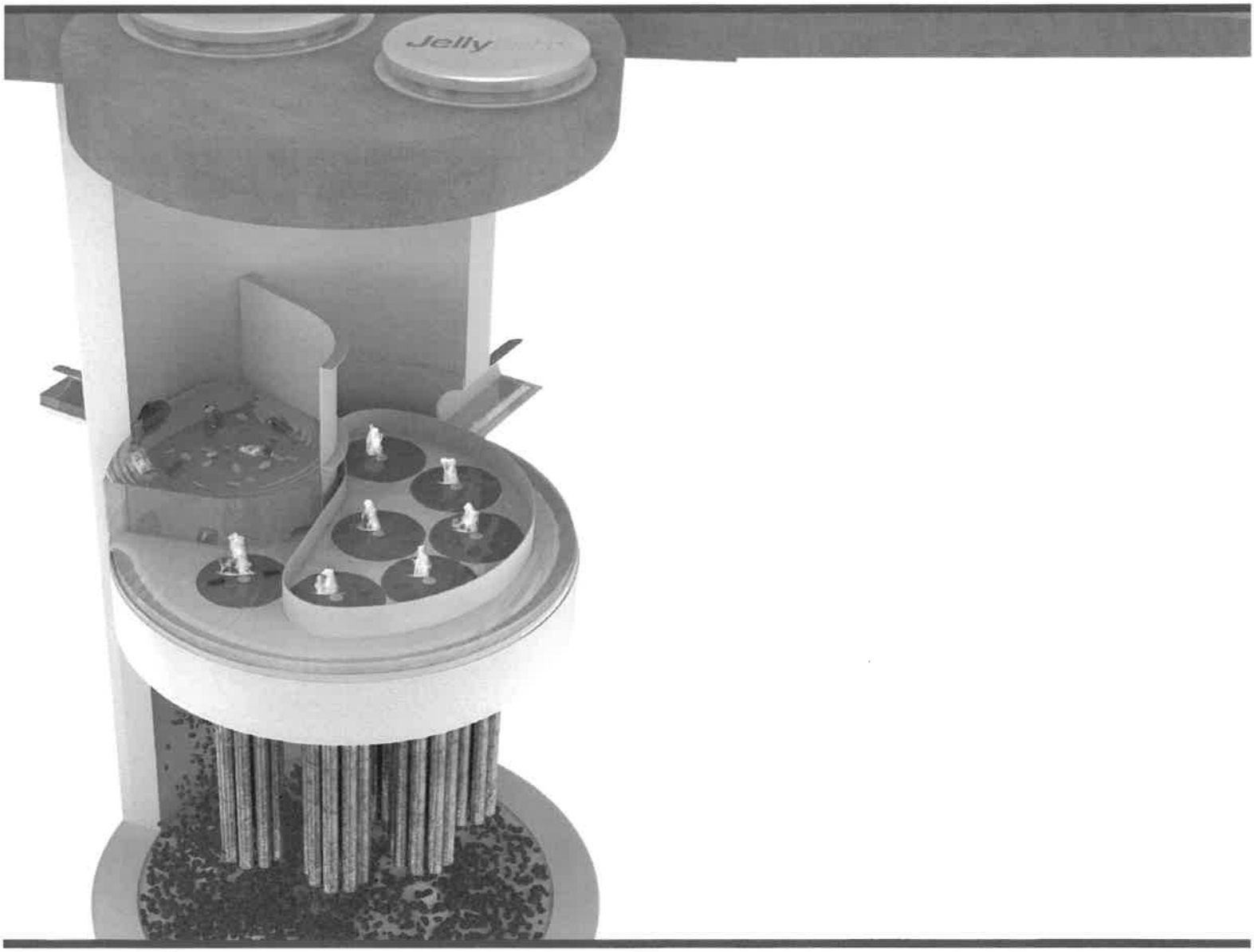
Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Easements shown on C1 & C2	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Enclosed	
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Pending	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	C2 Note #5	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	C2 Note #19	N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	C2 Notes #20 & #21	N/A

Applicant's Signature: (Patricia Dagorth) **Date:** 3/22/22

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.

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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.

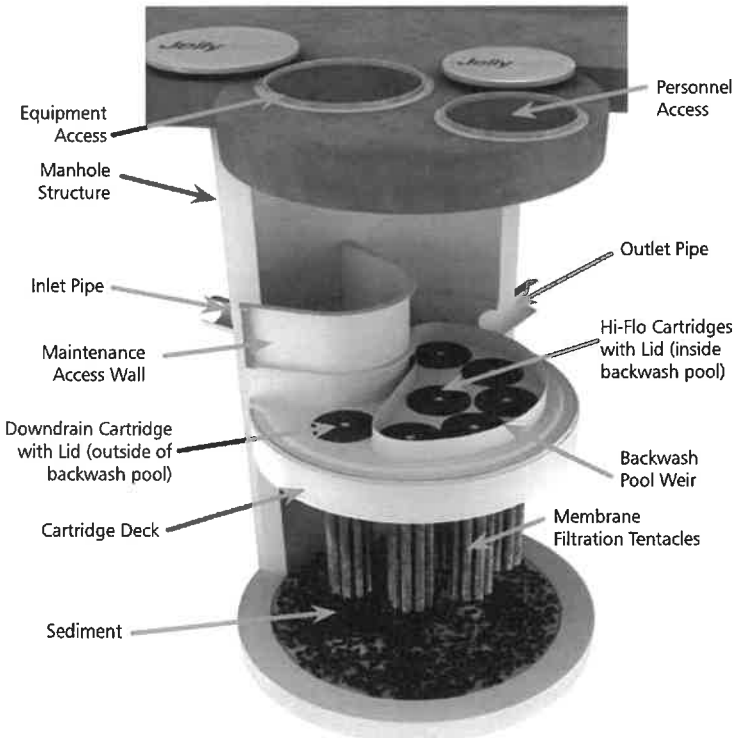
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion 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:

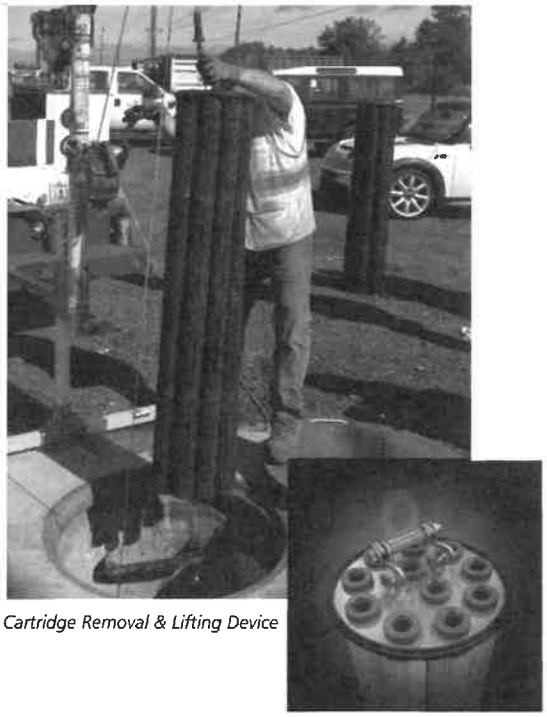
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage.*
3. Perform Inspection Procedure prior to maintenance activity.
4. 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

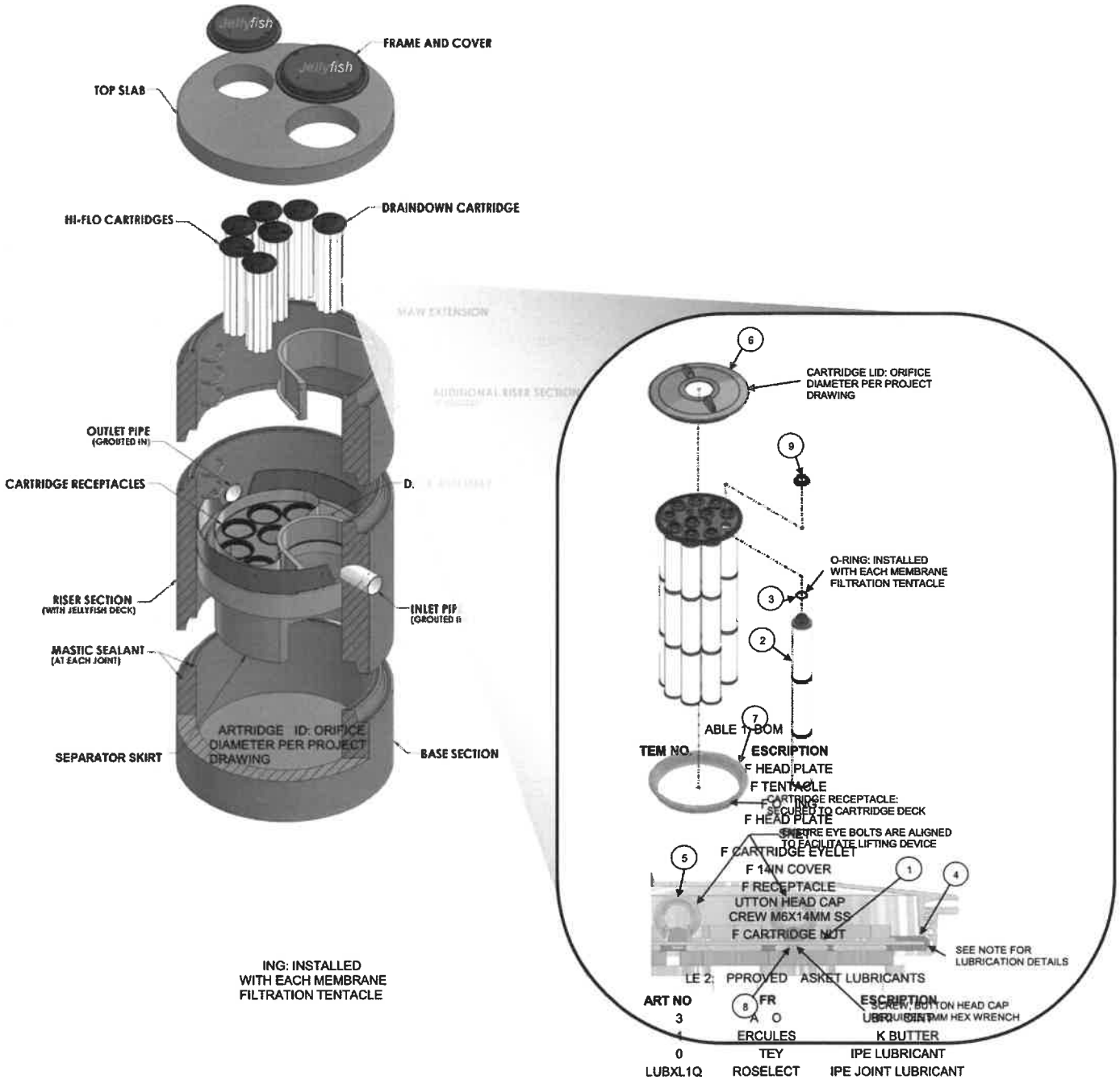


TABLE 1: BOM

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

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

May 24, 2022

Portsmouth Planning Board
Attn: Board Members
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Conditional Use Application
1169 & 1171 Sagamore Avenue, Portsmouth, NH
Tax Map 224, Lots 14 & 15, and Tax Map 201, Lot 26
JBE Project No. 21047

Dear Board Members,

Jones & Beach Engineers, Inc., respectfully submits a Conditional Use Application for the above-referenced properties on behalf of the applicant, The Sagamore Group, LLC. The intent of this project is to remove existing structures on the subject parcels and construct 10 condominium units. Runoff from impervious surfaces will be treated and detained on-site, and some of it infiltrated. Then, it is discharged toward a depression with an isolated wetland in the northeast corner of the subject parcel. Peak rates of runoff toward the depression will be reduced in the proposed condition compared with the existing condition during all analyzed storm events.

After discussions with the Technical Advisory Committee and with the abutters, we have agreed to install a cross-culvert under Sagamore Avenue to connect the wetlands on either side. Although no one could find a culvert in the field an old culvert in the field or on old plans, it was agreed that one should be located here. The culvert also collects and treats roadway drainage with catch basins and a proprietary treatment device called a Jellyfish.

The culvert will drain toward a larger wetland located across the street on City-owned property (Tax Map 201, Lot 26). The intent of the proposed culvert is to reduce peak water elevations within the depression in the proposed condition and to mitigate the potential for flooding during larger storm events, as modelled. The culvert will unavoidably need to be within the buffer of the larger wetland and therefore triggers the need for a Conditional Use Permit. The smaller wetland on Lot 15 is under 10,000 S.F. in area and therefore too small to have a buffer of its own. Proposed temporary buffer impacts are as follows (whereas work within the right of way is exempt from the requirement for a CUP):

- 300 S.F. on Lot 15 (Proposed Condominium Site)
- 270 S.F. on Lot 26 (City Owned Property)
- 570 S.F. Total

Additionally, because a new sidewalk is being proposed as requested by the City, runoff from a 460' ± long stretch of the southbound side of Sagamore Avenue which currently drains via sheet flow is proposed to be directed into a closed drainage system. This closed drainage system is proposed to be tied into the proposed cross-culvert. Road runoff will be treated via a "Jellyfish" filtration device before being discharged toward the larger wetland on Lot 26. Runoff from the proposed condominium development will be treated on-site.

10.1017.50 Criteria for Approval of Conditional Use Applications:

1. *The land is reasonably suited to the use, activity or alteration.*
   RESPONSE: As agreed to by the Technical Advisory Committee, the wetland located on Map 201, Lot 26 has much more available flood storage than the depression surrounding the isolated wetland in the corner of the subject parcel on which the condominium units are proposed. The large wetland on this City-owned property is able to handle the runoff better than the isolated depression surrounding the smaller wetland across the street, and it should be noted that peak rates of runoff toward that isolated depression are reduced in the proposed conditions and the intent of the proposed culvert is to act as an overflow. The City-owned land is in conservation and therefore won't be developed and provides excellent stormwater attenuation.

2. *There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.*
   RESPONSE: It is not possible to build this culvert outside of the wetland buffer. The culvert directly provides an overflow from a smaller wetland to drain toward a larger one; therefore, it must be located in the wetland buffer.

3. *There will be no adverse impact on the wetland functional values of the site or surrounding properties.*
   RESPONSE: In the existing condition, the runoff from Sagamore Ave and from the subject parcel reach a wetland untreated. In the proposed condition, all runoff will be treated before reaching the wetland on the City-owned property. Runoff from the proposed condominium development will be treated on-site and runoff from the road will be treated with a proposed Jellyfish filtration device.

4. *Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals.*
   RESPONSE: A very minimal amount of vegetation will need to be cleared for the proposed culvert. It will be primarily underneath the roadway and only the inlet and outlet with associated erosion control measures will be in existing vegetated areas. Existing vegetation will only be disturbed on the side slope of the road for the installation of the culvert and of the rip rap. Grass and naturally occurring shrubs may be allowed to grow back over the proposed culvert along the side slope of the road, but trees should not be allowed to grow over it.

5. *The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this Section.*
   RESPONSE: There will be minimal temporary impact for the installation of the culvert. In the existing condition, stormwater enters the wetland untreated. In the proposed condition, the runoff from the condominium development and the roadway will be treated, which mitigates the potential for degradation of water quality downstream. The culvert is to be installed within the wetland buffer, not the wetland itself. Proposed temporary impacts to the wetland buffer are as noted above. There will be no permanent impacts to the wetland buffer.

6. *Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.*
   RESPONSE: The installation of the culvert results in only temporary disturbance. Grass may be allowed to grow back over the culvert. For maintenance purposes, trees should not be allowed to grow over the culvert, but the remainder of the wooded area within the wetland buffer will remain wooded.

The following information is additionally required for Conditional Use Applications:

- Total area of inland wetland (both on and off subject parcel): 521 S.F. *
- Distance of proposed activity to wetland requiring CUP: 7' (Only the wetland on Lot 26 is large enough to require a CUP)
- Wetland buffer total area on lot: 1,354 S.F. *
- Wetland buffer area to be disturbed: See Above
- Inland wetland total area on lot: 257 S.F.
- Inland wetland area to be disturbed: 0 S.F.

* Responses with asterisk refer only to Tax Map 224, Lot 15; Tax Map 201, Lot 26 has not been fully surveyed, only the portion shown on the plans.

The following items are provided in support of this Application:

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

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Joseph A. Coronati
Vice President

KNOW ALL MEN BY THESE PRESENTS

2299-1707

THAT the Mark H. Wentworth Home for Chronic Invalids, a voluntary corporation duly established by law and having a usual place of business in Portsmouth of~~x~~ Rockingham County, State of New Hampshire, for consideration paid, grant to the City of Portsmouth, a municipal corporation in the County of Rockingham and State of New Hampshire

of~~x~~ ~~County, State of~~

, with WARRANTY COVENANTS,

'77 DEC-5 A11:00
REC'D ROCKINGHAM COUNTY 35571
REGISTRY OF DEEDS

(Description and incumbrances, if any)

A certain tract of land situate on the Easterly side of Sagamore Avenue and the Southerly side of Wentworth Road, also known as Wentworth House Road in said Portsmouth and more particularly bounded as follows:

Beginning at a point in the Southerly sideline of Wentworth Road at the Northeasterly corner of land of Harold and Katherine Abbott and running Easterly along the Southerly sideline of Wentworth Road 464 feet more or less to land of Herman and Bertraude L. Odiorne; thence turning and running Southerly by said Odiornes, land of Mike Kuchtey and land of Helen F. Mulcahy 605 feet more or less to the Portsmouth-Rye town line; thence turning and running Southwesterly by said Portsmouth-Rye town line 1090 feet more or less to the Westerly sideline of Sagamore Avenue; thence turning and running Northerly by said Sagamore Avenue 1200 feet more or less to an iron pipe in the ground at land of Richard and Kathryn Cooper; thence turning and running Easterly by said land of Cooper 100 feet to an iron pipe in the ground; thence turning and running Northerly by said land of Cooper 100 feet to a drill hole in a ledge; thence continuing Northerly by land of Richard Cooper and others 80 feet to a corner at land of Valley Oil Company; thence turning and running Easterly by land of said Oil Company 49 feet more or less to an iron pipe at land of said Abbotts; thence continuing in an Easterly direction by land of Abbotts 100 feet more or less to an iron pipe; thence turning and running Northerly by said land of said Abbotts 139 feet more or less to Wentworth Road and the point of beginning. Containing by estimation 16.5 acres.

Being the same premises acquired by deed of Charles J. Griffin Executor of the will of Henry Kenney dated October 17, 1939, recorded in Rockingham County Registry of Deeds Book 963 Page 375 less a certain lot conveyed to Richard Cooper and Kathryn E. Cooper by deed dated September 27, 1956, recorded in Rockingham County Registry of Deeds Book 1410 Page 350.

~~wife~~x husband~~x~~ of said Grantor~~x~~

release to said Grantee all rights of ~~dower~~ ~~curtesy~~ and homestead and other interest therein~~x~~

WITNESS the ~~hand~~ and ~~seal~~ corporate this 27th day of September, 19 77

Witness:

Patricia A. Pugh

Mark H. Wentworth Home for Chronic Invalids

By: Wyman P. Boynton, President

State of New Hampshire

Rockingham, ss. September 27, 1977

Then personally appeared the above named Wyman P. Boynton, President of the Board of Trustees of the Mark H. Wentworth Home for Chronic Invalids, and for this purpose duly authorized and acknowledged the foregoing instrument to be ~~his~~ voluntary act and deed, ~~before me~~ of said corporation, before me

Patricia A. Pugh

Notary Public — Justice of the Peace.

2299-1708

Mark H. Wentworth Home
for Chronic Invalids

Meeting of the Board of Trustees of the Mark H. Wentworth Home for Chronic Invalids held at the Home on December 3, 1976, with a quorum of the Trustees present.

President, Wyman P. Boynton, presided.

On motion it was

VOTED: To sell the Sagamore Avenue property of the Home to the City of Portsmouth for the sum of $40,000.00, together with the appraisers fee and the abatement of the 1976 taxes; and further that the President be authorized to execute all deeds and other instruments required.

A true extract from the reco

Richard E. Winslow, Cl

THE MARK H. WENTWORTH HOME FOR CHRONIC INVALICS INCORPORATED 1911 NEW HAMPSHIRE

Approved

Jul 29 2 55 PM '82 14391

KNOW ALL MEN BY THESE PRESENTS, That Norman J. Smith, of P.O. Box 95, Portsmouth, County of Rockingham and State of New Hampshire,

2418 P0173

for consideration paid, grant to Colleen M. Hebert of 1169 Sagamore Avenue, Portsmouth, County of Rockingham and State of New Hampshire,

with warranty covenants

A certain parcel of land, together with the buildings thereon, situate on the Westerly side of Sagamore Avenue, so-called, in Portsmouth in the County of Rockingham and State of New Hampshire, more particularly bounded and described as follows:

Beginning in the Westerly sideline of the Avenue at land now or formerly of Haven L. Joy; thence running Westerly by other land of Joy, Two Hundred Ninety-three and Five Tenths (293.5) feet to land now or formerly of Ralph W. Junkins Est. et als; thence turning and running Norterly by other land of Junkins et als One Hundred Twenty-six and Thirty-two Hundredths (126.32) feet to a point at other land now or formerly of John J. and Harriet Scammon; thence turning and running Easterly by other land of Scammon Three Hundred (300) feet, more or less, to the Westerly sideline of the Avenue, thence running Southerly by the sideline Forty-seven and Sixty-five Hundredths (47.65) feet to a point, thence running Southeasterly by the sideline Forty-nine and Eight Hundredths (49.08) feet to land of Joy which is the point of beginning.

Being the same premises conveyed to Norman J. Smith and Janet S. Smith by deed of John J. Scammon et al dated July 24, 1954 and recorded in the Rockingham County Registry of Deeds in Book 1323 Page 324.

STATE OF NEW HAMPSHIRE
TAX ON TRANSFER OF REAL PROPERTY
STATE TAX COMMISSION
JUL 29'82
325.00
RR. 10655

Norman J. Smith, being single . husband xxxxxxxxxxxxxxxx do hereby release and quitclaim all rights of curtesy dower and homestead and other interests therein

Witness, my hand xxxxxxx this 29th day of July A.D. 82.

Witness
Judith A. Gile

Norman J. Smith L.S.

L.S.

L.S.

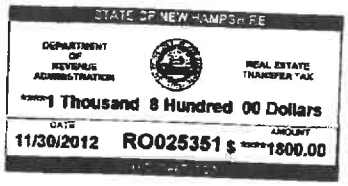
State of New Hampshire

Rockingham ss. July 29 A.D. 82

Personally appeared Norman J. Smith

known to me, or satisfactorily proven to be the person whose name subscribed to the foregoing instrument and acknowledged that he executed the same for the purposes therein contained

Before me, Judith A. Gile
Justice of the Peace



061594

2012 NOV 30 PM 1:45

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS THAT I, ROBERT F. SCAMMON, JR., single and not a party to a civil union, of 1169 Sagamore Avenue, Portsmouth, New Hampshire, 03801

For consideration paid, grant to **JOHN J. HEBERT AND COLLEEN HEBERT,** husband and wife, of 54 Pioneer Road, Rye, New Hampshire, 03870, as joint tenants with rights of survivorship,

With Warranty Covenants, the following described premises situate in Portsmouth, Rockingham County, New Hampshire:

A certain lot or parcel of land with the buildings thereon situate on Sagamore Avenue, City of Portsmouth, County Rockingham and State of New Hampshire, bounded and described as follows:

Beginning at the concrete bound at the Northeasterly corner of the within described lot, the said bound being Four Hundred Seventy-nine (479) feet southerly along said Sagamore Avenue from the southeasterly corner of land now or formerly of Charles F. Moody; thence running Southerly twenty-four (24) degrees thirty-four (34) minutes west along said Sagamore Avenue one hundred (100) feet to a stake in the stone wall at other land now or formerly of Allen B. Keen; thence turning and running N 83° 43' W by other land of said Keen 300 feet to a stake; thence turning and running N 24° 30' E 100 feet by land now or formerly of Frank E. Brooks, etals; thence turning and running S 83° 43' E by land of said Brooks and other 300 feet to Sagamore Avenue and being the point of beginning.

Also a parcel of land situated on Sagamore Avenue in said Portsmouth adjoining and lying on the northerly side of the above described parcel and bounded and described as follows: Beginning at a concrete bound at the southeasterly corner of these premises at land described above, said bound being 479 feet southerly along said Sagamore Avenue from the southeasterly corner of land now or formerly of Charles F. Moody; thence running N 83° 43' W by the above described parcel 300 feet to a point of land now or formerly of Frank E Brooks et als; thence turning and running N 24° 30' E by other land of said Brooks and others 300 feet, more or less to

said Sagamore Avenue; thence turning and running southerly along said Sagamore Avenue 50 feet to said concrete bound and being the point of beginning.

Also a parcel of land situated on Sagamore Avenue in said Portsmouth and bounded and described as follows: Beginning at the northeasterly corner of the herein described parcel at the intersection of the westerly sideline of said Sagamore Avenue and land now or formerly of Allen B. Keen, said point being 100 feet S 24° 34' W along said Sagamore Avenue from the concrete bound aforementioned; thence running southerly along said Avenue 25 feet to land now or formerly of Frank E .Brooks, et als; thence turning and running N 83° 43' W by land now or formerly Frank E. Brooks, et als 300 feet, more or less, to a point; thence turning and running N 24° 30' E 25 feet by land of said Brooks, et als, to a stake at other land now or formerly of Allen B. Keen; thence turning and running Southeast 83° 43' E by other land of said Keen 300 feet to Sagamore Avenue and being the point of beginning. This parcel adjoining and lying on the southerly side of the first described parcel herein.

Being the same premises conveyed to the within Grantor by deed of Barbara Scammon dated April 25, 1995, recorded in Rockingham County Registry of Deeds, Book 3097, Page 1715.

Signed this 30th day of November, 2012.

Robert F. Scammon, Jr.

STATE OF NEW HAMPSHIRE
ROCKINGHAM COUNTY

Personally appeared this 30th day of November, 2012, Robert F. Scammon, Jr., who acknowledged that he/she/they executed the foregoing instrument as his/her/their free act and deed for the purposes contained herein.

Before me,

Lori Hebert, Notary Public

My commission expires: 05/09/2017

LORI HEBERT NOTARY PUBLIC HAMPSHIRE

Letter of Authorization

The Sagamore Group, LLC, 4 Merrill Industrial Drive, Hampton, NH, 03842, USA, developer of property located in Portsmouth, NH, known as Tax Map 224, Lots 14 & 15, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on our behalf concerning the subject properties. The parcels are located at 1169 & 1171 Sagamore Avenue in Portsmouth, NH.

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

The Sagamore Group, LLC

Daniel Jackson, Member
Duly authorized

5/4/21
Date

dotloop signature verification:

Letter of Authorization

We, John & Colleen Hebert, 54 Pioneer Road, Rye, NH 03870, owners of property located in Portsmouth, NH, known as Tax Map 224, Lot 15, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcel is located on 1169 Sagamore Avenue in Portsmouth, NH.

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

	John G Hebert dotloop verified 05/04/21 2:47 PM EDT 5E1O-MUAR-1SWP-P2NG	
Witness	John Hebert	Date
	Colleen Hebert dotloop verified 05/04/21 2:49 PM EDT CJBG-7MIM-TUFK-BAEX	
Witness	Colleen Hebert	Date

dotloop signature verification:

Letter of Authorization

I, Colleen Hebert, 54 Pioneer Road, Rye, NH 03870, owner of property located in Portsmouth, NH, known as Tax Map 224, Lot 14, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcel is located on 1171 Sagamore 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.

Witness

Colleen Hebert dotloop verified 05/04/21 2:49 PM EDT RLSS-SIAZ-YMEI-YUBD

Colleen Hebert

Date

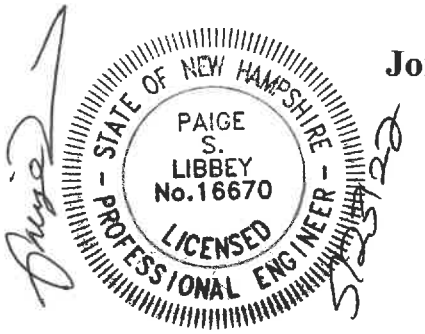
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

Sagamore Avenue Condominiums
1169 & 1171 Sagamore Ave.
Portsmouth, NH 03801
Tax Map 224, Lots 14 & 15

Prepared for:

The Sagamore Group, LLC
P.O. Box 430
Hampton, NH 03842



Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
August 23, 2021
Revised October 5, 2021
Revised December 28, 2021
Revised February 9, 2022
Revised March 22, 2022
Revised April 18, 2022
Revised May 10, 2022
JBE Project No. 21047

EXECUTIVE SUMMARY

The Sagamore Group, LLC proposes to construct ten (10) residential condominium units on a 1.83-acre parcel of land located at 1169 & 1171 Sagamore Avenue in Portsmouth, NH. In the existing condition, the two lots to be consolidated are home to single-family residences with multiple sheds and paved driveways, a pool, and a gravel driveway running through the lots.

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 (3.70"), 10 Year – 24 Hour (5.61"), 25 Year – 24 Hour (7.12"), and 50 Year – 24 Hour (8.53") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region. A summary of the existing and proposed conditions peak rates of runoff 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	0.60	0.31	1.40	0.87	2.11	1.40	2.80	1.92
Analysis Point #2	0.86	0.72	1.53	1.25	2.06	1.68	2.56	2.07
Analysis Point #3	1.20	0.22	2.24	0.53	3.14	0.80	3.98	1.07
Analysis Point #4	0.24	0.21	0.50	0.40	0.73	0.56	0.94	0.70
Analysis Point #5	N/A	0.69	N/A	1.05	N/A	1.50	N/A	2.40

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	0.063	0.036	0.140	0.089	0.208	0.139	0.275	0.189
Analysis Point #2	0.072	0.067	0.127	0.117	0.172	0.158	0.215	0.196
Analysis Point #3	0.086	0.017	0.228	0.039	0.402	0.058	0.573	0.077
Analysis Point #4	0.022	0.019	0.045	0.037	0.064	0.051	0.083	0.065
Analysis Point #5	N/A	0.082	N/A	0.206	N/A	0.343	N/A	0.478

The subject parcels are located in the Mixed Residential / Office (MRO) Zoning District. The subject parcels currently consist of the aforementioned single-family residences with associated driveways, sheds, and a pool, all of which is proposed to be demolished. The topography and ledge outcrops on the site as well as a stretch of Sagamore Ave. that is considered in this analysis define six (6) subcatchments, which drain to four (4) analysis points. Subcatchments 2S-4S drain directly toward their respective analysis points while subcatchment 6S drains directly toward Analysis Point #1, subcatchment 1S drains directly toward an isolated wetland which overflows toward both Analysis Points 1&3, and subcatchment 5S drains toward a shallow depression straddling the two properties, modelled as a pond, before cresting over a "berm" and running off toward the northerly abutter's detention pond (Analysis Point 3). The neighboring "Westwind Townhomes of Portsmouth" site to the south stands topographically prominent to this parcel, so some runoff from this development reaches

the southeast corner of the subject parcel although most of it drains directly into the Sagamore Avenue right of way. The runoff reaching this corner of the property (Analysis Point 2) then continues south along Sagamore Avenue. The majority of the site drains to the north in the existing condition, reaching either the abutting "Sea Star Cove Condominium" detention pond (Analysis Point 3) or the adjacent depression (Analysis Point 1) after overflowing from the isolated wetland in the rear of the site. Also included in Subcatchment 1S, which drains toward Analysis Point 1, is a stretch of Sagamore Ave with a low point at a horseshoe shaped driveway for an abutter to the subject property. Runoff from this stretch of the road sheet flows across the abutter's property in the proposed condition before ultimately reaching either the isolated wetland or a wooded depression defined as Analysis Point 1.

The proposed site development consists of the aforementioned ten (10) condominium units with associated paved roadway and individual driveways. 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 nineteen (19) 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. The proposed stormwater management system for the front of the site consists of two (2) bioretention systems to filter runoff and a downstream concrete galley field that will detain runoff and release it slowly, allowing for peak flow rates to be reduced. The proposed stormwater management system for the rear of the site consists of two catch basins as well as several yard drains draining into a concrete galley field designed for infiltration, from which overflow will be routed to the concrete galley field in the center of the site that is designed for detention. Through the use of these practices, the peak rate and volume of runoff is reduced toward Analysis Points #1-4 during all analyzed storm events.

Otherwise, some roof runoff will be infiltrated through subsurface stone beds. These systems, in combination with the concrete galley field designed for infiltration, will help to reduce volumes of runoff below the existing condition and promote groundwater recharge.

Additionally, although the system has been designed to reduce the amount of flooding on to abutting properties in the proposed condition, a cross-street culvert is proposed as an overflow from the depression surrounding the isolated wetland. As modelled, this culvert protects against flooding on to adjacent properties during all analyzed storm events. This culvert outlets across the street into a larger wetland area, so new Analysis Point 5 is introduced in the proposed condition for the runoff that is captured by this culvert.

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.

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1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same 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 (3.70"), 10 Year – 24 Hour (5.61"), 25 Year – 24 Hour (7.12"), and 50 Year – 24 Hour (8.53") storm events. This data was taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC), and the values have been increased by 15% due to the project being within the Coastal/Great Bay Region.

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

2.0 EXISTING CONDITIONS ANALYSIS

The two existing single-family residential properties feature three houses, two sheds, a pool, two paved driveways and a gravel driveway running through the site in addition to a paved island in the center of the site. The site is otherwise covered by both woods and grass, with sporadic ledge outcrops. A small section of the southern part of the site is sloped toward the south, while the majority of it is sloped toward the north.

The area draining toward the north is split into three subcatchments; Subcatchments 1S, 3S, and 5S. Subcatchment 1S drains into an isolated wetland near the northeast corner of the site. Subcatchment 1S includes the entire on and off-site contributing watershed area toward the isolated wetland, which includes parts of abutting properties as well as a stretch of Sagamore Avenue. Subcatchment 3S drains into Analysis Point #3 (AP3) representing the abutting condominium property's private detention pond. Subcatchment 5S drains toward a shallow depression straddling the two existing subject parcels, represented as 1P, and once the depression fills it crests over a berm and drains across Subcatchment 3S toward Analysis Point #3.

Two additional subcatchments were defined for the area draining toward the south; Subcatchment 2S and Subcatchment 4S. Subcatchment 2S is directed toward Analysis Point #2 (AP2), representing the shoulder of Sagamore Avenue. Runoff in this direction combines with runoff from the edge of the abutting property and continues south. Subcatchment 4S, which is separated from 3S by a ledge outcrop, a building roof, and otherwise a subtle inflection in the surface topography, is located in the southwestern corner of the property and this small area drains directly into the Sea Star Cove Condiminium property, represented by Analysis Point #4 (AP4).

There are two berms on the isolated wetland in the northeast corner of the subject site. A lower berm carries overflow toward the abutter's detention pond and a higher, 70' long x 10' wide berm carries any extreme overflow toward a depression in the woods represented as Analysis Point AP1. Additionally, a stretch of the road and areas of abutting properties drain directly toward Analysis Point AP1 and are represented as Subcatchment 6S.

Existing soil types were determined through a High Intensity Soil Survey (HISS) conducted by a Certified Soil Scientist. A Site-Specific Soil Map (SSSM) conversion table was provided along with the report that was generated based on the results of the HISS. These soils are categorized into Hydrologic Soil Groups (HSG) B and D. Areas surrounding ledge outcrops are categorized into HSG D while the remainder of the upland area of the site is mostly categorized into HSG B. Specifically, the upland soil types include the Hollis-Rock Outcrop Complex, Made Land – Similar to Canton, Newfields, and Chatfield Variant. According to "Ksat Values for New Hampshire Soils" sponsored by the Society of Soil Scientists of Northern New England SSSNNE Special Publication No. 5, the saturated hydraulic conductivity (Ksat) value for Canton soils ranges from 2 to 6 inches/hour within the B horizon and 6 to 20 inches/hour within the C horizon; the Ksat value for Newfields soils ranges from 0.6 to 2 inches per hour within both the B and C horizons, and the Ksat value for both Chatfield Variant and Hollis soils ranges from 0.6 to 6 inches/hour within both the B and C horizons.

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 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 development, consisting of the aforementioned ten (10) condominium units with associated paved roadway and driveways as well as stormwater management features divide the subject parcel into nineteen (19) subcatchments. Subcatchments 2S-4S drain directly into their respective Analysis Points, AP2-AP4, as previously outlined. Subcatchments 5S-6S will drain into the two bioretention systems in the front of the site, and after receiving treatment in the bioretention systems, runoff will be piped into concrete "Galley" chambers for underground detention. Subcatchments 7S-8S represent the rear of the site and runoff from here is graded toward two catch basins in sequence from which a closed drainage network feeds into another Galley chamber system, except that this one is designed for infiltration. Overflow from this will be piped into the Galley chamber system in the center of the site that is designed for detention only. Subcatchments 9S-12S represent lawn areas that are proposed to drain toward yard drains. Subcatchments 13S-15S represent roof subcatchments from which runoff will be infiltrated through subsurface stone infiltration beds in lawn areas. Subcatchments 16S, 17S, and 18S represent three stretches of Sagamore Avenue that are to drain toward proposed deep sump catch basins, the purpose of which is to pre-treat roadway runoff and drain it to the wetland across the street. The three proposed catch basins drain toward a proposed "Jellyfish" filtration system for treatment. Finally, Subcatchment 19S represents the sections of adjacent properties draining directly toward the wooded depression to the north of the site represented as AP1. As explained in the executive summary, the proposed stormwater management features help to reduce off-site peak rates and volumes toward AP1-AP4 below the existing condition.

As stated in the executive summary, a new cross street culvert is proposed to be installed as an overflow to prevent runoff from cresting on to adjacent properties after filling the depression surrounding the isolated wetland. Because this culvert carries water across the road, a new analysis point is introduced, represented as Analysis Point 5 to delineate the runoff that enters the larger wetland across the street. The three proposed catch basins along Sagamore Ave feed into a "Jellyfish" filtration system which intercepts the cross-street culvert and treats runoff directed toward it, and therefore the roadway runoff that enters the proposed catch basin also directly reaches Analysis Point AP5 after being treated.

As modelled, this proposed culvert reduces the peak elevation within the depression surrounding the isolated wetland and reduces the potential for flooding during peak storm events. A summary of the peak elevations during each analyzed storm event are as follows, noting that the flood elevation is situated at 31.3:

	2 Year	10 Year	25 Year	50 Year
Existing	30.48	31.32 (Flooding)	31.36 (Flooding)	31.44 (Flooding)
Proposed	30.42	30.65	30.96	31.18

After passing through the bioretention systems and concrete "Galley" chambers, treated and attenuated runoff will gradually drain toward the isolated wetland in the northeast corner of the site, from which any overflow will drain across the street via the proposed culvert during all analyzed storm events. The peak rates and volumes of runoff will be reduced in all analyzed storm events toward Analysis Points 1-4 in the proposed condition compared to the existing condition.

The site will be graded such that runoff from all impervious areas, with the exception of clean roof, patio, and deck runoff, will be treated, detained, and some of it infiltrated to groundwater, by way of bioretention systems and subsurface infiltration and detention chambers. The two bioretention systems in the front of the site cannot be used for infiltration due to the presence of ledge in the area where they are proposed, therefore they shall be lined and underdrained. The proposed concrete Galley chambers in the center of the site will also lined and underdrained due to the presence of groundwater while the proposed concrete Galley chambers in the northwest corner of the site are designed as a subsurface infiltration basin, with at least 3' between the bottom of the chamber and the SHWT.

The Ksat values stated at the end of the Existing Conditions Analysis were used to determine the design infiltration rates of each stormwater practice. The lower Ksat for each soil type was divided by 2 to develop a design infiltration rate of 0.3 or 1 inches/hour for each stormwater practice depending on what soil type they are located in. When a practice is located within multiple soil types, a weighted average is taken. For example, the underground stone infiltration bed in back of Units 1 and 2 straddles two soil types, one with each aforementioned design infiltration rate, so the two rates were averaged and a design infiltration rate of 0.65 inches/hour was ultimately used.

By reducing the peak rate and volume of stormwater runoff toward the neighbor's detention pond, the functioning of the overall drainage system between the two properties is improved resultant to this development. The outfall is in an optimal location as the treated and attenuated runoff will be released toward an existing wetland, a rip rap outlet protection apron is proposed in order to dissipate any concentrated flows that result, and a proposed cross-street culvert will work to reduce the potential for flooding on adjacent properties. The contours surrounding the isolated wetland in the northeastern corner of the site are modelled as a pond, 21P, in the proposed condition, where it is modelled as 2P in the existing condition.

According to the NH Stormwater Manual, bioretention systems provide a pollutant removal efficiency of 90% for TSS and 65% for nitrogen, and infiltration basins (including subsurface ones) provide a removal efficiency of 90% for TSS and 60% for nitrogen provided that there is 3' of soil or stone separating the bottom of the chamber from the seasonal high water table and that the chamber is at least 75' from surface water. Runoff from all impervious surfaces with the exception of roofs is being directed toward one of these two types of treatment systems. 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. This plan exceeds the requirements for pollutant removal because appropriate treatment / groundwater recharge systems are used and the Water Quality Volume is retained and treated.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, properties, and wetlands 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, catch basins, drain manholes, yard drains, bioretention systems, concrete "Galley" chambers, subsurface stone infiltration beds, rip rap outlet protection, a "Jellyfish" filtration system for road runoff, and a proposed cross-street culvert as well as temporary erosion control measures including but not limited to silt fence and the use of a stabilized construction entrance. The drainage outfall is in its optimal location and the rate and the volume of runoff reaching the abutter's detention pond from the subject site will be reduced. Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and their application will be enforced throughout the construction process. Peak rates and volumes of runoff from the site will be reduced toward all analysis points during all analyzed storm events.

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

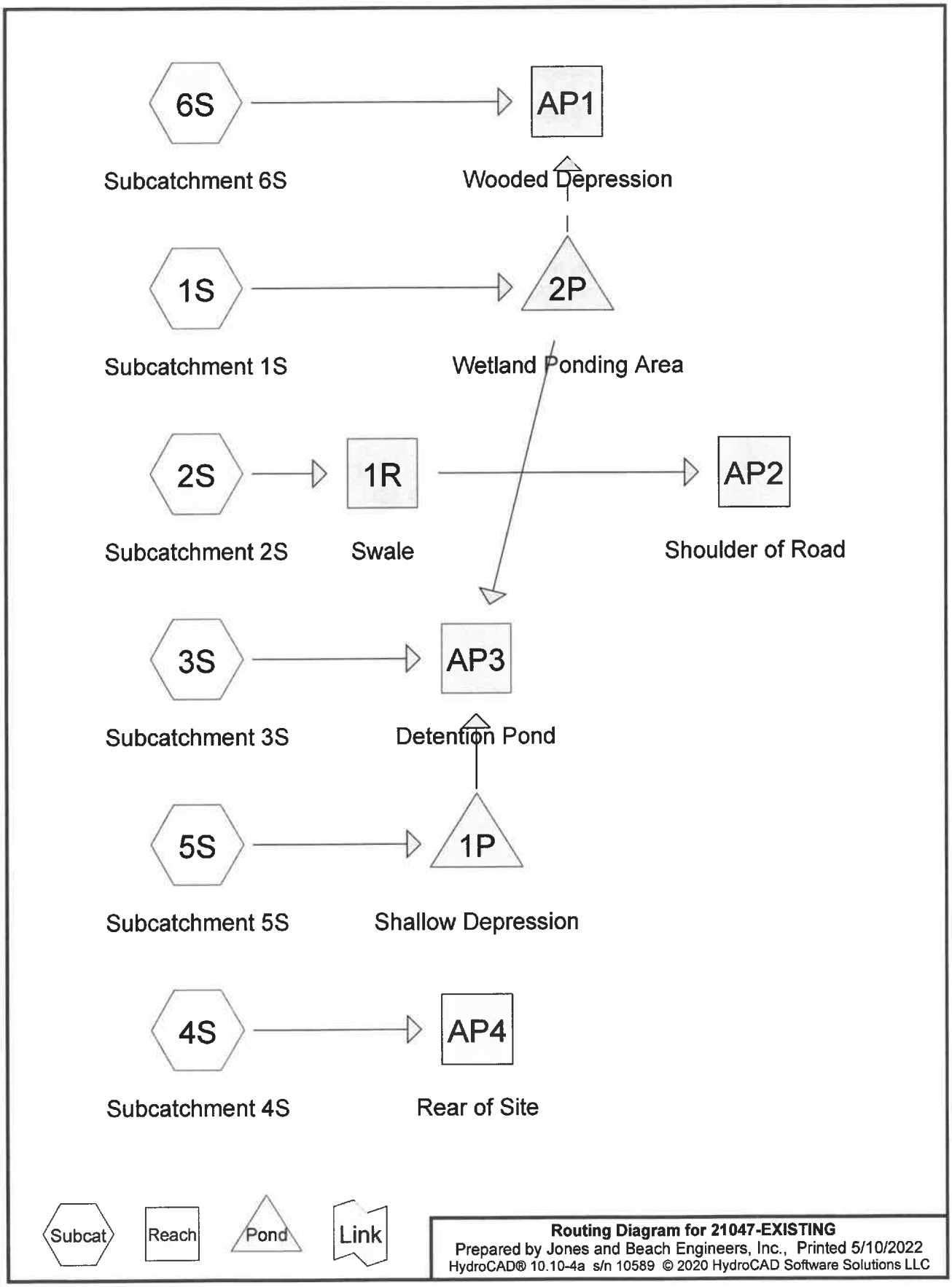
Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

Daniel Meditz, 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 21047-EXISTING
Prepared by Jones and Beach Engineers, Inc., Printed 5/10/2022
HydroCAD® 10.10-4a s/n 10589 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.644	61	>75% Grass cover, Good, HSG B (1S, 3S, 4S, 5S, 6S)
0.448	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 4S, 5S)
0.135	96	Gravel surface, HSG B (1S, 5S)
0.107	96	Gravel surface, HSG D (1S, 2S, 3S, 4S, 5S)
0.156	98	Ledge Outcrop, HSG D (1S, 2S, 3S, 4S, 5S)
0.228	98	Paved parking, HSG B (5S, 6S)
0.047	98	Paved roads w/curbs & sewers, HSG B (1S)
0.040	98	Paved roads w/curbs & sewers, HSG D (1S, 2S)
0.064	98	Roofs, HSG B (1S, 4S, 5S, 6S)
0.103	98	Roofs, HSG D (1S, 2S, 4S, 5S)
0.861	55	Woods, Good, HSG B (1S, 3S, 4S, 5S, 6S)
0.088	77	Woods, Good, HSG D (1S, 3S, 4S, 5S)
2.921	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.980	HSG B	1S, 3S, 4S, 5S, 6S
0.000	HSG C	
0.941	HSG D	1S, 2S, 3S, 4S, 5S
0.000	Other	
2.921		**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=34,729 sf 15.46% Impervious Runoff Depth>1.25"
Flow Length=112' Tc=20.1 min CN=72 Runoff=0.75 cfs 0.083 af

Subcatchment2S: Subcatchment2S Runoff Area=16,495 sf 25.67% Impervious Runoff Depth>2.27"
Flow Length=45' Slope=0.0400 '/' Tc=6.0 min CN=86 Runoff=0.99 cfs 0.072 af

Subcatchment3S: Subcatchment3S Runoff Area=16,448 sf 0.17% Impervious Runoff Depth>0.61"
Flow Length=180' Tc=24.1 min CN=60 Runoff=0.13 cfs 0.019 af

Subcatchment4S: Subcatchment4S Runoff Area=7,905 sf 42.56% Impervious Runoff Depth>1.44"
Flow Length=68' Slope=0.0290 '/' Tc=12.6 min CN=75 Runoff=0.24 cfs 0.022 af

Subcatchment5S: Subcatchment5S Runoff Area=22,358 sf 25.08% Impervious Runoff Depth>1.87"
Flow Length=87' Tc=7.2 min CN=81 Runoff=1.07 cfs 0.080 af

Subcatchment6S: Subcatchment6S Runoff Area=29,310 sf 31.34% Impervious Runoff Depth>1.13"
Flow Length=137' Tc=16.7 min CN=70 Runoff=0.60 cfs 0.063 af

Reach 1R: Swale Avg. Flow Depth=0.43' Max Vel=0.52 fps Inflow=0.99 cfs 0.072 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=8.19 cfs Outflow=0.86 cfs 0.072 af

Reach AP1: Wooded Depression Inflow=0.60 cfs 0.063 af
Outflow=0.60 cfs 0.063 af

Reach AP2: Shoulder of Road Inflow=0.86 cfs 0.072 af
Outflow=0.86 cfs 0.072 af

Reach AP3: Detention Pond Inflow=1.20 cfs 0.086 af
Outflow=1.20 cfs 0.086 af

Reach AP4: Rear of Site Inflow=0.24 cfs 0.022 af
Outflow=0.24 cfs 0.022 af

Pond 1P: Shallow Depression Peak Elev=37.14' Storage=590 cf Inflow=1.07 cfs 0.080 af
Outflow=1.16 cfs 0.067 af

Pond 2P: Wetland Ponding Area Peak Elev=30.48' Storage=3,609 cf Inflow=0.75 cfs 0.083 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 2.921 ac Runoff Volume = 0.339 af Average Runoff Depth = 1.39"
78.16% Pervious = 2.283 ac 21.84% Impervious = 0.638 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=34,729 sf 15.46% Impervious Runoff Depth>2.67"
Flow Length=112' Tc=20.1 min CN=72 Runoff=1.67 cfs 0.177 af

Subcatchment2S: Subcatchment2S Runoff Area=16,495 sf 25.67% Impervious Runoff Depth>4.04"
Flow Length=45' Slope=0.0400 '/' Tc=6.0 min CN=86 Runoff=1.72 cfs 0.127 af

Subcatchment3S: Subcatchment3S Runoff Area=16,448 sf 0.17% Impervious Runoff Depth>1.66"
Flow Length=180' Tc=24.1 min CN=60 Runoff=0.43 cfs 0.052 af

Subcatchment4S: Subcatchment4S Runoff Area=7,905 sf 42.56% Impervious Runoff Depth>2.95"
Flow Length=68' Slope=0.0290 '/' Tc=12.6 min CN=75 Runoff=0.50 cfs 0.045 af

Subcatchment5S: Subcatchment5S Runoff Area=22,358 sf 25.08% Impervious Runoff Depth>3.53"
Flow Length=87' Tc=7.2 min CN=81 Runoff=2.00 cfs 0.151 af

Subcatchment6S: Subcatchment6S Runoff Area=29,310 sf 31.34% Impervious Runoff Depth>2.49"
Flow Length=137' Tc=16.7 min CN=70 Runoff=1.40 cfs 0.140 af

Reach 1R: Swale Avg. Flow Depth=0.53' Max Vel=0.60 fps Inflow=1.72 cfs 0.127 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=8.19 cfs Outflow=1.53 cfs 0.127 af

Reach AP1: Wooded Depression Inflow=1.40 cfs 0.140 af
Outflow=1.40 cfs 0.140 af

Reach AP2: Shoulder of Road Inflow=1.53 cfs 0.127 af
Outflow=1.53 cfs 0.127 af

Reach AP3: Detention Pond Inflow=2.24 cfs 0.228 af
Outflow=2.24 cfs 0.228 af

Reach AP4: Rear of Site Inflow=0.50 cfs 0.045 af
Outflow=0.50 cfs 0.045 af

Pond 1P: Shallow Depression Peak Elev=37.17' Storage=590 cf Inflow=2.00 cfs 0.151 af
Outflow=2.06 cfs 0.138 af

Pond 2P: Wetland Ponding Area Peak Elev=31.32' Storage=6,101 cf Inflow=1.67 cfs 0.177 af
Primary=0.10 cfs 0.038 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.038 af

Total Runoff Area = 2.921 ac Runoff Volume = 0.692 af Average Runoff Depth = 2.84"
78.16% Pervious = 2.283 ac 21.84% Impervious = 0.638 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.67 cfs @ 12.29 hrs, Volume= 0.177 af, Depth> 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
	4,202	55	Woods, Good, HSG B
	191	61	>75% Grass cover, Good, HSG B
	9,900	61	>75% Grass cover, Good, HSG B
	4,049	96	Gravel surface, HSG B
	2,054	98	Paved roads w/curbs & sewers, HSG B
	5,450	55	Woods, Good, HSG B
	745	98	Roofs, HSG B
*	1,274	98	Ledge Outcrop, HSG D
	1,901	77	Woods, Good, HSG D
	666	96	Gravel surface, HSG D
	3,000	80	>75% Grass cover, Good, HSG D
	534	98	Paved roads w/curbs & sewers, HSG D
	763	98	Roofs, HSG D
	34,729	72	Weighted Average
	29,359		84.54% Pervious Area
	5,370		15.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.1	12	0.3300	2.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	112	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.72 cfs @ 12.09 hrs, Volume= 0.127 af, Depth> 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
*	401	98	Ledge Outcrop, HSG D
	1,855	96	Gravel surface, HSG D
	7,620	80	>75% Grass cover, Good, HSG D
	1,200	98	Paved roads w/curbs & sewers, HSG D
	908	98	Roofs, HSG D
	2,786	80	>75% Grass cover, Good, HSG D
	1,725	98	Roofs, HSG D
	16,495	86	Weighted Average
	12,261		74.33% Pervious Area
	4,234		25.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	45	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.6	45	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.43 cfs @ 12.37 hrs, Volume= 0.052 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
*	28	98	Ledge Outcrop, HSG D
	660	96	Gravel surface, HSG D
	1,114	77	Woods, Good, HSG D
	291	80	>75% Grass cover, Good, HSG D
	4,820	61	>75% Grass cover, Good, HSG B
	9,535	55	Woods, Good, HSG B
	16,448	60	Weighted Average
	16,420		99.83% Pervious Area
	28		0.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	11	0.0230	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
5.4	18	0.0167	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.2	19	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.0	22	0.0540	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
8.0	30	0.0180	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
2.0	80	0.0180	0.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.1	180	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.50 cfs @ 12.18 hrs, Volume= 0.045 af, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
*	2,545	98	Ledge Outcrop, HSG D
	27	96	Gravel surface, HSG D
	21	98	Roofs, HSG D
	111	77	Woods, Good, HSG D
	174	80	>75% Grass cover, Good, HSG D
	798	98	Roofs, HSG B
	1,028	61	>75% Grass cover, Good, HSG B
	3,201	55	Woods, Good, HSG B
	7,905	75	Weighted Average
	4,541		57.44% Pervious Area
	3,364		42.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	68	0.0290	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 2.00 cfs @ 12.10 hrs, Volume= 0.151 af, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
*	2,532	98	Ledge Outcrop, HSG D
	1,442	96	Gravel surface, HSG D
	59	98	Roofs, HSG D
	715	77	Woods, Good, HSG D
	3,730	80	>75% Grass cover, Good, HSG D
	1,158	98	Roofs, HSG B
	852	98	Paved parking, HSG B
	1,842	96	Gravel surface, HSG B
	6,869	61	>75% Grass cover, Good, HSG B
	256	55	Woods, Good, HSG B
	1,896	80	>75% Grass cover, Good, HSG D
	1,007	98	Roofs, HSG D
	22,358	81	Weighted Average
	16,750		74.92% Pervious Area
	5,608		25.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	6	0.0500	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.2	15	0.0200	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
3.8	31	0.0167	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.9	14	0.1400	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.6	21	0.0676	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
7.2	87	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.40 cfs @ 12.24 hrs, Volume= 0.140 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
9,085	98	Paved parking, HSG B
5,246	61	>75% Grass cover, Good, HSG B
14,877	55	Woods, Good, HSG B
102	98	Roofs, HSG B
29,310	70	Weighted Average
20,123		68.66% Pervious Area
9,187		31.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0350	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	37	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.7	137	Total			

Summary for Reach 1R: Swale

Inflow Area = 0.379 ac, 25.67% Impervious, Inflow Depth > 4.04" for 10 Yr 24 Hr(+15%) event
Inflow = 1.72 cfs @ 12.09 hrs, Volume= 0.127 af
Outflow = 1.53 cfs @ 12.13 hrs, Volume= 0.127 af, Atten= 11%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.60 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 9.6 min

Peak Storage= 358 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 9.59'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 8.19 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 8.0 '/' Top Width= 18.00'
Length= 140.0' Slope= 0.0214 '/'
Inlet Invert= 40.00', Outlet Invert= 37.00'

‡

Summary for Reach AP1: Wooded Depression

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

Inflow Area = 0.673 ac, 31.34% Impervious, Inflow Depth > 2.49" for 10 Yr 24 Hr(+15%) event
Inflow = 1.40 cfs @ 12.24 hrs, Volume= 0.140 af
Outflow = 1.40 cfs @ 12.24 hrs, Volume= 0.140 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: Shoulder of Road

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

Inflow Area = 0.379 ac, 25.67% Impervious, Inflow Depth > 4.03" for 10 Yr 24 Hr(+15%) event
Inflow = 1.53 cfs @ 12.13 hrs, Volume= 0.127 af
Outflow = 1.53 cfs @ 12.13 hrs, Volume= 0.127 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: Detention Pond

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

Inflow Area = 1.688 ac, 14.97% Impervious, Inflow Depth > 1.62" for 10 Yr 24 Hr(+15%) event
Inflow = 2.24 cfs @ 12.11 hrs, Volume= 0.228 af
Outflow = 2.24 cfs @ 12.11 hrs, Volume= 0.228 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: Rear of Site

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

Inflow Area = 0.181 ac, 42.56% Impervious, Inflow Depth > 2.95" for 10 Yr 24 Hr(+15%) event
Inflow = 0.50 cfs @ 12.18 hrs, Volume= 0.045 af
Outflow = 0.50 cfs @ 12.18 hrs, Volume= 0.045 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: Shallow Depression

[93] Warning: Storage range exceeded by 0.09'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=39)

Inflow Area = 0.513 ac, 25.08% Impervious, Inflow Depth > 3.53" for 10 Yr 24 Hr(+15%) event
Inflow = 2.00 cfs @ 12.10 hrs, Volume= 0.151 af
Outflow = 2.06 cfs @ 12.10 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.0 min
Primary = 2.06 cfs @ 12.10 hrs, Volume= 0.138 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.17' @ 12.10 hrs Surf.Area= 3,088 sf Storage= 590 cf

Plug-Flow detention time= 64.1 min calculated for 0.138 af (91% of inflow)
Center-of-Mass det. time= 20.8 min (835.5 - 814.7)

Volume	Invert	Avail.Storage	Storage Description
#1	36.75'	590 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
36.75	417	0	0
36.88	1,613	132	132
37.00	2,380	240	372
37.08	3,088	219	590

Device	Routing	Invert	Outlet Devices
#1	Primary	37.07'	**27.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=2.04 cfs @ 12.10 hrs HW=37.17' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 2.04 cfs @ 0.77 fps)

Summary for Pond 2P: Wetland Ponding Area

Inflow Area = 0.797 ac, 15.46% Impervious, Inflow Depth > 2.67" for 10 Yr 24 Hr(+15%) event
Inflow = 1.67 cfs @ 12.29 hrs, Volume= 0.177 af
Outflow = 0.10 cfs @ 16.12 hrs, Volume= 0.038 af, Atten= 94%, Lag= 230.1 min
Primary = 0.10 cfs @ 16.12 hrs, Volume= 0.038 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.32' @ 16.12 hrs Surf.Area= 4,120 sf Storage= 6,101 cf

Plug-Flow detention time= 438.2 min calculated for 0.038 af (21% of inflow)

Center-of-Mass det. time= 299.4 min (1,146.8 - 847.3)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	6,968 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)
28.00	619	194.0	0	0	619
29.00	1,245	250.0	914	914	2,610
30.00	2,036	357.0	1,624	2,538	7,787
31.00	2,891	433.0	2,451	4,989	12,582
31.50	4,916	435.0	1,929	6,919	12,839
31.51	4,916	435.0	49	6,968	12,843

Device	Routing	Invert	Outlet Devices
#1	Secondary	31.50'	**70.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	31.30'	**16.0' 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=0.10 cfs @ 16.12 hrs HW=31.32' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.33 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular 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=34,729 sf 15.46% Impervious Runoff Depth>3.92"
Flow Length=112' Tc=20.1 min CN=72 Runoff=2.46 cfs 0.260 af

Subcatchment2S: Subcatchment2S Runoff Area=16,495 sf 25.67% Impervious Runoff Depth>5.48"
Flow Length=45' Slope=0.0400 '/' Tc=6.0 min CN=86 Runoff=2.30 cfs 0.173 af

Subcatchment3S: Subcatchment3S Runoff Area=16,448 sf 0.17% Impervious Runoff Depth>2.67"
Flow Length=180' Tc=24.1 min CN=60 Runoff=0.72 cfs 0.084 af

Subcatchment4S: Subcatchment4S Runoff Area=7,905 sf 42.56% Impervious Runoff Depth>4.25"
Flow Length=68' Slope=0.0290 '/' Tc=12.6 min CN=75 Runoff=0.73 cfs 0.064 af

Subcatchment5S: Subcatchment5S Runoff Area=22,358 sf 25.08% Impervious Runoff Depth>4.91"
Flow Length=87' Tc=7.2 min CN=81 Runoff=2.77 cfs 0.210 af

Subcatchment6S: Subcatchment6S Runoff Area=29,310 sf 31.34% Impervious Runoff Depth>3.71"
Flow Length=137' Tc=16.7 min CN=70 Runoff=2.11 cfs 0.208 af

Reach 1R: Swale Avg. Flow Depth=0.60' Max Vel=0.64 fps Inflow=2.30 cfs 0.173 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=8.19 cfs Outflow=2.06 cfs 0.172 af

Reach AP1: Wooded Depression Inflow=2.11 cfs 0.208 af
Outflow=2.11 cfs 0.208 af

Reach AP2: Shoulder of Road Inflow=2.06 cfs 0.172 af
Outflow=2.06 cfs 0.172 af

Reach AP3: Detention Pond Inflow=3.14 cfs 0.402 af
Outflow=3.14 cfs 0.402 af

Reach AP4: Rear of Site Inflow=0.73 cfs 0.064 af
Outflow=0.73 cfs 0.064 af

Pond 1P: Shallow Depression Peak Elev=37.19' Storage=590 cf Inflow=2.77 cfs 0.210 af
Outflow=2.81 cfs 0.197 af

Pond 2P: Wetland Ponding Area Peak Elev=31.36' Storage=6,271 cf Inflow=2.46 cfs 0.260 af
Primary=0.55 cfs 0.121 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.121 af

Total Runoff Area = 2.921 ac Runoff Volume = 0.999 af Average Runoff Depth = 4.11"
78.16% Pervious = 2.283 ac 21.84% Impervious = 0.638 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=34,729 sf 15.46% Impervious Runoff Depth>5.14"
Flow Length=112' Tc=20.1 min CN=72 Runoff=3.23 cfs 0.342 af

Subcatchment2S: Subcatchment2S Runoff Area=16,495 sf 25.67% Impervious Runoff Depth>6.84"
Flow Length=45' Slope=0.0400 '/' Tc=6.0 min CN=86 Runoff=2.84 cfs 0.216 af

Subcatchment3S: Subcatchment3S Runoff Area=16,448 sf 0.17% Impervious Runoff Depth>3.72"
Flow Length=180' Tc=24.1 min CN=60 Runoff=1.01 cfs 0.117 af

Subcatchment4S: Subcatchment4S Runoff Area=7,905 sf 42.56% Impervious Runoff Depth>5.51"
Flow Length=68' Slope=0.0290 '/' Tc=12.6 min CN=75 Runoff=0.94 cfs 0.083 af

Subcatchment5S: Subcatchment5S Runoff Area=22,358 sf 25.08% Impervious Runoff Depth>6.24"
Flow Length=87' Tc=7.2 min CN=81 Runoff=3.48 cfs 0.267 af

Subcatchment6S: Subcatchment6S Runoff Area=29,310 sf 31.34% Impervious Runoff Depth>4.91"
Flow Length=137' Tc=16.7 min CN=70 Runoff=2.80 cfs 0.275 af

Reach 1R: Swale Avg. Flow Depth=0.65' Max Vel=0.68 fps Inflow=2.84 cfs 0.216 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=8.19 cfs Outflow=2.56 cfs 0.215 af

Reach AP1: Wooded Depression Inflow=2.80 cfs 0.275 af
Outflow=2.80 cfs 0.275 af

Reach AP2: Shoulder of Road Inflow=2.56 cfs 0.215 af
Outflow=2.56 cfs 0.215 af

Reach AP3: Detention Pond Inflow=3.98 cfs 0.573 af
Outflow=3.98 cfs 0.573 af

Reach AP4: Rear of Site Inflow=0.94 cfs 0.083 af
Outflow=0.94 cfs 0.083 af

Pond 1P: Shallow Depression Peak Elev=37.21' Storage=590 cf Inflow=3.48 cfs 0.267 af
Outflow=3.48 cfs 0.253 af

Pond 2P: Wetland Ponding Area Peak Elev=31.44' Storage=6,611 cf Inflow=3.23 cfs 0.342 af
Primary=1.90 cfs 0.202 af Secondary=0.00 cfs 0.000 af Outflow=1.90 cfs 0.202 af

Total Runoff Area = 2.921 ac Runoff Volume = 1.300 af Average Runoff Depth = 5.34"
78.16% Pervious = 2.283 ac 21.84% Impervious = 0.638 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 3.23 cfs @ 12.28 hrs, Volume= 0.342 af, Depth> 5.14"

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

	Area (sf)	CN	Description
	4,202	55	Woods, Good, HSG B
	191	61	>75% Grass cover, Good, HSG B
	9,900	61	>75% Grass cover, Good, HSG B
	4,049	96	Gravel surface, HSG B
	2,054	98	Paved roads w/curbs & sewers, HSG B
	5,450	55	Woods, Good, HSG B
	745	98	Roofs, HSG B
*	1,274	98	Ledge Outcrop, HSG D
	1,901	77	Woods, Good, HSG D
	666	96	Gravel surface, HSG D
	3,000	80	>75% Grass cover, Good, HSG D
	534	98	Paved roads w/curbs & sewers, HSG D
	763	98	Roofs, HSG D
	34,729	72	Weighted Average
	29,359		84.54% Pervious Area
	5,370		15.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	100	0.0200	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.1	12	0.3300	2.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	112	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 2.84 cfs @ 12.09 hrs, Volume= 0.216 af, Depth> 6.84"

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

	Area (sf)	CN	Description
*	401	98	Ledge Outcrop, HSG D
	1,855	96	Gravel surface, HSG D
	7,620	80	>75% Grass cover, Good, HSG D
	1,200	98	Paved roads w/curbs & sewers, HSG D
	908	98	Roofs, HSG D
	2,786	80	>75% Grass cover, Good, HSG D
	1,725	98	Roofs, HSG D
	16,495	86	Weighted Average
	12,261		74.33% Pervious Area
	4,234		25.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	45	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.6	45	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.01 cfs @ 12.35 hrs, Volume= 0.117 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 50 Yr 24 Hr(+15%) Rainfall=8.53"

	Area (sf)	CN	Description
*	28	98	Ledge Outcrop, HSG D
	660	96	Gravel surface, HSG D
	1,114	77	Woods, Good, HSG D
	291	80	>75% Grass cover, Good, HSG D
	4,820	61	>75% Grass cover, Good, HSG B
	9,535	55	Woods, Good, HSG B
	16,448	60	Weighted Average
	16,420		99.83% Pervious Area
	28		0.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	11	0.0230	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
5.4	18	0.0167	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.2	19	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.0	22	0.0540	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
8.0	30	0.0180	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
2.0	80	0.0180	0.67		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.1	180	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.94 cfs @ 12.17 hrs, Volume= 0.083 af, Depth> 5.51"

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

	Area (sf)	CN	Description
*	2,545	98	Ledge Outcrop, HSG D
	27	96	Gravel surface, HSG D
	21	98	Roofs, HSG D
	111	77	Woods, Good, HSG D
	174	80	>75% Grass cover, Good, HSG D
	798	98	Roofs, HSG B
	1,028	61	>75% Grass cover, Good, HSG B
	3,201	55	Woods, Good, HSG B
	7,905	75	Weighted Average
	4,541		57.44% Pervious Area
	3,364		42.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	68	0.0290	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 3.48 cfs @ 12.10 hrs, Volume= 0.267 af, Depth> 6.24"

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

	Area (sf)	CN	Description
*	2,532	98	Ledge Outcrop, HSG D
	1,442	96	Gravel surface, HSG D
	59	98	Roofs, HSG D
	715	77	Woods, Good, HSG D
	3,730	80	>75% Grass cover, Good, HSG D
	1,158	98	Roofs, HSG B
	852	98	Paved parking, HSG B
	1,842	96	Gravel surface, HSG B
	6,869	61	>75% Grass cover, Good, HSG B
	256	55	Woods, Good, HSG B
	1,896	80	>75% Grass cover, Good, HSG D
	1,007	98	Roofs, HSG D
	22,358	81	Weighted Average
	16,750		74.92% Pervious Area
	5,608		25.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	6	0.0500	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.2	15	0.0200	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
3.8	31	0.0167	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.9	14	0.1400	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.6	21	0.0676	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
7.2	87	Total			

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 2.80 cfs @ 12.23 hrs, Volume= 0.275 af, Depth> 4.91"

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

Area (sf)	CN	Description
9,085	98	Paved parking, HSG B
5,246	61	>75% Grass cover, Good, HSG B
14,877	55	Woods, Good, HSG B
102	98	Roofs, HSG B
29,310	70	Weighted Average
20,123		68.66% Pervious Area
9,187		31.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0350	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	37	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.7	137	Total			

Summary for Reach 1R: Swale

Inflow Area = 0.379 ac, 25.67% Impervious, Inflow Depth > 6.84" for 50 Yr 24 Hr(+15%) event
Inflow = 2.84 cfs @ 12.09 hrs, Volume= 0.216 af
Outflow = 2.56 cfs @ 12.13 hrs, Volume= 0.215 af, Atten= 10%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.68 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 8.6 min

Peak Storage= 527 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 11.65'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 8.19 cfs

0.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 10.0 8.0 '/' Top Width= 18.00'
Length= 140.0' Slope= 0.0214 '/'
Inlet Invert= 40.00', Outlet Invert= 37.00'

‡

Summary for Reach AP1: Wooded Depression

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

Inflow Area = 0.673 ac, 31.34% Impervious, Inflow Depth > 4.91" for 50 Yr 24 Hr(+15%) event
Inflow = 2.80 cfs @ 12.23 hrs, Volume= 0.275 af
Outflow = 2.80 cfs @ 12.23 hrs, Volume= 0.275 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: Shoulder of Road

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

Inflow Area = 0.379 ac, 25.67% Impervious, Inflow Depth > 6.83" for 50 Yr 24 Hr(+15%) event
Inflow = 2.56 cfs @ 12.13 hrs, Volume= 0.215 af
Outflow = 2.56 cfs @ 12.13 hrs, Volume= 0.215 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: Detention Pond

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

Inflow Area = 1.688 ac, 14.97% Impervious, Inflow Depth > 4.07" for 50 Yr 24 Hr(+15%) event
Inflow = 3.98 cfs @ 12.11 hrs, Volume= 0.573 af
Outflow = 3.98 cfs @ 12.11 hrs, Volume= 0.573 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: Rear of Site

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

Inflow Area = 0.181 ac, 42.56% Impervious, Inflow Depth > 5.51" for 50 Yr 24 Hr(+15%) event
Inflow = 0.94 cfs @ 12.17 hrs, Volume= 0.083 af
Outflow = 0.94 cfs @ 12.17 hrs, Volume= 0.083 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: Shallow Depression

[93] Warning: Storage range exceeded by 0.13'

Inflow Area = 0.513 ac, 25.08% Impervious, Inflow Depth > 6.24" for 50 Yr 24 Hr(+15%) event
Inflow = 3.48 cfs @ 12.10 hrs, Volume= 0.267 af
Outflow = 3.48 cfs @ 12.10 hrs, Volume= 0.253 af, Atten= 0%, Lag= 0.0 min
Primary = 3.48 cfs @ 12.10 hrs, Volume= 0.253 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.21' @ 12.10 hrs Surf.Area= 3,088 sf Storage= 590 cf

Plug-Flow detention time= 43.0 min calculated for 0.253 af (95% of inflow)
Center-of-Mass det. time= 15.6 min (814.3 - 798.7)

Volume	Invert	Avail.Storage	Storage Description
#1	36.75'	590 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
36.75	417	0	0
36.88	1,613	132	132
37.00	2,380	240	372
37.08	3,088	219	590

Device	Routing	Invert	Outlet Devices
#1	Primary	37.07'	**27.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.45 cfs @ 12.10 hrs HW=37.21' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 3.45 cfs @ 0.91 fps)

Summary for Pond 2P: Wetland Ponding Area

Inflow Area = 0.797 ac, 15.46% Impervious, Inflow Depth > 5.14" for 50 Yr 24 Hr(+15%) event
Inflow = 3.23 cfs @ 12.28 hrs, Volume= 0.342 af
Outflow = 1.90 cfs @ 12.57 hrs, Volume= 0.202 af, Atten= 41%, Lag= 17.7 min
Primary = 1.90 cfs @ 12.57 hrs, Volume= 0.202 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.44' @ 12.57 hrs Surf.Area= 4,625 sf Storage= 6,611 cf

Plug-Flow detention time= 192.9 min calculated for 0.202 af (59% of inflow)
Center-of-Mass det. time= 88.0 min (916.6 - 828.7)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	6,968 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)
28.00	619	194.0	0	0	619
29.00	1,245	250.0	914	914	2,610
30.00	2,036	357.0	1,624	2,538	7,787
31.00	2,891	433.0	2,451	4,989	12,582
31.50	4,916	435.0	1,929	6,919	12,839
31.51	4,916	435.0	49	6,968	12,843

Device	Routing	Invert	Outlet Devices
#1	Secondary	31.50'	**70.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	31.30'	**16.0' 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

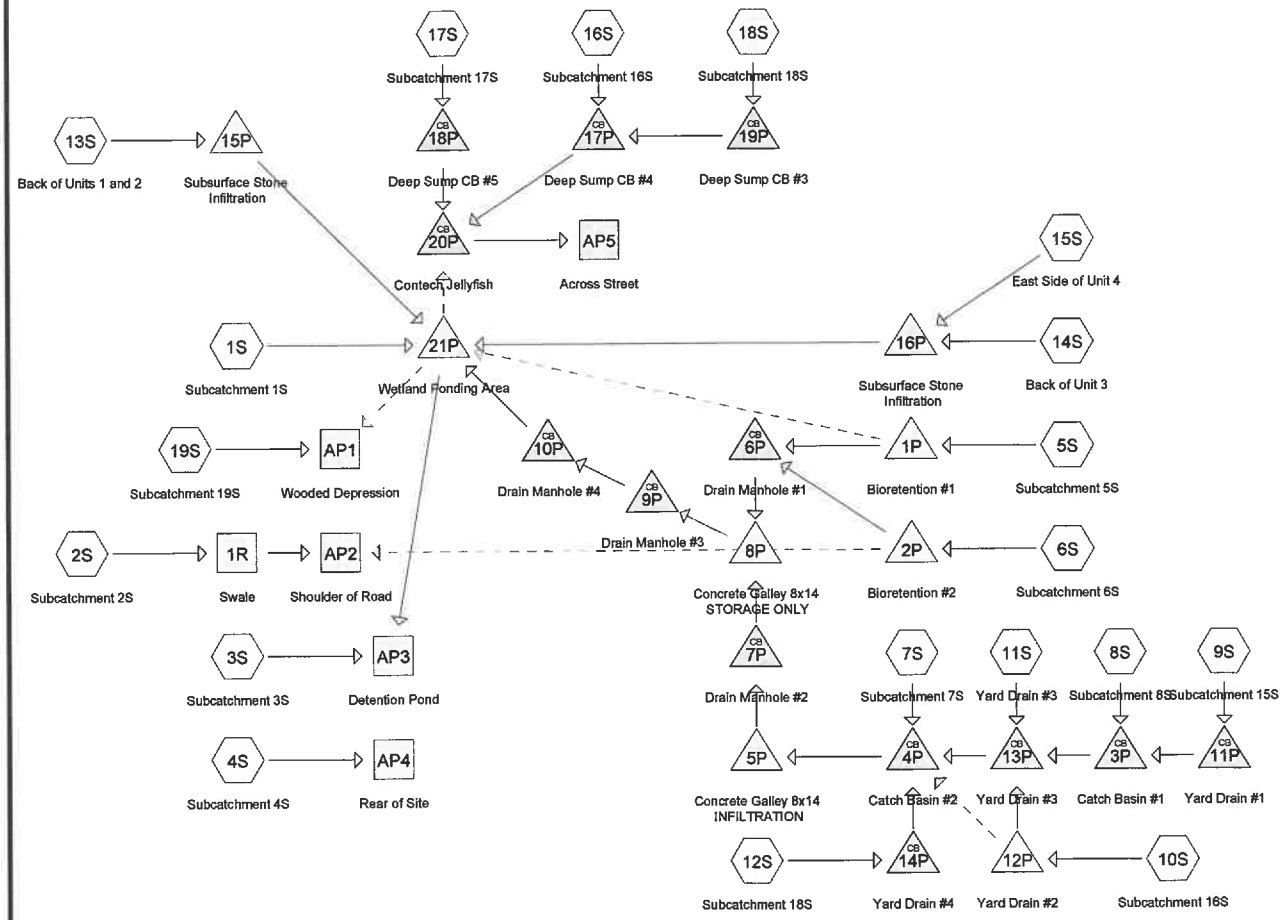
Primary OutFlow Max=1.86 cfs @ 12.57 hrs HW=31.43' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.86 cfs @ 0.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

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



Subcat | Reach | Pond | Link

Routing Diagram for 21047-PROPOSED
Prepared by Jones and Beach Engineers, Inc., Printed 5/10/2022
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.673	61	>75% Grass cover, Good, HSG B (1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 19S)
0.400	80	>75% Grass cover, Good, HSG D (1S, 2S, 6S, 7S, 8S, 9S, 10S, 12S)
0.095	98	Ledge Outcrop, HSG D (2S, 4S, 8S)
0.522	98	Paved parking, HSG B (5S, 6S, 7S, 8S, 17S, 18S, 19S)
0.136	98	Paved parking, HSG D (5S, 6S, 7S, 8S, 17S)
0.042	98	Paved roads w/curbs & sewers, HSG B (1S, 16S)
0.007	98	Paved roads w/curbs & sewers, HSG D (2S)
0.257	98	Roofs, HSG B (1S, 3S, 4S, 5S, 7S, 8S, 9S, 11S, 12S, 13S, 15S, 19S)
0.289	98	Roofs, HSG D (1S, 2S, 6S, 7S, 8S, 9S, 12S, 14S, 15S)
0.487	55	Woods, Good, HSG B (1S, 3S, 4S, 19S)
0.014	77	Woods, Good, HSG D (1S, 4S)
2.921	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.980	HSG B	1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 16S, 17S, 18S, 19S
0.000	HSG C	
0.941	HSG D	1S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 12S, 14S, 15S, 17S
0.000	Other	
2.921		**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=13,938 sf 18.32% Impervious Runoff Depth>0.96"
Flow Length=48' Tc=6.6 min CN=67 Runoff=0.31 cfs 0.026 af

Subcatchment2S: Subcatchment2S Runoff Area=14,773 sf 41.02% Impervious Runoff Depth>2.36"
Flow Length=126' Tc=12.0 min CN=87 Runoff=0.76 cfs 0.067 af

Subcatchment3S: Subcatchment3S Runoff Area=8,436 sf 21.48% Impervious Runoff Depth>1.07"
Tc=6.0 min CN=69 Runoff=0.22 cfs 0.017 af

Subcatchment4S: Subcatchment4S Runoff Area=5,429 sf 56.24% Impervious Runoff Depth>1.87"
Flow Length=87' Tc=13.2 min CN=81 Runoff=0.21 cfs 0.019 af

Subcatchment5S: Subcatchment5S Runoff Area=6,946 sf 73.74% Impervious Runoff Depth>2.45"
Tc=6.0 min CN=88 Runoff=0.44 cfs 0.033 af

Subcatchment6S: Subcatchment6S Runoff Area=10,412 sf 62.71% Impervious Runoff Depth>2.63"
Flow Length=60' Tc=6.0 min CN=90 Runoff=0.71 cfs 0.052 af

Subcatchment7S: Subcatchment7S Runoff Area=9,749 sf 83.39% Impervious Runoff Depth>2.93"
Flow Length=135' Tc=6.0 min CN=93 Runoff=0.72 cfs 0.055 af

Subcatchment8S: Subcatchment8S Runoff Area=13,276 sf 70.01% Impervious Runoff Depth>2.63"
Flow Length=86' Tc=11.2 min CN=90 Runoff=0.77 cfs 0.067 af

Subcatchment9S: Subcatchment15S Runoff Area=3,072 sf 26.66% Impervious Runoff Depth>1.58"
Flow Length=67' Slope=0.0160 '/' Tc=7.2 min CN=77 Runoff=0.12 cfs 0.009 af

Subcatchment10S: Subcatchment16S Runoff Area=3,155 sf 0.00% Impervious Runoff Depth>0.71"
Flow Length=83' Slope=0.0060 '/' Tc=12.7 min CN=62 Runoff=0.04 cfs 0.004 af

Subcatchment11S: Yard Drain #3 Runoff Area=2,881 sf 15.97% Impervious Runoff Depth>0.96"
Flow Length=60' Slope=0.0150 '/' Tc=6.8 min CN=67 Runoff=0.06 cfs 0.005 af

Subcatchment12S: Subcatchment18S Runoff Area=1,341 sf 25.58% Impervious Runoff Depth>2.03"
Flow Length=37' Slope=0.0190 '/' Tc=6.0 min CN=83 Runoff=0.07 cfs 0.005 af

Subcatchment13S: Back of Units 1 and 2 Runoff Area=918 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af

Subcatchment14S: Back of Unit 3 Runoff Area=310 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment15S: East Side of Unit 4 Runoff Area=502 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment16S: Subcatchment16S Runoff Area=1,247 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment17S: Subcatchment17S Runoff Area=2,806 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.019 af

Subcatchment18S: Subcatchment18S Runoff Area=4,475 sf 100.00% Impervious Runoff Depth>3.46"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.030 af

Subcatchment19S: Subcatchment19S Runoff Area=23,588 sf 18.01% Impervious Runoff Depth>0.80"
Flow Length=137' Tc=16.7 min CN=64 Runoff=0.31 cfs 0.036 af

Reach 1R: Swale Avg. Flow Depth=0.61' Max Vel=0.64 fps Inflow=0.76 cfs 0.067 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=2.65 cfs Outflow=0.72 cfs 0.067 af

Reach AP1: Wooded Depression Inflow=0.31 cfs 0.036 af
Outflow=0.31 cfs 0.036 af

Reach AP2: Shoulder of Road Inflow=0.72 cfs 0.067 af
Outflow=0.72 cfs 0.067 af

Reach AP3: Detention Pond Inflow=0.22 cfs 0.017 af
Outflow=0.22 cfs 0.017 af

Reach AP4: Rear of Site Inflow=0.21 cfs 0.019 af
Outflow=0.21 cfs 0.019 af

Reach AP5: Across Street Inflow=0.69 cfs 0.082 af
Outflow=0.69 cfs 0.082 af

Pond 1P: Bioretention #1 Peak Elev=35.21' Storage=137 cf Inflow=0.44 cfs 0.033 af
Primary=0.44 cfs 0.030 af Secondary=0.00 cfs 0.000 af Outflow=0.44 cfs 0.030 af

Pond 2P: Bioretention #2 Peak Elev=35.40' Storage=218 cf Inflow=0.71 cfs 0.052 af
Primary=0.60 cfs 0.051 af Secondary=0.00 cfs 0.000 af Outflow=0.60 cfs 0.051 af

Pond 3P: Catch Basin #1 Peak Elev=35.59' Inflow=0.89 cfs 0.076 af
15.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=0.89 cfs 0.076 af

Pond 4P: Catch Basin #2 Peak Elev=35.08' Inflow=1.70 cfs 0.145 af
15.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=1.70 cfs 0.145 af

Pond 5P: Concrete Galley 8x14 INFILTRATION Peak Elev=34.18' Storage=0.050 af Inflow=1.70 cfs 0.145 af
Discarded=0.46 cfs 0.144 af Primary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.144 af

Pond 6P: Drain Manhole #1 Peak Elev=34.70' Inflow=1.02 cfs 0.081 af
12.0" Round Culvert n=0.013 L=48.0' S=0.0056 '/' Outflow=1.02 cfs 0.081 af

Pond 7P: Drain Manhole #2 Peak Elev=34.20' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.00 cfs 0.000 af

Pond 8P: Concrete Galley 8x14 STORAGE Peak Elev=33.77' Storage=0.021 af Inflow=1.02 cfs 0.081 af
Primary=0.38 cfs 0.080 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.080 af

Pond 9P: Drain Manhole #3 Peak Elev=31.97' Inflow=0.38 cfs 0.080 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.38 cfs 0.080 af

Pond 10P: Drain Manhole #4 Peak Elev=31.47' Inflow=0.38 cfs 0.080 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.38 cfs 0.080 af

Pond 11P: Yard Drain #1 Peak Elev=36.03' Inflow=0.12 cfs 0.009 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=0.12 cfs 0.009 af

Pond 12P: Yard Drain #2 Peak Elev=39.02' Storage=1 cf Inflow=0.04 cfs 0.004 af
Primary=0.04 cfs 0.004 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.004 af

Pond 13P: Yard Drain #3 Peak Elev=35.31' Inflow=0.98 cfs 0.086 af
15.0" Round Culvert n=0.013 L=48.0' S=0.0052 '/' Outflow=0.98 cfs 0.086 af

Pond 14P: Yard Drain #4 Peak Elev=36.66' Inflow=0.07 cfs 0.005 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0100 '/' Outflow=0.07 cfs 0.005 af

Pond 15P: Subsurface Stone Infiltration Peak Elev=29.07' Storage=0.002 af Inflow=0.07 cfs 0.006 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 16P: Subsurface Stone Infiltration Peak Elev=32.44' Storage=0.002 af Inflow=0.07 cfs 0.005 af
Discarded=0.02 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.005 af

Pond 17P: Deep Sump CB #4 Peak Elev=29.99' Inflow=0.46 cfs 0.038 af
12.0" Round Culvert n=0.013 L=67.0' S=0.0060 '/' Outflow=0.46 cfs 0.038 af

Pond 18P: Deep Sump CB #5 Peak Elev=29.53' Inflow=0.23 cfs 0.019 af
12.0" Round Culvert n=0.013 L=3.0' S=0.0167 '/' Outflow=0.23 cfs 0.019 af

Pond 19P: Deep Sump CB #3 Peak Elev=30.20' Inflow=0.36 cfs 0.030 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.36 cfs 0.030 af

Pond 20P: Contech Jellyfish Peak Elev=29.41' Inflow=0.69 cfs 0.082 af
15.0" Round Culvert n=0.013 L=42.0' S=0.0060 '/' Outflow=0.69 cfs 0.082 af

Pond 21P: Wetland Ponding Area Peak Elev=30.42' Storage=3,584 cf Inflow=0.63 cfs 0.106 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=0.05 cfs 0.026 af Outflow=0.05 cfs 0.026 af

Total Runoff Area = 2.921 ac Runoff Volume = 0.464 af Average Runoff Depth = 1.91"
53.89% Pervious = 1.574 ac 46.11% Impervious = 1.347 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=13,938 sf 18.32% Impervious Runoff Depth>2.24"
Flow Length=48' Tc=6.6 min CN=67 Runoff=0.80 cfs 0.060 af

Subcatchment2S: Subcatchment2S Runoff Area=14,773 sf 41.02% Impervious Runoff Depth>4.14"
Flow Length=126' Tc=12.0 min CN=87 Runoff=1.32 cfs 0.117 af

Subcatchment3S: Subcatchment3S Runoff Area=8,436 sf 21.48% Impervious Runoff Depth>2.41"
Tc=6.0 min CN=69 Runoff=0.53 cfs 0.039 af

Subcatchment4S: Subcatchment4S Runoff Area=5,429 sf 56.24% Impervious Runoff Depth>3.52"
Flow Length=87' Tc=13.2 min CN=81 Runoff=0.40 cfs 0.037 af

Subcatchment5S: Subcatchment5S Runoff Area=6,946 sf 73.74% Impervious Runoff Depth>4.25"
Tc=6.0 min CN=88 Runoff=0.75 cfs 0.056 af

Subcatchment6S: Subcatchment6S Runoff Area=10,412 sf 62.71% Impervious Runoff Depth>4.46"
Flow Length=60' Tc=6.0 min CN=90 Runoff=1.17 cfs 0.089 af

Subcatchment7S: Subcatchment7S Runoff Area=9,749 sf 83.39% Impervious Runoff Depth>4.79"
Flow Length=135' Tc=6.0 min CN=93 Runoff=1.15 cfs 0.089 af

Subcatchment8S: Subcatchment8S Runoff Area=13,276 sf 70.01% Impervious Runoff Depth>4.46"
Flow Length=86' Tc=11.2 min CN=90 Runoff=1.28 cfs 0.113 af

Subcatchment9S: Subcatchment15S Runoff Area=3,072 sf 26.66% Impervious Runoff Depth>3.14"
Flow Length=67' Slope=0.0160 '/' Tc=7.2 min CN=77 Runoff=0.25 cfs 0.018 af

Subcatchment10S: Subcatchment16S Runoff Area=3,155 sf 0.00% Impervious Runoff Depth>1.82"
Flow Length=83' Slope=0.0060 '/' Tc=12.7 min CN=62 Runoff=0.12 cfs 0.011 af

Subcatchment11S: Yard Drain #3 Runoff Area=2,881 sf 15.97% Impervious Runoff Depth>2.24"
Flow Length=60' Slope=0.0150 '/' Tc=6.8 min CN=67 Runoff=0.16 cfs 0.012 af

Subcatchment12S: Subcatchment18S Runoff Area=1,341 sf 25.58% Impervious Runoff Depth>3.73"
Flow Length=37' Slope=0.0190 '/' Tc=6.0 min CN=83 Runoff=0.13 cfs 0.010 af

Subcatchment13S: Back of Units 1 and 2 Runoff Area=918 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment14S: Back of Unit 3 Runoff Area=310 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment15S: East Side of Unit 4 Runoff Area=502 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment16S: Subcatchment16S Runoff Area=1,247 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.013 af

Subcatchment17S: Subcatchment17S Runoff Area=2,806 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.35 cfs 0.029 af

Subcatchment18S: Subcatchment18S Runoff Area=4,475 sf 100.00% Impervious Runoff Depth>5.37"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.046 af

Subcatchment19S: Subcatchment19S Runoff Area=23,588 sf 18.01% Impervious Runoff Depth>1.98"
Flow Length=137' Tc=16.7 min CN=64 Runoff=0.87 cfs 0.089 af

Reach 1R: Swale Avg. Flow Depth=0.76' Max Vel=0.73 fps Inflow=1.32 cfs 0.117 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=2.65 cfs Outflow=1.25 cfs 0.117 af

Reach AP1: Wooded Depression Inflow=0.87 cfs 0.089 af
Outflow=0.87 cfs 0.089 af

Reach AP2: Shoulder of Road Inflow=1.25 cfs 0.117 af
Outflow=1.25 cfs 0.117 af

Reach AP3: Detention Pond Inflow=0.53 cfs 0.039 af
Outflow=0.53 cfs 0.039 af

Reach AP4: Rear of Site Inflow=0.40 cfs 0.037 af
Outflow=0.40 cfs 0.037 af

Reach AP5: Across Street Inflow=1.05 cfs 0.206 af
Outflow=1.05 cfs 0.206 af

Pond 1P: Bioretention #1 Peak Elev=35.60' Storage=155 cf Inflow=0.75 cfs 0.056 af
Primary=0.73 cfs 0.054 af Secondary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.054 af

Pond 2P: Bioretention #2 Peak Elev=36.19' Storage=303 cf Inflow=1.17 cfs 0.089 af
Primary=1.03 cfs 0.087 af Secondary=0.00 cfs 0.000 af Outflow=1.03 cfs 0.087 af

Pond 3P: Catch Basin #1 Peak Elev=35.87' Inflow=1.50 cfs 0.132 af
15.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=1.50 cfs 0.132 af

Pond 4P: Catch Basin #2 Peak Elev=35.75' Inflow=2.93 cfs 0.254 af
15.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=2.93 cfs 0.254 af

Pond 5P: Concrete Galley 8x14 INFILTRATION Peak Elev=35.72' Storage=0.094 af Inflow=2.93 cfs 0.254 af
Discarded=0.67 cfs 0.251 af Primary=0.00 cfs 0.000 af Outflow=0.68 cfs 0.251 af

Pond 6P: Drain Manhole #1 Peak Elev=34.96' Inflow=1.76 cfs 0.141 af
12.0" Round Culvert n=0.013 L=48.0' S=0.0056 '/' Outflow=1.76 cfs 0.141 af

Pond 7P: Drain Manhole #2 Peak Elev=34.71' Inflow=0.00 cfs 0.000 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.00 cfs 0.000 af

Pond 8P: Concrete Galley 8x14 STORAGE Peak Elev=34.73' Storage=0.041 af Inflow=1.76 cfs 0.141 af
Primary=0.50 cfs 0.140 af Secondary=0.00 cfs 0.000 af Outflow=0.50 cfs 0.140 af

Pond 9P: Drain Manhole #3 Peak Elev=32.03' Inflow=0.50 cfs 0.140 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.50 cfs 0.140 af

Pond 10P: Drain Manhole #4 Peak Elev=31.53' Inflow=0.50 cfs 0.140 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.50 cfs 0.140 af

Pond 11P: Yard Drain #1 Peak Elev=36.14' Inflow=0.25 cfs 0.018 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=0.25 cfs 0.018 af

Pond 12P: Yard Drain #2 Peak Elev=39.04' Storage=2 cf Inflow=0.12 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 13P: Yard Drain #3 Peak Elev=35.76' Inflow=1.76 cfs 0.155 af
15.0" Round Culvert n=0.013 L=48.0' S=0.0052 '/' Outflow=1.76 cfs 0.155 af

Pond 14P: Yard Drain #4 Peak Elev=36.72' Inflow=0.13 cfs 0.010 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0100 '/' Outflow=0.13 cfs 0.010 af

Pond 15P: Subsurface Stone Infiltration Peak Elev=30.07' Storage=0.004 af Inflow=0.11 cfs 0.009 af
Discarded=0.02 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.009 af

Pond 16P: Subsurface Stone Infiltration Peak Elev=32.81' Storage=0.003 af Inflow=0.10 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 17P: Deep Sump CB #4 Peak Elev=30.09' Inflow=0.70 cfs 0.059 af
12.0" Round Culvert n=0.013 L=67.0' S=0.0060 '/' Outflow=0.70 cfs 0.059 af

Pond 18P: Deep Sump CB #5 Peak Elev=29.64' Inflow=0.35 cfs 0.029 af
12.0" Round Culvert n=0.013 L=3.0' S=0.0167 '/' Outflow=0.35 cfs 0.029 af

Pond 19P: Deep Sump CB #3 Peak Elev=30.31' Inflow=0.55 cfs 0.046 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.55 cfs 0.046 af

Pond 20P: Contech Jellyfish Peak Elev=29.53' Inflow=1.05 cfs 0.206 af
15.0" Round Culvert n=0.013 L=42.0' S=0.0060 '/' Outflow=1.05 cfs 0.206 af

Pond 21P: Wetland Ponding Area Peak Elev=30.65' Storage=4,209 cf Inflow=1.19 cfs 0.200 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=0.44 cfs 0.119 af Outflow=0.44 cfs 0.119 af

Total Runoff Area = 2.921 ac Runoff Volume = 0.846 af Average Runoff Depth = 3.48"
53.89% Pervious = 1.574 ac 46.11% Impervious = 1.347 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 0.80 cfs @ 12.10 hrs, Volume= 0.060 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
586	98	Paved roads w/curbs & sewers, HSG B
1,864	55	Woods, Good, HSG B
3,396	61	>75% Grass cover, Good, HSG B
611	80	>75% Grass cover, Good, HSG D
541	77	Woods, Good, HSG D
3,408	55	Woods, Good, HSG B
1,564	61	>75% Grass cover, Good, HSG B
1,600	98	Roofs, HSG B
368	98	Roofs, HSG D
13,938	67	Weighted Average
11,384		81.68% Pervious Area
2,554		18.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	32	0.0625	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
1.5	16	0.3300	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
6.6	48	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.32 cfs @ 12.16 hrs, Volume= 0.117 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
	4,812	80	>75% Grass cover, Good, HSG D
	319	98	Paved roads w/curbs & sewers, HSG D
	2,823	98	Roofs, HSG D
*	186	98	Ledge Outcrop, HSG D
	3,901	80	>75% Grass cover, Good, HSG D
	2,732	98	Roofs, HSG D
	14,773	87	Weighted Average
	8,713		58.98% Pervious Area
	6,060		41.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	38	0.1000	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.7	17	0.3300	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
9.1	71	0.0100	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
12.0	126	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
6,481	61	>75% Grass cover, Good, HSG B
143	55	Woods, Good, HSG B
1,812	98	Roofs, HSG B
8,436	69	Weighted Average
6,624		78.52% Pervious Area
1,812		21.48% Impervious Area

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

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.40 cfs @ 12.18 hrs, Volume= 0.037 af, Depth> 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
*	2,343	98	Ledge Outcrop, HSG D
	73	77	Woods, Good, HSG D
	917	55	Woods, Good, HSG B
	1,386	61	>75% Grass cover, Good, HSG B
	710	98	Roofs, HSG B
	5,429	81	Weighted Average
	2,376		43.76% Pervious Area
	3,053		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	38	0.2100	3.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.8	7	0.2860	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
12.2	42	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
13.2	87	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
1,824	61	>75% Grass cover, Good, HSG B
14	98	Paved parking, HSG D
3,268	98	Paved parking, HSG B
1,840	98	Roofs, HSG B
6,946	88	Weighted Average
1,824		26.26% Pervious Area
5,122		73.74% Impervious Area

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

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.089 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
687	61	>75% Grass cover, Good, HSG B
1,334	98	Paved parking, HSG B
2,813	98	Paved parking, HSG D
3,196	80	>75% Grass cover, Good, HSG D
2,382	98	Roofs, HSG D
10,412	90	Weighted Average
3,883		37.29% Pervious Area
6,529		62.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.7	40	0.0100	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
2.4	60	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 1.15 cfs @ 12.09 hrs, Volume= 0.089 af, Depth> 4.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
1,935	98	Roofs, HSG B
2,857	98	Paved parking, HSG B
1,047	61	>75% Grass cover, Good, HSG B
857	98	Roofs, HSG D
2,481	98	Paved parking, HSG D
572	80	>75% Grass cover, Good, HSG D
9,749	93	Weighted Average
1,619		16.61% Pervious Area
8,130		83.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	40	0.0175	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.0	60	0.0100	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.3	35	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.9	135	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 1.28 cfs @ 12.15 hrs, Volume= 0.113 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

	Area (sf)	CN	Description
	1,788	61	>75% Grass cover, Good, HSG B
	4,412	98	Paved parking, HSG B
	1,219	98	Roofs, HSG B
	2,194	80	>75% Grass cover, Good, HSG D
*	1,608	98	Ledge Outcrop, HSG D
	39	98	Paved parking, HSG D
	2,016	98	Roofs, HSG D
	13,276	90	Weighted Average
	3,982		29.99% Pervious Area
	9,294		70.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	40	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.5	20	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
5.4	26	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
11.2	86	Total			

Summary for Subcatchment 9S: Subcatchment 15S

Runoff = 0.25 cfs @ 12.11 hrs, Volume= 0.018 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
1,238	61	>75% Grass cover, Good, HSG B
1,015	80	>75% Grass cover, Good, HSG D
72	98	Roofs, HSG B
747	98	Roofs, HSG D
3,072	77	Weighted Average
2,253		73.34% Pervious Area
819		26.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	67	0.0160	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment 10S: Subcatchment 16S

Runoff = 0.12 cfs @ 12.19 hrs, Volume= 0.011 af, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
2,918	61	>75% Grass cover, Good, HSG B
237	80	>75% Grass cover, Good, HSG D
3,155	62	Weighted Average
3,155		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	83	0.0060	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment 11S: Yard Drain #3

Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
2,421	61	>75% Grass cover, Good, HSG B
460	98	Roofs, HSG B
2,881	67	Weighted Average
2,421		84.03% Pervious Area
460		15.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	60	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment 12S: Subcatchment 18S

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.010 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
94	61	>75% Grass cover, Good, HSG B
904	80	>75% Grass cover, Good, HSG D
11	98	Roofs, HSG B
332	98	Roofs, HSG D
1,341	83	Weighted Average
998		74.42% Pervious Area
343		25.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0190	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.2	37	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: Back of Units 1 and 2

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
918	98	Roofs, HSG B
918		100.00% Impervious Area

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

Summary for Subcatchment 14S: Back of Unit 3

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
310	98	Roofs, HSG D
310		100.00% Impervious Area

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

Summary for Subcatchment 15S: East Side of Unit 4

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
500	98	Roofs, HSG B
2	98	Roofs, HSG D
502	98	Weighted Average
502		100.00% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
1,247	98	Paved roads w/curbs & sewers, HSG B
1,247		100.00% Impervious Area

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

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG B
576	98	Paved parking, HSG D
2,806	98	Weighted Average
2,806		100.00% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
4,475	98	Paved parking, HSG B
4,475		100.00% Impervious Area

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

Summary for Subcatchment 19S: Subcatchment 19S

Runoff = 0.87 cfs @ 12.25 hrs, Volume= 0.089 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Yr 24 Hr(+15%) Rainfall=5.61"

Area (sf)	CN	Description
4,147	98	Paved parking, HSG B
4,462	61	>75% Grass cover, Good, HSG B
102	98	Roofs, HSG B
14,877	55	Woods, Good, HSG B
23,588	64	Weighted Average
19,339		81.99% Pervious Area
4,249		18.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0350	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	37	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.7	137	Total			

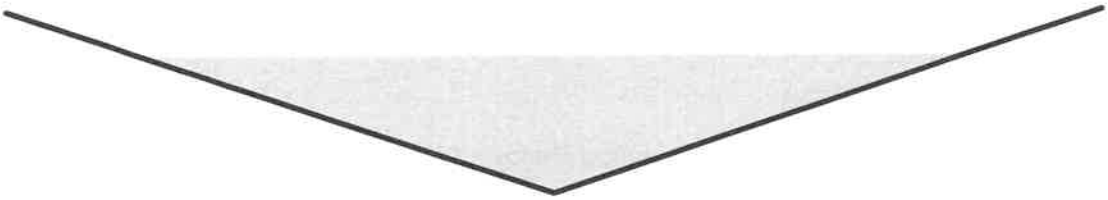
Summary for Reach 1R: Swale

Inflow Area = 0.339 ac, 41.02% Impervious, Inflow Depth > 4.14" for 10 Yr 24 Hr(+15%) event
Inflow = 1.32 cfs @ 12.16 hrs, Volume= 0.117 af
Outflow = 1.25 cfs @ 12.21 hrs, Volume= 0.117 af, Atten= 5%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.73 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 7.7 min

Peak Storage= 240 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.76' , Surface Width= 4.53'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 2.65 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= 140.0' Slope= 0.0214 '/'
Inlet Invert= 40.00', Outlet Invert= 37.00'



Summary for Reach AP1: Wooded Depression

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

Inflow Area = 0.542 ac, 18.01% Impervious, Inflow Depth > 1.98" for 10 Yr 24 Hr(+15%) event
Inflow = 0.87 cfs @ 12.25 hrs, Volume= 0.089 af
Outflow = 0.87 cfs @ 12.25 hrs, Volume= 0.089 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: Shoulder of Road

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

Inflow Area = 0.339 ac, 41.02% Impervious, Inflow Depth > 4.13" for 10 Yr 24 Hr(+15%) event
Inflow = 1.25 cfs @ 12.21 hrs, Volume= 0.117 af
Outflow = 1.25 cfs @ 12.21 hrs, Volume= 0.117 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: Detention Pond

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

Inflow Area = 1.720 ac, 49.10% Impervious, Inflow Depth > 0.27" for 10 Yr 24 Hr(+15%) event
Inflow = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af
Outflow = 0.53 cfs @ 12.10 hrs, Volume= 0.039 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: Rear of Site

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

Inflow Area = 0.125 ac, 56.24% Impervious, Inflow Depth > 3.52" for 10 Yr 24 Hr(+15%) event
Inflow = 0.40 cfs @ 12.18 hrs, Volume= 0.037 af
Outflow = 0.40 cfs @ 12.18 hrs, Volume= 0.037 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: Across Street

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

Inflow Area = 0.196 ac,100.00% Impervious, Inflow Depth > 12.64" for 10 Yr 24 Hr(+15%) event
Inflow = 1.05 cfs @ 12.09 hrs, Volume= 0.206 af
Outflow = 1.05 cfs @ 12.09 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Bioretention #1

Inflow Area = 0.159 ac, 73.74% Impervious, Inflow Depth > 4.25" for 10 Yr 24 Hr(+15%) event
Inflow = 0.75 cfs @ 12.09 hrs, Volume= 0.056 af
Outflow = 0.73 cfs @ 12.11 hrs, Volume= 0.054 af, Atten= 3%, Lag= 1.1 min
Primary = 0.73 cfs @ 12.11 hrs, Volume= 0.054 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.60' @ 12.11 hrs Surf.Area= 315 sf Storage= 155 cf

Plug-Flow detention time= 39.0 min calculated for 0.054 af (96% of inflow)
Center-of-Mass det. time= 15.9 min (809.2 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	33.99'	694 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.99	315	0.0	0	0
34.00	315	40.0	1	1
34.99	315	40.0	125	126
35.00	315	15.0	0	126
36.49	315	15.0	70	197
36.50	315	100.0	3	200
37.00	484	100.0	200	400
37.50	668	100.0	288	688
37.51	668	100.0	7	694

Device	Routing	Invert	Outlet Devices
#1	Primary	34.58'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.58' / 34.40' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	34.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	37.30'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	37.50'	**31.0' 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=0.72 cfs @ 12.11 hrs HW=35.58' TW=34.94' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.72 cfs of 1.00 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 3.68 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=33.99' TW=28.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

Inflow Area = 0.239 ac, 62.71% Impervious, Inflow Depth > 4.46" for 10 Yr 24 Hr(+15%) event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 0.089 af
Outflow = 1.03 cfs @ 12.13 hrs, Volume= 0.087 af, Atten= 12%, Lag= 2.7 min
Primary = 1.03 cfs @ 12.13 hrs, Volume= 0.087 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.19' @ 12.13 hrs Surf.Area= 600 sf Storage= 303 cf

Plug-Flow detention time= 24.2 min calculated for 0.087 af (98% of inflow)
Center-of-Mass det. time= 12.3 min (798.7 - 786.4)

Volume	Invert	Avail.Storage	Storage Description
#1	34.49'	1,249 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.49	600	0.0	0	0
34.50	600	40.0	2	2
35.49	600	40.0	238	240
35.50	600	15.0	1	241
36.99	600	15.0	134	375
37.00	600	100.0	6	381
38.00	1,113	100.0	857	1,237
38.01	1,113	100.0	11	1,249

Device	Routing	Invert	Outlet Devices
#1	Primary	34.58'	**8.0" Round Culvert** L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.58' / 34.40' S= 0.0055 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	34.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	37.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	38.00'	**13.0' 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=1.02 cfs @ 12.13 hrs HW=36.15' TW=34.94' (Dynamic Tailwater)
└1=**Culvert** (Passes 1.02 cfs of 1.46 cfs potential flow)
  ├2=**Orifice/Grate** (Orifice Controls 1.02 cfs @ 5.17 fps)
  └3=**Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.49' TW=0.00' (Dynamic Tailwater)
└4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Catch Basin #1

Inflow Area = 0.375 ac, 61.86% Impervious, Inflow Depth > 4.21" for 10 Yr 24 Hr(+15%) event
Inflow = 1.50 cfs @ 12.15 hrs, Volume= 0.132 af
Outflow = 1.50 cfs @ 12.15 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Primary = 1.50 cfs @ 12.15 hrs, Volume= 0.132 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.87' @ 12.13 hrs
Flood Elev= 38.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**15.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 35.00' / 34.75' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.49 cfs @ 12.15 hrs HW=35.86' TW=35.61' (Dynamic Tailwater)
└1=**Culvert** (Outlet Controls 1.49 cfs @ 2.33 fps)

Summary for Pond 4P: Catch Basin #2

Inflow Area = 0.768 ac, 56.90% Impervious, Inflow Depth > 3.97" for 10 Yr 24 Hr(+15%) event
Inflow = 2.93 cfs @ 12.11 hrs, Volume= 0.254 af
Outflow = 2.93 cfs @ 12.11 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min
Primary = 2.93 cfs @ 12.11 hrs, Volume= 0.254 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.75' @ 12.55 hrs
Flood Elev= 38.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.30'	**15.0" Round Culvert** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.30' / 34.10' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.88 cfs @ 12.11 hrs HW=35.38' TW=34.39' (Dynamic Tailwater)
└1=**Culvert** (Barrel Controls 2.88 cfs @ 3.42 fps)

Summary for Pond 5P: Concrete Galley 8x14 INFILTRATION

Inflow Area = 0.768 ac, 56.90% Impervious, Inflow Depth > 3.97" for 10 Yr 24 Hr(+15%) event
Inflow = 2.93 cfs @ 12.11 hrs, Volume= 0.254 af
Outflow = 0.68 cfs @ 12.57 hrs, Volume= 0.251 af, Atten= 77%, Lag= 27.6 min
Discarded = 0.67 cfs @ 12.57 hrs, Volume= 0.251 af
Primary = 0.00 cfs @ 12.57 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.72' @ 12.57 hrs Surf.Area= 0.071 ac Storage= 0.094 af

Plug-Flow detention time= 79.0 min calculated for 0.251 af (99% of inflow)
Center-of-Mass det. time= 71.3 min (865.5 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	33.90'	0.000 af	**24.00'W x 42.00'L x 3.67'H Field A** 0.085 af Overall - 0.085 af Embedded = 0.000 af x 40.0% Voids
#2A	33.90'	0.062 af	**Shea Leaching Chamber 8x14x3.7** x 9 Inside #1 Inside= 84.0"W x 36.0"H => 23.08 sf x 13.00'L = 300.0 cf Outside= 96.0"W x 44.0"H => 29.36 sf x 14.00'L = 411.0 cf 9 Chambers in 3 Rows
#3	30.90'	0.035 af	**28.00'W x 46.00'L x 3.00'H Prismatoid** 0.089 af Overall x 40.0% Voids
#4	30.90'	0.007 af	**8.00'W x 32.00'L x 3.00'H Prismatoid** 0.018 af Overall x 40.0% Voids
#5	33.90'	0.010 af	**2.00'W x 148.00'L x 3.67'H Prismatoid** 0.025 af Overall x 40.0% Voids
#6B	33.90'	0.000 af	**8.00'W x 28.00'L x 3.67'H Field B** 0.019 af Overall - 0.019 af Embedded = 0.000 af x 40.0% Voids
#7B	33.90'	0.014 af	**Shea Leaching Chamber 8x14x3.7** x 2 Inside #6 Inside= 84.0"W x 36.0"H => 23.08 sf x 13.00'L = 300.0 cf Outside= 96.0"W x 44.0"H => 29.36 sf x 14.00'L = 411.0 cf
		0.128 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	30.90'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 30.82' Phase-In= 0.01'
#2	Primary	35.70'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 35.70' / 34.30' S= 0.0233 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	37.56'	**160.0' 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=0.67 cfs @ 12.57 hrs HW=35.72' (Free Discharge)
└**1=Exfiltration** (Controls 0.67 cfs)

Primary OutFlow Max=0.00 cfs @ 12.57 hrs HW=35.72' TW=34.69' (Dynamic Tailwater)
├**2=Culvert** (Inlet Controls 0.00 cfs @ 0.39 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Drain Manhole #1

Inflow Area = 0.398 ac, 67.12% Impervious, Inflow Depth > 4.25" for 10 Yr 24 Hr(+15%) event
Inflow = 1.76 cfs @ 12.12 hrs, Volume= 0.141 af
Outflow = 1.76 cfs @ 12.12 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Primary = 1.76 cfs @ 12.12 hrs, Volume= 0.141 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 34.96' @ 12.12 hrs
Flood Elev= 38.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.07'	**12.0" Round Culvert** L= 48.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.07' / 33.80' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.71 cfs @ 12.12 hrs HW=34.94' TW=33.93' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.71 cfs @ 3.16 fps)

Summary for Pond 7P: Drain Manhole #2

Inflow Area = 0.768 ac, 56.90% Impervious, Inflow Depth = 0.00" for 10 Yr 24 Hr(+15%) event
Inflow = 0.00 cfs @ 12.57 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 12.57 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 12.57 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 34.71' @ 12.54 hrs
Flood Elev= 39.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.20'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.20' / 34.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.57 hrs HW=34.69' TW=34.71' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 8P: Concrete Galley 8x14 STORAGE ONLY

[92] Warning: Device #4 is above defined storage
[80] Warning: Exceeded Pond 7P by 0.41' @ 12.70 hrs (0.46 cfs 0.010 af)

Inflow Area =	1.167 ac,	60.39% Impervious,	Inflow Depth >	1.45"	for 10 Yr 24 Hr(+15%) event
Inflow =	1.76 cfs @	12.12 hrs,	Volume=	0.141 af	
Outflow =	0.50 cfs @	12.50 hrs,	Volume=	0.140 af,	Atten= 72%, Lag= 22.8 min
Primary =	0.50 cfs @	12.50 hrs,	Volume=	0.140 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 34.73' @ 12.50 hrs Surf.Area= 0.055 ac Storage= 0.041 af

Plug-Flow detention time= 38.0 min calculated for 0.140 af (99% of inflow)
Center-of-Mass det. time= 32.6 min (835.3 - 802.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	33.30'	0.000 af	**16.00'W x 56.00'L x 3.67'H Field A** 0.075 af Overall - 0.075 af Embedded = 0.000 af x 40.0% Voids
#2A	33.30'	0.055 af	**Shea Leaching Chamber 8x14x3.7** x 8 Inside #1 Inside= 84.0"W x 36.0"H => 23.08 sf x 13.00'L = 300.0 cf Outside= 96.0"W x 44.0"H => 29.36 sf x 14.00'L = 411.0 cf 8 Chambers in 2 Rows
#3	32.30'	0.011 af	**20.00'W x 60.00'L x 1.00'H Prismatoid** 0.028 af Overall x 40.0% Voids
#4	33.30'	0.010 af	**2.00'W x 144.00'L x 3.67'H Prismatoid** 0.024 af Overall x 40.0% Voids
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	32.30'	**4.0" Round Culvert** L= 3.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 32.30' / 32.27' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	32.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	34.70'	**8.0" Round Culvert** L= 3.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.70' / 34.67' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Secondary	39.80'	**160.0' 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=0.50 cfs @ 12.50 hrs HW=34.73' TW=32.03' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.50 cfs @ 5.72 fps)
└─**2=Orifice/Grate** (Passes 0.50 cfs of 0.63 cfs potential flow)
└─**3=Culvert** (Barrel Controls 0.00 cfs @ 0.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=32.30' TW=31.60' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: Drain Manhole #3

Inflow Area = 1.167 ac, 60.39% Impervious, Inflow Depth > 1.44" for 10 Yr 24 Hr(+15%) event
Inflow = 0.50 cfs @ 12.50 hrs, Volume= 0.140 af
Outflow = 0.50 cfs @ 12.50 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.50 hrs, Volume= 0.140 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.03' @ 12.50 hrs
Flood Elev= 39.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	**12.0" Round Culvert** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 31.60' / 31.10' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.50 hrs HW=32.03' TW=31.53' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.50 cfs @ 2.30 fps)

Summary for Pond 10P: Drain Manhole #4

Inflow Area = 1.167 ac, 60.39% Impervious, Inflow Depth > 1.44" for 10 Yr 24 Hr(+15%) event
Inflow = 0.50 cfs @ 12.50 hrs, Volume= 0.140 af
Outflow = 0.50 cfs @ 12.50 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.50 hrs, Volume= 0.140 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.53' @ 12.50 hrs
Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.10'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 31.10' / 30.90' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.50 hrs HW=31.53' TW=30.20' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.50 cfs @ 2.28 fps)

Summary for Pond 11P: Yard Drain #1

Inflow Area = 0.071 ac, 26.66% Impervious, Inflow Depth > 3.14" for 10 Yr 24 Hr(+15%) event
Inflow = 0.25 cfs @ 12.11 hrs, Volume= 0.018 af
Outflow = 0.25 cfs @ 12.11 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.11 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.14' @ 12.12 hrs
Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.80'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 35.80' / 35.58' S= 0.0055 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.24 cfs @ 12.11 hrs HW=36.13' TW=35.85' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.24 cfs @ 1.98 fps)

Summary for Pond 12P: Yard Drain #2

Inflow Area = 0.072 ac, 0.00% Impervious, Inflow Depth > 1.82" for 10 Yr 24 Hr(+15%) event
Inflow = 0.12 cfs @ 12.19 hrs, Volume= 0.011 af
Outflow = 0.12 cfs @ 12.20 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.4 min
Primary = 0.12 cfs @ 12.20 hrs, Volume= 0.011 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 39.04' @ 12.20 hrs Surf.Area= 107 sf Storage= 2 cf

Plug-Flow detention time= 0.2 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (866.4 - 866.2)

Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	1,358 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	5	0	0
40.01	2,685	1,358	1,358

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**8.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.00' / 35.33' S= 0.0134 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	39.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	40.00'	**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

Primary OutFlow Max=0.12 cfs @ 12.20 hrs HW=39.04' TW=35.55' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.12 cfs of 2.18 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 0.12 cfs @ 0.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=39.00' TW=34.30' (Dynamic Tailwater)
↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: Yard Drain #3

Inflow Area = 0.514 ac, 47.23% Impervious, Inflow Depth > 3.62" for 10 Yr 24 Hr(+15%) event
Inflow = 1.76 cfs @ 12.14 hrs, Volume= 0.155 af
Outflow = 1.76 cfs @ 12.14 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min
Primary = 1.76 cfs @ 12.14 hrs, Volume= 0.155 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.76' @ 12.53 hrs
Flood Elev= 38.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.65'	**15.0" Round Culvert** L= 48.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.65' / 34.40' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.74 cfs @ 12.14 hrs HW=35.61' TW=35.36' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.74 cfs @ 2.38 fps)

Summary for Pond 14P: Yard Drain #4

Inflow Area = 0.031 ac, 25.58% Impervious, Inflow Depth > 3.73" for 10 Yr 24 Hr(+15%) event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.010 af
Outflow = 0.13 cfs @ 12.09 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Primary = 0.13 cfs @ 12.09 hrs, Volume= 0.010 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.72' @ 12.09 hrs
Flood Elev= 39.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.50'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.50' / 36.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.13 cfs @ 12.09 hrs HW=36.72' TW=35.37' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.13 cfs @ 1.26 fps)

Summary for Pond 15P: Subsurface Stone Infiltration

Inflow Area = 0.021 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr(+15%) event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
Outflow = 0.02 cfs @ 12.58 hrs, Volume= 0.009 af, Atten= 85%, Lag= 29.4 min
Discarded = 0.02 cfs @ 12.58 hrs, Volume= 0.009 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 30.07' @ 12.58 hrs Surf.Area= 0.004 ac Storage= 0.004 af

Plug-Flow detention time= 111.7 min calculated for 0.009 af (100% of inflow)
Center-of-Mass det. time= 111.0 min (856.8 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.007 af	**4.00'W x 40.00'L x 4.51'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**0.650 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 27.08' Phase-In= 0.01'
#2	Primary	32.00'	**88.0' 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=0.02 cfs @ 12.58 hrs HW=30.07' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.50' TW=28.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 16P: Subsurface Stone Infiltration

Inflow Area = 0.019 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr(+15%) event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.008 af
Outflow = 0.03 cfs @ 12.44 hrs, Volume= 0.008 af, Atten= 73%, Lag= 21.3 min
Discarded = 0.03 cfs @ 12.44 hrs, Volume= 0.008 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.81' @ 12.44 hrs Surf.Area= 0.006 ac Storage= 0.003 af

Plug-Flow detention time= 51.1 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 50.1 min (795.8 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	31.80'	0.004 af	**8.00'W x 35.00'L x 1.71'H Prismatoid** 0.011 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 31.72' Phase-In= 0.01'
#2	Primary	33.50'	**86.0' 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=0.03 cfs @ 12.44 hrs HW=32.81' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.80' TW=28.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: Deep Sump CB #4

Inflow Area = 0.131 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr(+15%) event
Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.059 af
Outflow = 0.70 cfs @ 12.09 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.09 hrs, Volume= 0.059 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 30.09' @ 12.09 hrs
Flood Elev= 33.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.60'	**12.0" Round Culvert** L= 67.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.60' / 29.20' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=30.08' TW=29.52' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.69 cfs @ 2.66 fps)

Summary for Pond 18P: Deep Sump CB #5

Inflow Area = 0.064 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr(+15%) event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 29.64' @ 12.09 hrs
Flood Elev= 34.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.25'	**12.0" Round Culvert** L= 3.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.25' / 29.20' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.09 hrs HW=29.63' TW=29.52' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.34 cfs @ 1.84 fps)

Summary for Pond 19P: Deep Sump CB #3

Inflow Area = 0.103 ac,100.00% Impervious, Inflow Depth > 5.37" for 10 Yr 24 Hr(+15%) event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.046 af
Outflow = 0.55 cfs @ 12.09 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.09 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 30.31' @ 12.09 hrs
Flood Elev= 33.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.80'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.80' / 29.60' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 12.09 hrs HW=30.30' TW=30.08' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.54 cfs @ 1.99 fps)

Summary for Pond 20P: Contech Jellyfish

Inflow Area = 0.196 ac,100.00% Impervious, Inflow Depth > 12.64" for 10 Yr 24 Hr(+15%) event
Inflow = 1.05 cfs @ 12.09 hrs, Volume= 0.206 af
Outflow = 1.05 cfs @ 12.09 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
Primary = 1.05 cfs @ 12.09 hrs, Volume= 0.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 29.53' @ 12.09 hrs
Flood Elev= 33.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.95'	**15.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.95' / 28.70' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.02 cfs @ 12.09 hrs HW=29.52' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.02 cfs @ 2.76 fps)

Summary for Pond 21P: Wetland Ponding Area

Inflow Area = 1.527 ac, 52.60% Impervious, Inflow Depth > 1.57" for 10 Yr 24 Hr(+15%) event
Inflow = 1.19 cfs @ 12.11 hrs, Volume= 0.200 af
Outflow = 0.44 cfs @ 13.61 hrs, Volume= 0.119 af, Atten= 63%, Lag= 90.1 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Tertiary = 0.44 cfs @ 13.61 hrs, Volume= 0.119 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 30.65' @ 13.61 hrs Surf.Area= 2,746 sf Storage= 4,209 cf

Plug-Flow detention time= 216.1 min calculated for 0.119 af (59% of inflow)
Center-of-Mass det. time= 112.2 min (951.6 - 839.4)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	7,242 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)
28.00	619	194.0	0	0	619
29.00	1,245	250.0	914	914	2,610
30.00	2,174	307.0	1,688	2,602	5,152
31.00	3,074	298.0	2,611	5,213	5,680
31.50	4,916	435.0	1,980	7,193	13,674
31.51	4,916	435.0	49	7,242	13,678

Device	Routing	Invert	Outlet Devices
#1	Secondary	31.50'	**70.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	31.30'	**16.0' 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
#3	Tertiary	30.30'	**15.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.30' / 30.20' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.44 cfs @ 13.61 hrs HW=30.65' TW=29.34' (Dynamic Tailwater)
↑**3=Culvert** (Barrel Controls 0.44 cfs @ 2.30 fps)

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

Subcatchment1S: Subcatchment1S Runoff Area=13,938 sf 18.32% Impervious Runoff Depth>3.40"
Flow Length=48' Tc=6.6 min CN=67 Runoff=1.23 cfs 0.091 af

Subcatchment2S: Subcatchment2S Runoff Area=14,773 sf 41.02% Impervious Runoff Depth>5.59"
Flow Length=126' Tc=12.0 min CN=87 Runoff=1.75 cfs 0.158 af

Subcatchment3S: Subcatchment3S Runoff Area=8,436 sf 21.48% Impervious Runoff Depth>3.61"
Tc=6.0 min CN=69 Runoff=0.80 cfs 0.058 af

Subcatchment4S: Subcatchment4S Runoff Area=5,429 sf 56.24% Impervious Runoff Depth>4.91"
Flow Length=87' Tc=13.2 min CN=81 Runoff=0.56 cfs 0.051 af

Subcatchment5S: Subcatchment5S Runoff Area=6,946 sf 73.74% Impervious Runoff Depth>5.71"
Tc=6.0 min CN=88 Runoff=1.00 cfs 0.076 af

Subcatchment6S: Subcatchment6S Runoff Area=10,412 sf 62.71% Impervious Runoff Depth>5.94"
Flow Length=60' Tc=6.0 min CN=90 Runoff=1.53 cfs 0.118 af

Subcatchment7S: Subcatchment7S Runoff Area=9,749 sf 83.39% Impervious Runoff Depth>6.29"
Flow Length=135' Tc=6.0 min CN=93 Runoff=1.48 cfs 0.117 af

Subcatchment8S: Subcatchment8S Runoff Area=13,276 sf 70.01% Impervious Runoff Depth>5.93"
Flow Length=86' Tc=11.2 min CN=90 Runoff=1.68 cfs 0.151 af

Subcatchment9S: Subcatchment15S Runoff Area=3,072 sf 26.66% Impervious Runoff Depth>4.47"
Flow Length=67' Slope=0.0160 '/' Tc=7.2 min CN=77 Runoff=0.35 cfs 0.026 af

Subcatchment10S: Subcatchment16S Runoff Area=3,155 sf 0.00% Impervious Runoff Depth>2.88"
Flow Length=83' Slope=0.0060 '/' Tc=12.7 min CN=62 Runoff=0.19 cfs 0.017 af

Subcatchment11S: Yard Drain #3 Runoff Area=2,881 sf 15.97% Impervious Runoff Depth>3.40"
Flow Length=60' Slope=0.0150 '/' Tc=6.8 min CN=67 Runoff=0.25 cfs 0.019 af

Subcatchment12S: Subcatchment18S Runoff Area=1,341 sf 25.58% Impervious Runoff Depth>5.14"
Flow Length=37' Slope=0.0190 '/' Tc=6.0 min CN=83 Runoff=0.18 cfs 0.013 af

Subcatchment13S: Back of Units 1 and 2 Runoff Area=918 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.012 af

Subcatchment14S: Back of Unit 3 Runoff Area=310 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment15S: East Side of Unit 4 Runoff Area=502 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af

Subcatchment16S: Subcatchment16S Runoff Area=1,247 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment17S: Subcatchment17S Runoff Area=2,806 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.44 cfs 0.037 af

Subcatchment18S: Subcatchment18S Runoff Area=4,475 sf 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.70 cfs 0.059 af

Subcatchment19S: Subcatchment19S Runoff Area=23,588 sf 18.01% Impervious Runoff Depth>3.08"
Flow Length=137' Tc=16.7 min CN=64 Runoff=1.40 cfs 0.139 af

Reach 1R: Swale Avg. Flow Depth=0.84' Max Vel=0.79 fps Inflow=1.75 cfs 0.158 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=2.65 cfs Outflow=1.68 cfs 0.158 af

Reach AP1: Wooded Depression Inflow=1.40 cfs 0.139 af
Outflow=1.40 cfs 0.139 af

Reach AP2: Shoulder of Road Inflow=1.68 cfs 0.158 af
Outflow=1.68 cfs 0.158 af

Reach AP3: Detention Pond Inflow=0.80 cfs 0.058 af
Outflow=0.80 cfs 0.058 af

Reach AP4: Rear of Site Inflow=0.56 cfs 0.051 af
Outflow=0.56 cfs 0.051 af

Reach AP5: Across Street Inflow=1.50 cfs 0.343 af
Outflow=1.50 cfs 0.343 af

Pond 1P: Bioretention#1 Peak Elev=36.08' Storage=178 cf Inflow=1.00 cfs 0.076 af
Primary=0.93 cfs 0.073 af Secondary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.073 af

Pond 2P: Bioretention#2 Peak Elev=37.00' Storage=382 cf Inflow=1.53 cfs 0.118 af
Primary=1.30 cfs 0.116 af Secondary=0.00 cfs 0.000 af Outflow=1.30 cfs 0.116 af

Pond 3P: Catch Basin #1 Peak Elev=36.58' Inflow=1.99 cfs 0.177 af
15.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=1.99 cfs 0.177 af

Pond 4P: Catch Basin #2 Peak Elev=36.51' Inflow=3.93 cfs 0.343 af
15.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=3.93 cfs 0.343 af

Pond 5P: Concrete Galley 8x14 INFILTRATION Peak Elev=36.33' Storage=0.110 af Inflow=3.93 cfs 0.343 af
Discarded=0.76 cfs 0.306 af Primary=1.10 cfs 0.033 af Outflow=1.86 cfs 0.339 af

Pond 6P: Drain Manhole #1 Peak Elev=35.66' Inflow=2.22 cfs 0.190 af
12.0" Round Culvert n=0.013 L=48.0' S=0.0056 '/' Outflow=2.22 cfs 0.190 af

Pond 7P: Drain Manhole #2 Peak Elev=35.71' Inflow=1.10 cfs 0.033 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=1.10 cfs 0.033 af

Pond 8P: Concrete Galley 8x14 STORAGE Peak Elev=35.60' Storage=0.059 af Inflow=2.22 cfs 0.223 af
Primary=1.59 cfs 0.222 af Secondary=0.00 cfs 0.000 af Outflow=1.59 cfs 0.222 af

Pond 9P: Drain Manhole #3 Peak Elev=32.48' Inflow=1.59 cfs 0.222 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=1.59 cfs 0.222 af

Pond 10P: Drain Manhole #4 Peak Elev=31.95' Inflow=1.59 cfs 0.222 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=1.59 cfs 0.222 af

Pond 11P: Yard Drain #1 Peak Elev=36.67' Inflow=0.35 cfs 0.026 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=0.35 cfs 0.026 af

Pond 12P: Yard Drain #2 Peak Elev=39.05' Storage=4 cf Inflow=0.19 cfs 0.017 af
Primary=0.19 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.017 af

Pond 13P: Yard Drain #3 Peak Elev=36.62' Inflow=2.39 cfs 0.213 af
15.0" Round Culvert n=0.013 L=48.0' S=0.0052 '/' Outflow=2.39 cfs 0.213 af

Pond 14P: Yard Drain #4 Peak Elev=36.76' Inflow=0.18 cfs 0.013 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0100 '/' Outflow=0.18 cfs 0.013 af

Pond 15P: Subsurface Stone Infiltration Peak Elev=30.87' Storage=0.005 af Inflow=0.14 cfs 0.012 af
Discarded=0.02 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.012 af

Pond 16P: Subsurface Stone Infiltration Peak Elev=33.11' Storage=0.003 af Inflow=0.13 cfs 0.011 af
Discarded=0.03 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.011 af

Pond 17P: Deep Sump CB #4 Peak Elev=30.16' Inflow=0.90 cfs 0.075 af
12.0" Round Culvert n=0.013 L=67.0' S=0.0060 '/' Outflow=0.90 cfs 0.075 af

Pond 18P: Deep Sump CB #5 Peak Elev=29.72' Inflow=0.44 cfs 0.037 af
12.0" Round Culvert n=0.013 L=3.0' S=0.0167 '/' Outflow=0.44 cfs 0.037 af

Pond 19P: Deep Sump CB #3 Peak Elev=30.39' Inflow=0.70 cfs 0.059 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.70 cfs 0.059 af

Pond 20P: Contech Jellyfish Peak Elev=29.66' Inflow=1.50 cfs 0.343 af
15.0" Round Culvert n=0.013 L=42.0' S=0.0060 '/' Outflow=1.50 cfs 0.343 af

Pond 21P: Wetland Ponding Area Peak Elev=30.96' Storage=5,086 cf Inflow=2.00 cfs 0.312 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=1.35 cfs 0.230 af Outflow=1.35 cfs 0.230 af

Total Runoff Area = 2.921 ac Runoff Volume = 1.169 af Average Runoff Depth = 4.80"
53.89% Pervious = 1.574 ac 46.11% Impervious = 1.347 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=13,938 sf 18.32% Impervious Runoff Depth>4.56"
Flow Length=48' Tc=6.6 min CN=67 Runoff=1.65 cfs 0.122 af

Subcatchment2S: Subcatchment2S Runoff Area=14,773 sf 41.02% Impervious Runoff Depth>6.95"
Flow Length=126' Tc=12.0 min CN=87 Runoff=2.16 cfs 0.197 af

Subcatchment3S: Subcatchment3S Runoff Area=8,436 sf 21.48% Impervious Runoff Depth>4.80"
Tc=6.0 min CN=69 Runoff=1.07 cfs 0.077 af

Subcatchment4S: Subcatchment4S Runoff Area=5,429 sf 56.24% Impervious Runoff Depth>6.23"
Flow Length=87' Tc=13.2 min CN=81 Runoff=0.70 cfs 0.065 af

Subcatchment5S: Subcatchment5S Runoff Area=6,946 sf 73.74% Impervious Runoff Depth>7.08"
Tc=6.0 min CN=88 Runoff=1.22 cfs 0.094 af

Subcatchment6S: Subcatchment6S Runoff Area=10,412 sf 62.71% Impervious Runoff Depth>7.32"
Flow Length=60' Tc=6.0 min CN=90 Runoff=1.87 cfs 0.146 af

Subcatchment7S: Subcatchment7S Runoff Area=9,749 sf 83.39% Impervious Runoff Depth>7.68"
Flow Length=135' Tc=6.0 min CN=93 Runoff=1.79 cfs 0.143 af

Subcatchment8S: Subcatchment8S Runoff Area=13,276 sf 70.01% Impervious Runoff Depth>7.32"
Flow Length=86' Tc=11.2 min CN=90 Runoff=2.05 cfs 0.186 af

Subcatchment9S: Subcatchment15S Runoff Area=3,072 sf 26.66% Impervious Runoff Depth>5.76"
Flow Length=67' Slope=0.0160 '/' Tc=7.2 min CN=77 Runoff=0.45 cfs 0.034 af

Subcatchment10S: Subcatchment16S Runoff Area=3,155 sf 0.00% Impervious Runoff Depth>3.96"
Flow Length=83' Slope=0.0060 '/' Tc=12.7 min CN=62 Runoff=0.27 cfs 0.024 af

Subcatchment11S: Yard Drain #3 Runoff Area=2,881 sf 15.97% Impervious Runoff Depth>4.56"
Flow Length=60' Slope=0.0150 '/' Tc=6.8 min CN=67 Runoff=0.34 cfs 0.025 af

Subcatchment12S: Subcatchment18S Runoff Area=1,341 sf 25.58% Impervious Runoff Depth>6.48"
Flow Length=37' Slope=0.0190 '/' Tc=6.0 min CN=83 Runoff=0.22 cfs 0.017 af

Subcatchment13S: Back of Units 1 and 2 Runoff Area=918 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.015 af

Subcatchment14S: Back of Unit 3 Runoff Area=310 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment15S: East Side of Unit 4 Runoff Area=502 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.008 af

Subcatchment16S: Subcatchment16S Runoff Area=1,247 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.020 af

Subcatchment17S: Subcatchment17S Runoff Area=2,806 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.53 cfs 0.044 af

Subcatchment18S: Subcatchment18S Runoff Area=4,475 sf 100.00% Impervious Runoff Depth>8.28"
Tc=6.0 min CN=98 Runoff=0.84 cfs 0.071 af

Subcatchment19S: Subcatchment19S Runoff Area=23,588 sf 18.01% Impervious Runoff Depth>4.19"
Flow Length=137' Tc=16.7 min CN=64 Runoff=1.92 cfs 0.189 af

Reach 1R: Swale Avg. Flow Depth=0.91' Max Vel=0.83 fps Inflow=2.16 cfs 0.197 af
n=0.150 L=140.0' S=0.0214 '/' Capacity=2.65 cfs Outflow=2.07 cfs 0.196 af

Reach AP1: Wooded Depression Inflow=1.92 cfs 0.189 af
Outflow=1.92 cfs 0.189 af

Reach AP2: Shoulder of Road Inflow=2.07 cfs 0.196 af
Outflow=2.07 cfs 0.196 af

Reach AP3: Detention Pond Inflow=1.07 cfs 0.077 af
Outflow=1.07 cfs 0.077 af

Reach AP4: Rear of Site Inflow=0.70 cfs 0.065 af
Outflow=0.70 cfs 0.065 af

Reach AP5: Across Street Inflow=2.40 cfs 0.478 af
Outflow=2.40 cfs 0.478 af

Pond 1P: Bioretention #1 Peak Elev=36.75' Storage=289 cf Inflow=1.22 cfs 0.094 af
Primary=1.06 cfs 0.092 af Secondary=0.00 cfs 0.000 af Outflow=1.06 cfs 0.092 af

Pond 2P: Bioretention #2 Peak Elev=37.27' Storage=561 cf Inflow=1.87 cfs 0.146 af
Primary=1.29 cfs 0.144 af Secondary=0.00 cfs 0.000 af Outflow=1.29 cfs 0.144 af

Pond 3P: Catch Basin #1 Peak Elev=37.51' Inflow=2.44 cfs 0.220 af
15.0" Round Culvert n=0.013 L=47.0' S=0.0053 '/' Outflow=2.44 cfs 0.220 af

Pond 4P: Catch Basin #2 Peak Elev=37.27' Inflow=4.86 cfs 0.429 af
15.0" Round Culvert n=0.013 L=36.0' S=0.0056 '/' Outflow=4.86 cfs 0.429 af

Pond 5P: Concrete Galley 8x14 INFILTRATION Peak Elev=36.86' Storage=0.125 af Inflow=4.86 cfs 0.429 af
Discarded=0.83 cfs 0.353 af Primary=1.90 cfs 0.070 af Outflow=2.70 cfs 0.423 af

Pond 6P: Drain Manhole #1 Peak Elev=36.79' Inflow=2.35 cfs 0.236 af
12.0" Round Culvert n=0.013 L=48.0' S=0.0056 '/' Outflow=2.35 cfs 0.236 af

Pond 7P: Drain Manhole #2 Peak Elev=36.75' Inflow=1.90 cfs 0.070 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=1.90 cfs 0.070 af

Pond 8P: Concrete Galley 8x14 STORAGE Peak Elev=36.26' Storage=0.073 af Inflow=3.62 cfs 0.305 af
Primary=2.10 cfs 0.304 af Secondary=0.00 cfs 0.000 af Outflow=2.10 cfs 0.304 af

Pond 9P: Drain Manhole #3 Peak Elev=32.75' Inflow=2.10 cfs 0.304 af
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=2.10 cfs 0.304 af

Pond 10P: Drain Manhole #4 Peak Elev=32.13' Inflow=2.10 cfs 0.304 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=2.10 cfs 0.304 af

Pond 11P: Yard Drain #1 Peak Elev=37.85' Inflow=0.45 cfs 0.034 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=0.45 cfs 0.034 af

Pond 12P: Yard Drain #2 Peak Elev=39.07' Storage=6 cf Inflow=0.27 cfs 0.024 af
Primary=0.27 cfs 0.024 af Secondary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.024 af

Pond 13P: Yard Drain #3 Peak Elev=37.69' Inflow=3.00 cfs 0.269 af
15.0" Round Culvert n=0.013 L=48.0' S=0.0052 '/' Outflow=3.00 cfs 0.269 af

Pond 14P: Yard Drain #4 Peak Elev=37.28' Inflow=0.22 cfs 0.017 af
8.0" Round Culvert n=0.013 L=40.0' S=0.0100 '/' Outflow=0.22 cfs 0.017 af

Pond 15P: Subsurface Stone Infiltration Peak Elev=31.61' Storage=0.006 af Inflow=0.17 cfs 0.015 af
Discarded=0.03 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.014 af

Pond 16P: Subsurface Stone Infiltration Peak Elev=33.39' Storage=0.004 af Inflow=0.15 cfs 0.013 af
Discarded=0.04 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.013 af

Pond 17P: Deep Sump CB #4 Peak Elev=30.24' Inflow=1.07 cfs 0.091 af
12.0" Round Culvert n=0.013 L=67.0' S=0.0060 '/' Outflow=1.07 cfs 0.091 af

Pond 18P: Deep Sump CB #5 Peak Elev=29.90' Inflow=0.53 cfs 0.044 af
12.0" Round Culvert n=0.013 L=3.0' S=0.0167 '/' Outflow=0.53 cfs 0.044 af

Pond 19P: Deep Sump CB #3 Peak Elev=30.47' Inflow=0.84 cfs 0.071 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.84 cfs 0.071 af

Pond 20P: Contech Jellyfish Peak Elev=29.89' Inflow=2.40 cfs 0.478 af
15.0" Round Culvert n=0.013 L=42.0' S=0.0060 '/' Outflow=2.40 cfs 0.478 af

Pond 21P: Wetland Ponding Area Peak Elev=31.18' Storage=5,810 cf Inflow=2.73 cfs 0.426 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=2.20 cfs 0.343 af Outflow=2.20 cfs 0.343 af

Total Runoff Area = 2.921 ac Runoff Volume = 1.481 af Average Runoff Depth = 6.08"
53.89% Pervious = 1.574 ac 46.11% Impervious = 1.347 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 1.65 cfs @ 12.10 hrs, Volume= 0.122 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 50 Yr 24 Hr(+15%) Rainfall=8.53"

Area (sf)	CN	Description
586	98	Paved roads w/curbs & sewers, HSG B
1,864	55	Woods, Good, HSG B
3,396	61	>75% Grass cover, Good, HSG B
611	80	>75% Grass cover, Good, HSG D
541	77	Woods, Good, HSG D
3,408	55	Woods, Good, HSG B
1,564	61	>75% Grass cover, Good, HSG B
1,600	98	Roofs, HSG B
368	98	Roofs, HSG D
13,938	67	Weighted Average
11,384		81.68% Pervious Area
2,554		18.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	32	0.0625	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
1.5	16	0.3300	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
6.6	48	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 2.16 cfs @ 12.16 hrs, Volume= 0.197 af, Depth> 6.95"

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

	Area (sf)	CN	Description
	4,812	80	>75% Grass cover, Good, HSG D
	319	98	Paved roads w/curbs & sewers, HSG D
	2,823	98	Roofs, HSG D
*	186	98	Ledge Outcrop, HSG D
	3,901	80	>75% Grass cover, Good, HSG D
	2,732	98	Roofs, HSG D
	14,773	87	Weighted Average
	8,713		58.98% Pervious Area
	6,060		41.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	38	0.1000	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.7	17	0.3300	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
9.1	71	0.0100	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
12.0	126	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 1.07 cfs @ 12.09 hrs, Volume= 0.077 af, Depth> 4.80"

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

Area (sf)	CN	Description
6,481	61	>75% Grass cover, Good, HSG B
143	55	Woods, Good, HSG B
1,812	98	Roofs, HSG B
8,436	69	Weighted Average
6,624		78.52% Pervious Area
1,812		21.48% Impervious Area

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

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.70 cfs @ 12.18 hrs, Volume= 0.065 af, Depth> 6.23"

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

	Area (sf)	CN	Description
*	2,343	98	Ledge Outcrop, HSG D
	73	77	Woods, Good, HSG D
	917	55	Woods, Good, HSG B
	1,386	61	>75% Grass cover, Good, HSG B
	710	98	Roofs, HSG B
	5,429	81	Weighted Average
	2,376		43.76% Pervious Area
	3,053		56.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	38	0.2100	3.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.8	7	0.2860	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
12.2	42	0.0120	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
13.2	87	Total			

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.094 af, Depth> 7.08"

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

Area (sf)	CN	Description
1,824	61	>75% Grass cover, Good, HSG B
14	98	Paved parking, HSG D
3,268	98	Paved parking, HSG B
1,840	98	Roofs, HSG B
6,946	88	Weighted Average
1,824		26.26% Pervious Area
5,122		73.74% Impervious Area

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

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.87 cfs @ 12.09 hrs, Volume= 0.146 af, Depth> 7.32"

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

Area (sf)	CN	Description
687	61	>75% Grass cover, Good, HSG B
1,334	98	Paved parking, HSG B
2,813	98	Paved parking, HSG D
3,196	80	>75% Grass cover, Good, HSG D
2,382	98	Roofs, HSG D
10,412	90	Weighted Average
3,883		37.29% Pervious Area
6,529		62.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0500	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.7	40	0.0100	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
2.4	60	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 1.79 cfs @ 12.09 hrs, Volume= 0.143 af, Depth> 7.68"

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

Area (sf)	CN	Description
1,935	98	Roofs, HSG B
2,857	98	Paved parking, HSG B
1,047	61	>75% Grass cover, Good, HSG B
857	98	Roofs, HSG D
2,481	98	Paved parking, HSG D
572	80	>75% Grass cover, Good, HSG D
9,749	93	Weighted Average
1,619		16.61% Pervious Area
8,130		83.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	40	0.0175	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.0	60	0.0100	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
0.3	35	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.9	135	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 2.05 cfs @ 12.15 hrs, Volume= 0.186 af, Depth> 7.32"

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

	Area (sf)	CN	Description
	1,788	61	>75% Grass cover, Good, HSG B
	4,412	98	Paved parking, HSG B
	1,219	98	Roofs, HSG B
	2,194	80	>75% Grass cover, Good, HSG D
*	1,608	98	Ledge Outcrop, HSG D
	39	98	Paved parking, HSG D
	2,016	98	Roofs, HSG D
	13,276	90	Weighted Average
	3,982		29.99% Pervious Area
	9,294		70.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	40	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.5	20	0.0200	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
5.4	26	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
11.2	86	Total			

Summary for Subcatchment 9S: Subcatchment 15S

Runoff = 0.45 cfs @ 12.10 hrs, Volume= 0.034 af, Depth> 5.76"

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

Area (sf)	CN	Description
1,238	61	>75% Grass cover, Good, HSG B
1,015	80	>75% Grass cover, Good, HSG D
72	98	Roofs, HSG B
747	98	Roofs, HSG D
3,072	77	Weighted Average
2,253		73.34% Pervious Area
819		26.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	67	0.0160	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment 10S: Subcatchment 16S

Runoff = 0.27 cfs @ 12.18 hrs, Volume= 0.024 af, Depth> 3.96"

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

Area (sf)	CN	Description
2,918	61	>75% Grass cover, Good, HSG B
237	80	>75% Grass cover, Good, HSG D
3,155	62	Weighted Average
3,155		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	83	0.0060	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment 11S: Yard Drain #3

Runoff = 0.34 cfs @ 12.10 hrs, Volume= 0.025 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 50 Yr 24 Hr(+15%) Rainfall=8.53"

Area (sf)	CN	Description
2,421	61	>75% Grass cover, Good, HSG B
460	98	Roofs, HSG B
2,881	67	Weighted Average
2,421		84.03% Pervious Area
460		15.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	60	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Summary for Subcatchment 12S: Subcatchment 18S

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth> 6.48"

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

Area (sf)	CN	Description
94	61	>75% Grass cover, Good, HSG B
904	80	>75% Grass cover, Good, HSG D
11	98	Roofs, HSG B
332	98	Roofs, HSG D
1,341	83	Weighted Average
998		74.42% Pervious Area
343		25.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	37	0.0190	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.2	37	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 13S: Back of Units 1 and 2

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af, Depth> 8.28"

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

Area (sf)	CN	Description
918	98	Roofs, HSG B
918		100.00% Impervious Area

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

Summary for Subcatchment 14S: Back of Unit 3

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth> 8.28"

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

Area (sf)	CN	Description
310	98	Roofs, HSG D
310		100.00% Impervious Area

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

Summary for Subcatchment 15S: East Side of Unit 4

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 8.28"

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

Area (sf)	CN	Description
500	98	Roofs, HSG B
2	98	Roofs, HSG D
502	98	Weighted Average
502		100.00% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 8.28"

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

Area (sf)	CN	Description
1,247	98	Paved roads w/curbs & sewers, HSG B
1,247		100.00% Impervious Area

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

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.044 af, Depth> 8.28"

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

Area (sf)	CN	Description
2,230	98	Paved parking, HSG B
576	98	Paved parking, HSG D
2,806	98	Weighted Average
2,806		100.00% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.071 af, Depth> 8.28"

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

Area (sf)	CN	Description
4,475	98	Paved parking, HSG B
4,475		100.00% Impervious Area

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

Summary for Subcatchment 19S: Subcatchment 19S

Runoff = 1.92 cfs @ 12.24 hrs, Volume= 0.189 af, Depth> 4.19"

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

Area (sf)	CN	Description
4,147	98	Paved parking, HSG B
4,462	61	>75% Grass cover, Good, HSG B
102	98	Roofs, HSG B
14,877	55	Woods, Good, HSG B
23,588	64	Weighted Average
19,339		81.99% Pervious Area
4,249		18.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0350	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.7	37	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.7	137	Total			

Summary for Reach 1R: Swale

Inflow Area = 0.339 ac, 41.02% Impervious, Inflow Depth > 6.95" for 50 Yr 24 Hr(+15%) event
Inflow = 2.16 cfs @ 12.16 hrs, Volume= 0.197 af
Outflow = 2.07 cfs @ 12.20 hrs, Volume= 0.196 af, Atten= 4%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.83 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 6.9 min

Peak Storage= 349 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.91' , Surface Width= 5.47'
Bank-Full Depth= 1.00' Flow Area= 3.0 sf, Capacity= 2.65 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= 140.0' Slope= 0.0214 '/'
Inlet Invert= 40.00', Outlet Invert= 37.00'

Summary for Reach AP1: Wooded Depression

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

Inflow Area = 0.542 ac, 18.01% Impervious, Inflow Depth > 4.19" for 50 Yr 24 Hr(+15%) event
Inflow = 1.92 cfs @ 12.24 hrs, Volume= 0.189 af
Outflow = 1.92 cfs @ 12.24 hrs, Volume= 0.189 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: Shoulder of Road

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

Inflow Area = 0.339 ac, 41.02% Impervious, Inflow Depth > 6.94" for 50 Yr 24 Hr(+15%) event
Inflow = 2.07 cfs @ 12.20 hrs, Volume= 0.196 af
Outflow = 2.07 cfs @ 12.20 hrs, Volume= 0.196 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: Detention Pond

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

Inflow Area = 1.720 ac, 49.10% Impervious, Inflow Depth > 0.54" for 50 Yr 24 Hr(+15%) event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 0.077 af
Outflow = 1.07 cfs @ 12.09 hrs, Volume= 0.077 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: Rear of Site

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

Inflow Area = 0.125 ac, 56.24% Impervious, Inflow Depth > 6.23" for 50 Yr 24 Hr(+15%) event
Inflow = 0.70 cfs @ 12.18 hrs, Volume= 0.065 af
Outflow = 0.70 cfs @ 12.18 hrs, Volume= 0.065 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: Across Street

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

Inflow Area = 0.196 ac,100.00% Impervious, Inflow Depth > 29.31" for 50 Yr 24 Hr(+15%) event
Inflow = 2.40 cfs @ 12.52 hrs, Volume= 0.478 af
Outflow = 2.40 cfs @ 12.52 hrs, Volume= 0.478 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Bioretention #1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.159 ac, 73.74% Impervious, Inflow Depth > 7.08" for 50 Yr 24 Hr(+15%) event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.094 af
Outflow = 1.06 cfs @ 12.10 hrs, Volume= 0.092 af, Atten= 13%, Lag= 0.5 min
Primary = 1.06 cfs @ 12.10 hrs, Volume= 0.092 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.75' @ 12.49 hrs Surf.Area= 400 sf Storage= 289 cf

Plug-Flow detention time= 28.5 min calculated for 0.092 af (97% of inflow)
Center-of-Mass det. time= 13.5 min (793.2 - 779.6)

Volume	Invert	Avail.Storage	Storage Description
#1	33.99'	694 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.99	315	0.0	0	0
34.00	315	40.0	1	1
34.99	315	40.0	125	126
35.00	315	15.0	0	126
36.49	315	15.0	70	197
36.50	315	100.0	3	200
37.00	484	100.0	200	400
37.50	668	100.0	288	688
37.51	668	100.0	7	694

Device	Routing	Invert	Outlet Devices
#1	Primary	34.58'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.58' / 34.40' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	34.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	37.30'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	37.50'	**31.0' 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=1.06 cfs @ 12.10 hrs HW=36.49' TW=35.24' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.06 cfs of 1.48 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.06 cfs @ 5.38 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=33.99' TW=28.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Bioretention #2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area =	0.239 ac, 62.71% Impervious, Inflow Depth > 7.32"	for 50 Yr 24 Hr(+15%) event		
Inflow =	1.87 cfs @	12.09 hrs, Volume=	0.146 af	
Outflow =	1.29 cfs @	12.09 hrs, Volume=	0.144 af, Atten= 31%, Lag= 0.3 min	
Primary =	1.29 cfs @	12.09 hrs, Volume=	0.144 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.27' @ 12.22 hrs Surf.Area= 738 sf Storage= 561 cf

Plug-Flow detention time= 19.5 min calculated for 0.144 af (99% of inflow)
Center-of-Mass det. time= 11.5 min (785.1 - 773.6)

Volume	Invert	Avail.Storage	Storage Description
#1	34.49'	1,249 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.49	600	0.0	0	0
34.50	600	40.0	2	2
35.49	600	40.0	238	240
35.50	600	15.0	1	241
36.99	600	15.0	134	375
37.00	600	100.0	6	381
38.00	1,113	100.0	857	1,237
38.01	1,113	100.0	11	1,249

Device	Routing	Invert	Outlet Devices
#1	Primary	34.58'	**8.0" Round Culvert** L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.58' / 34.40' S= 0.0055 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	34.75'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	37.70'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	38.00'	**13.0' 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=1.28 cfs @ 12.09 hrs HW=37.06' TW=35.23' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.28 cfs of 1.80 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.28 cfs @ 6.52 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=34.49' TW=0.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Catch Basin #1

[80] Warning: Exceeded Pond 11P by 0.20' @ 12.10 hrs (0.59 cfs 0.005 af)

Inflow Area =	0.375 ac,	61.86% Impervious,	Inflow Depth >	7.02"	for 50 Yr 24 Hr(+15%) event
Inflow =	2.44 cfs @	12.14 hrs,	Volume=	0.220 af	
Outflow =	2.44 cfs @	12.14 hrs,	Volume=	0.220 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.44 cfs @	12.14 hrs,	Volume=	0.220 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.51' @ 12.20 hrs
Flood Elev= 38.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**15.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 35.00' / 34.75' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.14 hrs HW=37.34' TW=37.59' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 4P: Catch Basin #2

[80] Warning: Exceeded Pond 14P by 0.01' @ 12.30 hrs (0.12 cfs 0.001 af)

Inflow Area =	0.768 ac,	56.90% Impervious,	Inflow Depth >	6.69"	for 50 Yr 24 Hr(+15%) event
Inflow =	4.86 cfs @	12.11 hrs,	Volume=	0.429 af	
Outflow =	4.86 cfs @	12.11 hrs,	Volume=	0.429 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.86 cfs @	12.11 hrs,	Volume=	0.429 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.27' @ 12.18 hrs
Flood Elev= 38.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.30'	**15.0" Round Culvert** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.30' / 34.10' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.77 cfs @ 12.11 hrs HW=36.94' TW=35.90' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 4.77 cfs @ 3.89 fps)

Summary for Pond 5P: Concrete Galley 8x14 INFILTRATION

[80] Warning: Exceeded Pond 4P by 0.01' @ 12.50 hrs (0.51 cfs 0.002 af)

Inflow Area =	0.768 ac, 56.90% Impervious, Inflow Depth > 6.69"	for 50 Yr 24 Hr(+15%) event		
Inflow =	4.86 cfs @ 12.11 hrs, Volume=	0.429 af		
Outflow =	2.70 cfs @ 12.22 hrs, Volume=	0.423 af, Atten= 44%, Lag= 6.2 min		
Discarded =	0.83 cfs @ 12.40 hrs, Volume=	0.353 af		
Primary =	1.90 cfs @ 12.21 hrs, Volume=	0.070 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.86' @ 12.40 hrs Surf.Area= 0.071 ac Storage= 0.125 af

Plug-Flow detention time= 69.4 min calculated for 0.422 af (98% of inflow)
Center-of-Mass det. time= 61.1 min (843.7 - 782.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	33.90'	0.000 af	**24.00'W x 42.00'L x 3.67'H Field A** 0.085 af Overall - 0.085 af Embedded = 0.000 af x 40.0% Voids
#2A	33.90'	0.062 af	**Shea Leaching Chamber 8x14x3.7** x 9 Inside #1 Inside= 84.0"W x 36.0"H => 23.08 sf x 13.00'L = 300.0 cf Outside= 96.0"W x 44.0"H => 29.36 sf x 14.00'L = 411.0 cf 9 Chambers in 3 Rows
#3	30.90'	0.035 af	**28.00'W x 46.00'L x 3.00'H Prismatoid** 0.089 af Overall x 40.0% Voids
#4	30.90'	0.007 af	**8.00'W x 32.00'L x 3.00'H Prismatoid** 0.018 af Overall x 40.0% Voids
#5	33.90'	0.010 af	**2.00'W x 148.00'L x 3.67'H Prismatoid** 0.025 af Overall x 40.0% Voids
#6B	33.90'	0.000 af	**8.00'W x 28.00'L x 3.67'H Field B** 0.019 af Overall - 0.019 af Embedded = 0.000 af x 40.0% Voids
#7B	33.90'	0.014 af	**Shea Leaching Chamber 8x14x3.7** x 2 Inside #6 Inside= 84.0"W x 36.0"H => 23.08 sf x 13.00'L = 300.0 cf Outside= 96.0"W x 44.0"H => 29.36 sf x 14.00'L = 411.0 cf
		0.128 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	30.90'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 30.82' Phase-In= 0.01'
#2	Primary	35.70'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 35.70' / 34.30' S= 0.0233 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	37.56'	**160.0' 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=0.83 cfs @ 12.40 hrs HW=36.86' (Free Discharge)
└**1=Exfiltration** (Controls 0.83 cfs)

Primary OutFlow Max=1.96 cfs @ 12.21 hrs HW=36.63' TW=35.99' (Dynamic Tailwater)
├**2=Culvert** (Inlet Controls 1.96 cfs @ 2.59 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Drain Manhole #1

[80] Warning: Exceeded Pond 1P by 0.04' @ 12.50 hrs (0.20 cfs 0.001 af)

Inflow Area =	0.398 ac,	67.12% Impervious,	Inflow Depth >	7.10"	for 50 Yr 24 Hr(+15%) event
Inflow =	2.35 cfs @	12.09 hrs,	Volume=	0.236 af	
Outflow =	2.35 cfs @	12.09 hrs,	Volume=	0.236 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.35 cfs @	12.09 hrs,	Volume=	0.236 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.79' @ 12.50 hrs
Flood Elev= 38.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.07'	**12.0" Round Culvert** L= 48.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.07' / 33.80' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.39 cfs @ 12.09 hrs HW=35.23' TW=34.59' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.39 cfs @ 3.04 fps)

Summary for Pond 7P: Drain Manhole #2

Inflow Area =	0.768 ac,	56.90% Impervious,	Inflow Depth =	1.09"	for 50 Yr 24 Hr(+15%) event
Inflow =	1.90 cfs @	12.21 hrs,	Volume=	0.070 af	
Outflow =	1.90 cfs @	12.21 hrs,	Volume=	0.070 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.90 cfs @	12.21 hrs,	Volume=	0.070 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.75' @ 12.50 hrs
Flood Elev= 39.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.20'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.20' / 34.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.91 cfs @ 12.21 hrs HW=35.99' TW=35.58' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.91 cfs @ 2.43 fps)

Summary for Pond 8P: Concrete Galley 8x14 STORAGE ONLY

[92] Warning: Device #4 is above defined storage
[80] Warning: Exceeded Pond 6P by 0.01' @ 12.70 hrs (0.31 cfs 0.004 af)
[80] Warning: Exceeded Pond 7P by 0.61' @ 13.30 hrs (0.91 cfs 0.022 af)

Inflow Area =	1.167 ac,	60.39% Impervious,	Inflow Depth >	3.14"	for 50 Yr 24 Hr(+15%) event
Inflow =	3.62 cfs @	12.20 hrs,	Volume=	0.305 af	
Outflow =	2.10 cfs @	12.44 hrs,	Volume=	0.304 af,	Atten= 42%, Lag= 14.4 min
Primary =	2.10 cfs @	12.44 hrs,	Volume=	0.304 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.26' @ 12.44 hrs Surf.Area= 0.055 ac Storage= 0.073 af

Plug-Flow detention time= 31.6 min calculated for 0.304 af (99% of inflow)
Center-of-Mass det. time= 28.4 min (807.3 - 779.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	33.30'	0.000 af	**16.00'W x 56.00'L x 3.67'H Field A** 0.075 af Overall - 0.075 af Embedded = 0.000 af x 40.0% Voids
#2A	33.30'	0.055 af	**Shea Leaching Chamber 8x14x3.7** x 8 Inside #1 Inside= 84.0"W x 36.0"H => 23.08 sf x 13.00'L = 300.0 cf Outside= 96.0"W x 44.0"H => 29.36 sf x 14.00'L = 411.0 cf 8 Chambers in 2 Rows
#3	32.30'	0.011 af	**20.00'W x 60.00'L x 1.00'H Prismatoid** 0.028 af Overall x 40.0% Voids
#4	33.30'	0.010 af	**2.00'W x 144.00'L x 3.67'H Prismatoid** 0.024 af Overall x 40.0% Voids
		0.076 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	32.30'	**4.0" Round Culvert** L= 3.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 32.30' / 32.27' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	32.30'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	34.70'	**8.0" Round Culvert** L= 3.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.70' / 34.67' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Secondary	39.80'	**160.0' 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=2.09 cfs @ 12.44 hrs HW=36.25' TW=32.70' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.63 cfs @ 7.16 fps)
└─**2=Orifice/Grate** (Passes 0.63 cfs of 0.79 cfs potential flow)
└─**3=Culvert** (Inlet Controls 1.47 cfs @ 4.20 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=32.30' TW=31.60' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: Drain Manhole #3

Inflow Area = 1.167 ac, 60.39% Impervious, Inflow Depth > 3.13" for 50 Yr 24 Hr(+15%) event
Inflow = 2.10 cfs @ 12.44 hrs, Volume= 0.304 af
Outflow = 2.10 cfs @ 12.44 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
Primary = 2.10 cfs @ 12.44 hrs, Volume= 0.304 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.75' @ 12.49 hrs
Flood Elev= 39.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	**12.0" Round Culvert** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 31.60' / 31.10' S= 0.0059 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.12 cfs @ 12.44 hrs HW=32.70' TW=32.13' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.12 cfs @ 3.05 fps)

Summary for Pond 10P: Drain Manhole #4

Inflow Area = 1.167 ac, 60.39% Impervious, Inflow Depth > 3.13" for 50 Yr 24 Hr(+15%) event
Inflow = 2.10 cfs @ 12.44 hrs, Volume= 0.304 af
Outflow = 2.10 cfs @ 12.44 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
Primary = 2.10 cfs @ 12.44 hrs, Volume= 0.304 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.13' @ 12.44 hrs
Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.10'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 31.10' / 30.90' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.09 cfs @ 12.44 hrs HW=32.13' TW=31.11' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.09 cfs @ 3.21 fps)

Summary for Pond 11P: Yard Drain #1

Inflow Area = 0.071 ac, 26.66% Impervious, Inflow Depth > 5.76" for 50 Yr 24 Hr(+15%) event
Inflow = 0.45 cfs @ 12.10 hrs, Volume= 0.034 af
Outflow = 0.45 cfs @ 12.10 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 12.10 hrs, Volume= 0.034 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.85' @ 12.20 hrs
Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.80'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 35.80' / 35.58' S= 0.0055 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=36.78' TW=36.94' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 12P: Yard Drain #2

Inflow Area = 0.072 ac, 0.00% Impervious, Inflow Depth > 3.96" for 50 Yr 24 Hr(+15%) event
Inflow = 0.27 cfs @ 12.18 hrs, Volume= 0.024 af
Outflow = 0.27 cfs @ 12.19 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.6 min
Primary = 0.27 cfs @ 12.19 hrs, Volume= 0.024 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 39.07' @ 12.19 hrs Surf.Area= 183 sf Storage= 6 cf

Plug-Flow detention time= 0.3 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (843.5 - 843.2)

Volume	Invert	Avail.Storage	Storage Description
#1	39.00'	1,358 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.00	5	0	0
40.01	2,685	1,358	1,358

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**8.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.00' / 35.33' S= 0.0134 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	39.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	40.00'	**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

Primary OutFlow Max=0.26 cfs @ 12.19 hrs HW=39.07' TW=37.60' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.26 cfs of 1.58 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 0.26 cfs @ 0.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=39.00' TW=34.30' (Dynamic Tailwater)
↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: Yard Drain #3

[80] Warning: Exceeded Pond 3P by 0.32' @ 12.10 hrs (2.64 cfs 0.032 af)

Inflow Area =	0.514 ac,	47.23% Impervious,	Inflow Depth >	6.28"	for 50 Yr 24 Hr(+15%) event
Inflow =	3.00 cfs @	12.14 hrs,	Volume=	0.269 af	
Outflow =	3.00 cfs @	12.14 hrs,	Volume=	0.269 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.00 cfs @	12.14 hrs,	Volume=	0.269 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.69' @ 12.17 hrs
Flood Elev= 38.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.65'	**15.0" Round Culvert** L= 48.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.65' / 34.40' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.96 cfs @ 12.14 hrs HW=37.58' TW=37.17' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.96 cfs @ 2.41 fps)

Summary for Pond 14P: Yard Drain #4

Inflow Area =	0.031 ac,	25.58% Impervious,	Inflow Depth >	6.48"	for 50 Yr 24 Hr(+15%) event
Inflow =	0.22 cfs @	12.09 hrs,	Volume=	0.017 af	
Outflow =	0.22 cfs @	12.09 hrs,	Volume=	0.017 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.22 cfs @	12.09 hrs,	Volume=	0.017 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.28' @ 12.18 hrs
Flood Elev= 39.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.50'	**8.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.50' / 36.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.31 cfs @ 12.09 hrs HW=36.91' TW=36.65' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.31 cfs @ 1.99 fps)

Summary for Pond 15P: Subsurface Stone Infiltration

Inflow Area = 0.021 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr(+15%) event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.03 cfs @ 12.58 hrs, Volume= 0.014 af, Atten= 85%, Lag= 29.4 min
Discarded = 0.03 cfs @ 12.58 hrs, Volume= 0.014 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.61' @ 12.58 hrs Surf.Area= 0.004 ac Storage= 0.006 af

Plug-Flow detention time= 130.4 min calculated for 0.014 af (99% of inflow)
Center-of-Mass det. time= 122.9 min (862.9 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	27.50'	0.007 af	**4.00'W x 40.00'L x 4.51'H Prismatoid** 0.017 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	27.50'	**0.650 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 27.08' Phase-In= 0.01'
#2	Primary	32.00'	**88.0' 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=0.03 cfs @ 12.58 hrs HW=31.61' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.50' TW=28.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 16P: Subsurface Stone Infiltration

Inflow Area = 0.019 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr(+15%) event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.04 cfs @ 12.44 hrs, Volume= 0.013 af, Atten= 73%, Lag= 21.3 min
Discarded = 0.04 cfs @ 12.44 hrs, Volume= 0.013 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.39' @ 12.44 hrs Surf.Area= 0.006 ac Storage= 0.004 af

Plug-Flow detention time= 56.9 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 55.9 min (796.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	31.80'	0.004 af	**8.00'W x 35.00'L x 1.71'H Prismatoid** 0.011 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.80'	**0.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 31.72' Phase-In= 0.01'
#2	Primary	33.50'	**86.0' 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=0.04 cfs @ 12.44 hrs HW=33.39' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.80' TW=28.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: Deep Sump CB #4

Inflow Area = 0.131 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr(+15%) event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 0.091 af
Outflow = 1.07 cfs @ 12.09 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.09 hrs, Volume= 0.091 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 30.24' @ 12.09 hrs
Flood Elev= 33.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.60'	**12.0" Round Culvert** L= 67.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.60' / 29.20' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.05 cfs @ 12.09 hrs HW=30.23' TW=29.70' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.05 cfs @ 2.88 fps)

Summary for Pond 18P: Deep Sump CB #5

Inflow Area = 0.064 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr(+15%) event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.044 af
Outflow = 0.53 cfs @ 12.09 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.09 hrs, Volume= 0.044 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 29.90' @ 12.51 hrs
Flood Elev= 34.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.25'	**12.0" Round Culvert** L= 3.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.25' / 29.20' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.09 hrs HW=29.79' TW=29.70' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.51 cfs @ 1.17 fps)

Summary for Pond 19P: Deep Sump CB #3

Inflow Area = 0.103 ac,100.00% Impervious, Inflow Depth > 8.28" for 50 Yr 24 Hr(+15%) event
Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.071 af
Outflow = 0.84 cfs @ 12.09 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.09 hrs, Volume= 0.071 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 30.47' @ 12.09 hrs
Flood Elev= 33.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.80'	**12.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.80' / 29.60' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.82 cfs @ 12.09 hrs HW=30.45' TW=30.23' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.82 cfs @ 2.14 fps)

Summary for Pond 20P: Contech Jellyfish

Inflow Area = 0.196 ac,100.00% Impervious, Inflow Depth > 29.31" for 50 Yr 24 Hr(+15%) event
Inflow = 2.40 cfs @ 12.52 hrs, Volume= 0.478 af
Outflow = 2.40 cfs @ 12.52 hrs, Volume= 0.478 af, Atten= 0%, Lag= 0.0 min
Primary = 2.40 cfs @ 12.52 hrs, Volume= 0.478 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 29.89' @ 12.52 hrs
Flood Elev= 33.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	28.95'	**15.0" Round Culvert** L= 42.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.95' / 28.70' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.39 cfs @ 12.52 hrs HW=29.89' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.39 cfs @ 3.35 fps)

Summary for Pond 21P: Wetland Ponding Area

Inflow Area = 1.527 ac, 52.60% Impervious, Inflow Depth > 3.34" for 50 Yr 24 Hr(+15%) event
Inflow = 2.73 cfs @ 12.33 hrs, Volume= 0.426 af
Outflow = 2.20 cfs @ 12.69 hrs, Volume= 0.343 af, Atten= 19%, Lag= 21.7 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Tertiary = 2.20 cfs @ 12.69 hrs, Volume= 0.343 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.18' @ 12.69 hrs Surf.Area= 3,677 sf Storage= 5,810 cf

Plug-Flow detention time= 121.0 min calculated for 0.343 af (81% of inflow)
Center-of-Mass det. time= 56.5 min (869.7 - 813.3)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	7,242 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)
28.00	619	194.0	0	0	619
29.00	1,245	250.0	914	914	2,610
30.00	2,174	307.0	1,688	2,602	5,152
31.00	3,074	298.0	2,611	5,213	5,680
31.50	4,916	435.0	1,980	7,193	13,674
31.51	4,916	435.0	49	7,242	13,678

Device	Routing	Invert	Outlet Devices
#1	Secondary	31.50'	**70.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	31.30'	**16.0' 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
#3	Tertiary	30.30'	**15.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.30' / 30.20' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.00' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

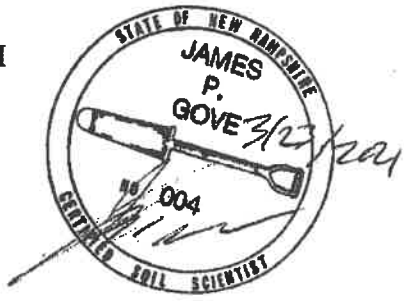
Tertiary OutFlow Max=2.20 cfs @ 12.69 hrs HW=31.18' TW=29.89' (Dynamic Tailwater)
└**3=Culvert** (Barrel Controls 2.20 cfs @ 3.37 fps)

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA



Project	1169 &1171 Sagamore Avenue, Portsmouth, NH	
Client	Garrepy Planning Consultants, LLC	
GES Project No.	2021039	
MM/DD/YY Staff	03-23-2021	JP Gove, CSS # 004

Test Pit No.	**1**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	60"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
Fill – 0-12"	10YR3/2	SL	Gr	Fr	None
Fill – 12-35"	10YR3/3	SL	Gr	Fr	None
Apb – 35-45"	10YR3/2	SL	Gr	Fr	None
Bwb – 45-60"	10YR4/3	SL	Om	Fr	None
Bedrock – 60"					

Test Pit No.	**2**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	55"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
Ap – 0-10"	10YR3/2	SL	Gr	Fr	None
Bw – 10-55"	7.5YR3/4	SL	Gr	Fr	None
Rippable Bedrock – 55"					

Test Pit No.	**3**	Lot No.:	
ESHWT:	31"	WSPCD Group:	
Termination @	51"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
Ap – 0-11"	10YR3/3	SL	Gr	Fr	None
Bw – 11-31"	10YR4/4	GRLS	Gr	Fr	None
Bw2 – 31-51"	7.5YR5/4	CBSL	Om	Fr	Yes
Rippable Bedrock – 51"					

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**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	33"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
Ap - 0-11"	10YR3/2	SL	Gr	Fr	None
Bw – 11-33"	10YR4/4	CBSL	Gr	Fr	None
Bedrock – 33"					

Test Pit No.	**5**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	22"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
Ap – 0-10"	10YR3/3	SL	Gr	Fr	None
Bw – 10-22"	10YR4/4	CBSL	Gr	Fr	None
Bedrock – 22"					

Test Pit No.	**6**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	2"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
A – 0-2"	10YR3/2	CBSL	Gr	Fr	None
Bedrock 2"					

Test Pit No.	**7**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	21"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
A – 0-21"	10YR3/3	CBSL	Gr	Fr	None
Bedrock – 21"					

Test Pit No.	**8**	Lot No.:	
ESHWT:	None Observed	WSPCD Group:	
Termination @	31"	Roots to:	
Refusal:	Yes	SCS Soil:	
Obs. Water:	none	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Redox
Ap – 0-10"	10YR3/2	SL	Gr	Fr	None
Bw – 10-31"	10YR4/6	CBSL	Gr	Fr	None
Bedrock – 31"					

Legend:
GRLS = gravelly loamy sand
CBSL = cobbly sandy loam
SL= sandy loam
Gr = granular
Fr = friable
Om = massive
Ap = top soil
Bw = subsoil
Apb = buried topsoil
Bwb = buried subsoil

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project1169 Sagamore Avenue, Portsmouth
Client Garrepy Planning Consultants, LLC
GES Project No. 2021039
MM/DD/YY Staff 11-10-2021 JP Gove

Test Pit No. B1
ESHWT: 54
Termination @ 84
Refusal: 84
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–29"	10YR 4/4	GRS	OM	FR	NONE , Fill
29–33"	10YR 3/2	FSL	GR	FR	NONE, buried A
33–54"	10YR 5/6	FSL	GR	FR	NONE, buried B
54–84"	2.5Y 5/3	FSL	OM	FR	30%, C

Test Pit No. B2
ESHWT: 50
Termination @ 65
Refusal: 65
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–31"	10YR 4/4	GRS	OM	FR	NONE , Fill
31–35"	10YR 3/2	FSL	GR	FR	NONE, buried A
35–50"	10YR 5/6	FSL	GR	FR	NONE, buried B
50–65"	2.5Y 4/3	FSL	OM	FR	30%, C

Test Pit No. B3
ESHWT: 33
Termination @ 47
Refusal: 47
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–33"	10YR 4/4	GRS	OM	FR	NONE , Fill
33–47"	10YR 4/3	FSL	OM	FR	20%, buried A/B

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. B4
ESHWT: 42
Termination @ 60
Refusal: 60
Obs. Water: 50

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–21"	10YR 4/4	GRS	OM	FR	NONE , Fill
21–29"	10YR 3/2	FSL	GR	FR	NONE, buried A
29–42"	10YR 5/6	FSL	GR	FR	NONE, buried B
42–60"	2.5Y 5/3	FSL	OM	FR	30%, C

Test Pit No. B5
ESHWT: 47
Termination @ 62
Refusal: 62
Obs. Water: 60

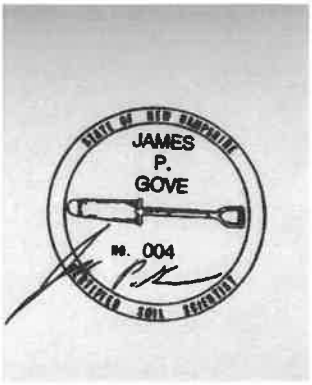
Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–25"	10YR 4/4	GRS	OM	FR	NONE , Fill
25–36"	10YR 3/2	FSL	GR	FR	NONE, buried A
36–47"	10YR 4/6	FSL	GR	FR	NONE, buried B
47–62"	2.5Y 5/3	FSL	OM	FR	30%, C

Test Pit No. B6
ESHWT: none
Termination @ 38
Refusal: 38
Obs. Water: none

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–20"	10YR 4/4	FSL	OM	FR	NONE , A/Fill
20–38"	10YR 5/6	FSL	GR	FR	NONE, B

Test Pit No. B7
ESHWT: none
Termination @ 49
Refusal: 49
Obs. Water: none

Depth	Color	Texture	Structure	Consistence
0–36"	10YR 3/3 - Fill	FSL	OM	FR
20–38"	10YR 5/6 – buried B	FSL	GR	FR



11-11-2021

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project – 1169 &1171 Sagamore Ave., Portsmouth, NH – TM 224, Lots 14 & 15.
Client - Jones & Beach Engineers, Inc.
GES Project No. 2021039
MM/DD/YY Staff 1-25-2022 JPG

Test Pit No. X1
ESHWT: n/a
Termination @ 20"
Refusal: 20"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–12"	10YR 3/2	FSL	GR	FR	NONE , Ap
12–20"	10YR 4/4	FSL	GR	FR	NONE, Bw
20"	Bedrock				

Test Pit No. X2
ESHWT: n/a
Termination @ 36"
Refusal: 36"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–6"	10YR 3/2	FSL	GR	FR	NONE , Ap
6–36"	10YR 4/6	FSL	GR	FR	NONE, Bw
36"	Bedrock				

Test Pit No. X3
ESHWT: n/a
Termination @ 57"
Refusal: 57"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–12"	10YR 3/2	FSL	GR	FR	NONE , Ap
12–57"	10YR 4/6	FSL	GR	FR	NONE, Bw
57"	Bedrock				

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. X4
ESHWT: n/a
Termination @ 75"
Refusal: n/a
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–70"	10YR 3/3	FSL	OM	FR	NONE , Fill
70-75"	10YR 4/6	FSL	GR	FR	NONE, Bw

Test Pit No. X5
ESHWT: 51"
Termination @ 66"
Refusal: 66"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–6"	10YR 3/3	LS	GR	FR	NONE , Fill
6–39"	10YR 5/6	LS	OM	FR	NONE, Fill
39–51"	10YR3/2	FSL	GR	FR	Buried Ap
51-66"	7.5YR4/6	FSL	GR	FR	5%, Bw
66"	Bedrock				

Test Pit No. X6
ESHWT: 51"
Termination @ 65"
Refusal: 65"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–5"	10YR 3/3	LS	GR	FR	NONE , Fill
5–51"	10YR 4/6	LS	OM	FR	NONE, Fill
51–65"	10YR3/2	FSL	GR	FR	5%, Buried Ap
65"	Bedrock				

Test Pit No. X7
ESHWT: 49"
Termination @ 65"
Refusal: 65"
Obs. Water: None

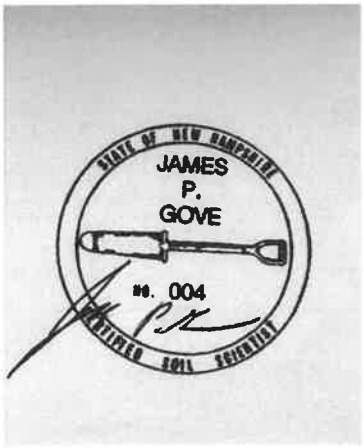
Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–10"	10YR 3/2	LS	GR	FR	NONE , Fill
10–49"	10YR 4/4	LS	OM	FR	NONE, Fill
49–65"	10YR3/2	FSL	GR	FR	5%, Buried Ap
65"	Bedrock				

Test Pit No. X8
ESHWT: n/a
Termination @ 58"
Refusal: 58"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–25"	10YR 3/3	LS	GR	FR	NONE , Fill
25–37"	10YR 3/2	FSL	GR	FR	NONE, Buried Ap
37–58"	10YR4/6	FSL	GR	FR	NONE, Bw
58"	Bedrock				

Test Pit No. X9
ESHWT: n/a
Termination @ 20"
Refusal: 20"
Obs. Water: None

Depth	Color	Texture	Structure	Consistence	Redox %, Layer
0–16"	10YR 3/2	FSL	GR	FR	NONE , Ap
16–20"	10YR 4/6	FSL	GR	FR	NONE, Bw
20"	Bedrock				



1-26-2022

APPENDIX IV

HISS Soil Note and Map

This soil map was prepared by a professional soil scientist and meets the technical standards of the SSSNNE Publication No. 1, High Intensity Soil Maps for NH, December 2017. Soil map was prepared on 4 April 2021. Soil map site was 1169 &1171 Sagamore Avenue, Portsmouth, NH.

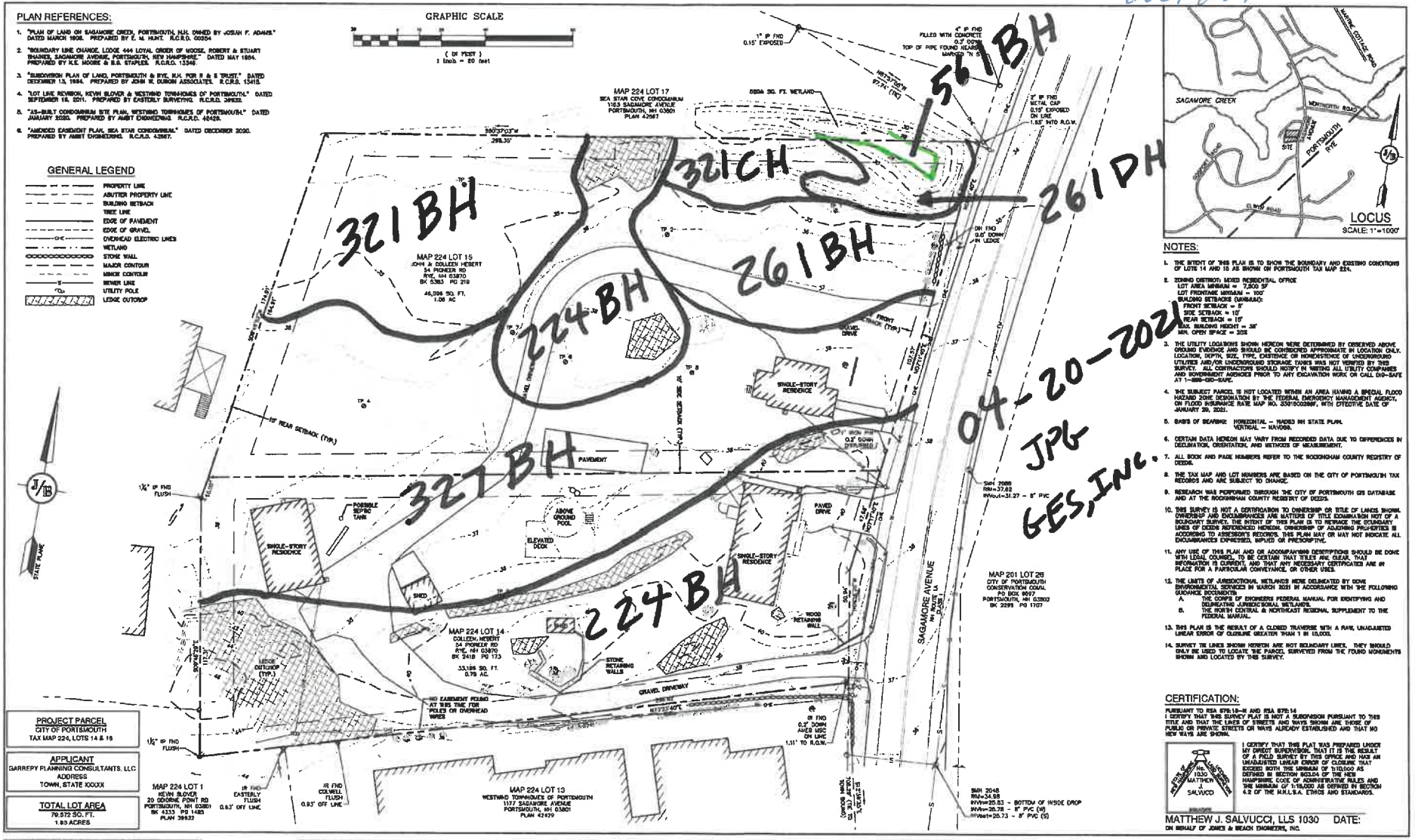
Soil Map Units were identified using the Key to Soil Types. The conversion of High Intensity Soil Map Unit to NRCS Soil Map Unit Name was based upon the observed soil profiles, as was hydrologic soil group, as taken from SSSNNE Special Publication No. 5.

Soil mapping was performed by James Gove, CSS # 004.

HISS Soil Map Unit	Soil Map Unit Name	Hydrologic Soil Group
224 (slope) H	Hollis-Rock Outcrop Complex	D
261 (slope) H	Made land – similar to Canton	B
321 (slope) H	Newfields	B
327 (slope) H	Chatfield Variant	B
561 (slope) H	Made land- similar to Walpole	C

B slope = 0-8%, C slope = 8-15%, D slope = 15-25%

2021039



Design: JAC	Draft: DJM	Date: 3/25/21	
Checked: JAC	Scale: 1" = 20'	Project No.: 21047	
Drawing Name: 21047-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
0	4/8/21	ISSUED FOR REVIEW	DJM

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

Plan Name:	EXISTING CONDITIONS PLAN
Project:	1169 & 1171 SAGAMORE AVENUE PORTSMOUTH, NEW HAMPSHIRE
Owner of Record:	LOT 14 COLLEEN HEBERT 54 PIONEER RD RYE, NH 03870 BK 2418 PG 173 — LOT 15 JOHN J & COLLEEN HEBERT 54 PIONEER RD RYE, NH 03870 BK 5383 PG 219

DRAWING No.
C1
SHEET 2 OF 18
JBE PROJECT NO. 21047

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(1169 & 1171 Sagamore Ave)

Map Scale: 1:1,280 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 22, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	3.5	53.7%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	2.7	40.6%
699	Urban land	0.4	5.7%
Totals for Area of Interest		**6.6**	**100.0%**

APPENDIX VI

Extreme Precipitation Estimates

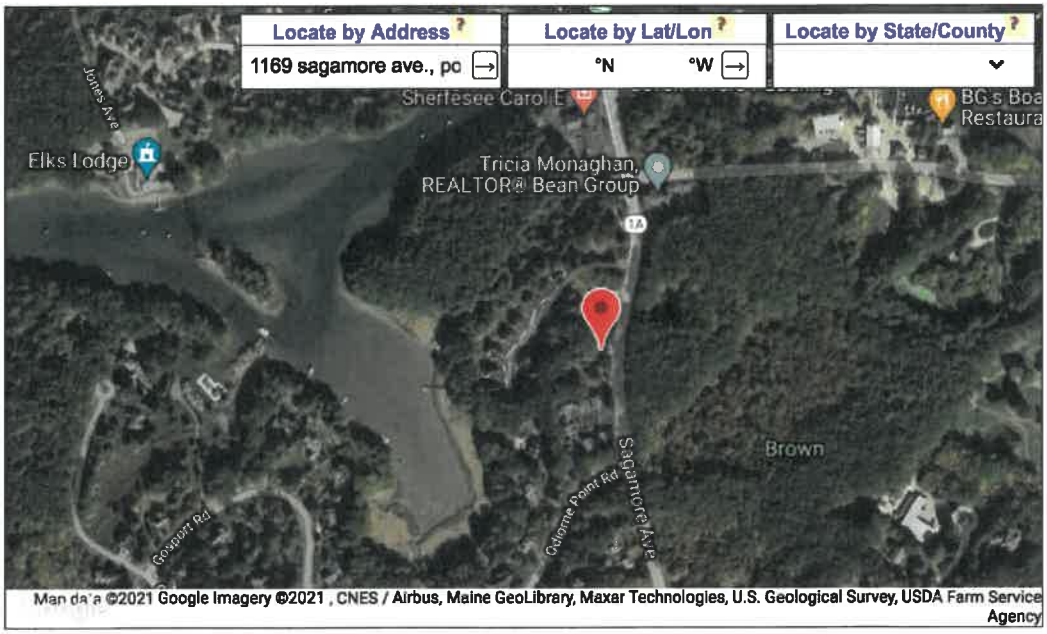
About this Project **Data & Products** **Daily Monitoring** **Documentation**

Select Product

- Extreme Precipitation Tables - HTML
- Extreme Precipitation Tables - Text/CSV
- Partial Duration Series - by Point
- Partial Duration Series - by Station
- Distribution Curves - Graphical
- Distribution Curves - Text/TBL
- Intensity Frequency Duration Graphs
- Precipitation Frequency Duration Graphs
- GIS Data Files
- Regional/State Maps

Select Location Double-click the map to place a marker, or enter address or latitude/longitude.

Locate by Address	Locate by Lat/Lon	Locate by State/County
1169 sagamore ave., po	°N °W	



Select Options

Smoothing	Delivery
Yes	Popup

Submit

Version 1.12 Copyright 2010-2021.
This project is a joint collaboration between:

Northeast Regional Climate Center (NRCC) Cornell University

Natural Resources Conservation Service (NRCS) USDA NRCS

Contact: precip@cornell.edu

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	
Location	
Longitude	70.748 degrees West
Latitude	43.051 degrees North
Elevation	0 feet
Date/Time	Wed, 16 Jun 2021 12:03:11 -0400

Extreme Precipitation Estimates

+15%

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.67	2.94	**1yr**	2.36	2.82	3.24	3.96	4.57	**1yr**
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.08	4.60	**5yr**	3.61	4.42	5.07	5.96	6.73	**5yr**
10yr	0.41	0.65	0.82	1.12	1.46	1.90	**10yr**	1.26	1.73	2.24	2.91	3.76	4.88	5.55	**10yr**	4.32	5.34	6.12	7.14	8.01	**10yr**
25yr	0.48	0.77	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.76	6.19	7.13	**25yr**	5.48	6.85	7.85	9.07	10.09	**25yr**
50yr	0.54	0.87	1.11	1.55	2.09	2.78	**50yr**	1.80	2.54	3.31	4.35	5.69	7.42	8.62	**50yr**	6.56	8.29	9.48	10.87	12.02	**50yr**
100yr	0.60	0.97	1.26	1.79	2.44	3.28	**100yr**	2.10	3.00	3.93	5.19	6.80	8.88	10.42	**100yr**	7.86	10.02	11.46	13.03	14.33	**100yr**
200yr	0.68	1.11	1.44	2.07	2.85	3.87	**200yr**	2.46	3.54	4.65	6.17	8.12	10.65	12.60	**200yr**	9.42	12.11	13.85	15.63	17.08	**200yr**
500yr	0.81	1.33	1.73	2.51	3.52	4.81	**500yr**	3.03	4.42	5.82	7.76	10.28	13.53	16.20	**500yr**	11.97	15.58	17.81	19.89	21.57	**500yr**

3.70
5.61
7.12
8.53

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.62	0.86	0.93	1.34	1.69	2.26	2.50	**1yr**	2.00	2.41	2.88	3.21	3.94	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.81	2.33	3.07	3.47	**2yr**	2.72	3.33	3.84	4.56	5.11	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.11	2.72	3.80	4.20	**5yr**	3.36	4.04	4.74	5.56	6.26	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.80	2.38	3.05	4.38	4.88	**10yr**	3.88	4.69	5.47	6.44	7.22	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.74	3.52	4.78	5.91	**25yr**	4.23	5.68	6.69	7.83	8.72	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.05	3.91	5.41	6.82	**50yr**	4.79	6.56	7.77	9.10	10.06	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.41	2.63	3.39	4.31	6.10	7.87	**100yr**	5.40	7.57	9.04	10.58	11.63	**100yr**
200yr	0.59	0.89	1.13	1.64	2.28	2.81	**200yr**	1.97	2.75	2.94	3.74	4.74	6.86	9.09	**200yr**	6.07	8.74	10.50	12.32	13.45	**200yr**
500yr	0.69	1.02	1.31	1.91	2.72	3.36	**500yr**	2.34	3.29	3.42	4.26	5.39	8.01	10.98	**500yr**	7.09	10.56	12.80	15.09	16.30	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.09	**1yr**	0.77	1.06	1.26	1.74	2.20	2.98	3.18	**1yr**	2.64	3.06	3.59	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.87	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.52	3.43	3.72	**2yr**	3.03	3.58	4.11	4.86	5.64	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.63	**5yr**	1.16	1.59	1.89	2.54	3.26	4.36	4.98	**5yr**	3.85	4.79	5.40	6.40	7.18	**5yr**
10yr	0.47	0.72	0.89	1.25	1.62	1.99	**10yr**	1.39	1.94	2.29	3.11	3.97	5.36	6.23	**10yr**	4.74	5.99	6.85	7.87	8.79	**10yr**
25yr	0.58	0.88	1.10	1.57	2.06	2.59	**25yr**	1.78	2.53	2.97	4.08	5.18	7.75	8.38	**25yr**	6.86	8.05	9.20	10.38	11.45	**25yr**
50yr	0.68	1.03	1.28	1.84	2.48	3.15	**50yr**	2.14	3.08	3.61	5.02	6.36	9.69	10.50	**50yr**	8.57	10.10	11.51	12.78	14.01	**50yr**
100yr	0.80	1.20	1.51	2.18	2.99	3.84	**100yr**	2.58	3.76	4.40	6.19	7.83	12.11	13.16	**100yr**	10.71	12.65	14.40	15.76	17.15	**100yr**
200yr	0.93	1.41	1.78	2.58	3.60	4.70	**200yr**	3.10	4.59	5.37	7.63	9.63	15.17	16.51	**200yr**	13.43	15.87	18.04	19.43	20.98	**200yr**
500yr	1.16	1.73	2.22	3.23	4.59	6.11	**500yr**	3.96	5.97	6.97	10.10	12.71	20.46	22.28	**500yr**	18.11	21.43	24.31	25.62	27.41	**500yr**

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Northeast Regional Climate Center

APPENDIX VII

Rip Rap Calculations

RIP RAP CALCULATIONS
Sagamore Avenue Condominiums
1169 & 1171 Sagamore Avenue
Portsmouth, NH 03801

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
8/11/2021, Rev 9/20/2021, Rev 12/22/2021, Rev 1/28/2022, Rev 3/21/22, Rev 4/18/22, Rev 5/10/22

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)
15" HDPE (Pond 20P)	0.47	1.5	1.25	10.7	14	0.06

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)
12" HDPE (Pond 10P)	0.63	1.59	1	11.8	8	0.06

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.25	Feet	3	Inches
% of Weight Smaller	Size of Stone (Inches)			
Than the Given d_{50} Size	From		To	
100%	5		6	
85%	4		5	
50%	3		5	
15%	1		2	

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.5	Feet	6	Inches
% of Weight Smaller	Size of Stone (Inches)			
Than the Given d_{50} Size	From		To	
100%	9		12	
85%	8		11	
50%	6		9	
15%	2		3	

APPENDIX VIII

BMP Worksheets

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Bioretention #1 (1P)**

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).	
0.16	ac	A = Area draining to the practice	
0.12	ac	A_I = Impervious area draining to the practice	
0.77	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.74	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1" x Rv x A	
427	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
107	cf	25% x WQV (check calc for sediment forebay volume)	
320	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:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	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
430	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	D5	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 mod. 304.1 (see spec)
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

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

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
33.99	315	0
34.04	315	6
34.09	315	13
34.14	315	19
34.19	315	25
34.24	315	32
34.29	315	38
34.34	315	44
34.39	315	50
34.44	315	57
34.49	315	63
34.54	315	69
34.59	315	76
34.64	315	82
34.69	315	88
34.74	315	95
34.79	315	101
34.84	315	107
34.89	315	113
34.94	315	120
34.99	315	126
35.04	315	128
35.09	315	131
35.14	315	133
35.19	315	135
35.24	315	138
35.29	315	140
35.34	315	143
35.39	315	145
35.44	315	147
35.49	315	150
35.54	315	152
35.59	315	154
35.64	315	157
35.69	315	159
35.74	315	161
35.79	315	164
35.84	315	166
35.89	315	169
35.94	315	171
35.99	315	173
36.04	315	176
36.09	315	178
36.14	315	180
36.19	315	183
36.24	315	185
36.29	315	187
36.34	315	190
36.39	315	192
36.44	315	195
36.49	315	197
36.54	329	213
36.59	345	230
36.64	362	247
36.69	379	266
36.74	396	285
36.79	413	306
36.84	430	327
36.89	447	349
36.94	464	371
36.99	481	395
37.04	499	419
37.09	517	445
37.14	536	471
37.19	554	498
37.24	572	527
37.29	591	556
37.34	609	586
37.39	628	617
37.44	646	648
37.49	664	681

Bottom of filter course = 35.0

Storage below = 126 cf

Riser Grate El. = 37.3
Storage below = 556 cf

WQV Required = 427 cf
WQV Provided = 556-126 = 430 cf > 427 cf

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Bioretention #2 (2P)**

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	
0.15	ac	A_I = Impervious area draining to the practice	
0.63	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.62	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.15	ac-in	WQV= 1" x Rv x A	
533	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
133	cf	25% x WQV (check calc for sediment forebay volume)	
400	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:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
Calculate time to drain if system IS underdrained:			
	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
677	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	D5	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 mod. 304.1 (see spec)
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.
2. See lines 34, 40 and 48 for required depths of filter media.
3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Stage-Area-Storage for Pond 2P: Bioretention #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.49	600	0
34.54	600	12
34.59	600	24
34.64	600	36
34.69	600	48
34.74	600	60
34.79	600	72
34.84	600	84
34.89	600	96
34.94	600	108
34.99	600	120
35.04	600	132
35.09	600	144
35.14	600	156
35.19	600	168
35.24	600	180
35.29	600	192
35.34	600	204
35.39	600	216
35.44	600	228
35.49	600	240
35.54	600	244
35.59	600	249
35.64	600	253
35.69	600	258
35.74	600	263
35.79	600	267
35.84	600	272
35.89	600	276
35.94	600	281
35.99	600	285
36.04	600	289
36.09	600	294
36.14	600	298
36.19	600	303
36.24	600	308
36.29	600	312
36.34	600	317
36.39	600	321
36.44	600	326
36.49	600	330
36.54	600	334
36.59	600	339
36.64	600	343
36.69	600	348
36.74	600	353
36.79	600	357
36.84	600	362
36.89	600	366
36.94	600	371
36.99	600	375
37.04	621	405
37.09	646	437
37.14	672	470
37.19	697	504
37.24	723	540
37.29	749	577
37.34	774	615
37.39	800	654
37.44	826	695
37.49	851	737
37.54	877	780
37.59	903	824
37.64	928	870
37.69	954	917
37.74	980	965
37.79	1,005	1,015
37.84	1,031	1,066
37.89	1,057	1,118
37.94	1,082	1,172
37.99	1,108	1,226

Bottom of filter course = 35.5
Storage below = 240 cf

Riser Grate El. = 37.7
Storage below = 917 cf

WQV Required = 533 cf
WQV Provided = 917-240 = 677 cf

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Concrete Galley 8x14 (Subsurface infiltration basin, 5P)**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
0.77	ac	A = Area draining to the practice	
0.44	ac	A_I = Impervious area draining to the practice	
0.57	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.57	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.43	ac-in	WQV= 1" x Rv x A	
1,577	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
394	cf	25% x WQV (check calc for sediment forebay volume)	
		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
2,178	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
1,232	sf	A_{SA} = Surface area of the bottom of the pond	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
51.2	hours	I_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
33.90	feet	E_{BTM} = Elevation of the bottom of the basin	
30.82	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
29.57	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.08	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
4.3	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
Yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
	:1	If a basin is proposed, pond side slopes.	≥3:1
35.72	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
36.86	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
36.90	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Stage-Area-Storage for Pond 5P: Concrete Galley 8x14 INFILTRATION

Elevation (feet)	Surface (acres)	Storage (acre-feet)
30.90	0.035	0.000
31.00	0.035	0.001
31.10	0.035	0.003
31.20	0.035	0.004
31.30	0.035	0.006
31.40	0.035	0.007
31.50	0.035	0.009
31.60	0.035	0.010
31.70	0.035	0.011
31.80	0.035	0.013
31.90	0.035	0.014
32.00	0.035	0.016
32.10	0.035	0.017
32.20	0.035	0.018
32.30	0.035	0.020
32.40	0.035	0.021
32.50	0.035	0.023
32.60	0.035	0.024
32.70	0.035	0.026
32.80	0.035	0.027
32.90	0.035	0.028
33.00	0.035	0.030
33.10	0.035	0.031
33.20	0.035	0.033
33.30	0.035	0.034
33.40	0.035	0.035
33.50	0.035	0.037
33.60	0.035	0.038
33.70	0.035	0.040
33.80	0.035	0.041
33.90	0.071	0.043
34.00	0.071	0.045
34.10	0.071	0.048
34.20	0.071	0.051
34.30	0.071	0.054
34.40	0.071	0.057
34.50	0.071	0.059
34.60	0.071	0.062
34.70	0.071	0.065
34.80	0.071	0.068
34.90	0.071	0.071
35.00	0.071	0.073
35.10	0.071	0.076
35.20	0.071	0.079
35.30	0.071	0.082
35.40	0.071	0.084
35.50	0.071	0.087
35.60	0.071	0.090
35.70	0.071	0.093
35.80	0.071	0.096
35.90	0.071	0.098
36.00	0.071	0.101
36.10	0.071	0.104
36.20	0.071	0.107
36.30	0.071	0.110
36.40	0.071	0.112
36.50	0.071	0.115
36.60	0.071	0.118
36.70	0.071	0.121
36.80	0.071	0.124
36.90	0.071	0.126
37.00	0.071	0.127
37.10	0.071	0.127
37.20	0.071	0.127
37.30	0.071	0.128
37.40	0.071	0.128
37.50	0.071	**0.128**

Bottom of basin = 33.9
Storage below = 0.043 ac-ft = 1873 cf

WQV Required = 1,577 cf
WQV Provided = 4,051 cf - 1,873 cf = 2,178 cf > 1,577 cf
(see below calculations)

Overflow invert = 35.7
Storage below = 0.093 ac-ft = 4051 cf

APPENDIX IX

Jellyfish Design Information

CONTECH
ENGINEERED SOLUTIONS

CONTECH Stormwater Solutions Inc. Engineer:	JBS
Date Prepared:	**5/4/2022**

Site Information

Project Name	**Sagamore Avenue Condominiums**	
Project State	**NH**	
Project City	**Portsmouth**	
Site Designation	**Jellyfish**	
Total Drainage Area, Ad	**0.19**	ac
Post Development Impervious Area, Ai	**0.19**	ac
Pervious Area, Ap	**0.00**	ac
% Impervious	**100%**	
Runoff Coefficient, Rc	**0.95**	

Mass Loading Calculations

Mean Annual Rainfall, P	**50**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**29,485**	ft^3
Event Mean Concentration of Pollutant, EMC	**75**	mg/l
Annual Mass Load, M total	**138**	lbs

Filter System

Filtration Brand	**Jelly Fish**	
Cartridge Length	**40**	in

Jelly Fish Sizing Parameters

Mass to be Captured by Fitler Vault	**110**	lbs
Water Quality Flow to be treated by Filter Vault	**0.18**	cfs

Method to Use **FLOW BASED**

Summary		
Flow	Required Size	**JF4-1-1**
	Treatment Flow Rate provided:	0.20 cfs

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.19	ac	A = Area draining to the practice
0.19	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)
0.18	ac-in	WQV= 1" x Rv x A
655	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".
0.95	inches	Q = Water quality depth. Q = WQV/A
100	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.0	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.009	inches	Ia = Initial abstraction. Ia = 0.2S
.	minutes	T_c = Time of Concentration
650.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.183	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 sheet is for the design of the Jellyfish filter system. System is designed to only treat runoff from Sagamore Ave., as all other impervious runoff directed toward it is already treated.

APPENDIX X

Pre- and Post-Construction Watershed Plans

LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT (X)
- REACH (X)
- POND (X)
- TC PATH
- WETLANDS
- HISS SOILS (224BH)
- FLOW ARROW

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: DJM	Draft: DJM	Date: 3/25/21
Checked: PSL	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-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.

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

REV.	DATE	REVISION	BY
7	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
6	4/18/22	REVISED DRAINAGE	DJM
5	3/21/22	REVISED PER CITY COMMENTS	DJM
4	2/23/22	REVISED PER NHDOT COMMENTS	DJM
3	2/9/22	REVISED PER TAC AND REVIEW ENGINEER COMMENTS	DJM

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

Plan Name: **EXISTING WATERSHED PLAN**

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVENUE, PORTSMOUTH, NEW HAMPSHIRE

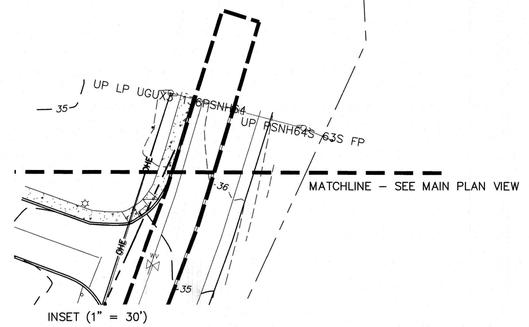
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No. **W1**

SHEET 1 OF 2
JBE PROJECT NO. **21047**

LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT (X)
- REACH (X)
- POND (X)
- TC PATH
- WETLANDS
- HISS SOILS (224BH)
- FLOW ARROW



INSET (1" = 30')

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: DJM	Draft: DJM	Date: 3/25/21
Checked: PSL	Scale: AS NOTED	Project No.: 21047
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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16870 – LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
7	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
6	4/18/22	REVISED DRAINAGE	DJM
5	3/21/22	REVISED PER CITY COMMENTS	DJM
4	2/23/22	REVISED PER NHDOT COMMENTS	DJM
3	2/9/22	REVISED PER TAC AND REVIEW ENGINEER COMMENTS	DJM

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

Plan Name: PROPOSED WATERSHED PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVENUE, PORTSMOUTH, NEW HAMPSHIRE

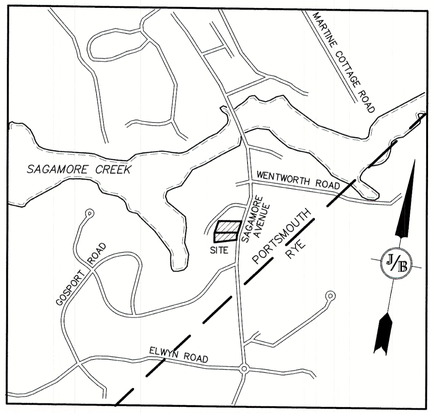
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 21047

CONDOMINIUM SITE PLAN
"SAGAMORE AVENUE CONDOMINIUMS"
TAX MAP 224, LOTS 14 & 15
1169 & 1171 SAGAMORE AVENUE, PORTSMOUTH, NH

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		FRESHWATER WETLANDS LINE
		TIDAL WETLANDS LINE
		STREAM CHANNEL
		TREE LINE
		STONEWALL
		BARBED WIRE
		FENCE
		STOCKADE FENCE
		SOIL BOUNDARY
		AQUIFER PROTECTION LINE
		FLOOD PLAIN LINE
		ZONELINE
		EASEMENT
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
VGC	VGC	EDGE OF PAVEMENT
SGC	SGC	VERTICAL GRANITE CURB
CCB	CCB	SLOPE GRANITE CURB
PCC	PCC	CAPE COD BERM
		POURED CONCRETE CURB
X	X	SILT FENCE
D		DRAINAGE LINE
S	S	SEWER LINE
G	G	GAS LINE
W	W	WATER LINE
WS	WS	WATER SERVICE
OHE	OHE	OVERHEAD ELECTRIC
UGE	UGE	UNDERGROUND ELECTRIC
		GUARDRAIL
UD	UD	UNDERDRAIN
F	F	FIRE PROTECTION LINE
	W	THRUST BLOCK
		IRON PIPE/IRON ROD
		DRILL HOLE
		IRON ROD/DRILL HOLE
		STONE/GRANITE BOUND
100x0	100x0	SPOT GRADE
100.00	100.00	PAVEMENT SPOT GRADE
100.00 / 99.50	100.00 / 99.50	CURB SPOT GRADE
		BENCHMARK (TBM)
		DOUBLE POST SIGN
		SINGLE POST SIGN
		WELL
TP1		TEST PIT
		FAILED TEST PIT
M	M	MONITORING WELL
1		PERC TEST
		PHOTO LOCATION
		TREES AND BUSHES
		UTILITY POLE
		LIGHT POLES
		DRAIN MANHOLE
S	S	SEWER MANHOLE
		HYDRANT
		WATER GATE
		WATER SHUT OFF
D		REDUCER
		SINGLE GRATE CATCH BASIN
		DOUBLE GRATE CATCH BASIN
		TRANSFORMER
D		CULVERT W/WINGWALLS
D		CULVERT W/FLARED END SECTION
D		CULVERT W/STRAIGHT HEADWALL
		STONE CHECK DAM
		DRAINAGE FLOW DIRECTION
		4K SEPTIC AREA
		WETLAND IMPACT
		VEGETATED FILTER STRIP
		RIPRAP
		OPEN WATER
		FRESHWATER WETLANDS
		TIDAL WETLANDS
		STABILIZED CONSTRUCTION ENTRANCE
		CONCRETE
		GRAVEL
		SNOW STORAGE
		RETAINING WALL



LOCUS MAP
SCALE 1" = 1000'

SHEET INDEX

CS	COVER SHEET
C1	EXISTING CONDITIONS PLAN
C1	DEMOLITION PLAN
C2	CONDOMINIUM SITE PLAN
C3	GRADING AND DRAINAGE PLAN
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C5	UTILITY PLAN
P1	SEWER PLAN AND PROFILE
L1	LANDSCAPE PLAN
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E1	EROSION AND SEDIMENT CONTROL DETAILS
T1-T4	TRUCK TURNING PLAN
H1	HIGHWAY ACCESS PLAN

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: KEN SWEENEY
EMAIL: KSWEENEY@CHARRONINC.COM

WETLAND 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 PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: BRIAN GOETZ, P.E.
(603) 427-1530

SEWER
CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
SEWER DIVISION
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
CONTACT: TERRY DESMARAIS, P.E.
(603) 766-1421

ELECTRIC
EVERSOURCE
74 OLD DOVER ROAD
ROCHESTER, NH 03867
(800) 555-5334
CONTACT: NICHOLAI KOSKO

TELEPHONE
FAIRPOINT COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(603) 427-5525
CONTACT: JOE CONSIDINE

CABLE TV
COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

APPROVED – PORTSMOUTH, NH
PLANNING BOARD

DATE:

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-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
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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Plan Name:	COVER SHEET
Project:	SAGAMORE AVENUE CONDOMINIUMS 1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE
Owner of Record:	LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173 LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
CS
SHEET 1 OF 22
JBE PROJECT NO. 21047

"SAGAMORE AVENUE CONDOMINIUMS", PORTSMOUTH, NH
JBE # 21047 REVISION 14, 5/10/22

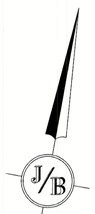
PLAN REFERENCES:

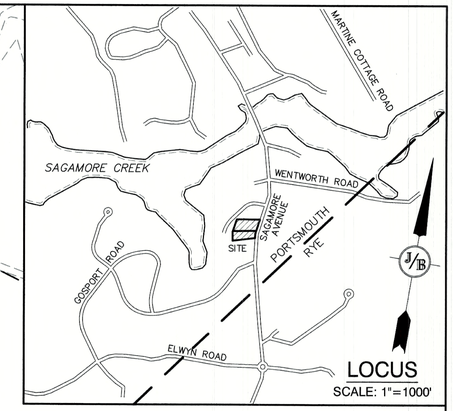
1. "PLAN OF LAND ON SAGAMORE CREEK, PORTSMOUTH, N.H. OWNED BY JOSIAH F. ADAMS." DATED MARCH 1908. PREPARED BY E. M. HUNT. R.C.R.D. 00254
2. "BOUNDARY LINE CHANGE, LODGE 444 LOYAL ORDER OF MOOSE, ROBERT & STUART SHAINES, SAGAMORE AVENUE, PORTSMOUTH, NEW HAMPSHIRE." DATED MAY 1984. PREPARED BY K.E. MOORE & B.G. STAPLES. R.C.R.D. 13349.
3. "SUBDIVISION PLAN OF LAND, PORTSMOUTH & RYE, N.H. FOR R & S TRUST." DATED DECEMBER 13, 1984. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 13415.
4. "LOT LINE REVISION, KEVIN SLOVER & WESTWND TOWNHOMES OF PORTSMOUTH." DATED SEPTEMBER 16, 2011. PREPARED BY EASTERLY SURVEYING. R.C.R.D. 39932.
5. "AS-BUILT CONDOMINIUM SITE PLAN, WESTWND TOWNHOMES OF PORTSMOUTH." DATED JANUARY 2020. PREPARED BY AMBIT ENGINEERING. R.C.R.D. 42429.
6. "AMENDED EASEMENT PLAN, SEA STAR CONDOMINIUM." DATED DECEMBER 2020. PREPARED BY AMBIT ENGINEERING. R.C.R.D. 42567.

GENERAL LEGEND

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- BUILDING SETBACK
- TREE LINE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- OVERHEAD ELECTRIC LINES
- WETLAND
- STONE WALL
- MAJOR CONTOUR
- MINOR CONTOUR
- SEWER LINE
- UTILITY POLE
- LEDGE OUTCROP

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 feet





MAP 224 LOT 16
SIMONE ROCCO
1167 SAGAMORE AVE.
PORTSMOUTH, NH 03801
BK 2253 PG 0986

MAP 224 LOT 17
SEA STAR COVE CONDOMINIUM
1163 SAGAMORE AVENUE
PORTSMOUTH, NH 03801
PLAN 42567

MAP 224 LOT 15
JOHN & COLLEEN HEBERT
54 PIONEER RD
RYE, NH 03870
BK 5383 PG 219
46,096 SQ. FT.
1.06 AC

MAP 224 LOT 14
COLLEEN HEBERT
54 PIONEER RD
RYE, NH 03870
BK 2418 PG 173
33,196 SQ. FT.
0.76 AC.

MAP 224 LOT 10-1
KEVIN SLOVER
20 ODIORNE POINT RD
PORTSMOUTH, NH 03801
BK 4333 PG 1485
PLAN 39932

MAP 224 LOT 13
WESTWND TOWNHOMES OF PORTSMOUTH
1177 SAGAMORE AVENUE
PORTSMOUTH, NH 03801
PLAN 42429

MAP 201 LOT 26
CITY OF PORTSMOUTH
CONSERVATION COMM.
PO BOX 6697
PORTSMOUTH, NH 03802
BK 2299 PG 1707

1" IP FND 0.15' EXPOSED
EXISTING UNDERGROUND ELECTRIC SERVICE
4" IP FND FILLED WITH CONCRETE 0.3' DOWN TOP OF PIPE FOUND NEARBY MARKED "N S"
EXISTING UTILITY POLE WITH DROP
RIGHT OF WAY PER PLAN REF. 1
2" IP FND METAL CAP 0.15' EXPOSED ON LINE 1.65' INTO R.O.W.
APPROXIMATE BURIED WETLAND LOCATION
520± SQ. FT. WETLAND
100' BUFFER FROM OFFSITE WETLAND (TYP.)
OFFSITE WETLAND
S80°37'03"W 298.35'
N67°57'08"W 97.74' (TIE)
561 BH
321 CH
321 BH
261 DH
261 BH
224 BH
327 BH
DH FND 0.8' DOWN IN LEDGE
N06°41'40"E 48.25'
APPROXIMATE AREA OF OLD FILL AND BURIED TOPSOIL
GRAVEL DRIVE
5' FRONT SETBACK (TYP.)
EXISTING 12" CAST IRON WATER MAIN
FINE LAWN AREA
GRAVEL DRIVEWAY
SINGLE-STORY RESIDENCE
10' SIDE SETBACK (TYP.)
15' REAR SETBACK (TYP.)
PAVEMENT
N79°16'50"E 305.92'
1" IRON PIN 0.2' DOWN DISTURBED
EXISTING WATER SERVICE WITH SHUTOFF
SMH 2088
RIM=37.62
EX. 3" & 4" FM INV. IN UNKNOWN
INVout=31.27 - 8" PVC
1¼" IP FND FLUSH
N10°00'00"E 170.00'
POSSIBLE SEPTIC TANK
ABOVE GROUND POOL
ELEVATED DECK
SHED
PAVED DRIVE
N07°11'40"E 47.81'
EXISTING UTILITY POLE
SAGAMORE AVENUE
NH ROUTE 1A
CLASS I
N09°16'20"W 50.99'
7" ORNAMENTAL TREE
WOOD RETAINING WALLS
STONE RETAINING WALLS
EXISTING WATER SERVICE WITH SHUTOFF
EXISTING GATE VALVE AND FIRE HYDRANT
EXISTING UTILITY POLE
TBM - NAIL IN UP EL = 37.72
S09°45'29"E 117.31'
LEDGE OUTCROP (TYP.)
S08°19'52"W 174.91'
164.91'
N73°23'40"E 296.83'
IR FND 0.2' DOWN AMES MSC ON LINE 1.11' TO R.O.W.
NO EASEMENT FOUND AT THIS TIME FOR POLES OR OVERHEAD WIRES
EXISTING UTILITY POLE
IR FND EASTERLY FLUSH 0.63' OFF LINE
IR FND COLWELL FLUSH 0.93' OFF LINE
S17°39'16"E 120.28' TO MHD
SMH 2048
RIM=34.98
INVin=25.83 - BOTTOM OF INSIDE DROP
INVin=25.78 - 8" PVC (W)
INVout=25.73 - 8" PVC (S)

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY AND EXISTING CONDITIONS OF LOTS 14 AND 15 AS SHOWN ON PORTSMOUTH TAX MAP 224.
2. ZONING DISTRICT: MIXED RESIDENTIAL OFFICE
   LOT AREA MINIMUM = 7,500 SF
   LOT FRONTAGE MINIMUM = 100'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 5'
   SIDE SETBACK = 10'
   REAR SETBACK = 15'
   WETLAND BUFFER = 100' FROM WETLANDS > 10,000 S.F. IN AREA
   MAX. BUILDING HEIGHT = 35'
   MIN. OPEN SPACE = 25%
3. 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.
4. THE SUBJECT PARCEL IS NOT LOCATED WITHIN AN AREA HAVING A SPECIAL FLOOD HAZARD ZONE DESIGNATION BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, ON FLOOD INSURANCE RATE MAP NO. 33015C0286F, WITH EFFECTIVE DATE OF JANUARY 29, 2021.
5. BASIS OF BEARING:
   HORIZONTAL - NAD83 NH STATE PLANE.
   VERTICAL - NAVD88.
6. CERTAIN DATA HEREON MAY VARY FROM RECORDED DATA DUE TO DIFFERENCES IN DECLINATION, ORIENTATION, AND METHODS OF MEASUREMENT.
7. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
8. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
9. RESEARCH WAS PERFORMED THROUGH THE CITY OF PORTSMOUTH GIS DATABASE AND AT 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.
12. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES IN MARCH 2021 IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
   A. THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.
   B. THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL.
13. THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000.
14. 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.

HISS SOIL NOTE

THIS SOIL MAP WAS PREPARED BY A PROFESSIONAL SOIL SCIENTIST AND MEETS THE TECHNICAL STANDARDS OF THE SSSNNE PUBLICATION NO. 1, HIGH INTENSITY SOIL MAPS FOR NH, DECEMBER 2017. SOIL MAP WAS PREPARED ON 4 APRIL 2021. SOIL MAP SITE WAS 1169 & 1171 SAGAMORE AVENUE, PORTSMOUTH, NH.

SOIL MAP UNITS WERE IDENTIFIED USING THE KEY TO SOIL TYPES. THE CONVERSION OF HIGH INTENSITY SOIL MAP UNIT TO NRCS SOIL MAP UNIT NAME WAS BASED UPON THE OBSERVED SOIL PROFILES, AS WAS HYDROLOGIC SOIL GROUP, AS TAKEN FROM SSSNNE SPECIAL PUBLICATION NO. 5.

SOIL MAPPING WAS PERFORMED BY JAMES GOVE, CSS # 004.

HISS SOIL MAP UNIT	SOIL MAP UNIT NAME	HYDROLOGIC SOIL GROUP
224 (SLOPE) H	HOLLIS-ROCK OUTCROP COMPLEX	D
261 (SLOPE) H	MADE LAND - SIMILAR TO CANTON	B
321 (SLOPE) H	NEWFIELDS	B
327 (SLOPE) H	CHATFIELD VARIANT	B
561 (SLOPE) H	MADE LAND- SIMILAR TO WALPOLE	C

B SLOPE = 0-8%, C SLOPE = 8-15%, D SLOPE = 15-25%

STATE OF NEW HAMPSHIRE JAMES P. GOVE 004 CERTIFIED SOIL SCIENTIST 5-23-2022

STATE OF NEW HAMPSHIRE JAMES P. GOVE No. 0051 CERTIFIED WETLAND SCIENTIST 5-23-2022

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

5/24/22

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

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

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Plan Name: EXISTING CONDITIONS PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
C1
SHEET 2 OF 22
JBE PROJECT NO. 21047

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 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.
5. EXISTING WATERLINES TO BE REMOVED SHALL BE CAPPED AT EXISTING WATERMAIN.
6. 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).
7. SEE LANDSCAPE PLAN FOR "TREES TO BE SAVED" AND DETAILS ASSOCIATED WITH LANDSCAPED AREAS.
8. THE CONTRACTOR SHALL OBTAIN TREE CLEARING PERMIT FROM LOCAL AND STATE AUTHORITIES PRIOR TO START OF CONSTRUCTION (IF REQUIRED).
9. 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.
10. 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.
11. EXCAVATED MATERIALS WILL BE PLACED WITHIN UPLAND AREAS AS FILL MATERIAL OR HAULED OFF-SITE FOR DISPOSAL IN AN APPROPRIATE UPLAND LOCATION.
12. SEPTIC LINES ARE TO BE CLEANED OUT AND REMOVED. SEPTIC TANK IS TO BE PUMPED, PUNCTURED, AND FILLED WITH SAND, AND SEPTIC TANK AND LEACH FIELD SHALL BE REMOVED IN ACCORDANCE WITH NHDES STANDARDS. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL CONTAMINATED MATERIAL LOCATED IN THE AREA OF EXISTING LEACHFIELDS IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.

REMOVE ANY OFF-SITE FILL AND REPLACE WITH FINE SANDY LOAM UP TO EXISTING GRADE. REPLANT ANY OFF-SITE VEGETATION THAT IS CUT IN THE PROCESS.
EXISTING UNDERGROUND ELECTRIC SERVICE TO BE REROUTED AFTER COORINATING WITH PROPERTY OWNER WHOM IT IS SERVICING
EXISTING OVERHEAD ELECTRIC SERVICE TO BE REROUTED AFTER COORDINATING WITH PROPERTY OWNER WHOM IT IS SERVICING
EXISTING WHITE BIRCH TO REMAIN
EXISTING OAK TO REMAIN
TREELINE REPRESENTING PROPOSED LIMIT OF CLEARING
APPROXIMATE BURIED WETLAND LOCATION
520± SQ. FT. WETLAND
TREES TO REMAIN
TREELINE REPRESENTING PROPOSED LIMIT OF CLEARING
EXISTING UTILITY POLE WITH DROP
RIGHT OF WAY PER PLAN REF. 1
MATCHLINE SEE INSET, THIS SHEET
RELOCATE UTILITY POLE PER SHEET C4 AFTER COORDINATING REROUTING OF ELECTRIC SERVICES WITH PROPERTY OWNERS WHOM IT IS SERVICING
LEDGE OUTCROP TO BE REMOVED UP TO PROPERTY LINE
100' BUFFER FROM OFFSITE WETLAND
TREES TO BE REMOVED
TREE TO BE REMOVED
SAWCUT LINE FOR OFFSITE IMPROVEMENTS (SEE SHEET C4)
FINE LAWN AREA
TREES TO REMAIN
FIRST FOUR TREES IN THIS ROW TO BE REMOVED AND REPLACED WITH SIMILAR TREES AFTER CONSTRUCTION FOUR TREES TO NORTH TO REMAIN SEE SHEET L1
TREES TO BE REMOVED
TREE TO BE REMOVED
APPROXIMATE AREA OF OLD FILL AND BURIED TOPSOIL REMOVE ENTIRE DEPTH OF FILL AND REPLACE WITH FINE SANDY LOAM UP TO PROPOSED GRADE, BOTTOM OF PROPOSED DRAINAGE SYSTEM, OR BOTTOM OF FOUNDATION BACKFILL LAYER AS APPLICABLE.
LEDGE OUTCROP TO BE REMOVED
GRAVEL DRIVE TO BE REMOVED
EXISTING 12" CAST IRON WATER MAIN
GRAVEL DRIVEWAY TO BE REMOVED
TREE AND BUILDING ACCESSORIES TO BE REMOVED
SINGLE-STORY RESIDENCE TO BE REMOVED
WATER SHUTOFF AND SERVICE TO BE REMOVED BUT CONTRACTOR TO REUSE SAME TAPPING LOCATION FOR WATER MAIN THROUGH SITE
SECTION OF 12" CAST IRON WATER MAIN TO BE REPLACED IF NECESSARY (SEE SHEET C5) CONTRACTOR TO NOTIFY AND OBTAIN PERMISSION FROM PORTSMOUTH DEPARTMENT OF PUBLIC WORKS BEFORE PERFORMING THIS WORK
TREELINE REPRESENTING PROPOSED LIMIT OF CLEARING
TREES TO BE REMOVED
PAVEMENT TO BE REMOVED
PAVEMENT
LOT LINE TO BE VACATED
EXISTING WATER SERVICE WITH SHUTOFF
SAWCUT LINE (VARIABLE DEPENDING UPON EXTENT TO WHICH THE WATER MAIN MUST BE REPLACED AS DESCRIBED ON SHEET C5)
TREE TO BE REMOVED
SMH 2088
RIM=37.62
EX. 3" & 4" FM INV. IN UNKNOWN
INVout=31.27 - 8" PVC
EXISTING OAK TO REMAIN
POSSIBLE SEPTIC TANK SEE NOTE #12
ABOVE GROUND POOL
ELEVATED DECK
POOL AND STRUCTURE TO BE REMOVED
HOUSE TO BE REMOVED
PAVED DRIVE TO BE REMOVED
EXISTING UTILITY POLE TO BE RELOCATED
SAWCUT LINE
SINGLE-STORY RESIDENCE TO BE REMOVED
SINGLE-STORY RESIDENCE
SAGAMORE AVENUE
ROUTE 1A
CLASS 1
SHED AND PAVEMENT TO BE REMOVED
RETAINING WALL TO BE REMOVED
SHED
TREE TO BE REMOVED
SAWCUT LINE
OVERHEAD ELECTRIC SERVICE TO BE REMOVED
LEDGE OUTCROP TO REMAIN
LEDGE OUTCROP TO BE REMOVED
SHED TO BE REMOVED
LEDGE OUTCROP TO BE REMOVED
WOOD RETAINING WALL TO BE REMOVED
LEDGE OUTCROP (TYP.)
TREES TO BE REMOVED
STONE RETAINING WALLS TO BE REMOVED
EXISTING WATER SERVICE WITH SHUTOFF TO BE REMOVED
TREES TO REMAIN
GRAVEL DRIVEWAY TO BE REMOVED
EXISTING GATE VALVE AND FIRE HYDRANT TO REMAIN
TREES TO BE REMOVED
NO EASEMENT FOUND AT THIS TIME FOR POLES OR OVERHEAD WIRES
EXISTING UTILITY POLE TO REMAIN
TBM = NAIL IN UP EL = 37.72
EXISTING UTILITY POLE
TREELINE REPRESENTING PROPOSED LIMIT OF CLEARING
SMH 2048
RIM=34.98
INVin=25.83 - BOTTOM OF INSIDE DROP
INVin=25.78 - 8" PVC (W)
INVout=25.73 - 8" PVC (S)

REMOVE EXISTING CURBING UP TO R.O.W LINE, THEN PROCEED AS DIRECTED ON SHEET C4 AND PER DETAIL ON SHEET D2
"SPONSOR A HIGHWAY" SIGN TO BE RELOCATED
RELOCATE UTILITY POLES (TYP. X2) SEE SHEET C4
REROUTE OVERHEAD ELECTRIC ACCORDING TO PROPOSED UTILITY POLE LOCATIONS
MAILBOX TO BE RELOCATED
EXISTING DRIVEWAY
SAWCUT LINE FOR OFFSITE IMPROVEMENTS (SEE SHEET C4)
RIGHT OF WAY PER PLAN REF. 1
MATCHLINE - SEE LEFT
RELOCATE UTILITY
INSET
1 INCH = 20 FEET
STATE PLANE
GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21	
Checked: JAC	Scale: AS NOTED	Project No.: 21047	
Drawing Name: 21047-PLAN.dwg			

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

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

Plan Name: **DEMOLITION PLAN**
Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
DM-1
SHEET 3 OF 22
JBE PROJECT NO. 21047

PLAN REFERENCES:

1. "PLAN OF LAND ON SAGAMORE CREEK, PORTSMOUTH, N.H. OWNED BY JOSIAH F. ADAMS." DATED MARCH 1908. PREPARED BY E. M. HUNT. R.C.R.D. 00254
2. "BOUNDARY LINE CHANGE, LODGE 444 LOYAL ORDER OF MOOSE, ROBERT & STUART SHAINES, SAGAMORE AVENUE, PORTSMOUTH, NEW HAMPSHIRE." DATED MAY 1984. PREPARED BY K.E. MOORE & B.G. STAPLES. R.C.R.D. 13349.
3. "SUBDIVISION PLAN OF LAND, PORTSMOUTH & RYE, N.H. FOR R & S TRUST." DATED DECEMBER 13, 1984. PREPARED BY JOHN W. DURGIN ASSOCIATES. R.C.R.D. 13415.
4. "LOT LINE REVISION, KEVIN SLOVER & WESTWIND TOWNHOMES OF PORTSMOUTH." DATED SEPTEMBER 16, 2011. PREPARED BY EASTERLY SURVEYING. R.C.R.D. 39932.
5. "AS-BUILT CONDOMINIUM SITE PLAN, WESTWIND TOWNHOMES OF PORTSMOUTH." DATED JANUARY 2020. PREPARED BY AMBIT ENGINEERING. R.C.R.D. 42429.
6. "AMENDED EASEMENT PLAN, SEA STAR CONDOMINIUM." DATED DECEMBER 2020. PREPARED BY AMBIT ENGINEERING. R.C.R.D. 42567.

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		FRESHWATER WETLANDS LINE
		TREE LINE
		FENCE
		EDGE OF PAVEMENT
		TREES AND BUSHES
		UTILITY POLE
		FRESHWATER WETLANDS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 feet

STATE PLANE

MAP 224 LOT 16
SIMONE ROCCO
1167 SAGAMORE AVE.
PORTSMOUTH, NH 03801
BK 2253 PG 0986

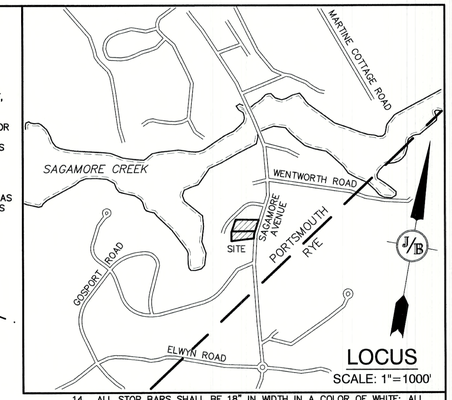
MAP 224 LOT 17
SEA STAR COVE CONDOMINIUM
1163 SAGAMORE AVENUE
PORTSMOUTH, NH 03801
PLAN 42567

MAP 201 LOT 26
CITY OF PORTSMOUTH
CONSERVATION COMM.
PO BOX 6697
PORTSMOUTH, NH 03802
BK 2299 PG 1707

MAP 224 LOT 10-1
KEVIN SLOVER
20 ODIORNE POINT RD
PORTSMOUTH, NH 03801
BK 4333 PG 1485
PLAN 39932

MAP 224 LOT 13
WESTWIND TOWNHOMES OF PORTSMOUTH
1177 SAGAMORE AVENUE
PORTSMOUTH, NH 03801
PLAN 42429

1" IP FND 0.15' EXPOSED
4" IP FND FILLED WITH CONCRETE 0.3' DOWN TOP OF PIPE FOUND NEARBY MARKED "N S"
N67°57'08"W 97.74' (TIE)
520 S.F. WETLAND NO REQUIRED BUFFER FROM WETLANDS SMALLER THAN 10,000 S.F.
PROPOSED CONCRETE BLOCK RETAINING WALL
PROPOSED 5.5' CONCRETE SIDEWALK WITH VERTICAL GRANITE CURB (6" INCLUDING VGC) (SEE OFFSITE IMPROVEMENTS PLAN, SHEET C4)
2" IP FND METAL CAP 0.15' EXPOSED ON LINE 1.65' INTO R.O.W.
PROPOSED TEMPORARY CONSTRUCTION EASEMENT, PERMANENT FLOWAGE EASEMENT, AND PERMANENT EASEMENT FOR INSTALLATION AND PLACEMENT OF MATERIALS UPON TAX MAP 201, LOT 26, TO BENEFIT CITY OF PORTSMOUTH SUBJECT TO CHANGE AS NO BOUNDARY SURVEY HAS BEEN PERFORMED BY THIS OFFICE.
100' BUFFER FROM OFFSITE WETLAND
PROPOSED SLOPE, GRADING, AND DRAINAGE EASEMENT TO BENEFIT NHDOT 871 S.F. (0.02 AC.)
DH FND 0.8' DOWN IN LEDGE
N08°41'40"E 48.25'
N61°18'53"W 85.10'
N07°11'40"E 107.62'
S07°11'40"W 67.33'
60.29'
5' FRONT SETBACK (TYP.)
278.05'
20.30'
MONUMENT TO BE SET (TYP.)
6 – 4' WIDE STEPS (TYP., EACH DECK)
10' SIDE SETBACK (TYP.)
S80°37'03"W 298.35'
15' REAR SETBACK (TYP.)
S08°49'52"W 174.91'
164.91'
200 S.F. PAVER PATIO (UNITS 5–7)
GARAGE (TYP.)
235 S.F. DECK (TYP., UNITS 1–4)
PROPOSED 1,760 S.F. CONDOMINIUM UNIT (TYP. X10)
GARAGE (TYP.)
BEGIN SLOPED GRANITE CURB (SGC)
END SGC
BEGIN SGC
SNOW STORAGE
12'R
8'R
6'x10' CONCRETE PAD FOR BICYCLE RACK WITH 4 BICYCLE SPACES PER DETAIL ON SHEET D1
2 VISITOR PARKING SPACES
2:1 TAPER
ONE–WAY
CONCRETE PAD FOR CLUSTER MAILBOX UNIT
18'R
22'
10.0'
5'R
"DO NOT ENTER" SIGN
GREEN SPACE (4,440 S.F.)
"VISITOR PARKING" SIGN (TYP. x2) SEE DETAIL
CONDOMINIUM COMPLEX SIGN
PROPOSED STOP SIGN AND STOP BAR
1" IRON PIN 0.2' DOWN DISTURBED
14'R
25'R
12'R
20'R
15'R
LOT LINE BETWEEN TAX MAP 224, LOT 14 AND TAX MAP 224, LOT 15 TO BE VACATED. LOTS TO BE CONSOLIDATED.
SITE OWNER OR CONDOMINIUM ASSOCIATION TO CONSISTENTLY MAINTAIN VEGETATION ALONG SITE FRONTAGE TO ENSURE THAT SIGHT LINES REMAIN UNOBSTRUCTED
1¼" IP FND FLUSH
S09°45'29"E 117.31'
PROPOSED TREELINE (TYP.)
235 S.F. PAVER PATIO (UNITS 8–10)
S80°43'40"W 100.00'
S16°20'20"E 100.00'
N16°16'20"W 40.99'
50.99'
PROPOSED DRAINAGE EASEMENT TO BENEFIT CITY OF PORTSMOUTH 106 S.F. (0.002 AC.)
N73°23'40"E 296.83'
IR FND 0.2' DOWN AMES MSC ON LINE 1.11' TO R.O.W.
IR FND EASTERLY FLUSH 0.63' OFF LINE
IR FND COLWELL FLUSH 0.93' OFF LINE
S17°29'35"E 706.29' (TIE TO TOWN BOUND)
SAGAMORE AVENUE NH ROUTE 1A CLASS I



LOCUS
SCALE: 1"=1000'

SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO REMOVE EXISTING STRUCTURES AS SHOWN ON SHT. C1 AND CONSTRUCT AN 10–UNIT CONDOMINIUM COMPLEX. PROJECT TO BE SERVED BY ELECTRIC, MUNICIPAL SEWER & PUBLIC WATER.
2. ZONING DISTRICT: MIXED RESIDENTIAL OFFICE
   LOT AREA MINIMUM = 7,500 SF
   LOT FRONTAGE MINIMUM = 100'
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 5'
   SIDE SETBACK = 10'
   REAR SETBACK = 15'
   WETLAND BUFFER = 100' FROM WETLANDS > 10,000 S.F. IN AREA
   MAX. BUILDING HEIGHT = 35'
   MAX BUILDING COVERAGE = 40%
   MIN. OPEN SPACE = 25%
   MIN. LOT AREA PER DWELLING UNIT = 7,500 S.F.
   BUILDING COVERAGE PROVIDED = 18,610 S.F. = 23.5%
   OPEN SPACE PROVIDED = 42,300 S.F. = 53.3%
3. DENSITY CALCULATION:
   LOT AREA = 79,292 S.F., 10 UNITS PROPOSED
   7,929 S.F. PER DWELLING UNIT PROVIDED > 7,500 S.F.
   7,500 S.F. PER DWELLING UNIT REQUIRED
4. PARKING CALCULATIONS:
   1.3 SPACES PER UNIT AND 1 VISITOR SPACE PER 5 UNITS REQUIRED
   1.3 SPACES * 10 UNITS + 1 SPACES * (10 UNITS / 5) =
   15 SPACES REQUIRED
   2 SPACES PROVIDED IN EACH GARAGE
   22 SPACES PROVIDED INCLUDING 2 VISITOR SPACES
5. NHDES SEWER CONNECTION PERMIT NO. , DATED .
   NHDOT DRIVEWAY PERMIT NO. , DATED .
6. 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.
7. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
8. THE SUBJECT PARCEL IS NOT LOCATED WITHIN AN AREA HAVING A SPECIAL FLOOD HAZARD ZONE DESIGNATION BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, ON FLOOD INSURANCE RATE MAP NO. 33015C0286F, WITH EFFECTIVE DATE OF JANUARY 29, 2021.
9. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
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 ARCHITECTURAL BLOCK RETAINING WALLS ARE TO BE DESIGNED AND STAMPED BY THE MANUFACTURER'S STRUCTURAL ENGINEER. CONTRACTOR TO COORDINATE WITH APPROVED MANUFACTURER PRIOR TO INSTALLATION.
18. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
19. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
20. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
21. 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.
22. THE OWNER OF EACH UNIT SHALL STORE TRASH IN THEIR GARAGE. TRASH WILL BE PICKED UP BY A PRIVATE HAULER.
23. 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.
24. BASIS OF BEARING:
    HORIZONTAL – NH STATE PLANE. VERTICAL – NAVD88.
25. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE CITY OF PORTSMOUTH TAX RECORDS AND ARE SUBJECT TO CHANGE.
26. 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.
27. 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.
28. 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.
29. THIS PLAN IS THE RESULT OF A CLOSED TRAVERSE WITH A RAW, UNADJUSTED LINEAR ERROR OF CLOSURE GREATER THAN 1 IN 15,000.
30. ON–SITE SALT STORAGE IS PROHIBITIED WITHIN 250' OF AN INLAND WETLAND UNLESS COMPLETELY COVERED AND CONTAINED IN A STRUCTURE.
31. LANDOWNERS OR CONDOMINIUM ASSOCIATION SHALL BE RESPONSIBLE FOR MAINTAINING DRIVEWAY SIGHT LINES.

CONDOMINIUM SITE PLAN CERTIFICATION:

I CERTIFY THAT THIS PLAN FULLY AND ACCURATELY DEPICTS THE LOCATION AND DIMENSIONS OF THE LAND AND EXISTING IMROVEMENTS SHOWN THEREON AND TO THE EXTEND FEASIBLE, ALL EASEMENTS APPURTENANT THERETO, THAT UNITS 1–10 ARE NOT YET BEGUN, AND THIS PLAN COMPLIES WITH NH RSA 356–B20 (1).

STATE OF NEW HAMPSHIRE – No. 1030 – MATTHEW J. SALVUCCI – LICENSED LAND SURVEYOR – SIGNATURE

MATTHEW J. SALVUCCI, LLS 1030 DATE: 5/24/22
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

APPROVED – PORTSMOUTH, NH
PLANNING BOARD

DATE:

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM
Checked: JAC	Scale: AS NOTED
Drawing Name: 21047-PLAN.dwg	Date: 3/25/21
	Project No.: 21047

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

REV.	DATE	REVISION	BY
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13	4/18/22	DRAINAGE REVISIONS	DJM
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10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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Civil Engineering Services
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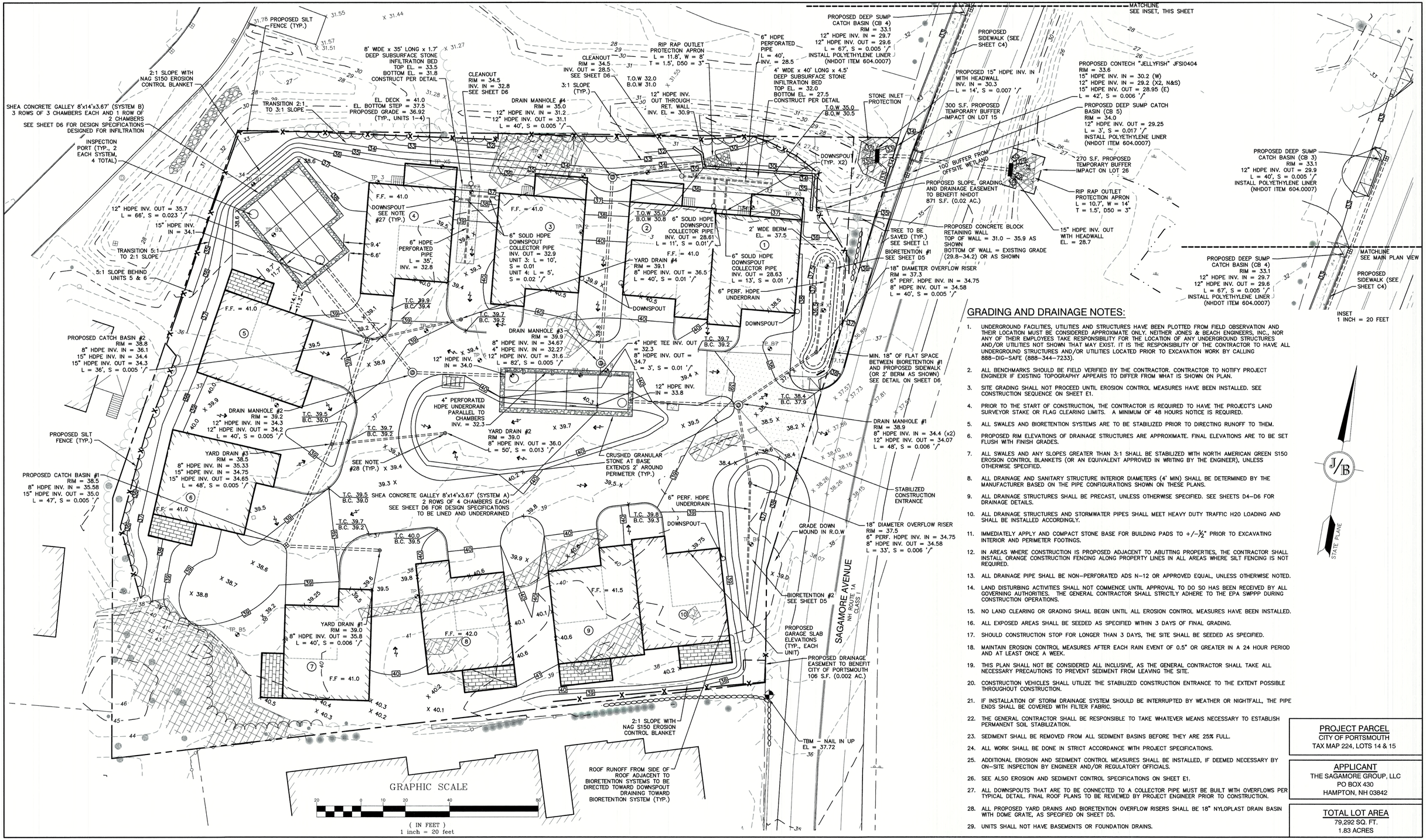
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: CONDOMINIUM SITE PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
C2
SHEET 4 OF 22
JBE PROJECT NO. 21047



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 SHOULD BE FIELD VERIFIED BY THE CONTRACTOR. CONTRACTOR TO NOTIFY PROJECT ENGINEER IF EXISTING TOPOGRAPHY APPEARS TO DIFFER FROM WHAT IS SHOWN ON PLAN.
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 SWALES AND BIORETENTION SYSTEMS ARE TO BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
6. PROPOSED RIM ELEVATIONS OF DRAINAGE STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES.
7. ALL SWALES AND ANY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER), UNLESS OTHERWISE SPECIFIED.
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.
9. ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE SHEETS D4-D6 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 PADS 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, UNLESS OTHERWISE NOTED.
14. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
15. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
16. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING.
17. SHOULD CONSTRUCTION STOP FOR LONGER THAN 3 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
18. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.5" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
19. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
20. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
21. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
22. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
23. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
24. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
25. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
26. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
27. ALL DOWNSPOUTS THAT ARE TO BE CONNECTED TO A COLLECTOR PIPE MUST BE BUILT WITH OVERFLOWS PER TYPICAL DETAIL. FINAL ROOF PLANS TO BE REVIEWED BY PROJECT ENGINEER PRIOR TO CONSTRUCTION.
28. ALL PROPOSED YARD DRAINS AND BIORETENTION OVERFLOW RISERS SHALL BE 18" NYLOPLAST DRAIN BASIN WITH DOME GRATE, AS SPECIFIED ON SHEET D5.
29. UNITS SHALL NOT HAVE BASEMENTS OR FOUNDATION DRAINS.

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

Plan Name: GRADING AND DRAINAGE PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No. C3
SHEET 5 OF 22
JBE PROJECT NO. 21047

MAP 224 LOT 17
SEA STAR COVE CONDOMINIUM
1163 SAGAMORE AVENUE
PORTSMOUTH, NH 03801
PLAN 42567

MAP 224 LOT 16
SIMONE ROCCO
1167 SAGAMORE AVE.
PORTSMOUTH, NH 03801
BK 2253 PG 0986

MAP 201 LOT 26
CITY OF PORTSMOUTH
CONSERVATION COMM.
PO BOX 6697
PORTSMOUTH, NH 03802
BK 2299 PG 1707

SAGAMORE AVENUE
NH ROUTE 1A
CLASS I

1163 SAGAMORE AVENUE
"SEA STAR COVE" PRIVATE ROAD

STATE PLANE

APPROXIMATE ABUTTER PROPERTY LINE (TYP.)

COORDINATE RELOCATION OF OVERHEAD AND UNDERGROUND ELECTRIC SERVICES WITH ASSOCIATED PROPERTY OWNERS BEFORE RELOCATING UTILITY POLE

PROPOSED RELOCATED UTILITY POLES (TYP. X2) REROUTE OVERHEAD ELECTRIC AS SHOWN

PROPOSED RELOCATED "SPONSOR A HIGHWAY" SIGN

TIP DOWN WITH DETECTABLE WARNING PANEL BEFORE STREET INTERSECTION

CURBING BEYOND PROPERTY LINE TO REMAIN (TYP.)

COORDINATE WITH "SEA STAR COVE" PROPERTY OWNER OR CONDOMINIUM ASSOCIATION PRIOR TO WORK ON THIS DRIVEWAY, INCLUDING RELOCATION OF OVERHEAD ELECTRIC

EXISTING CONCRETE SIDEWALK & TIP DOWNS

PROPOSED RELOCATED UTILITY POLE

CLEAR TREES IN RIGHT OF WAY AS NECESSARY FOR SIDEWALK (TYP.)

5.5' CONCRETE SIDEWALK WITH VERTICAL GRANITE CURB (6" WIDE INCLUDING CURB)

EXISTING UTILITY POLES AND OVERHEAD ELECTRIC FOR REFERENCE

DEEP SUMP CATCH BASIN SEE SHEET C3

TIP DOWN, NO TRUNCATED DOME (TYP.)

PROPOSED RELOCATED MAILBOX

RECONFIGURE DRIVEWAY CURB CUTS FOR SPECIFIED WIDTHS

REGRADE DRIVEWAY CURB CUTS FOR NO MORE THAN 2% SLOPE IN FIRST 6', WHERE CONCURRENT WITH PROPOSED SIDEWALK

PROPOSED RELOCATED OVERHEAD ELECTRIC

REMOVE EXISTING CURBING AT PROPOSED LANDING AND ADDITIONALLY ANOTHER 3' BEYOND LANDING, THEN INSTALL NEW CURBING BEYOND LANDING AS DEPICTED ON SHEET D2 IN ORDER TO TIP DOWN FROM TOP OF CURB TO FINISHED GRADE OF LANDING WITH TRUNCATED DOME.

B.C. 33.7 ±
T.C. 34.2 ±

PROPOSED CONTECH "JELLYFISH" JFSI0404 WITH THREE INLETS SEE SHEET C3

TIP DOWN, NO TRUNCATED DOME

SEE SHEET C5, NOTE #39 IN CASE OF DIRECT CONFLICT BETWEEN PROPOSED DRAINAGE AND EXISTING UTILITIES

PROPOSED DEEP SUMP CATCH BASIN SEE SHEET C3

ALL PROPOSED STRUCTURES IN SAGAMORE AVE. RIGHT OF WAY SHALL MEET OR EXCEED NHDOT STANDARDS (TYP.)

SIDEWALK SHALL BE AT TOP OF CURB, 6" ABOVE GRADE OF ROAD AND BE SLOPED 1% TO DRAIN AWAY FROM ROAD (TYP.)

PROVIDE 2" R-10 FOAM BOARD INSULATION BETWEEN EXISTING FORCEMAIN AND PROPOSED CULVERT

EDGE OF WETLAND (TYP.)

FACE OF CURB TO BE 18' OFF CENTERLINE (CENTERLINE BEING HALFWAY BETWEEN SOLID YELLOW LINES)

SAWCUT LINE (TYP., VARIABLE DEPENDING UPON EXTENT TO WHICH WATER MAIN MUST BE REPLACED PER NOTE ON SHEET C5)

CONTRACTOR TO SAWCUT ONLY BEYOND SOLID WHITE LINE, EXCEPT WHERE NECESSARY FOR PROPOSED SEWER MAIN AND CULVERT. IF CONTRACTOR MUST SAWCUT INTO TRAVEL LANE EXCEPT AT THESE TWO LOCATIONS, PROJECT ENGINEER SHALL BE NOTIFIED PRIOR TO ROAD EXCAVATION.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 feet

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
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PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.15670 – LICENSED PROFESSIONAL ENGINEER

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14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
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Civil Engineering Services
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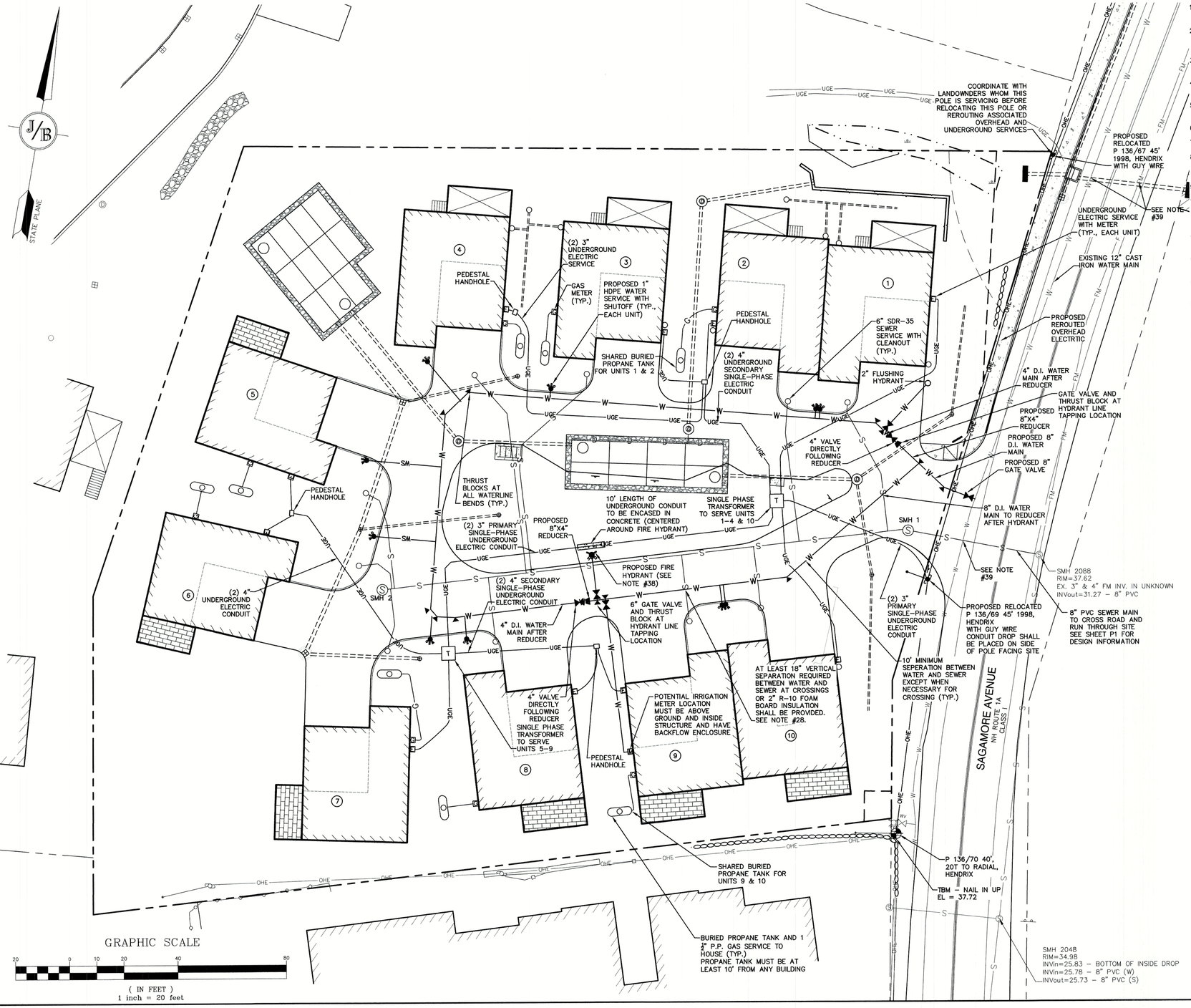
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **OFFSITE IMPROVEMENTS PLAN**

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
C4
SHEET 6 OF 22
JBE PROJECT NO. **21047**



UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
2. THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
3. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, FIRE ALARM, GAS, WATER, AND SEWER).
4. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT-RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
5. ALL CONSTRUCTION SHALL CONFORM TO THE CITY STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS OTHERWISE SPECIFIED.
6. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
7. BUILDINGS TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
8. 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.
9. AS-BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
10. 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.
11. 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.
12. 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.
13. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS AND SERVICES.
14. SANITARY SEWER FLOW CALCULATIONS:
    10 - THREE BEDROOM UNITS @ 150 GPD/BEDROOM = 4,500 GPD
    IRRIGATION USE = 1,000 GPD ±
15. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
16. 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.
17. 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.
18. 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.
19. 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.
20. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND HYDRANTS.
21. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
22. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHOULD BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
23. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
24. ALL WATER LINES SHOULD HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
25. 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.
26. ENV-WQ 704.06 GRAVITY SEWER PIPE TESTING: GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY USE OF LOW-PRESSURE AIR TESTS CONFORMING WITH ASTM F1417-92(2005) OR UNI-BELL PVC PIPE ASSOCIATION UNI-B-6. LINES SHALL BE CLEANED AND VISUALLY INSPECTED AND TRUE TO LINE AND GRADE. DEFLECTION TESTS SHALL TAKE PLACE AFTER 30 DAYS FOLLOWING INSTALLATION AND THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
27. ENV-WQ 704.17 SEWER MANHOLE TESTING: SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST PRIOR TO BACKFILLING AND PLACEMENT OF SHELVES AND INVERTS.
28. 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 FROM AN EXISTING OR PROPOSED WATER LINE, EXCEPT THAT WHERE 18" VERTICAL SEPARATION CANNOT BE ACHIEVED (AS DEPICTED ON SHEET P1), PROVIDE TWO INCHES R-10 FOAM BOARD INSULATION ABOVE THE SEWER AND BELOW THE WATER LINE.
29. 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.
30. THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY THE CITY SEWER DEPARTMENT.
31. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
32. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
33. AN AS-BUILT PLAN OF THE WATER LINE IS TO BE PREPARED AND SUBMITTED TO THE CITY OF PORTSMOUTH WATER DEPARTMENT.
34. WATER LINE TO BE CONSTRUCTED PER CITY OF PORTSMOUTH SPECIFICATIONS.
35. SHOP DRAWINGS TO BE SUBMITTED TO CITY OF PORTSMOUTH FOR REVIEW AND APPROVAL.
36. 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.
37. 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.
38. LAY WATER MAIN WITH FIRE HYDRANT AT HIGH SPOT TO ALLOW FOR AIR TO BE RELEASED DURING FILLING OF THE WATER MAIN.
39. CONTRACTOR TO DIG TEST PITS AT CROSSING OF PROPOSED SEWER AND EXISTING WATER MAIN, AND AT CROSSINGS OF PROPOSED DRAINAGE PIPE WITH EXISTING WATER MAIN AND FORCEMAIN. IF THE EXISTING WATER MAIN IS IN CONFLICT WITH THE PROPOSED SEWER, OR IF EXISTING WATER OR FORCEMAIN ARE IN CONFLICT WITH THE PROPOSED DRAINAGE PIPE, NOTIFY PROJECT ENGINEER AND PORTSMOUTH DEPARTMENT OF PUBLIC WORKS AND OBTAIN PERMISSION FROM PORTSMOUTH DPW AND REPLACE SECTION OF 12" CAST IRON WATER MAIN AS NECESSARY TO AVOID DIRECT CONFLICT BETWEEN WATER AND SEWER, OR TO REPLACE SECTION OF 12" CAST IRON WATER MAIN OR 3" & 4" FORCEMAIN AS NECESSARY TO AVOID DIRECT CONFLICT WITH PROPOSED DRAINAGE PIPE.
40. AN EASEMENT SHALL BE GRANTED TO THE CITY OF PORTSMOUTH FOR VALVE 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.

Design: JAC	Draft: DJM	Date: 3/25/21
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PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

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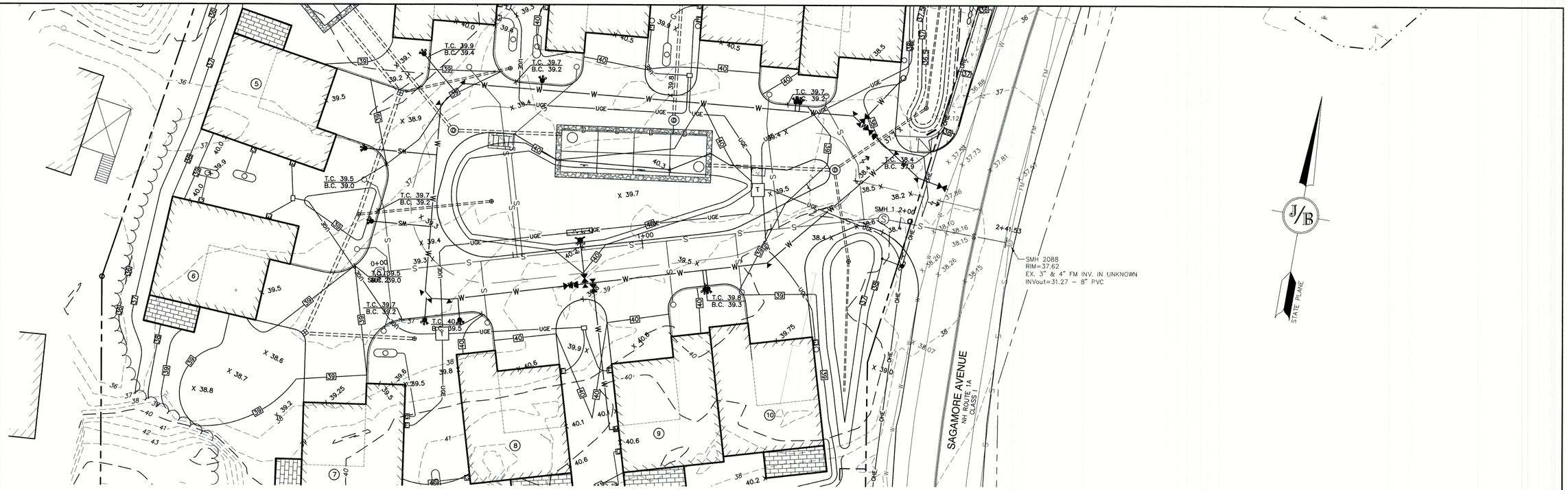
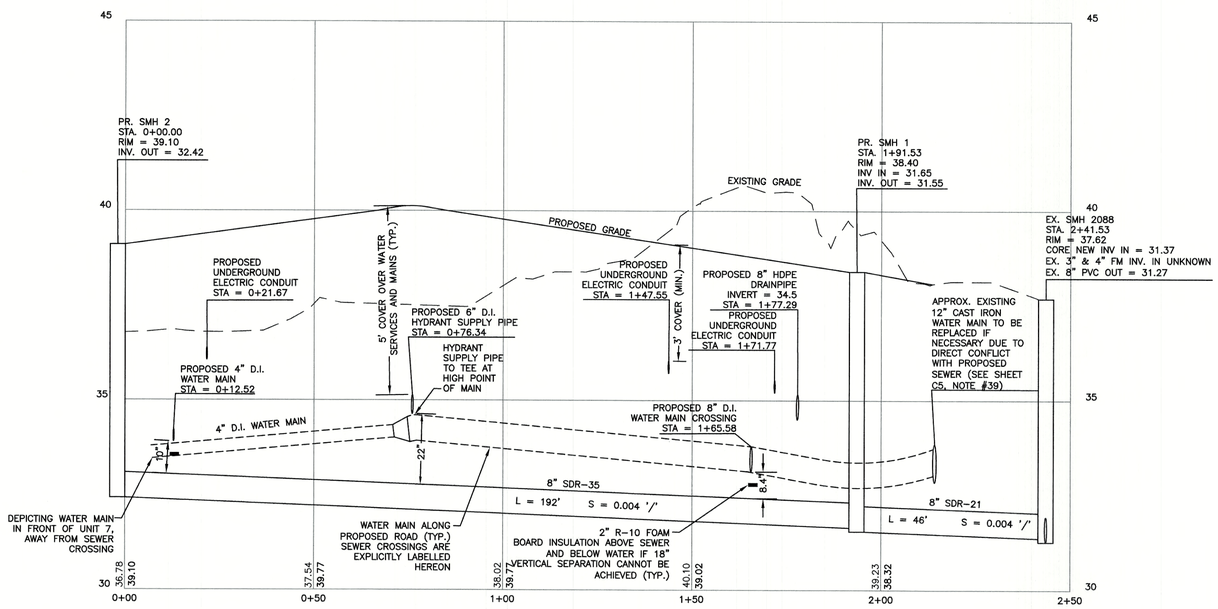
Plan Name: UTILITY PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No. C5
SHEET 7 OF 22
JBE PROJECT NO. 21047





GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.
0 20 40
4 2 0

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Checked: JAC	Scale: AS NOTED	Project No.: 21047	
Drawing Name: 21047-PLAN.dwg			

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

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

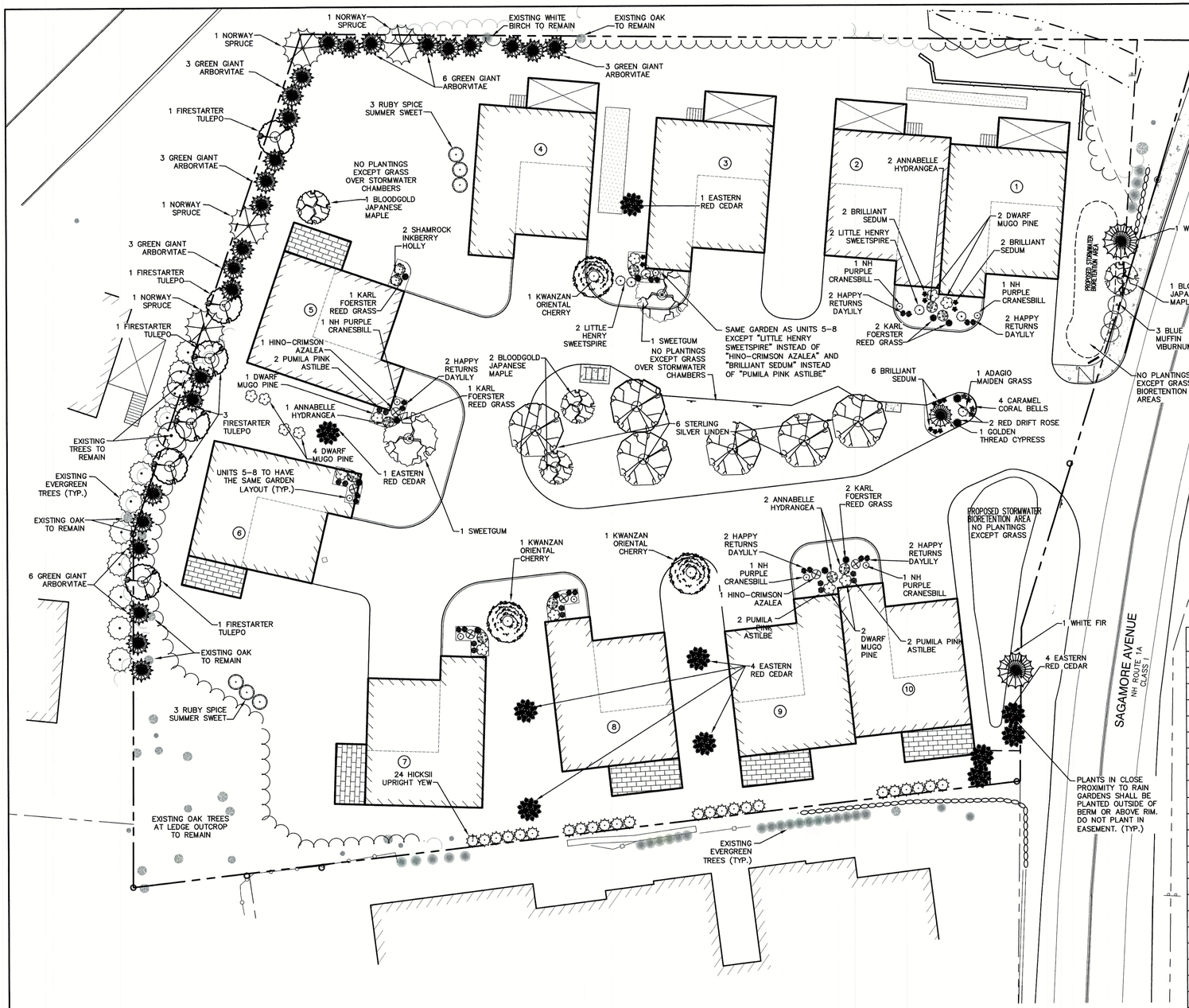
Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: PLAN AND SEWER PROFILE

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT
54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173
LOT 15: JOHN J. & COLLEEN HEBERT
54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
P1
SHEET 8 OF 22
JBE PROJECT NO. 21047



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.
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 9" BELOW FINISH GRADE. THE RESULTING VOID IS TO BE FILLED WITH A MINIMUM OF 9" HIGH-QUALITY SCREENED LOAM AMENDED WITH 3" OF AGED ORGANIC COMPOST.
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 D4.

PLANTING LIST

Trees			
Quantity	Botanical Name	Common Name	Size
2	Abies concolor	WHITE FIR	7-8 ft. ht.
4	Acer palmatum 'Bloodgood'	BLOODGOOD JAPANESE MAPLE	15 Gallon
10	Juniperus virginiana	EASTERN RED CEDAR	7-8 ft. ht.
2	Liquidambar styraciflua	SWEETGUM	2.5" Caliper
6	Nyssa sylvatica 'Firestarter'	FIRESTARTER TUPELO	4.5" Caliper
4	Picea abies	NORWAY SPRUCE	10-12 ft. ht.
3	Prunus serrulata 'Kwanzan'	KWANZAN ORIENTAL CHERRY	2" Caliper
24	Taxus x media 'Hicksii'	HICKSII UPRIGHT YEW	6-7 ft. ht.
26	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE	10-12 ft. ht.
6	Tilia tomentosa 'Sterling'	STERLING SILVER LINDEN	3" Caliper
Shrubs			
6	Azalea indicum 'Hino Crimson'	HINO CRIMSON AZALEA	3 Gallon
1	Chamaecyparis pisifera 'Aurea'	GOLDEN THREAD CYPRESS	7 Gallon
6	Clethra alnifolia 'Ruby Spice'	RUBY SPICE SUMMER SWEET	5 Gallon
9	Hydrangea arborescens 'Annabelle'	ANNABELLE HYDRANGEA	5 Gallon
2	Ilex glabra 'Shamrock'	SHAMROCK INKBERRY HOLLY	5 Gallon
5	Itea virginica 'Sprich Little Henry'	LITTLE HENRY SWEETSPIRE	3 Gallon
13	Pinus mugo 'Compacta'	DWARF MUGO PINE	5 Gallon
2	Rosa 'Red Drift'	RED DRIFT ROSE	3 Gallon
3	Viburnum dentatum 'Christom'	BLUE MUFFIN VIBURNUM	5 Gallon
Perennials			
12	Astilbe chinensis pumila	PUMILA PINK ASTILBE	1 Gallon
10	Calamagrostis x acutiflora 'Karl Foerster'	KARL FOERSTER REED GRASS	2 Gallon
9	Geranium sanguineum 'New Hampshire Purple'	NH PURPLE CRANESBILL	1 Gallon
18	Hemerocallis 'Happy Returns'	HAPPY RETURNS DAYLILY	1 Gallon
4	Heuchera micrantha 'Caramel'	CARAMEL CORALBELLS	1 Gallon
1	Miscanthus sinensis 'Adagio'	ADAGIO MAIDEN GRASS	2 Gallon
12	Sedum spectabile 'Brilliant'	BRILLIANT SEDUM	1 Gallon

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21	
Checked: JAC	Scale: AS NOTED	Project No.: 21047	
Drawing Name: 21047-PLAN.dwg			

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E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LANDSCAPE PLAN

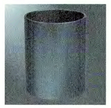
Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
L1
SHEET 9 OF 22
JBE PROJECT NO. 21047

Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
—●	1	P5	Single	EMM-E02-LED-E1-5WQ-SO-FL-BK-7030 / VA6105 / ARP5L416ABK
—⊕	10	W	SINGLE	66411/ WALL MTD 9' AFG

Invue



ARP ALUMINUM ROUND TAPERED DECORATIVE

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

FEATURES
- Tapered aluminum shaft spun from seamless 6063 alloy aluminum
- T6 four-bolt anchorage configuration provided
- Anchor bolt per ASTM F1554 Grade 55 with (2) hex nuts, (2) flat washers
- Cast 356 alloy aluminum base with access door
- 10' - 22' mounting heights
- Tenon mount only

DESIGN CONSIDERATIONS

Wind induced vibrations resulting from steady, unidirectional winds and other aerodynamic forces, as well as vibration and coefficient of height factors for non-grounded mounted installations (e.g., installations on bridges or buildings) are not included in this document. The information contained herein is for general guidance only and is not a replacement for professional judgement. Consult with a professional, and local and federal standards, before ordering to ensure product is appropriate for the intended purpose and installation location. Also, please review Cooper Lighting Solutions' Light Pole White Paper for risk factors and design considerations. Learn more.

Specifications and dimensions subject to change without notice. Consult your lighting representative at Cooper Lighting Solutions or visit www.cooperlighting.com for available options, accessories and ordering information.

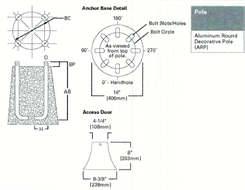
ORDERING INFORMATION

SAMPLE NUMBER: ARP5L310AGZ2

Product Family	Shaft Size (inches)	Wall Thickness (inches)	Pole Top Diameter (inches)	Mounting Height (Feet)	Base Type	Finish	Mounting Type	Number and Location of Arms	Options (Add as Suffix)
ARP=Aluminum Round Tapered Decorative	**5**=5"	**L**=0.156" **M**=0.159"	**3**=3" O.D.[1] **4**=4-1/2" O.D. **6**=6" O.D.[1]	**10**=10' **12**=12' **14**=14' **16**=16' **19**=19' [1] **22**=22' [1]	**A**=Aluminum (Round 4-Bolt Pole)	**AP**=Grey **BA**=Anodized Bronze **BK**=Black **BZ**=Bronze **CA**=Anodized Clear **DA**=Anodized Black **DP**=Dark Platinum **GM**=Graphite Metallic **GN**=Hartford Green **WH**=White	**2**=2-3/8" O.D. Tenon (4" Long) **5**=3" O.D. Tenon (4" Long)	**X**=None	**C**=Convenience Outlet [1] **E**=GFCI Convenience Outlet [1] **G**=Ground Lug **V**=Vibration Dampener [1]

NOTES 1. All shaft sizes nominal. 2. Vibration damper recommended over 18 feet add suffix "V" to catalog number. 3. Specify outlet location. Receptacle not included, provision only. 4. Provides 3"O.D. pole top suited for Arbor Post Top. 5. Provides 4" OD pole top suited for LuxeScape post tops.

ANCHORAGE DATA



Pole	Anchor Bolt and Template Package	Shaft Diameter (inches)	Bolt Circle (inches)	Number of Bolts	Bolt Size (inches)	Template Only
Aluminum Round Decorative Pole (ARP)	317AVE30	4 x 5	9	4	3/4 x 17	407040D

COOPER Lighting Solutions

TD513016EN
August 28, 2019 10:22 AM

LIGHTING AND ELECTRICAL NOTES:

1. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON-OPERATIONAL VALUES PER TOWN 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, ATTENTION KEN SWEENEY. 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.

LED wall luminaire - partially shielded

BEGA

Application
This LED wall luminaire has a partially shielded light source and is designed for the down lighting of interior and exterior locations with glare-free illumination.

Materials
Luminaire housing constructed of die-cast and spun marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy
Three ply opal glass
High temperature silicone gasket
NRTL listed to North American Standards, suitable for wet locations
Protection class IP 64
Weight: 4.0lbs

Electrical
Operating voltage 120-277VAC
Minimum start temperature -20°C
LED module wattage 8.0W
System wattage 10W
Controllability 0-10V dimmable
Color rendering index CRI ≥ 80
Color temperature / source 724 lumens (3000K)
Lifetime at Ta = 25°C 500,000 h (L70)
Lifetime at Ta = 45° C 268,000 h (L70)

LED color temperature
☐ 4000K - Product number = **K4**
☐ 3500K - Product number = **K35**
☐ 3000K - Product number = **K3**
☐ 2700K - Product number = **K27**
BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaire - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.
Available colors: ☐ Black (BLK) ☐ White (WHT) ☐ RAL ☐ Bronze (BRO) ☐ Silver (SLV) ☐ CUS:

Type:
BEGA Product:
Project:
Modified:

LED wall luminaire - partially shielded

	LO	A	B	C
66411	0.9W	10¾	14¼	13½	4¾

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Due to the dynamic nature of lighting products and the associated technologies, illuminator data on this sheet is subject to change at the discretion of BEGA North America. For the most current technical data, please refer to bega-us.com
© copyright BEGA 2014
updated 2014-v16

Invue

DESCRIPTION

The EPIC Collection delivers custom luminaire flexibility with high quality, yet availability expectations of standard specification grade product. The EPIC Collection can be dressed to suit any application. Recognizing evolving environmental and legislative trends, the EPIC Collection delivers world class LED optical and performance solutions to the decorative luminaire marketplace.

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

SPECIFICATION FEATURES

Construction
TOP: Cast aluminum top housing attaches to cast aluminum mounting arm hub with four stainless steel fasteners. One-piece silicone gasket between mounting hub and top casting seals out moisture and contaminants. (See the mounting accessories section for a full selection of mounting arms. (Only these arms are compatible with the Epic luminaire). MIDSECTION: Continuous silicone gaskets seal lens to top casting and shade. The mid section features cast aluminum construction and stainless steel assembly. SHADES: Heavy gauge precision spun aluminum shades offer superior surface finish and consistency in form. DOORFRAME: Die-cast aluminum 1/8" thick door and doorframe seal to underside of shade with a thick wall continuous silicone gasket. Mounting hub ships attached to mounting arm.

Optics
Choice of twelve patented, high-efficiency AccuLED Optic™ technology manufactured from injection-molded acrylic. Optics are precisely designed to shape the optics, maximizing efficiency and application spacing. AccuLED Optic technology, creates consistent distributions with the scalability to meet customized application requirements. Offered Standard in 4000K (+/- 275K) CCT and nominal 70 CRI. Optional 3000K CCT and 5000K CC. For the ultimate level of spill light control, an optional house-side shield accessory can be field or factory installed. The house-side shield is designed to seamlessly integrate with the SL2, SL3 or SL4 optics.

Electrical
LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation, greater than 0.9 power factor, less that 20% harmonic distortion, and is suitable for operation in -40°C to 40°C ambient environments. All fixtures are shipped standard with 10kV/10kA common - and differential - mode surge protection. LightBARs feature and IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

Finish
Housing is finished in five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. LightBAR™ cover plates are standard white and may be specified to match finish of luminaire housing. Standard colors include black, bronze, gray, white, dark platinum and graphite metallic. RAL and custom color matches available. Consult Outdoor Architectural Colors brochure for a complete selection.Options to meet Buy American Act requirements

Warranty
Five-year warranty.

ECM/EMM
EPIC MEDIUM LED

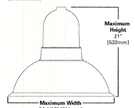
1 - 4 LightBARs
Solid State LED

DECORATIVE AREA LUMINAIRE

DIMENSIONS

ECM Classical

EMM Modern



See configurations for more detailed information.

CERTIFICATION DATA
UL/cUL Listed
DesignLights Consortium® Qualified*
IP66 LightBARs
LM79 / LM80 Compliant
3G Vibration Tested
ISO 9001

ENERGY DATA
Electronic LED Driver
≥0.9 Power Factor
<20% Total Harmonic Distortion
120-277V 50/60Hz, 347V/60Hz, 480V/60Hz
40°C Minimum Temperature
40°C Ambient Temperature Rating

EPA
Effective Projected Area: (Sq. Ft.) 0.94

SHIPPING DATA
Approximate Net Weight:
45 lbs. [20 kgs.]

COOPER Lighting Solutions

*www.designlights.org

TD560026EN
December 6, 2021 2:28 PM

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 feet

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

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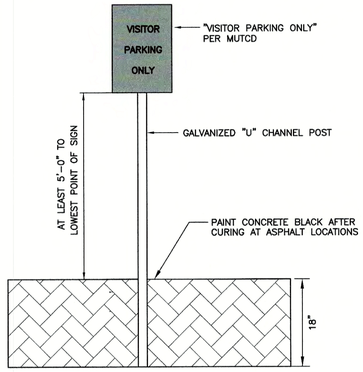
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: LIGHTING PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

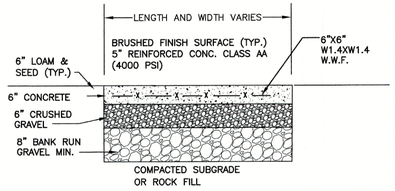
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
L2
SHEET 10 OF 22
JBE PROJECT NO. 21047



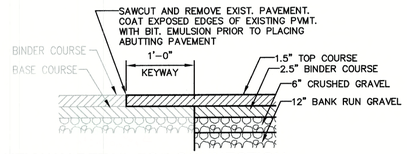
VISITOR PARKING SIGN

NOT TO SCALE



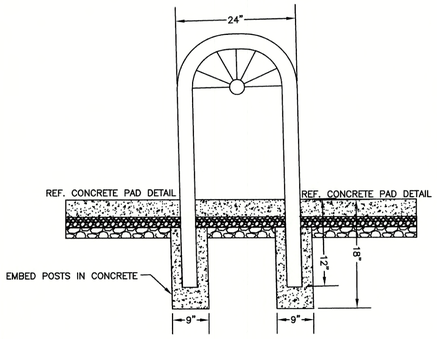
CONCRETE PAD DETAIL

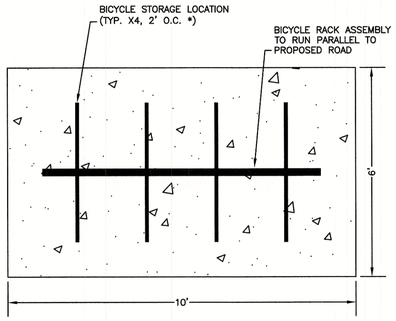
NOT TO SCALE



KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

NOT TO SCALE

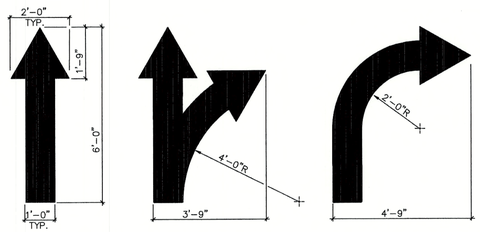




BICYCLE RACK PLAN VIEW (NOT TO SCALE)
* SEPARATION BETWEEN BICYCLE LOCATIONS MAY VARY PER PRODUCT SPECIFICATIONS AS LONG AS 4 BICYCLES CAN BE STORED ON 6'x10' CONCRETE PAD.

BICYCLE RACK

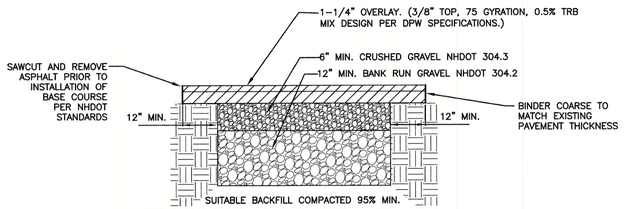
NOT TO SCALE



NOTES:
1. ALL FLOW ARROWS TO BE SOLID YELLOW REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.
2. REVERSE ARROWS FOR OPPOSITE DIRECTION OF FLOW.

PAINTED TRAFFIC ARROWS

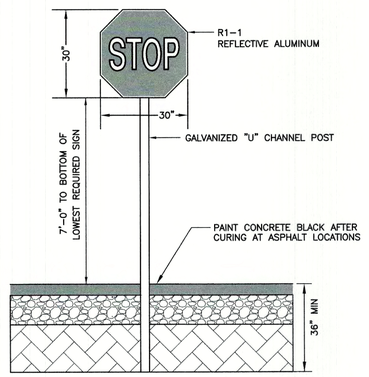
NOT TO SCALE



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.
6. PAVEMENT REPAIRS IN SAGAMORE AVE. RIGHT OF WAY TO MEET NHDOT STANDARDS.
7. WHERE WORK IMPACTS SAGAMORE AVE. TRAVEL LANE, MILL AND INLAY FOR FULL WIDTH OF LANE MAY BE REQUIRED.

TYPICAL PAVEMENT REPAIR DETAIL

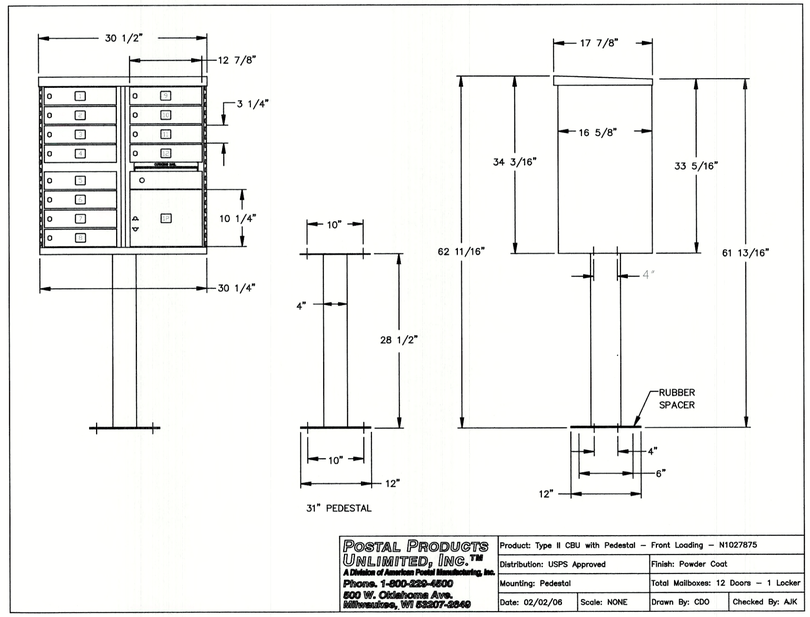
NOT TO SCALE



STOP SIGN (R1-1)

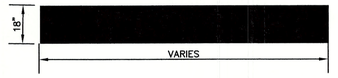
NOT TO SCALE

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.



CLUSTER MAILBOX UNIT DETAIL

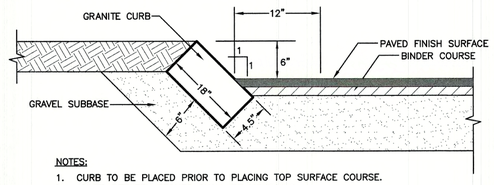
NOT TO SCALE



NOTES:
1. ALL STOP BARS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.

STOP BAR

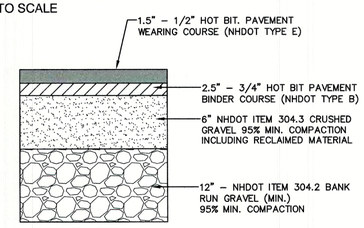
NOT TO SCALE



NOTES:
1. CURB TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.

SLOPED GRANITE CURB

NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

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13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

Designed and Produced in NH
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E-MAIL: JBE@JONESANDBEACH.COM

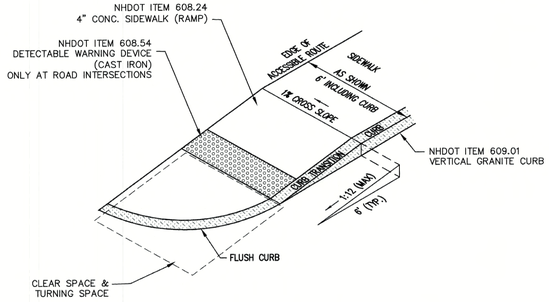
Plan Name: DETAIL SHEET

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No. D1

SHEET 11 OF 22
JBE PROJECT NO. 21047

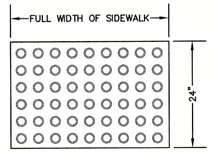


NOTES:

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



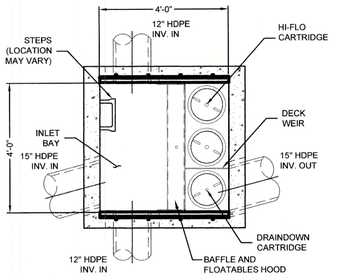
DETECTABLE WARNINGS SHALL CONSIST OF A SURFACE OF TRUNCATED DOMES AND SHALL COMPLY WITH THE FOLLOWING:

A. TRUNCATED DOMES SHALL HAVE A BASE DIAMETER OF 0.9" (MIN.) AND 1.4" (MAX.), A TOP DIAMETER OF 50% OF THE BASE DIAMETER MINIMUM TO 65% OF THE BASE DIAMETER MAXIMUM, AND A HEIGHT OF 0.2".
B. THE DETAIL PROVIDED IS NOT DRAWN TO SCALE. THE QUANTITY OF DOMES DEPICTED ON THE DETECTABLE WARNING DEVICE DETAIL IS FOR ILLUSTRATION ONLY. THE SIZE OF THE DETECTABLE WARNING FIELD SHALL BE 2' MINIMUM IN THE DIRECTION OF TRAVEL AND SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE, EXCLUDING ANY FLARED SIDES. THE WIDTH OF THE DETECTABLE WARNING FIELD INCLUDES A CONCRETE BORDER, IF PROVIDED. PLACEMENT AND ORIENTATION SHALL BE IN COMPLIANCE WITH THE PLANS AND DETAILS.
C. SOME DETECTABLE WARNING PRODUCTS REQUIRE A CONCRETE BORDER FOR PROPER INSTALLATION. IF REQUIRED, THE BORDER SHALL NOT EXCEED 2" IN WIDTH OR 6" ALONG ROADWAY EDGE/CURB. THE BORDER DIMENSION SHALL BE MEASURED FROM THE INSIDE EDGE OF THE RADIUS.
D. ON SLOPES OF 5% OR GREATER, THE ROWS OF DOMES SHALL BE ALIGNED TO BE PERPENDICULAR OR RADIAL TO THE LOWER GRADE BREAK ON THE RAMP RUN. WHERE DOMES ARE ARRAYED RADIALLY, THEY MAY DIFFER IN DOME DIAMETER AND CENTER-TO-CENTER SPACING. ON SLOPES LESS THAN 5%, DOME ORIENTATION IS LESS CRITICAL AND MAY DIFFER FROM PERPENDICULAR OR RADIAL ALIGNMENT TO THE GRADE BREAK.
E. TRUNCATED DOMES SHALL HAVE A CENTER-TO-CENTER SPACING OF 1.6" MINIMUM AND 2.4" MAXIMUM, AND A BASE-TO-BASE SPACING OF .65" MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.
F. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET, HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT.
G. DETECTABLE WARNING PANELS SHALL BE CAST IRON WITH NO SURFACE COATING AND SHALL BE ALLOWED TO TRANSITION TO THEIR NATURAL PATINA.

TRUNCATED DOMES TO BE PLACED IN SIDEWALK BASE IN PUBLIC TRAFFIC AREAS.

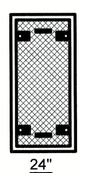
DETECTABLE WARNING PANEL WITH TRUNCATED DOMES

NOT TO SCALE

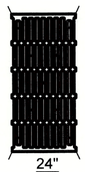


PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

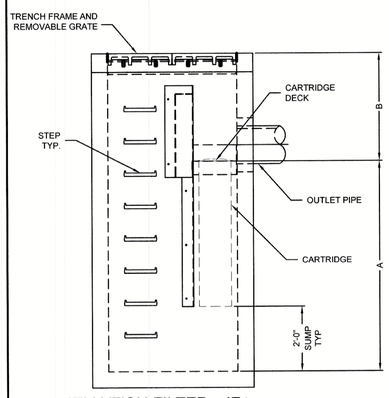
JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD SURFACE INLET STYLE WITH TRENCH COVER IS SHOWN. ALTERNATE CURB INLET OR PIPE INLET OPTIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.				
CARTRIDGE SELECTION				
CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HIGH-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	0.45	0.33	0.22	0.12
OUTLET INVERT TO RIM (MIN) (B)	3'-4"	3'-4"	3'-4"	3'-4"



24"
TRENCH COVER
N.T.S.



24"
TRENCH GRATE
N.T.S.
DO NOT USE FOR THIS APPLICATION



4' JELLYFISH FILTER - JF4

NOT TO SCALE

GENERAL NOTES:

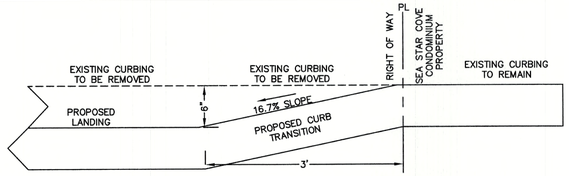
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA 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', 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 (WHERE APPLICABLE) 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.

PROJECT SPECIFIC NOTES

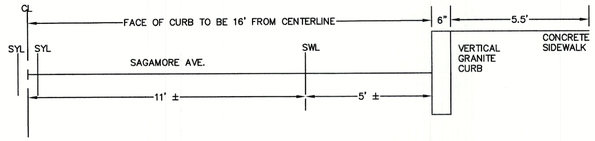
1. 24" TRENCH GRATE SHALL NOT BE UTILIZED. UTILIZE TWO SOLID TRENCH COVERS INSTEAD. THREE PIPE INLETS SHALL BE CORED PER GRADING AND DRAINAGE PLAN.
2. SURFACE INLET CONFIGURATION WITH NO GRATE SHALL BE UTILIZED. DO NOT UTILIZE IN-LINE CONFIGURATION, AS THREE INLETS ARE REQUIRED.
3. 12" INLETS SHALL ENTER AT EACH OPPOSING WALL OF INLET CHAMBER AND 15" INLET SHALL ENTER AT CORNER.
4. INLET BAY SHALL BE CLOSEST TO SIDEWALK AND ALL THREE INLETS MUST ENTER DIRECTLY INTO THIS SECTION.



CONTRACTOR SHALL NOT REMOVE ANY CURBING BEYOND SEA STAR COVE CONDOMINIUM PROPERTY LINE. THE CURBING AT THE PROPOSED TIP DOWN LANDING AND 3' BEYOND IT IN THE DIRECTION OF THE SEA STAR COVE PROPERTY LINE SHALL BE REMOVED. THEN 3' OF NEW CURBING SHALL BE SET IMMEDIATELY FOLLOWING THE TIP DOWN LANDING AT A 16.7% SLOPE IN ORDER TO TRANSITION FROM THE GRADE OF THE EXISTING CURBING TO THE GRADE OF THE PROPOSED TIP DOWN LANDING.

CURB TRANSITION AT SEA STAR COVE R.O.W LINE

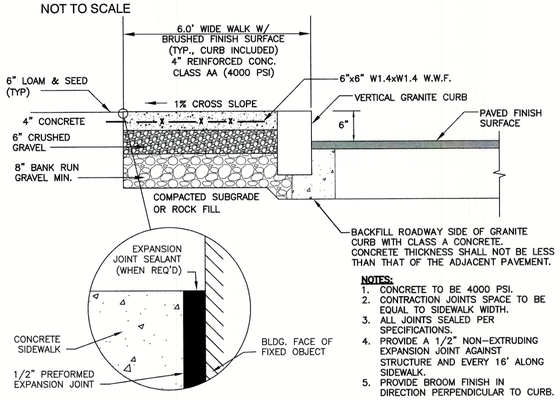
NOT TO SCALE



THE INTENT OF THIS DETAIL IS TO ILLUSTRATE THE LOCATION OF THE PROPOSED SIDEWALK IN RELATION TO THE CROSS SECTION OF SAGAMORE AVE. SEE BELOW CONCRETE SIDEWALK WITH VERTICAL GRANITE CURB DETAIL AS WELL

SAGAMORE AVE AND CONCRETE SIDEWALK CROSS SECTION

NOT TO SCALE

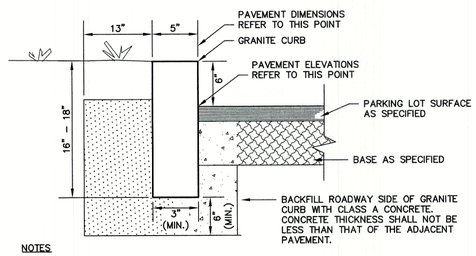


NOTES:

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

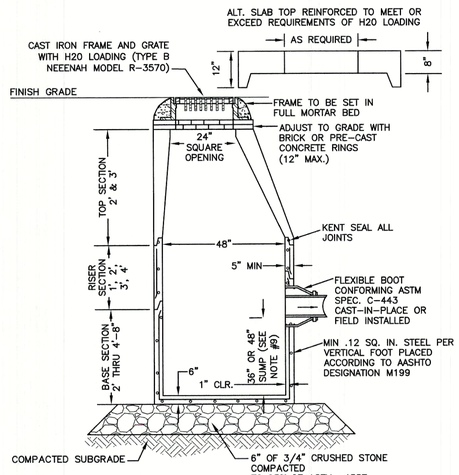


NOTES:

1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. PROPOSED VERTICAL GRANITE CURB WITHIN NHDOT RIGHT OF WAY SHALL MEET THE REQUIREMENTS OF NHDOT STANDARD SPECIFICATIONS SECTION 609.

VERTICAL GRANITE CURB

NOT TO SCALE

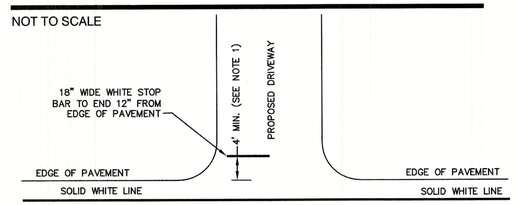


NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
4. FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H20 LOADING
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. ALL CATCH BASIN FRAMES AND GRATES SHALL BE NHDOT CATCH BASIN TYPE ALTERNATE 1 OR NEENAH R-3570 OR APPROVED EQUAL (24"x24" TYPICAL). CATCH BASIN FRAME AND GRATE IN NHDOT RIGHT OF WAY MUST BE TYPE B.
8. STANDARD CATCH BASIN FRAME AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM, BUT NO MORE THAN 12"), OR PRECAST CONCRETE 'DONUTS'.
9. CATCH BASINS CALLED OUT AS A "DEEP SUMP CATCH BASIN" SHALL HAVE A 48" SUMP; ALL OTHER CATCH BASINS SHALL HAVE A 36" SUMP.
10. INSTALL POLYETHYLENE LINER (NHDOT ITEM 604.0007) IN PROPOSED CATCH BASINS IN SAGAMORE AVE. RIGHT OF WAY.
11. PROPOSED CATCH BASINS WITHIN SAGAMORE AVE. RIGHT OF WAY SHALL MEET THE REQUIREMENTS OF NHDOT STANDARD SPECIFICATIONS SECTION 604.

CATCH BASIN

NOT TO SCALE



NOTES:

1. LOCATION OF STOP BAR MAY VARY DUE TO INTERSECTION SIGHT DISTANCE AND VEHICLE TURNING RADIUS AND MAY NOT ALWAYS COINCIDE WITH THE LOCATION OF THE STOP SIGN.
2. END STOP BAR 12" FROM EDGE OF PAVEMENT.
3. STOP BARS, WORDS, LANE LINES, SYMBOLS AND ARROWS SHALL BE THERMOPLASTIC.
4. SOLID WHITE LINE AND DOUBLE SOLID YELLOW LINE SHALL NOT BREAK AT THE PROPOSED DRIVEWAY.

NHDOT PAVEMENT MARKINGS

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 3/25/21	
Checked: JAC	Scale: AS NOTED	Project No.: 21047	
Drawing Name: 21047-PLAN.dwg			

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

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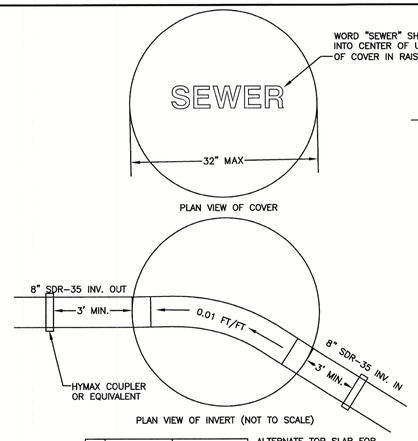
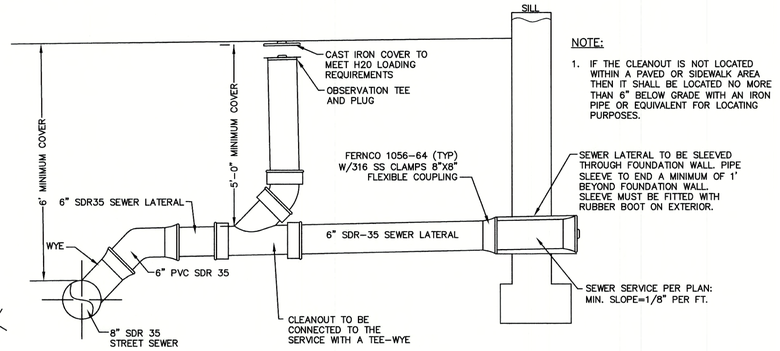
DRAWING No.
D2
SHEET 12 OF 22
JBE PROJECT NO. 21047



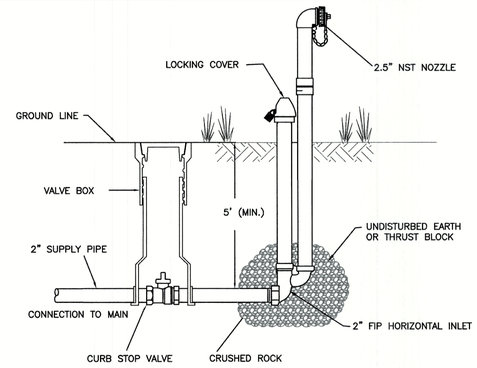


NOTE:

1. IF THE CLEANOUT IS NOT LOCATED WITHIN A PAVED OR SIDEWALK AREA THEN IT SHALL BE LOCATED NO MORE THAN 6" BELOW GRADE WITH AN IRON PIPE OR EQUIVALENT FOR LOCATING PURPOSES.

HOUSE SEWER SERVICE

NOT TO SCALE

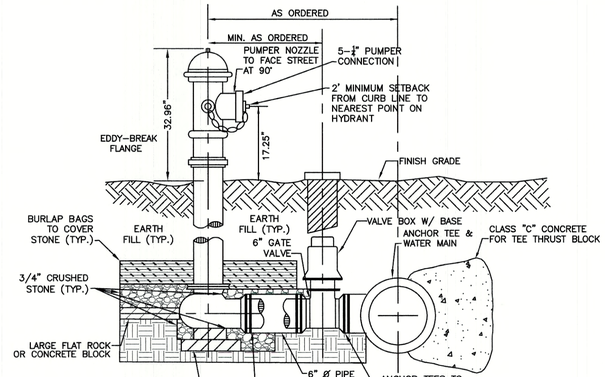


POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 5' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP HORIZONTAL INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN LEFT. BRONZE OPERATING MECHANISM AND ALUMINUM PLUNGER. DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET 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

FLUSHING HYDRANT DETAIL

NOT TO SCALE



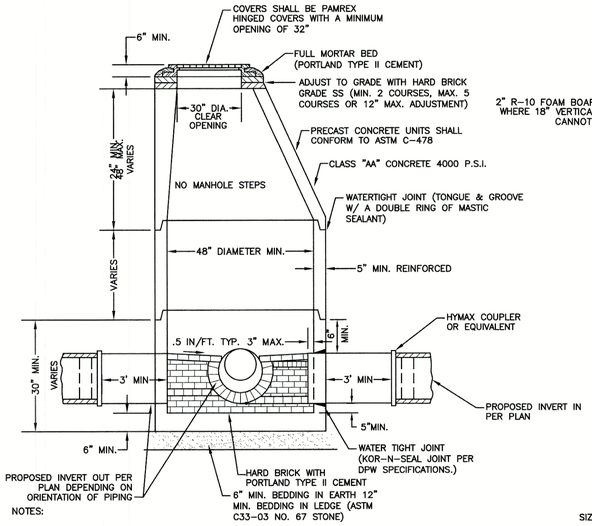
PORTSTMOUTH WATER DEPARTMENT SPECS.

NOTES

1. ALL PIPE FITTINGS TO BE D.I. PRESSURE CLASS 350, THICKNESS CLASS 52.
2. HYDRANT TO BE PAINTED RED WITH WHITE "REFLECTOR" PAINT ON BONNET.
3. MECHANICAL JOINTS SHALL HAVE MEGALUG RETAINING GLANDS AS MADE BY EBBA OR APPROVED EQUAL.
4. NATIONAL STANDARD THREAD.
5. HYDRANT AND ALL VALVES SHALL OPEN RIGHT
6. ANCHOR TEES SHALL HOLD VALVE DIRECTLY WITH NO PIPE IN BETWEEN VALVE AND MAIN.

HYDRANT INSTALLATION

NOT TO SCALE

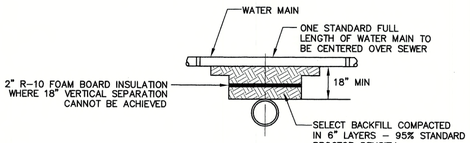


NOTES:

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

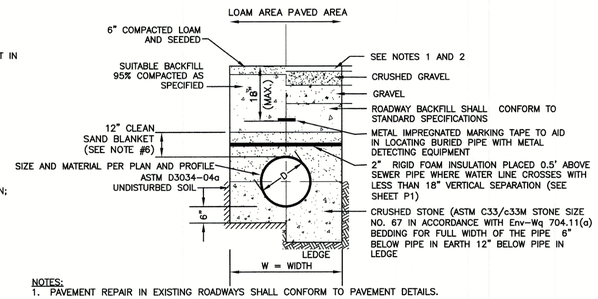


SEPARATION NOTES:

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 HORIZONTALLLY FROM THE WATER MAIN.

TYPICAL WATER / SEWER SEPARATION

NOT TO SCALE

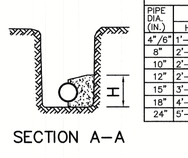


NOTES:

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).

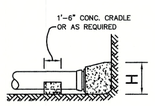
SEWER TRENCH

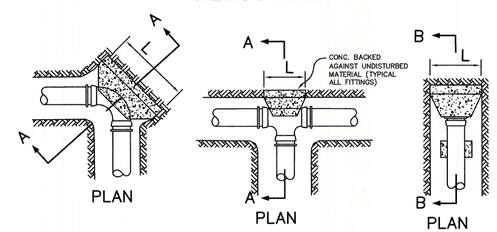
NOT TO SCALE



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'-0"	4'-6"	2'-6"	3'-0"
24"	5'-0"	7'-0"	6'-0"	8'-0"	4'-0"	6'-0"	3'-0"	4'-6"

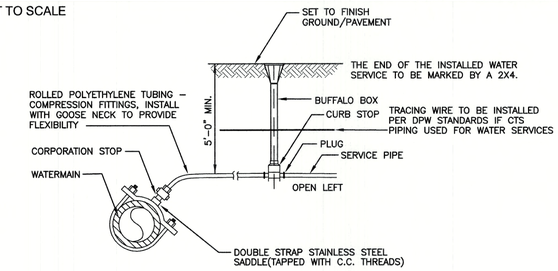
PIPING W/ MECHANICAL JOINT FITTINGS SHALL HAVE RETAINING GLANDS





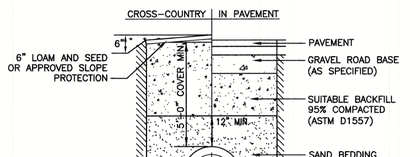
THRUST BLOCK DETAILS

NOT TO SCALE



WATER SERVICE CONNECTION-POLYETHYLENE

NOT TO SCALE



WATER SYSTEM TRENCH

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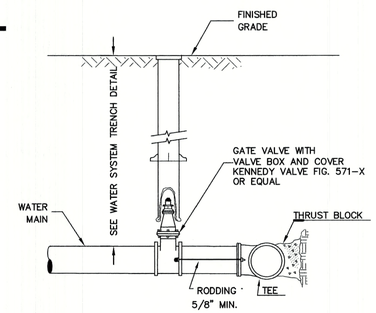

BURIED GATE VALVE DETAIL

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

Designed and Produced in NH
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PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

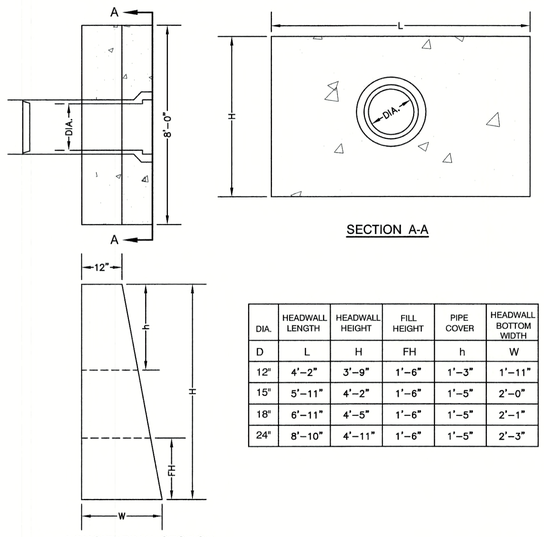
Plan Name:	DETAIL SHEET
Project:	SAGAMORE AVENUE CONDOMINIUMS 1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE
Owner of Record:	LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173 LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.

D3

SHEET 13 OF 22

JBE PROJECT NO. 21047



SECTION A-A

LONGITUDINAL SECTION

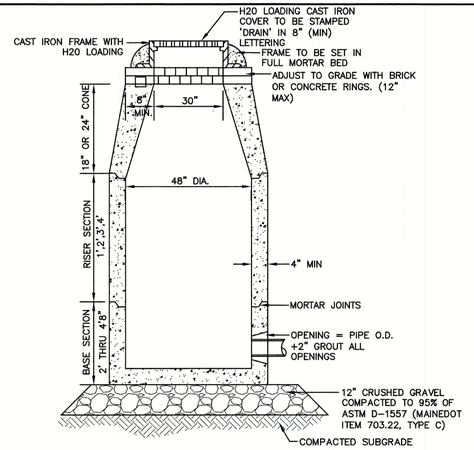
DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
12"	4'-2"	3'-9"	1'-6"	1'-3"	1'-11"
15"	5'-11"	4'-2"	1'-6"	1'-5"	2'-0"
18"	6'-11"	4'-5"	1'-6"	1'-5"	2'-1"
24"	8'-10"	4'-11"	1'-6"	1'-5"	2'-3"

NOTES:

1. ALL DIMENSIONS GIVEN IN FEET & INCHES.
2. PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
3. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS. CEMENT TO BE TYPE III PER ASTM C-150. REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
4. 1" THREADED INSERTS PROVED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

NOT TO SCALE

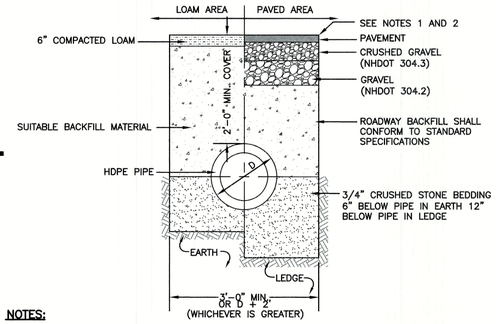


NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
4. FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H20 LOADING.
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. ALL DRAIN MANHOLE FRAMES AND GRATES SHALL BE NEENAH R-1798 OR APPROVED EQUAL (30" DIA. TYPICAL).
8. STANDARD FRAME(S) AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM, BUT NO MORE THAN 12"), OR PRECAST CONCRETE 'DONUTS'.

DRAIN MANHOLE (4' DIAM.)

NOT TO SCALE

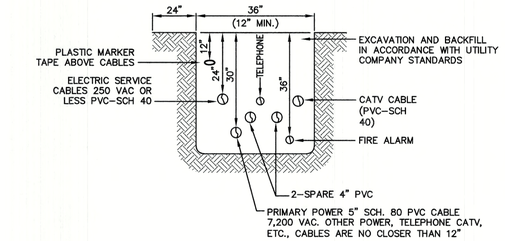


NOTES:

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

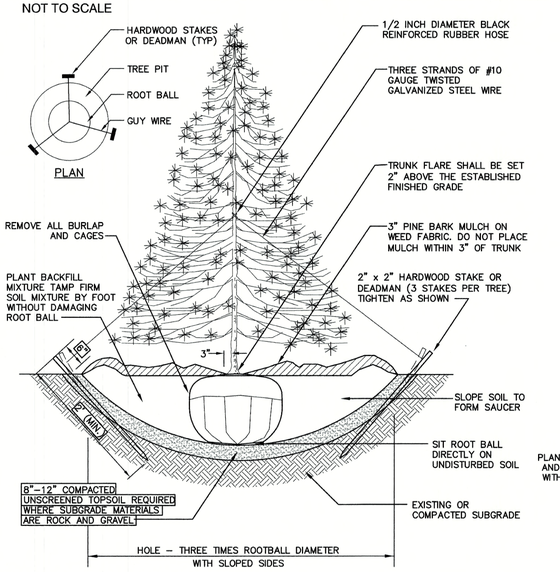
NOT TO SCALE



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

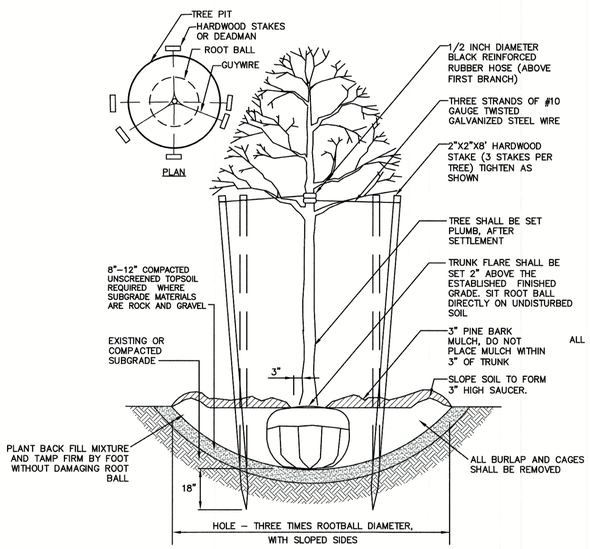
UTILITY TRENCH

NOT TO SCALE



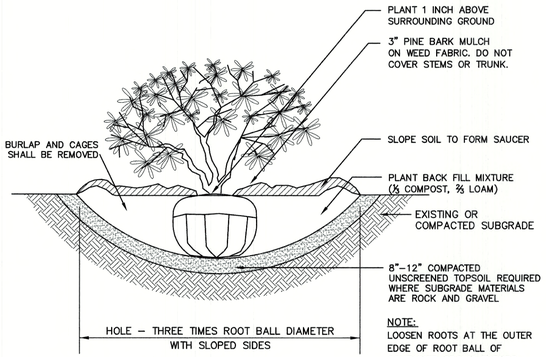
EVERGREEN PLANTING

NOT TO SCALE



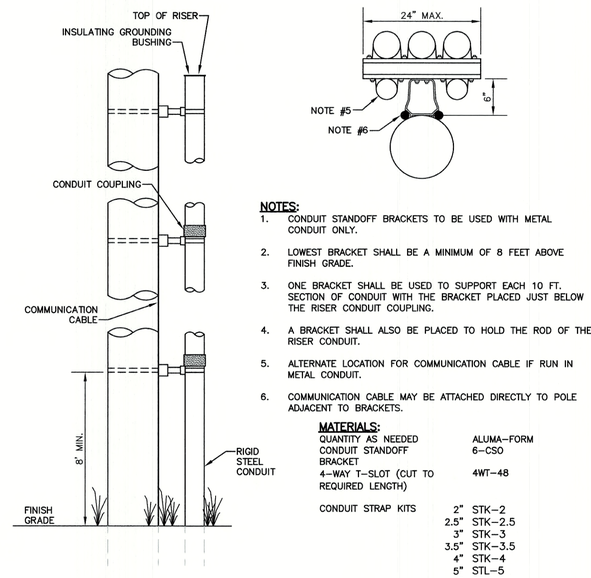
TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE



SHRUB PLANTING

NOT TO SCALE



NOTES:

1. CONDUIT STANDOFF BRACKETS TO BE USED WITH METAL CONDUIT ONLY.
2. LOWEST BRACKET SHALL BE A MINIMUM OF 8 FEET ABOVE FINISH GRADE.
3. ONE BRACKET SHALL BE USED TO SUPPORT EACH 10 FT. SECTION OF CONDUIT WITH THE BRACKET PLACED JUST BELOW THE RISER CONDUIT COUPLING.
4. A BRACKET SHALL ALSO BE PLACED TO HOLD THE ROD OF THE RISER CONDUIT.
5. ALTERNATE LOCATION FOR COMMUNICATION CABLE IF RUN IN METAL CONDUIT.
6. COMMUNICATION CABLE MAY BE ATTACHED DIRECTLY TO POLE ADJACENT TO BRACKETS.

MATERIALS:

QUANTITY AS NEEDED	ALUMA-FORM
CONDUIT STANDOFF BRACKET	6-CSO
4-WAY T-SLOT (CUT TO REQUIRED LENGTH)	4WT-48
CONDUIT STRAP KITS	2" STK-2 2.5" STK-2.5 3" STK-3 3.5" STK-3.5 4" STK-4 5" STL-5 6" STK-6

UTILITY POLE RISER DETAIL

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 3/25/21	
Checked: JAC	Scale: AS NOTED	Project No.: 21047	
Drawing Name: 21047-PLAN.dwg			

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1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
D4
SHEET 14 OF 22
JBE PROJECT NO. 21047

BIORETENTION SYSTEM ELEVATIONS

BIORETENTION	SIZE OF BOTTOM (S.F.)	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F	ELEV. G	SHWT	LEDGE
1	322	37.50	37.30	36.50	35.00	34.75	34.25	34.00	VARIES	VARIES
2	600	38.00	37.70	37.00	35.50	35.25	34.75	34.50	VARIES	VARIES

* SEE NOTE #4 UNDER DESIGN CONSIDERATIONS

SAND SPECIFICATION

SIEVE SIZE	% BY WEIGHT
3/8"	100
#4	95–100
#8	80–100
#16	50–85
#30	25–60
#60	10–30
#100	2–10
#200	0–5

TOPSOIL SPECIFICATION

LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.

MULCH SPECIFICATION

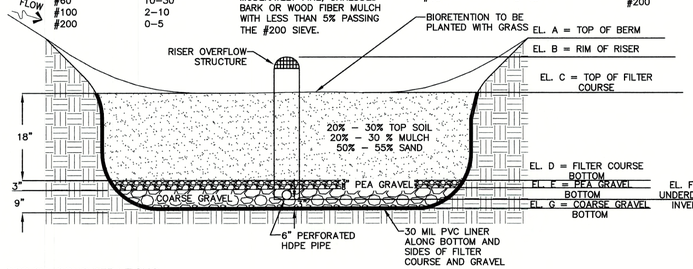
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

PEA GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	100
3/4"	85–100
#4	10–30
#8	0–10
#16	0–15

COARSE GRAVEL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	90–100
1/2"	75–100
#4	50–100
#20	15–80
#50	0–15
#200	0–5



DESIGN CONSIDERATIONS

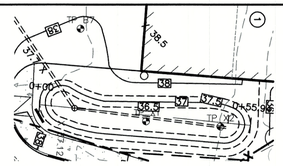
1. DO NOT PLACE BIORETENTION SYSTEMS INTO SERVICE UNTIL THE BMP HAS BEEN SEEDED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN–OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
4. REMOVE LEDGE TO AT LEAST 6" BELOW BOTTOM OF COARSE GRAVEL LAYER IF ENCOUNTERED.

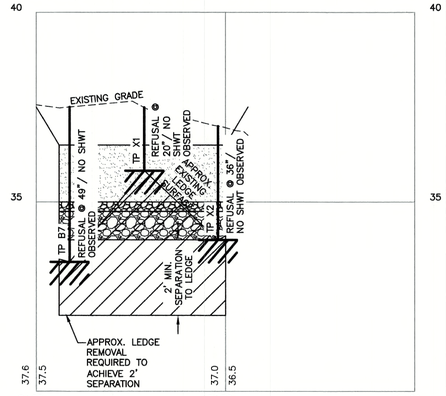
MAINTENANCE REQUIREMENTS:

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. PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
3. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
4. 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.
5. 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.
6. COMPACTION AND MATERIALS TESTING SERVICES SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE OWNER.

BIORETENTION SYSTEM WITH UNDERDRAIN

NOT TO SCALE





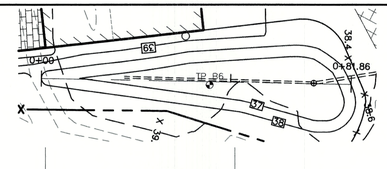
BIORETENTION #1 PROFILE

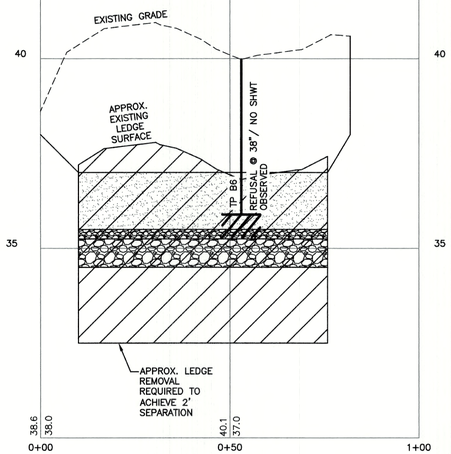
LEDGE PROFILE SHALL BE CONSIDERED APPROXIMATE AND CONTRACTOR SHALL REMOVE LEDGE TO THE EXTENT NECESSARY IN ORDER TO ACHIEVE 2' OF SEPARATION TO THE STONE BASE.

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.

BIORETENTION SYSTEM LEDGE PROFILES

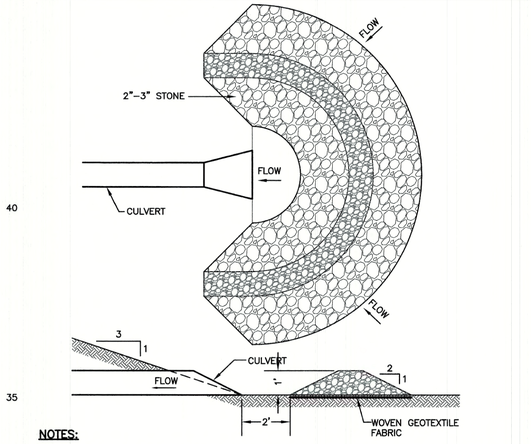
SCALE AS SHOWN





BIORETENTION #2 PROFILE

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.

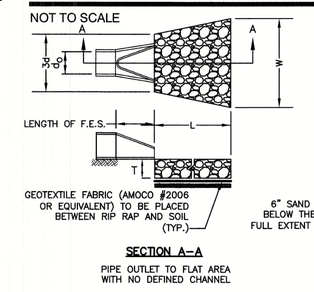


NOTES:

1. TEMPORARY CULVERT INLET PROTECTION CHECK DAMS SHALL BE CONSTRUCTED OF 2–3" STONE OVER WOVEN GEOTEXTILE FABRIC.
2. INLET PROTECTION MEASURES SHALL BE INSTALLED AT THE OPENINGS OF ALL EXISTING AND PROPOSED CULVERTS LOCATED BELOW (DOWNSTREAM) FROM AND WITHIN 100' OF THE PROJECT SITE.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURE WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
4. STRUCTURES SHALL BE REMOVED WHEN THE SITE IS STABILIZED WITH VEGETATION AND THE CHANNEL SHALL BE SMOOTHED AND REVEGETATED.

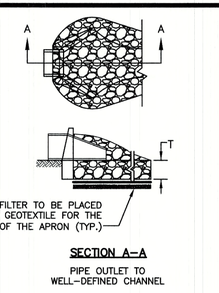
TEMPORARY CULVERT INLET PROTECTION CHECK DAM

NOT TO SCALE



SECTION A–A

PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL



SECTION A–A

PIPE OUTLET TO WELL–DEFINED CHANNEL

TABLE 7–24––RECOMMENDED RIP RAP GRADATION RANGES

THICKNESS OF RIP RAP = 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:

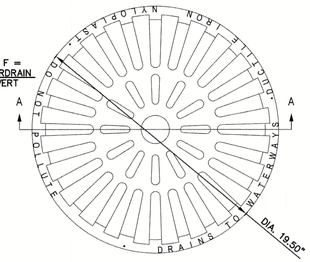
1. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP. DAMAGED AREAS IN THE FABRIC 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.

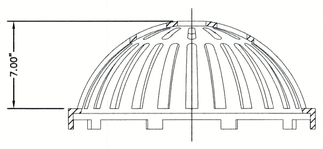
RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE

1899CGD

APPROX. DRAIN AREA = 175.59 SQ IN
APPROX. WEIGHT = 32.00 LBS





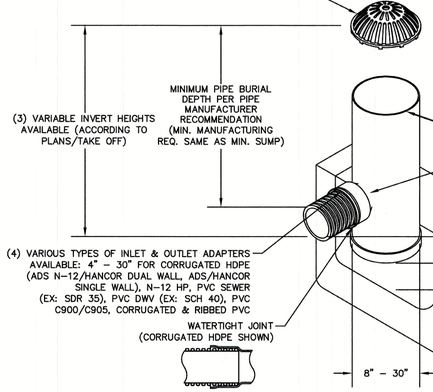
SECTION A-A

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

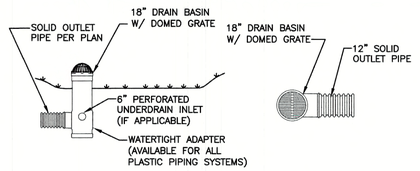
Nyloplast

NOT TO SCALE



NYLOPLAST DRAIN BASIN (W/ DOME GRATE) (YARD DRAIN SPECIFICATION)

NOT TO SCALE



NYOPLAST DRAIN BASIN AND INLINE DRAIN (BIORETENTION RISER SPECIFICATION)

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 3/25/21	
Checked: JAC	Scale: AS NOTED	Project No.: 21047	
Drawing Name: 21047-PLAN.dwg			

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

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

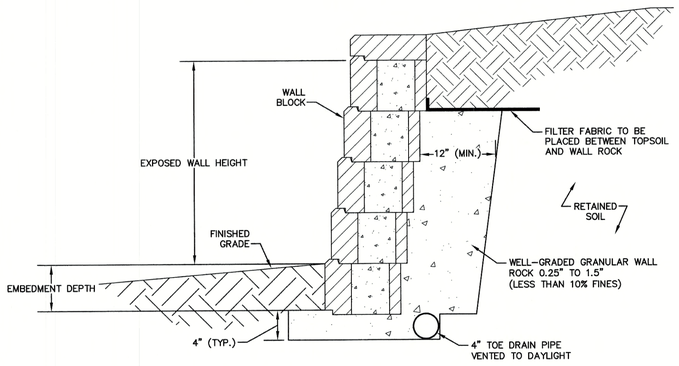
Plan Name: DETAIL SHEET

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No. D5

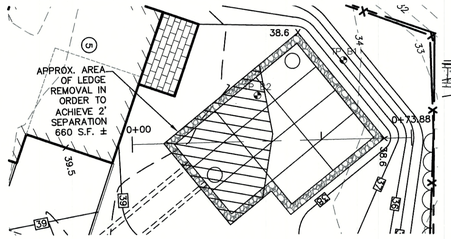
SHEET 15 OF 22
JBE PROJECT NO. 21047

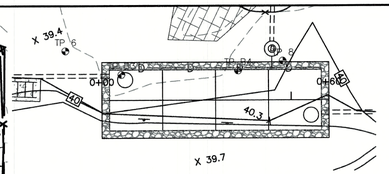


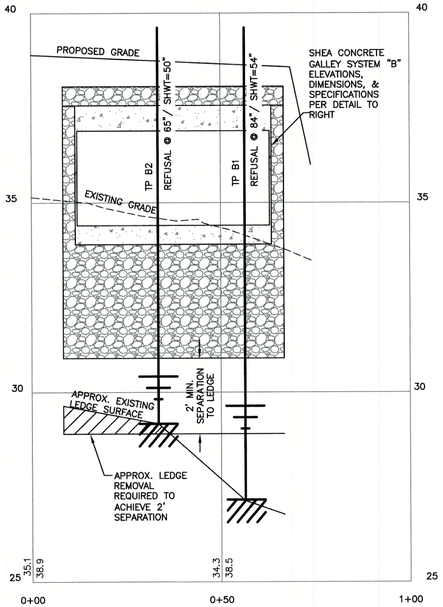
THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE SERVICES OF A STRUCTURAL ENGINEER LISENCED IN THE STATE OF NEW HAMPSHIRE TO DESIGN ANY WALL THAT HAS A HEIGHT OVER 4.0'. JONES & BEACH ENGINEERS, INC. DOES NOT ACCEPT ANY LIABILITY FOR THE STRUCTURAL DESIGN AND/OR INSTALLATION OF ANY RETAINING WALL OF ANY TYPE ABOVE THIS HEIGHT. THIS DETAIL IS INTENDED TO PROVIDE AN EXAMPLE OF THE RETAINING WALL FOR PLANNING PURPOSES ONLY AND IS SPECIFICALLY NOT INTENDED FOR USE BY THE CONTRACTOR IN ANY CONSTRUCTION-RELATED ACTIVITY FOR A WALL GREATER THAN 4.0' IN HEIGHT.

TYPICAL GRAVITY WALL DETAIL

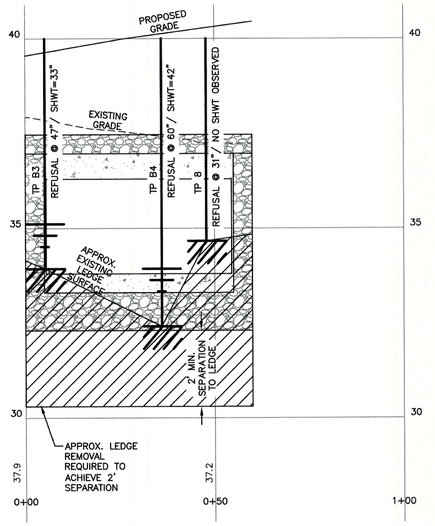
NOT TO SCALE







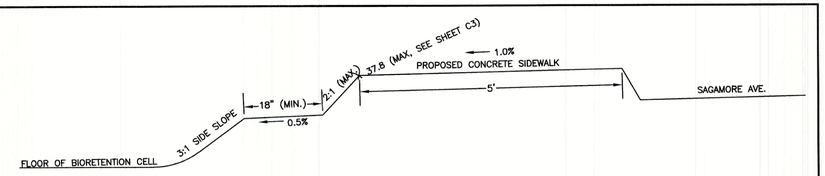
SYSTEM "B" PROFILE



SYSTEM "A" PROFILE

LEDGE PROFILE SHALL BE CONSIDERED APPROXIMATE AND CONTRACTOR SHALL REMOVE LEDGE TO THE EXTENT NECESSARY IN ORDER TO ACHIEVE 2' OF SEPARATION TO THE STONE BASE.

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft Horiz.
1 inch = 2 ft Vert.



1. AT LEAST 18" OF "FLAT" SPACE (0.5% SLOPED TOWARD THE BIORETENTION CELL) SHALL BE PROVIDED BETWEEN THE RIM OF THE BIORETENTION CELL AND THE SIDE SLOPE OF THE SIDEWALK.
2. THIS DETAIL IS INTENDED TO DEPICT SITUATIONS IN WHICH THE PROPOSED GRADE OF THE SIDEWALK IS HIGHER THAN THE TOP OF THE BIORETENTION CELL. WHERE THE PROPOSED GRADE OF THE SIDEWALK IS LOWER THAN THE TOP OF THE BIORETENTION CELL, A STANDARD 2' BERM SHALL BE PROVIDED.

BIORETENTION #1 / SIDEWALK INTERFACE

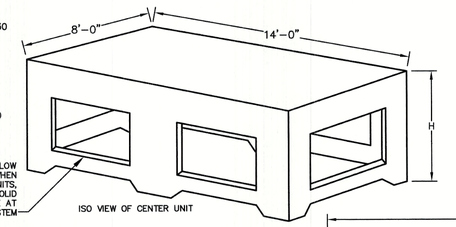
NOT TO SCALE

CONTRACTOR ORDER SCHEDULE				
	FLOW-THROUGH HOLES ON ALL SIDES	NO FLOW-THROUGH HOLES ON ONE 8' SIDE	NO FLOW-THROUGH HOLES ON ONE 14' SIDE	NO FLOW-THROUGH HOLES ON ONE 8' AND ONE 14' SIDE
SYSTEM A	0	0	4	4
SYSTEM B	2	3	1	5

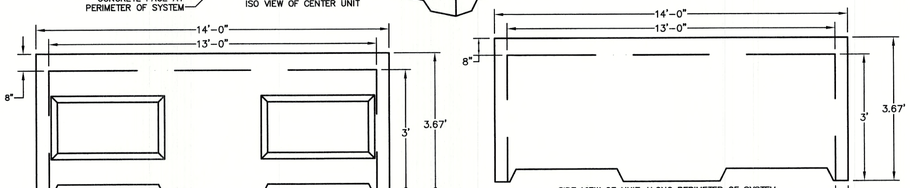
ELEVATION SCHEDULE							
	EL. A	EL. B	EL. C	EL. D	EL. E	EL.F	EL.G
SYSTEM A	> 39.0	36.97	36.3	34.7	33.3	32.3	32.3
SYSTEM B	> 38.6	37.57	36.9	35.8	33.9	N/A	30.9

STONE BACKFILL SPECIFICATION

SIEVE SIZE	% BY WEIGHT
1"	100
¾"	90-100
⅜"	40-90
#8	23-49
#200	2-8



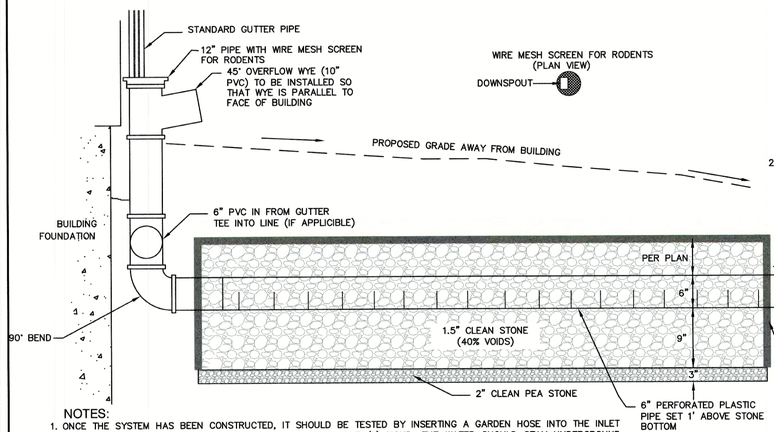
HEIGHT(H)	VOLUME(EA)	WEIGHT
3'-0"	300CF	16,600#



NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR AASHTO HS-20 LOAD, 0 TO 6FT COVER. CAN BE DESIGNED FOR ADDITIONAL COVER IF REQUIRED.
3. STANDARD SLAB DESIGN WITHSTANDS 40KIP OUTRIGGER LOAD ON A 24" SQUARE PAD WITH 24" COVER OVER SLAB.
4. CORE HOLE FOR MORTAR JOINT AT INVERT IN LOCATION(S). PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT
5. COMPACT SUBGRADE TO A BEARING CAPACITY OF AT LEAST 2000 PSF PRIOR TO PLACEMENT OF SYSTEM.
6. SYSTEM "A" IS PROPOSED IN THE MIDDLE OF THE SITE AND DESIGNED FOR DETENTION ONLY. SYSTEM "B" IS PROPOSED IN THE NORTHWEST CORNER OF THE SITE AND DESIGNED FOR DETENTION AND INFILTRATION. SEE SHEET C3 FOR OUTLINE. USE 3' MODEL FOR BOTH SYSTEMS.
7. CONTRACTOR TO PLACE SYSTEM "A" AND EXTEND ABOVE-SPECIFIED IMPERMEABLE LINER ON SYSTEM "A" UP TO SEASONAL HIGH WATER TABLE AT ELEVATION NOTED ABOVE. CITY STAFF OR REVIEW ENGINEER SHALL WITNESS INSTALLATION OF LINER.
8. GALLEY 8X14 UNITS THAT ARE ADJACENT TO OTHER GALLEY 8X14 UNITS ON ALL SIDES SHALL HAVE FLOW THROUGH HOLES ON ALL SIDES. UNITS THAT ARE NOT ADJACENT TO OTHER UNITS ON AT LEAST ONE SIDE SHALL HAVE A SOLID CONCRETE FACE ON THE SIDES ON THE UNIT THAT ARE NOT ADJACENT TO OTHER UNITS (ALONG PERIMETER OF SYSTEM).
9. LEDGE SHALL BE REMOVED TO AN ELEVATION AT LEAST 2-FEET BELOW BOTTOM OF STONE BASE AND REPLACED WITH GRANULAR MATERIAL.

SHEA CONCRETE PRODUCTS "GALLEY 8x14"

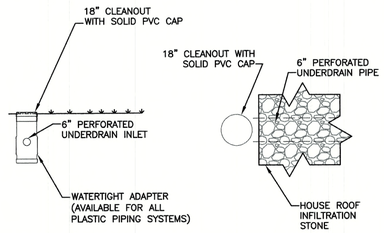
NOT TO SCALE



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. DO NOT PLANT DEEP ROOTED TREES AND SHRUBS WITHIN 5' OF THE SYSTEM.
4. KEEP HEAVY VEHICLES FROM DRIVING OR PARKING OVER THE SYSTEM.
5. 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.
6. A WATERTIGHT CONNECTION SHALL BE MAINTAINED WITH ANY TRANSITION FROM SCHEDULE 40 PVC PIPE TO ANY OTHER PIPE TYPE.
7. 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.
8. OVERFLOWS ARE TO BE INSTALLED ON EXTERIOR DOWNSPOUT LEADERS ONLY.
9. LEDGE SHALL BE REMOVED TO AT LEAST 2' BELOW BOTTOM OF INFILTRATION PRACTICE.

HOUSE ROOF INFILTRATION DETAIL

NOT TO SCALE



PERFORATED UNDERDRAIN CLEANOUT DETAIL

NOT TO SCALE

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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STATE OF NEW HAMPSHIRE · PAIGE S. LIBBEY No.18670 · LICENSED PROFESSIONAL ENGINEER

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12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
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Designed and Produced in NH
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85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: DETAIL SHEET

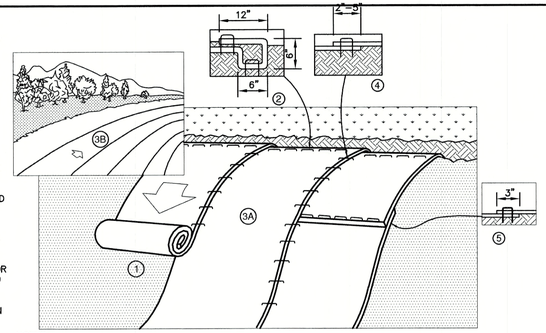
Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
D6
SHEET 16 OF 22
JBE PROJECT NO. 21047

TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.5" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN 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.



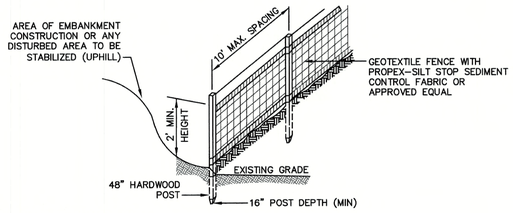
NOTES:

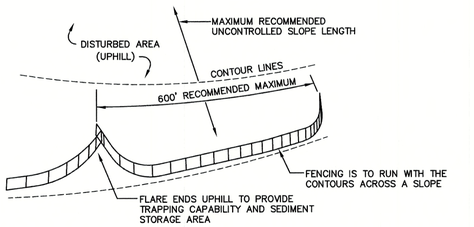
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

NORTH AMERICAN GREEN
14649 HIGHWAY 41 NORTH
EVANSVILLE, INDIANA 47725
1-800-772-2040

EROSION CONTROL BLANKET SLOPE INSTALLATION
NORTH AMERICAN GREEN (800) 772-2040

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(P2O5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      POTASH(K2O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
      (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

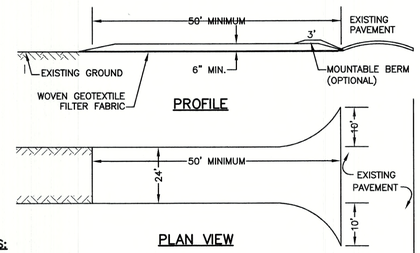
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH	15	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
* C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES



PLAN VIEW

NOTES:

1. STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, 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 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. WETLAND BOUNDARIES ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
3. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
4. 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.
5. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
6. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) (INCLUDING RAIN GARDENS AND UNDERGROUND DETENTION SYSTEM) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
7. STRIP LOAM AND PAVEMENT PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
8. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
9. PREPARE BUILDING PADS TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
10. 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.
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 DRIVEWAYS AND ROADWAY 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 ALL DRIVEWAYS AND ROADWAY WITH 'FINISH' COURSE.
18. DRIVEWAYS AND ROADWAY 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: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
E1
SHEET 17 OF 22
JBE PROJECT NO. 21047

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 feet

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

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
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STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

Plan Name: TRUCK TURNING PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
T1
SHEET 18 OF 22
JBE PROJECT NO. 21047

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 feet

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

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-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
14	5/10/22	REVISED PER NHDOT, TAC, AND REVIEW ENGINEER COMMENTS	DJM
13	4/18/22	DRAINAGE REVISIONS	DJM
12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

Plan Name: TRUCK TURNING PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

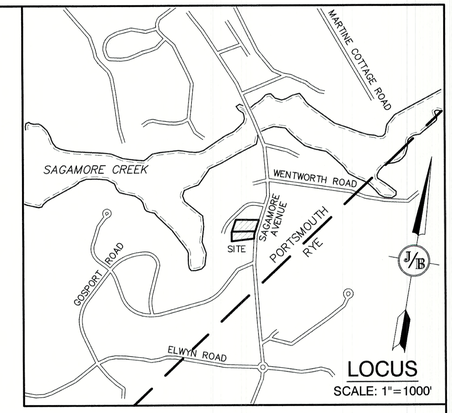
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

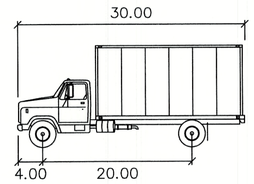
DRAWING No.
T2
SHEET 19 OF 22
JBE PROJECT NO. 21047

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 feet





SU-30

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

LEGEND:

= VEHICLE BODY
= FRONT WHEELS
= REAR WHEELS

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

REV.	DATE	REVISION	BY
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10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: TRUCK TURNING PLAN

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

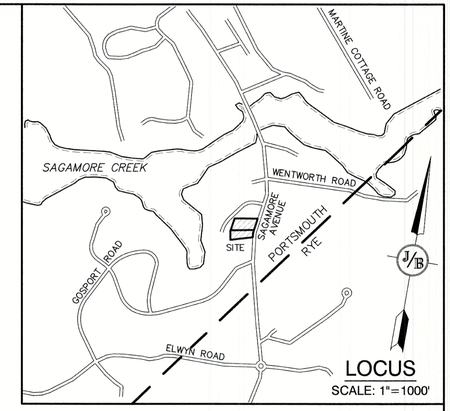
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

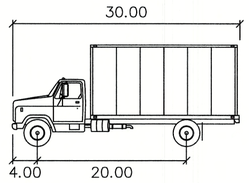
DRAWING No.
T3
SHEET 20 OF 22
JBE PROJECT NO. 21047

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 feet





SU-30

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

LEGEND:

- = VEHICLE BODY
- = FRONT WHEELS
- = REAR WHEELS

PROJECT PARCEL
CITY OF PORTSMOUTH
TAX MAP 224, LOTS 14 & 15

APPLICANT
THE SAGAMORE GROUP, LLC
PO BOX 430
HAMPTON, NH 03842

TOTAL LOT AREA
79,292 SQ. FT.
1.83 ACRES

Design: JAC	Draft: DJM	Date: 3/25/21
Checked: JAC	Scale: AS NOTED	Project No.: 21047
Drawing Name: 21047-PLAN.dwg		

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

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12	4/6/22	REMOVED WALKWAYS	DJM
11	3/22/22	REVISED PER CITY COMMENTS	DJM
10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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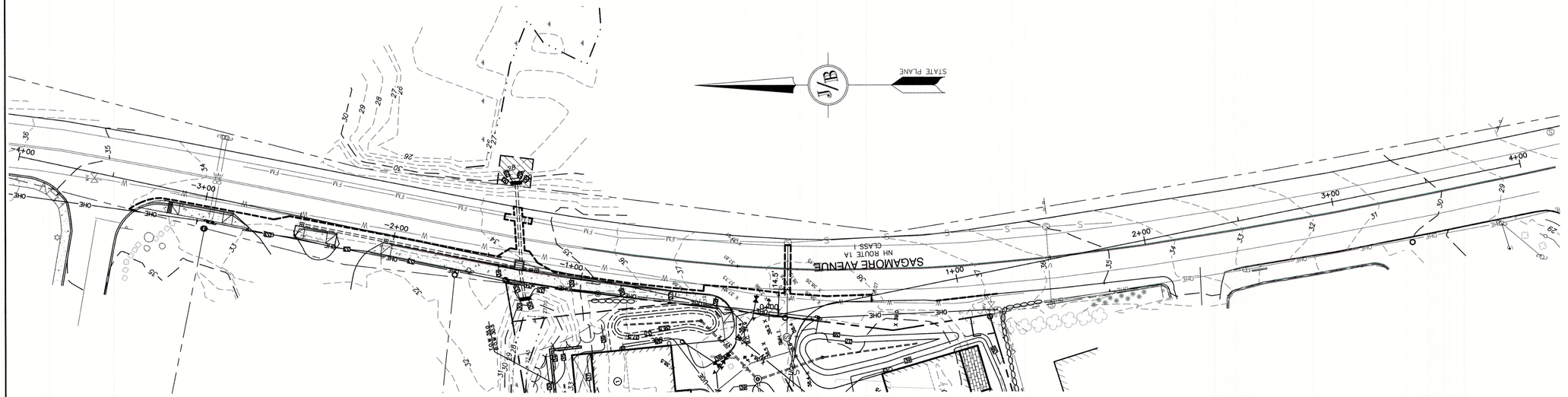
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

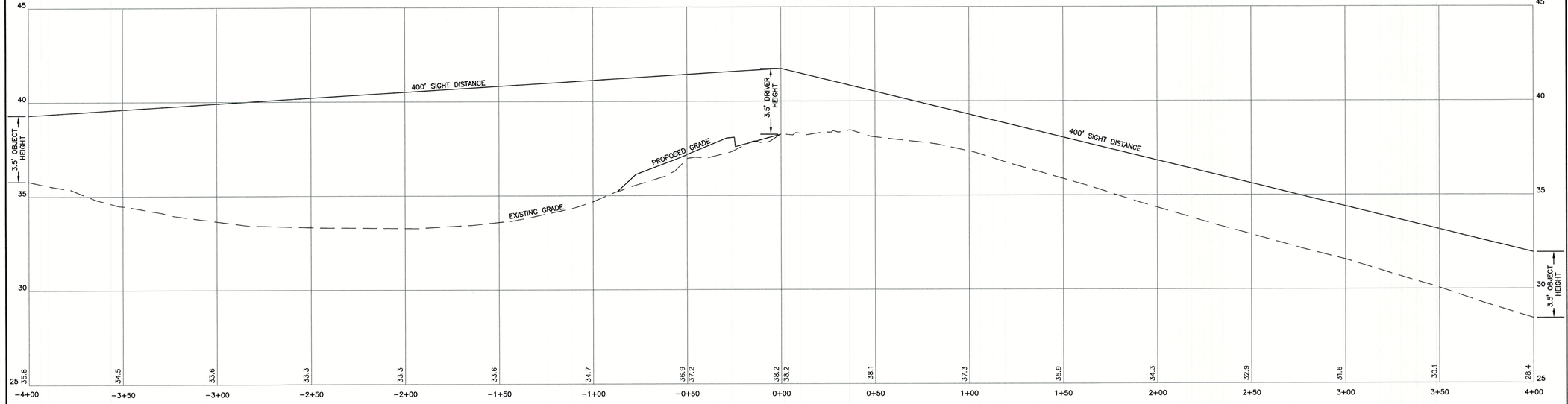
Plan Name: **TRUCK TURNING PLAN**

Project: SAGAMORE AVENUE CONDOMINIUMS
1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE

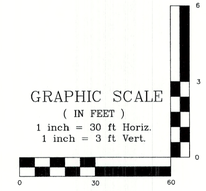
Owner of Record: LOT 14: COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173; LOT 15: JOHN J. & COLLEEN HEBERT, 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

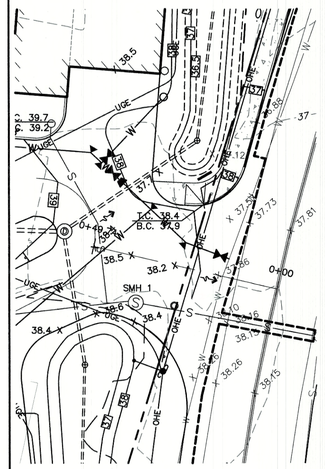
DRAWING No.
T4
SHEET 21 OF 22
JBE PROJECT NO. **21047**

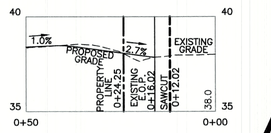


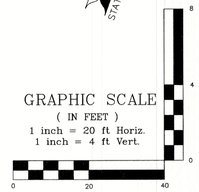


SIGHT DISTANCE PLAN AND PROFILE (SCALE AS SHOWN)









DRIVEWAY PLAN AND PROFILE (SCALE AS SHOWN)

Design: JAC	Draft: DJM
Checked: JAC	Scale: AS NOTED
Date: 3/25/21	Project No.: 21047
Drawing Name: 21047-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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10	3/4/22	REVISED PER NHDOT COMMENTS	DJM

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

Plan Name:	HIGHWAY ACCESS PLAN
Project:	SAGAMORE AVENUE CONDOMINIUMS 1169 & 1171 SAGAMORE AVE., PORTSMOUTH, NEW HAMPSHIRE
Owner of Record:	LOT 14: COLLEEN HEBERT 54 PIONEER RD, RYE, NH 03870 BK 2418 PG 173 LOT 15: JOHN J. & COLLEEN HEBERT 54 PIONEER RD, RYE, NH 03870 BK 5383 PG 219

DRAWING No.
H1
SHEET 22 OF 22
JBE PROJECT NO. 21047

P-0616-005
May 25, 2022

Ms. Beverly M. Zendt, Planning Director
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Review Permit Application**
Portsmouth Regional Hospital– Proposed Satellite Parking Lot

Dear Beverly:

On behalf of Portsmouth Regional Hospital, we are pleased to submit the following supplemental information to support a request to the Planning Board for a recommendation for approval to Portsmouth Regional Hospital for Site Plan Review for a proposed parking expansion across the street from the existing Hospital located at the east corner of Borthwick Ave and Eileen Dondero Foley Ave:

- One (1) copy of the Site Plan Application Checklist, dated March 22, 2022;
- One (1) copy of the Owner Authorization, dated March 16, 2022;
- One (1) full size & one (1) half size copy of the Site Plan Set, last revised May 23, 2022;
- One (1) copy of the Fire Truck Turning Plan, last revised May 12, 2022;
- One (1) copy of Light Fixture and Pole Cut Sheets;
- One (1) copy of the Drainage Analysis, last revised May 23, 2022;
- One (1) copy of the Operations and Maintenance Plan, last revised May 12, 2022;
- One (1) copy of the Sight Distance Exhibit, dated May 12, 2022; and,
- One (1) copy of the TAC Comment Response, dated May 12, 2022.

The enclosed revised plans and supplemental materials have been provided to address comments received from the Technical Advisory Committee (TAC) in correspondence date May 2, 2022 and at their meeting held on May 3, 2022. Additionally, the revised plans and drainage analysis have been updated to correspond with the latest updates associated with the NHDES Alteration of Terrain Permit Application submission. These updates include and are limited to the addition of two stormwater treatment units upstream of the underground infiltration basin and additional detail on the specific model type of the stormwater pretreatment and treatment units. These changes are found on sheets C-103 and C-505. Associated watershed plan and post development calculation updates to match these changes have been incorporated into the drainage analysis.

We respectfully request to be placed on the Technical Advisory Committee (TAC) meeting agenda for June 7, 2022. 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

Alexander Sellar, PE
Project Engineer

Copy: Portsmouth Regional Hospital

J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Report_Evaluation\Applications\20220525_TAC Update\P-0616-005 TAC Cover Letter.docx

City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Applicant: Portsmouth Regional Hospital Date Submitted: 03/22/2022

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

Site Address: Borthwick Ave, Portsmouth NH Map: 234 Lot: 7-4A

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	Completed	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)**	Completed	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)**	Site Plan Sheet C-102	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Existing Conditions Plan Sheet C-101	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plan Sheet C-101	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 Plan Sheet C-101	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Utilities Plan Sheet C-104	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☑	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☑	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Existing Conditions Plan Sheet C-101	N/A
☑	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☑	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Existing Conditions Plan Sheet C-101	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	All Plan Sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All Plan Sheets	N/A
☑	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☑	Source and date of data displayed on the plan. **(2.5.4.2D)**	All Plan Sheets	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheet C-101	
☐	**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.	N/A	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plan Sheet C-102.1	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan Sheet C-102.1	
☑	**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 Sheet C-104	
☐	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	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.	Utilities Plan Sheet C-104	
☐	**8. Solid Waste Facilities: (2.5.4.3H)**	N/A	
	• 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.	Grading, Drainage & Erosion Control Plan Sheet C-103	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Lighting Plan Sheet C-106	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Lighting Plan Sheet C-106	
☑	**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.	Landscaping Plan Sheet C-105	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading, Drainage & Erosion Control Plan Sheet C-103	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan Sheet C-102.1	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheet C-101	
☐	**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 & Erosion Control Plan Sheet C-103	
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheet C-102	N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Sheet C-102	N/A

Applicant's Signature: _____ **Date:** 3/22/22

Owner's/Agent Letter of Authorization

This letter is to Authorize Tighe & Bond, Inc. (Civil Engineer), to represent and submit on behalf of Portsmouth Regional Hospital (Applicant), applications and materials in all site design and permitting matters for the proposed project at the east corner between Borthwick Ave and Eileen Dondero Foley Ave. This project includes the construction of a satellite parking lot, and associated site and stormwater improvements. This authorization shall relate to those activities that are required for local, state, and federal permitting for the above project and include and required signatures for those applications.

Signature	DEAN M. CARUCCI Print Name	3.16.22 Date
Witness	MATTHEW P. LARKIN Print Name	3.16.2022 Date

PROPOSED SATELLITE PARKING LOT

PORTSMOUTH, NEW HAMPSHIRE

BORTHWICK AVENUE & EILEEN DONDERO FOLEY AVENUE

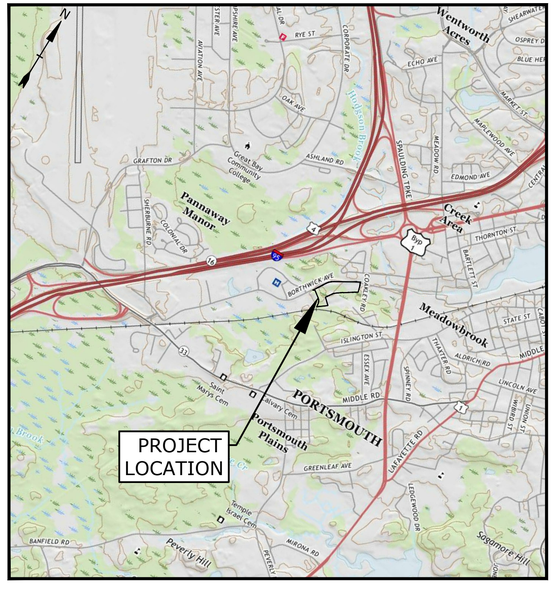
PERMIT DRAWINGS

MARCH 22, 2022

LAST REVISED MAY 23, 2022

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	05/23/2022
1 OF 2	EXISTING CONDITIONS PLAN	03/22/2022
2 OF 2	EXISTING CONDITIONS PLAN	03/22/2022
G-101	GENERAL NOTES, ABBREVIATIONS, & LEGEND SHEET	05/23/2022
C-101	DEMOLITION PLAN	05/23/2022
C-102	OVERALL PARKING PLAN	05/23/2022
C-102.1	SITE PLAN	05/23/2022
C-103	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	05/23/2022
C-104	UTILITY PLAN	05/23/2022
C-105	LANDSCAPE PLAN	05/23/2022
C-106	PHOTOMETRICS PLAN	05/23/2022
C-501	EROSION CONTROL NOTES & DETAILS SHEET	05/23/2022
C-502	DETAILS SHEET	05/23/2022
C-503	DETAILS SHEET	05/23/2022
C-504	DETAILS SHEET	05/23/2022
C-505	DETAILS SHEET	05/23/2022
C-506	DETAILS SHEET	05/23/2022
C-507	DETAILS SHEET	05/23/2022
C-508	DETAILS SHEET	05/23/2022
C-509	DETAILS SHEET	05/23/2022
C-510	DETAILS SHEET	05/23/2022

LIST OF PERMITS		
FEDERAL	STATUS	DATE
CONSTRUCTION GENERAL PERMIT (CGP) & NOI		
LOCAL		
SITE PLAN REVIEW PERMIT		
ZONING BOARD OF ADJUSTMENT - SPECIAL EXCEPTION & VARIANCE	APPROVED	2/23/2022
STATE		
NHDES STANDARD DREDGE AND FILL WETLAND IMPACT PERMIT		
NHDES ALTERATION OF TERRAIN		



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, NH 03801
(603) 433-8818

BRADLEE MEZQUITA, PE

PATRICK M. CRIMMINS, PE

APPLICANT:
Portsmouth Regional Hospital
333 Borthwick Avenue
Portsmouth, NH 03801

OWNER:
HCA Realty Inc.
c/o Ducharme Mcmillen & Assoc - HCA NH
PO Box 80610
Indianapolis, IN 46280

SURVEY CONSULTANT:
DOUCET SURVEY LLC
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

811 DigSafe MA-ME-NH-RI-VT

COMPLETE SET 21 SHEETS

Last Save Date: May 17, 2022 4:48 PM By: ASELLAR
Plot Date: Monday, May 23, 2022 4:49 PM By: Alexander Seller
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_CS.dwg Layout Tab: CS

NOTES:

1. REFERENCE: TAX MAP 234, LOT 7-4A
BORTHWICK AVENUE EXTENSION
PORTSMOUTH, NEW HAMPSHIRE
D.S. PROJECT NO. 2826

2. TOTAL PARCEL AREA: 395,745 SQ. FT. OR 9.09 AC.

3. OWNER OF RECORD: HCA REALTY INC.
C/O DUCHARME MCMILLEN & ASSOC. – HCA NH
PO BOX 80610
INDIANAPOLIS, IN 46280
R.C.R.D BOOK 4400 PAGE 2048, BOOK 4639 PAGE 2128.

4. TOPOGRAPHY SHOWN HEREON IS BASED ON A COMBINATION OF AERIAL MAPPING BY EASTERN TOPOGRAPHICS IN 5/03 AND CONVENTIONAL SURVEY BY DOUCET SURVEY, SEE NOTE 5. EXCEPT FOR THE NOTED AREA, NO ADDITIONAL UPDATES WERE DONE TO THE AERIAL TOPOGRAPHY FROM 2003.

5. FIELD SURVEY PERFORMED BY DOUCET SURVEY AT VARIOUS TIMES BETWEEN 2003 & 2021.

6. JURISDICTIONAL WETLANDS DELINEATED BY TIGHE & BOND, DURING MONTH YEAR IN ACCORDANCE WITH 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 AND THE INTERIM REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION (OCTOBER, 2009).

7. FLOOD HAZARD ZONE: "X", PER FIRM MAP #33015C0260F, DATED 1/29/2021.

8. HORIZONTAL DATUM IS BASED ON NH STATE PLANE COORDINATE SYSTEM. AS ESTABLISHED BY JAMES VERRA & ASSOCIATES IN MAY 2003.

9. VERTICAL DATUM IS BASED ON NGVD 29.

10. THE PARCEL IS SUBJECT TO, AND/OR IN BENEFIT OF THE FOLLOWING EASEMENTS, RESTRICTIONS, ETC.
    A. SUBJECT TO AN ELECTRIC EASEMENT GRANTED BY SAN ANTONIO ET AL TO NH ELECTRIC CO, SEE R.C.R.D. BOOK 1230, PAGE 222.
    B. SUBJECT TO A GAS LINE EASEMENT RESERVED BY NORTHERN UTILITIES, INC., SEE R.C.R.D. BK. 4392 PG. 110
    C. SUBJECT TO AN ACCESS AND UTILITY EASEMENT RESERVED BY ISLINGTON WOODS, LLC, SEE R.C.R.D. BOOK 4639 PAGE 2128.
    D. SUBJECT TO THE RIGHTS OF THE CITY OF PORTSMOUTH TO CONSTRUCT & MAINTAIN A SEWER LINE, SEE R.C.R.D. BOOK 4685, PAGE 553.
    E. SUBJECT TO AN "AGREEMENT REGARDING PROHIBITED USES", SEE R.C.R.D. BOK. 4400 PG. 2051.
    F. ALL OTHER RIGHTS OR EASEMENTS OF RECORD OR OTHERWISE. THIS PLAN DOES NOT REPRESENT A TITLE EXAMINATION, AND NONE WAS PROVIDED.

11. 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, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

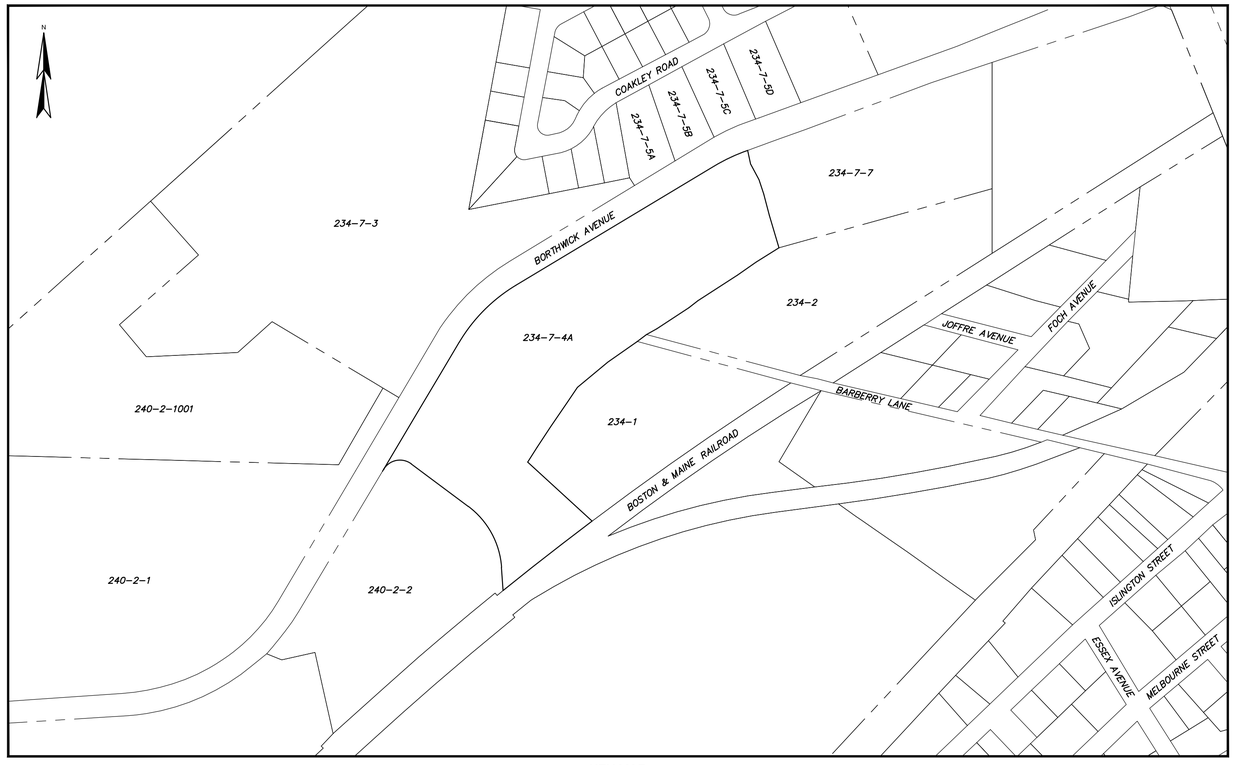
12. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.

13. 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.

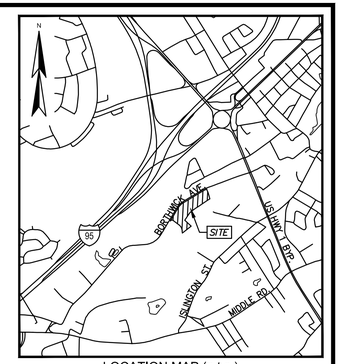
14. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

REFERENCE PLANS:

1. "LOT LINE REVISION PLAN FOR PORTSMOUTH HOSPITAL OFFICE BUILDING ASSOCIATION, ISLINGTON WOODS, LLC AND HCA REALTY, INC. (TAX MAP 234, LOTS 7-4A & 7-4B) (TAX MAP 240, LOT 2-2) BORTHWICK AVENUE EXTENSION PORTSMOUTH, NEW HAMPSHIRE" DATED 1/13/06 BY DOUCET SURVEY, INC., R.C.R.D. PLAN D-33642.
2. "SUBDIVISION & LOT LINE REVISION PLAN BETWEEN NORTHERN UTILITIES, INC. AND ISLINGTON WOODS, LLC," BY DOUCET SURVEY, INC., DATED FEBRUARY 25, 2004, R.C.R.D. PLAN D-31871.
3. "GAS LINE AS-BUILT EASEMENT AND CONSERVATION EASEMENT PLAN," BY KIMBALL CHASE COMPANY, INC. DATED 10/31/85, R.C.R.D. PLAN D-15830.
4. "PLAT OF PROPERTY AND IMPROVEMENTS FOR HCA REALTY, INC.," BY CESP, INC. DATED DECEMBER 12, 1986, R.C.R.D. PLAN D-15831.
5. "EASEMENT PLAN FOR ISLINGTON WOODS, LLC AND BOSTON & MAINE CORPORATION BETWEEN ISLINGTON ST. & BORTHWICK AVE. EXT. (TAX MAP 223 LOT 113 & TAX MAP 234 LOT 7-4B) PORTSMOUTH, NEW HAMPSHIRE" DATED 10/20/2005 BY DOUCET SURVEY, INC., R.C.R.D. PLAN D-33500.
6. "LOT LINE REVISION PLAN LAND OF SEARAY REALTY, LLC TAX AMP 234 LOTS 2, 3, & 7-7 US ROUTE 1 BY-PASS & BARBERRY LANE PORTSMOUTH, NEW HAMPSHIRE. DATED 3/12/2014 BY DOUCET SURVEY, INC., R.C.R.D. PLAN D-38435.
7. "SUBDIVISION & EASEMENT PLAN LAND OF BORTHWICK FOREST, LLC (TAX MAP 241, LOT 25) AND SHOWING LAND OF HCA REALTY, INC. (TAX MAP 234, LOT 7-4A) (TAX MAP 240 LOT 2-2102) BORTHWICK AVE. & ISLINGTON ST. PORTSMOUTH, NH" DATED 11/12/2019 BY DOUCET SURVEY, INC., R.C.R.D. PLAN D-42049



KEY MAP



LOCATION MAP (n.t.s.)

200 0 200 400
SCALE: 1 INCH = 200 FT.

LEGEND: AERIAL DATA

BUILDINGS	UTILITY POLE
STRUCTURE	U.P.? UTILITY POLE OBSCURED
TREELINE	HYDRANT
TRAIL/WALK	MEDIUM LONE TREE
DRIVEWAY	SMALL LONE TREE
DRIVEWAY OBSCURED	SIGN
CURBING	POST
PAVED ROAD	SIGN
PAVED ROAD OBSCURED	
GRAVEL ROAD	
DRAINAGE OBSCURED	
FENCE OBSCURED	
FENCE	
PIPELINE	
PILE LIMIT	
STONE WALL	
DITCH	
TRAIL/WALK OBSCURED	
HEADWALL	
CONCRETE	
RAILROAD	
RAILROAD OBSCURED	

LEGEND

LOT LINE	SIGN
APPROXIMATE ABUTTERS LOT LINE	SIGN (TWO POSTS)
EXISTING EASEMENT LINE	DRILL HOLE FOUND
STONE WALL	IRON PIPE/ROD FOUND
REMNANT STONE WALL	FIRE HYDRANT
OHW OVERHEAD WIRE	WATER GATE VALVE
SS SEWER LINE	IRRIGATION CONTROL VALVE
SD DRAIN LINE	GAS GATE VALVE
CULVERT	CATCH BASIN
G GAS LINE	DRAIN MANHOLE
100 MAJOR CONTOUR LINE (SEE NOTE 5)	F.E.S FLARED END SECTION
98 MINOR CONTOUR LINE (SEE NOTE 5)	SEWER MANHOLE
TREE LINE	HAND HOLE
EDGE OF WETLAND (SEE NOTE 6)	
EDGE OF WETLAND AS PROVIDED BY CLIENT (NOT SURVEY LOCATED)	DECIDUOUS TREE
WETLAND AREA	MAST ARM
CONCRETE	RAIL ROAD SIGNAL
RIP RAP	D.H.F. DRILL HOLE FOUND
LANDSCAPED AREA	EP EDGE OF PAVEMENT
LEDGE OUTCROP	EOG EDGE OF GRAVEL
XW REFERENCED WATER LINE	VGC VERTICAL GRANITE CURB
UTILITY POLE	SWL SINGLE WHITE LINE
UTILITY POLE & GUY WIRE	DYL DOUBLE YELLOW LINE
UTILITY POLE W/LIGHT	EM ELECTRIC METER

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
No. 916
STEVEN V. MICHAUD
SIGNATURE

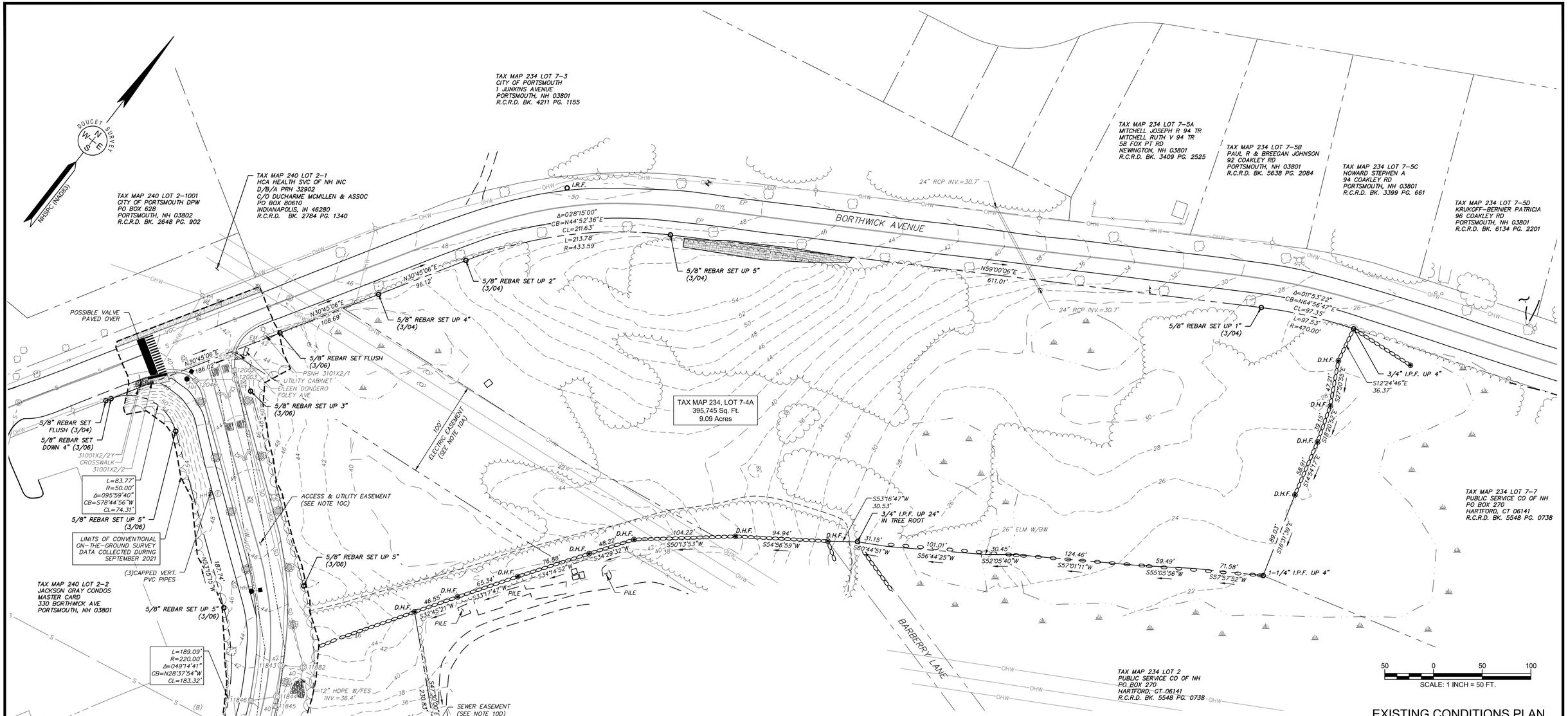
EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
OF
TAX MAP 234 LOT 7-4A
BORTHWICK AVENUE EXTENSION
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	3/22/22	UPDATE WETLANDS PER CLIENT	SVM

DRAWN BY:	W.D.C.	DATE:	OCTOBER 2021
CHECKED BY:	S.V.M.	DRAWING NO.	2826B
JOB NO.	2826	SHEET	1 OF 2

DOUCET SURVEY LLC
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

FILE NAME: I:\PROJECTS\2826 DA\DWG\2826B Tech 2021.dwg LAYOUT NAME: TOPO PLAN (1) PLOTTED: Tuesday, March 22, 2022 - 10:32am



DRAINAGE STRUCTURES		SEWER STRUCTURES
DMH 11843	DMH 11882	SMH 11847
RIM ELEV.=41.6'	RIM ELEV.=43.8'	RIM ELEV.=39.1'
(11844) 12" HDPE INV.=36.6'	(12003) 12" HDPE INV.=36.5'	(11848) 8" PVC DROP CATCH INV.=27.3'
(11882) 12" HDPE INV.=36.4'	(11843) 12" HDPE INV.=36.4'	(A) 18" PVC INV.=15.3'
	(OUTFALL) 12" HDPE INV.=36.5'	(B) 18" PVC INV.=15.2'
DMH 11844		
RIM ELEV.=40.4'	CB 12002	SMH 11848
(11846)12" HDPE INV.=36.9	RIM ELEV.=42.6'	RIM ELEV.=36.4'
(11845) 12" HDPE INV.=36.7'	(12003, CAPPED UNABLE TO MEASURE)	(A) 8" PVC INV.=27.8'
(11843) 12" HDPE INV.=36.8'	WATER ELEV.=37.7'	(11847) 8" PVC INV.=27.7'
	SUMP ELEV.=34.2'	
CB 11845		
RIM ELEV.=40.1'	DMH 12003	
(11844, CAPPED UNABLE TO MEASURE)	RIM ELEV.=42.8'	
WATER ELEV.=37.1'	(12046) 12" HDPE INV.=37.9'	
SUMP ELEV.=32.9'	(12002) 12" HDPE INV.=37.9'	
	(11882) 12" HDPE INV.=37.9'	
CB 11846		
RIM ELEV.=40'	CB 12046	
(11844, CAPPED UNABLE TO MEASURE)	RIM ELEV.=41.6'	
WATER ELEV.=37.2'	(12003, CAPPED UNABLE TO MEASURE)	
SUMP ELEV.=33'	WATER ELEV.=38.2'	
	SUMP ELEV.=34'	

EXISTING CONDITIONS PLAN
FOR
TIGHE & BOND
OF
TAX MAP 234 LOT 7-4A
BORTHWICK AVENUE EXTENSION
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	3/22/22	UPDATE WETLANDS PER CLIENT	SVM

DRAWN BY:	W.D.C.	DATE:	OCTOBER 2021
CHECKED BY:	S.V.M.	DRAWING NO.	2826B
JOB NO.	2826	SHEET	2 OF 2

STATE OF NEW HAMPSHIRE
No. 916
STEVEN V. MICHAUD
LICENSED LAND SURVEYOR
SIGNATURE

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FILE NAME: I:\PROJECTS\2826 CAD\DWG\2826B Topo 2021.dwg LAYOUT NAME: TOPO PLAN (2) PLOTTED: Tuesday, March 22, 2022 - 10:22am

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
3. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
4. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
5. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
7. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER THE UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
9. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
11. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
12. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
14. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
15. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL WORK WITHIN THE CITY OF PORTSMOUTH RIGHT OF WAY IS SUBJECT TO REVIEW AND APPROVAL BY THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING RETAINING WALL DESIGN FROM STRUCTURAL ENGINEER AND/OR WALL MANUFACTURER. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO CONSTRUCT WALL IN ACCORDANCE WITH DESIGN APPROVED BY THE ENGINEER. RETAINING WALL SHALL BE SEGMENTAL BLOCK WALL SYSTEM AS OUTLINED IN THE DETAILS.
10. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
11. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
12. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
13. ALL TREES PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
14. THE APPLICANT SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.

SITE RECORDING NOTES:

1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESSED APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS AND NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - FAIRPOINT AND COMCAST
2. 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.
3. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
4. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE APPLICABLE UTILITY COMPANIES.
5. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
6. 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.
7. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
8. 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.
9. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.

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 NON-COMBUSTIBLE MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE MULCH IS TO BE USED IN A CURBED ISLAND THE MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
10. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
11. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
12. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
13. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
14. 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.
15. 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.
16. 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.
17. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
18. 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.
19. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY, DATED OCTOBER 2021.
2. WETLAND DELINEATION BY TIGHE & BOND, ON SEPTEMBER 17, 2021, AND FIELD LOCATED BY DOUCET SURVEY.

REFERENCE PLANS:

1. SEE EXISTING CONDITIONS PLAN, BY DOUCET SURVEY.

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AC	ACRES
ADA	AMERICANS WITH DISABILITIES ACT
AGGR	AGGREGATE
AOT	ALTERATION OF TERRIAN
BLDG	BUILDING
BMP(S)	BEST MANAGEMENT PRACTICE(S)
BOC	BOTTOM OF CURB
BOW	BOTTOM OF WALL
CB	CATCH BASIN
CCB	CAPE COD BERM
CMP	CORRUGATED METAL PIPE
CONST	CONSTRUCT
COORD	COORDINATE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DMH	DRAINAGE MANHOLE
DH	DOGHOUSE
DWG	DRAWING
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EXIST	EXISTING
FES	FLARED END SECTION
FF	FINISHED FLOOR
HDPE	HIGH DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
HMP	HOT MIX PAVEMENT
HW	HEADWALL
HYD	HYDRANT
ID	INSIDE DIAMETER
INV	INVERT
L	LENGTH
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
NCSS	NATIONAL COOPERATIVE SURVEY
NHDES	NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
NRCC	NORTHEAST REGIONAL CLIMATE CENTER
NRCS	NATURAL RESOURCES CONSERVATION SERVICE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PAD	PROPOSED AREA DRAIN
PC	POINT OF CURVATURE
PCB	PROPOSED CATCH BASIN
PDMH	PROPOSED DRAINAGE MANHOLE
PI	POINT OF INTERSECTION
POS	PROPOSED OUTLET STRUCTURE
PROP	PROPOSED
PSMH	PROPOSED SEWER MANHOLE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PYD	PROPOSED YARD DRAIN
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RL	ROOF LEADER
ROW	RIGHT OF WAY
SF	SQUARE FEET
SSSNNE	SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND
STD	STANDARD
TBR	TO BE REMOVED
TOC	TOP OF CURB
TOW	TOP OF WALL
TYP	TYPICAL
UD	UNDERDRAIN
USCS	UNIFIED SOIL CLASSIFICATION SYSTEM
USDA	UNITED STATES DEPARTMENT OF AGRICULTURE
W	WIDTH
W/	WITH
YD	YARD DARIN

LEGEND

EXISTING LOT LINE
PROPOSED LEASE LINE
APPROXIMATE LIMIT OF WORK
APPROXIMATE LIMIT OF SAWCUT
EXISTING RIGHT-OF-WAY LINE
EXISTING CHAIN LINK FENCE
PROPOSED FENCE
EXISTING OVERHEAD WIRE
EXISTING SEWER LINE
PROPOSED SEWER LINE
EXISTING DRAIN LINE
PROPOSED DRAIN LINE
PROPOSED DRAIN LINE
EXISTING GAS LINE
PROPOSED GAS LINE
EXISTING TELEPHONE LINE
PROPOSED COMMUNICATIONS LINE
PROPOSED ELECTRIC LINE
PROPOSED ELECTRIC & COMMUNICATIONS LINE
EXISTING WATER LINE
PROPOSED WATER LINE
EXISTING MAJOR CONTOUR LINE
EXISTING MINOR CONTOUR LINE
PROPOSED CONTOUR LINE
EXISTING TREE LINE
PROPOSED TREE LINE
EXISTING SHRUB LINE
PROPOSED SHRUB LINE
EXISTING EDGE OF WETLAND
EXISTING WETLAND AREA
WETLAND BUFFER
EXISTING CONCRETE
PROPOSED CONCRETE
EXISTING CRUSHED STONE
EXISTING PAVEMENT/CONCRETE TO BE REMOVED
PROPOSED STANDARD DUTY PAVEMENT SECTION
PROPOSED HEAVY DUTY PAVEMENT SECTION
PROPOSED BITUMINOUS SIDEWALK
PROPOSED SNOW STORAGE AREA
PROPOSED BUFFER ENHANCEMENT AREA
APPROXIMATE LIMIT OF WORK
APPROXIMATE LIMIT OF SAWCUT
PROPOSED SILT SOCK
EXISTING UTILITY POLE
EXISTING UTILITY POLE & GUY WIRE
EXISTING UTILITY POLE W/LIGHT
EXISTING UTILITY POLE STUMP
PROPOSED LIGHT POLE BASE
EXISTING SIGN
PROPOSED SIGN
EXISTING IRON PIPE/ROD FOUND
EXISTING POST
EXISTING BOLLARD
PROPOSED BOLLARD
EXISTING FIRE HYDRANT
PROPOSED FIRE HYDRANT
WATER GATE VALVE
PROPOSED WATER GATE VALVE
EXISTING GAS GATE VALVE
EXISTING GAS REGULATOR
EXISTING VENT PIPE
EXISTING TELEPHONE BOX
EXISTING UTILITY BOX
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
EXISTING DRAIN MANHOLE
PROPOSED DRAIN MANHOLE
EXISTING ELECTRIC MANHOLE
EXISTING SEWER MANHOLE
EXISTING DECIDUOUS TREE
PROPOSED LANDSCAPING
EXISTING TREE STUMP
BORING LOCATION
TEST PIT LOCATION
EXISTING SURVEYED SPOT GRADE
APPROX EXISTING SPOT GRADE
PROPOSED SPOT GRADE
CONC. CONCRETE
TH THRESHOLD ELEVATION
VGC VERTICAL GRANITE CURB
VBB SLOPED BITUMINOUS BERM
SWL SINGLE WHITE LINE
DYL DOUBLE YELLOW LINE

Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

PATRICK M. CRIMMINS No. 15378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

SCALE IN FEET 0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

GENERAL NOTES, ABBREVIATIONS, AND LEGEND SHEET

SCALE: AS SHOWN

G-101

Last Save Date: May 17, 2022, 4:19 PM By: ASELLAR
Plot Date: Monday, May 23, 2022, 2:16 PM By: Alexander Sellar
T&B File Location: J:\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 RRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: G-101

Tighe&Bond

DOUCET SURVEY
GRID (NAD83)

PROTECT EXISTING TREES WITHIN RIGHT OF WAY(TYP)

APPROXIMATE LIMIT OF WORK (TYP)

EXISTING TREE TO BE REMOVED (COORDINATE WITH THE CITY'S TREES AND GREENERY COMMITTEE)

EXISTING TREE TO BE REMOVED (COORDINATE WITH THE CITY'S TREES AND GREENERY COMMITTEE)

APPROXIMATE LIMIT OF SAWCUT (TYP)

EXISTING HYDRANT TO BE REMOVED AND SALVAGED (COORDINATE WITH THE CITY)

PORTION OF EXISTING 24" RCP TO BE REMOVED

BEGIN SILT SOCK

APPROXIMATE AREA OF TREE CLEARING (TYP)

TAX MAP 234, LOT 7-4A
395,745 Sq. Ft.
9.09 Acres

100' WETLAND BUFFER

50' WETLAND BUFFER

25' WETLAND BUFFER

CONSTRUCT SILT SOCK

APPROXIMATE AREA OF TREE CLEARING (TYP)

PROPOSED LIMIT OF CLEARING (TYP)

ACCESS & UTILITY EASEMENT (SEE NOTE 10C)

APPROXIMATE AREA OF TREE CLEARING (TYP)

APPROXIMATE LIMIT OF SAWCUT (TYP)

END SILT SOCK

SEWER EASEMENT (SEE NOTE 10D)

GAS LINE EASEMENT (SEE NOTE 10B)

ELECTRIC EASEMENT (SEE NOTE 10A)

BORTHWICK AVENUE

BARBERRY LANE

BOSTON & MAINE RAILROAD

TAX MAP 234 LOT 7-3
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03801
R.C.R.D. BK. 4211 PG. 1155

TAX MAP 234 LOT 7-5A
MITCHELL JOSEPH R 94 TR
MITCHELL RUTH V 94 TR
58 FOX PT RD
NEWINGTON, NH 03801
R.C.R.D. BK. 3409 PG. 2525

TAX MAP 234 LOT 7-5B
PAUL R & BREEGAN JOHNSON
92 COAKLEY RD
PORTSMOUTH, NH 03801
R.C.R.D. BK. 5638 PG. 2084

TAX MAP 234 LOT 7-5C
HOWARD STEPHEN A
94 COAKLEY RD
PORTSMOUTH, NH 03801
R.C.R.D. BK. 3399 PG. 661

TAX MAP 240 LOT 2-1
HCA HEALTH SVC OF NH INC
D/B/A PRH 32902
C/O DUCHARME MCMILLEN & ASSOC
PO BOX 80610
INDIANAPOLIS, IN 46280
R.C.R.D. BK. 2784 PG. 1340

TAX MAP 240 LOT 2-1001
CITY OF PORTSMOUTH DPW
PO BOX 628
PORTSMOUTH, NH 03802
R.C.R.D. BK. 2648 PG. 902

TAX MAP 240 LOT 2-2
JACKSON GRAY CONDOS
MASTER CARD
330 BORTHWICK AVE
PORTSMOUTH, NH 03801

TAX MAP 234 LOT 7-7
PUBLIC SERVICE CO OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BK. 5548 PG. 0738

TAX MAP 234 LOT 2
PUBLIC SERVICE CO OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BK. 5548 PG. 0738

POSSIBLE VALVE PAVED OVER

5/8" REBAR SET FLUSH (3/04)

5/8" REBAR SET DOWN 4" (3/06)

31001X2/2Y CROSSWALK 31001X2/2

5/8" REBAR SET UP 5" (3/06)

LIMITS OF CONVENTIONAL ON-THE-GROUND SURVEY DATA COLLECTED DURING SEPTEMBER 2021

(3)CAPPED VERT. PVC PIPES

5/8" REBAR SET UP 5" (3/06)

5/8" REBAR SET UP 4" (3/04)

5/8" REBAR SET FLUSH (3/06)
DSNH 3101X2/1
UTILITY CABINET
EILEEN DONDERO FOLEY AVE

5/8" REBAR SET UP 5" (3/06)

5/8" REBAR SET UP 5" (3/04)

5/8" REBAR SET UP 1" (3/04)

5/8" REBAR SET UP 3" W/ID CAP DOUCET SURVEY LLS

5/8" REBAR SET UP 6" (3/06)

GAS LINE MARKER

12" HDPE W/FES INV.=33.2'

12" HDPE W/FES INV.=33.5'

12" HDPE W/FES INV.=36.4'

12" CIP INV.=31.6'

12" CIP INV.=30.4'

12" CIP INV.=30.2'

12" HDPE W/FES INV.=32.8'

5/8" REBAR SET UP 3" (3/06)

UTILITY ROOM

24" RCP INV.=30.7'

3/4" I.P.F.

1-1/4" I.P.F. UP 4"

3/4" I.P.F. UP 24" IN TREE

26" ELM W/ROW

D.H.F.

PILE

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
5/23/22

PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
5/23/22

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

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PROJECT NO:	P0616-001
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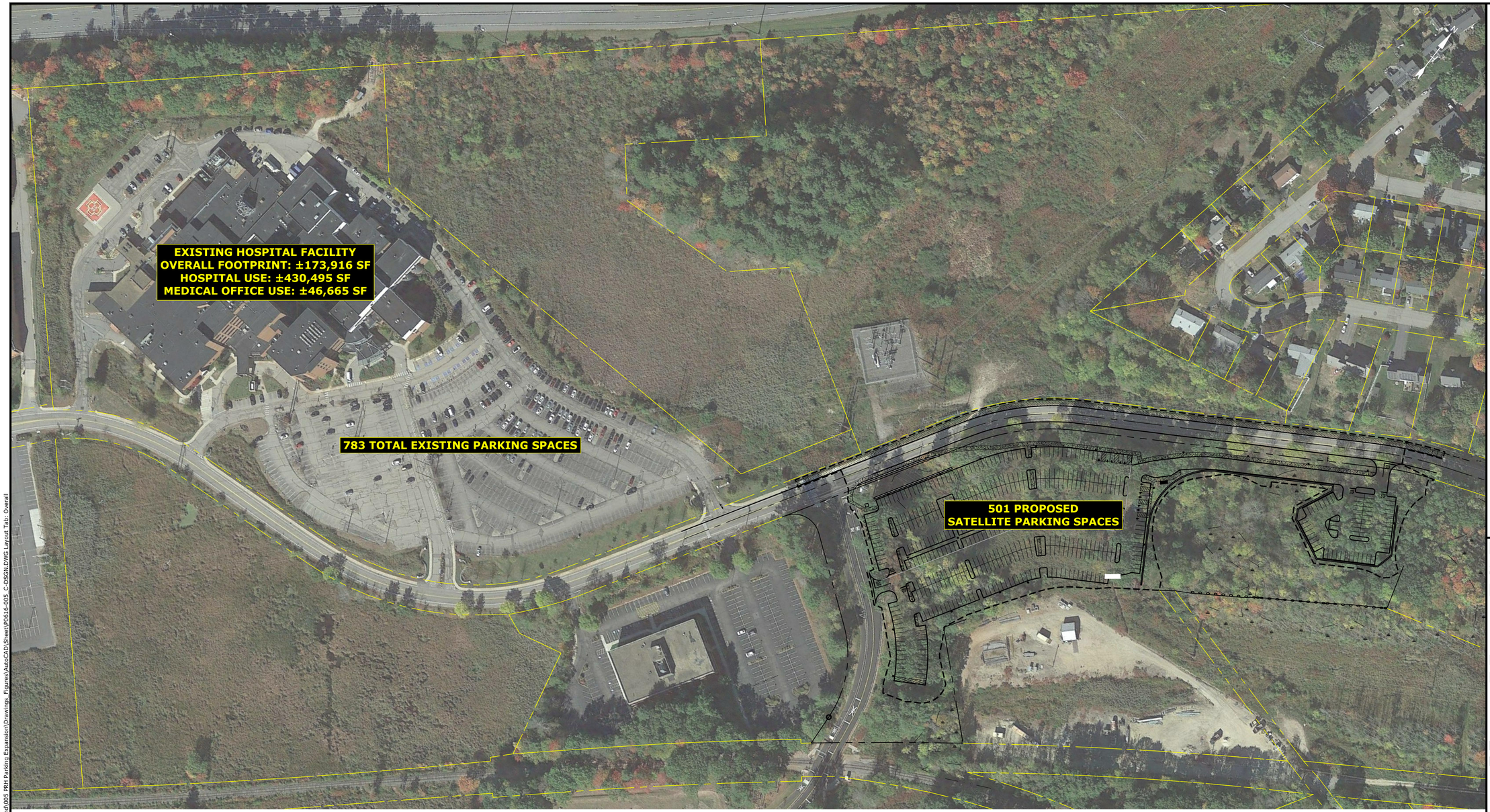
APPROVED:	BLM

DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Save Date: May 17, 2022, 4:18 PM By: ASELLAR
Plot Date: Monday, May 23, 2022, 2:19 PM By: Alexander Sellar
T&B File Location: J:\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: Demo



PARKING REQUIREMENTS:	REQUIRED	PROPOSED
PARKING STALL LAYOUT:		
• STANDARD 90°	8.5' X 19'	8.5' X 19'
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT
MINIMUM SETBACKS:		
• FRONT:	50 FT	35.4 FT (1)

PARKING SPACE REQUIREMENTS:

MEDICAL OFFICE:		
1 SPACE / 250 GFA		
= ±46,665 SF / 250 SF/SPACE =	187 SPACES	
HOSPITAL:		
PER PARKING DEMAND ANALYSIS(2)	965 SPACES	
MINIMUM PARKING:	1,152 SPACES	
		783 EXISTING SPACES
MAXIMUM PARKING(3):	1,382 SPACES	501 PROPOSED SPACES(4)
		1,284 TOTAL SPACES
ACCESSIBLE PARKING REQUIREMENTS:		
PROPOSED SATELLITE PARKING LOT	11 SPACES	11 SPACES

(1) - A VARIANCE WAS GRANTED BY THE ZONING BOARD OF ADJUSTMENT ON FEBRUARY 23, 2022 FROM SECTION 10.113.41 TO ALLOW A 35 FOOT FRONT SETBACK FOR A PARKING LOT WHERE 50 FEET IS REQUIRED
(2) - PARKING DEMAND BASED ON GFA OF THE EXISTING HOSPITAL (±430,495 SF)
(3) - MAXIMUM PARKING EQUALS 120% OF MINIMUM
(4) - INCLUDING 11 ADA SPACES IN THE SATELLITE PARKING LOT PER ADA STANDARDS SECTION 208

Tighe&Bond

STATE OF NEW HAMPSHIRE
BRADLEE MEZQUITA
No. 08830
LICENSED
PROFESSIONAL ENGINEER
5/23/22

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
No. 16378
LICENSED
PROFESSIONAL ENGINEER
5/23/22

SCALE IN FEET
0 100' 200'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

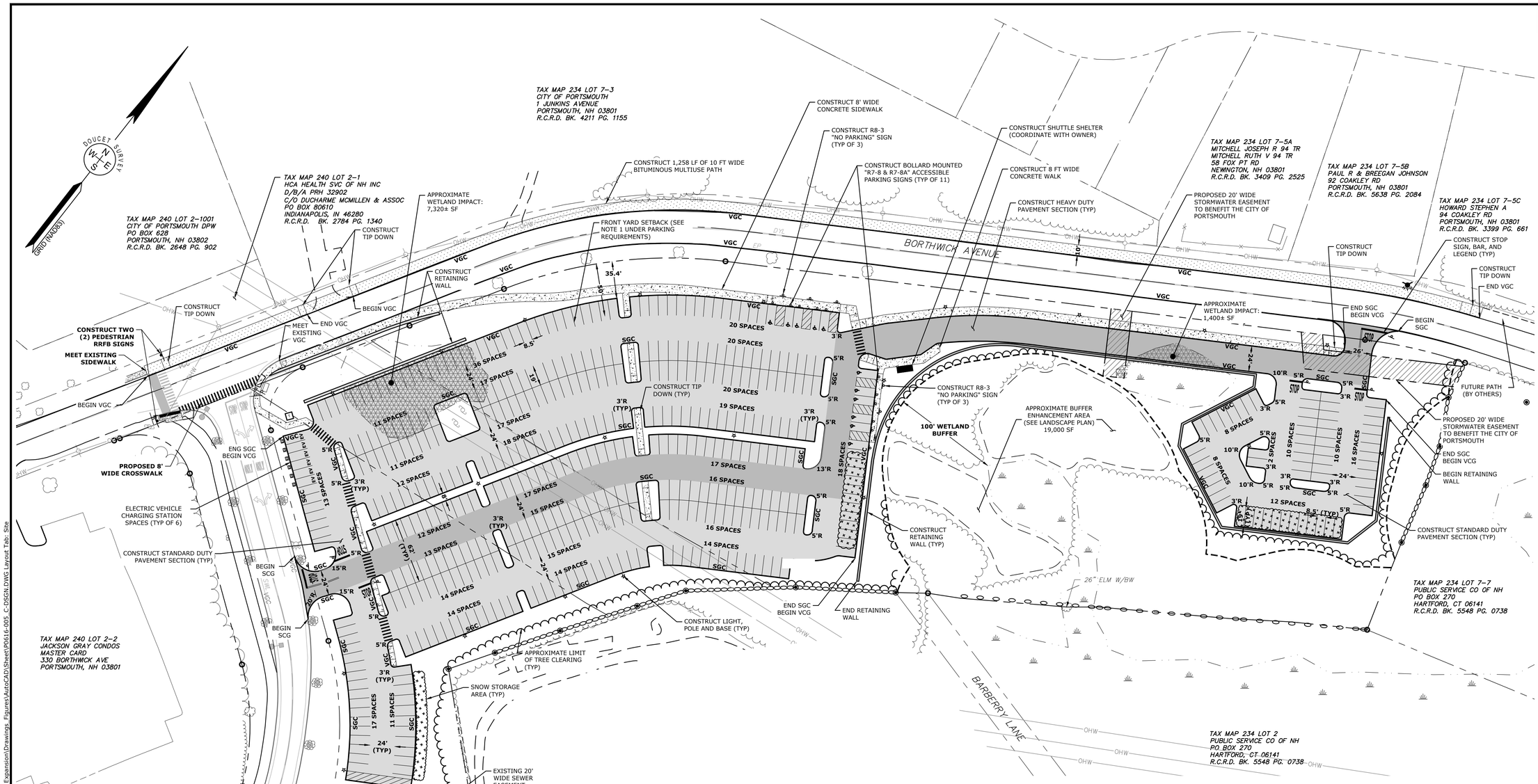
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CML/AFS/MKF
CHECKED:	PMC
APPROVED:	BLM

OVERALL PARKING PLAN

SCALE: AS SHOWN

C-102

Last Save Date: May 17, 2022 4:19 PM By: ASELLAR
Plot Date: Monday, May 23, 2022 7:56 AM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Tab: Overall



PARKING REQUIREMENTS:	REQUIRED	PROPOSED
PARKING STALL LAYOUT:		
• STANDARD 90°	8.5' X 19'	8.5' X 19'
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT
MINIMUM SETBACKS:		
• FRONT:	50 FT	35.4 FT (1)
PARKING SPACE REQUIREMENTS:		
MEDICAL OFFICE:		
1 SPACE / 250 GFA		
= ±46,665 SF / 250 SF/SPACE =	187 SPACES	
HOSPITAL:		
PER PARKING DEMAND ANALYSIS(2)	965 SPACES	
MINIMUM PARKING:	1,152 SPACES	783 EXISTING SPACES
MAXIMUM PARKING(3):	1,382 SPACES	501 PROPOSED SPACES(4)
		1,284 TOTAL SPACES
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PROPOSED SATELLITE PARKING LOT	11 SPACES	11 SPACES

(1) - A VARIANCE WAS GRANTED BY THE ZONING BOARD OF ADJUSTMENT ON FEBRUARY 23, 2022 FROM SECTION 10.113.41 TO ALLOW A 35 FOOT FRONT SETBACK FOR A PARKING LOT WHERE 50 FEET IS REQUIRED
(2) - PARKING DEMAND BASED ON GFA OF THE EXISTING HOSPITAL (±430,495 SF)
(3) - MAXIMUM PARKING EQUALS 120% OF MINIMUM
(4) - INCLUDING 11 ADA SPACES IN THE SATELLITE PARKING LOT PER ADA STANDARDS SECTION 208

SITE DATA:
LOCATION:TAX MAP 0234, LOT 0007-004A
BORTHWICK AVENUE & EILEEN DONDERO FOLEY AVENUE
PORTSMOUTH, NH 03801

ZONING DISTRICTS:OFFICE RESEARCH
WETLAND

ALLOWED USE: SATELLITE PARKING LOT (1)

(1) - A SPECIAL EXCEPTION WAS GRANTED BY THE ZONING BOARD OF ADJUSTMENT ON FEBRUARY 23, 2022 FROM SECTION 10.1113.112 TO ALLOW A PARKING LOT ON ANOTHER LOT IN THE SAME OWNERSHIP

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROPOSED
MINIMUM LOT AREA:	3 ACRES	±9.09 ACRES
MINIMUM STREET FRONTAGE:	300 FT	±1,313 FT
MINIMUM SETBACKS:		
• FRONT:	50 FT	N/A
• SIDE:	75 FT	N/A
• REAR:	50 FT	N/A
MAXIMUM BUILDING HEIGHT:	30 FT	N/A
MAXIMUM BUILDING COVERAGE:	30%	0 %
MINIMUM OPEN SPACE:	25%	±56.5%

Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
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B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

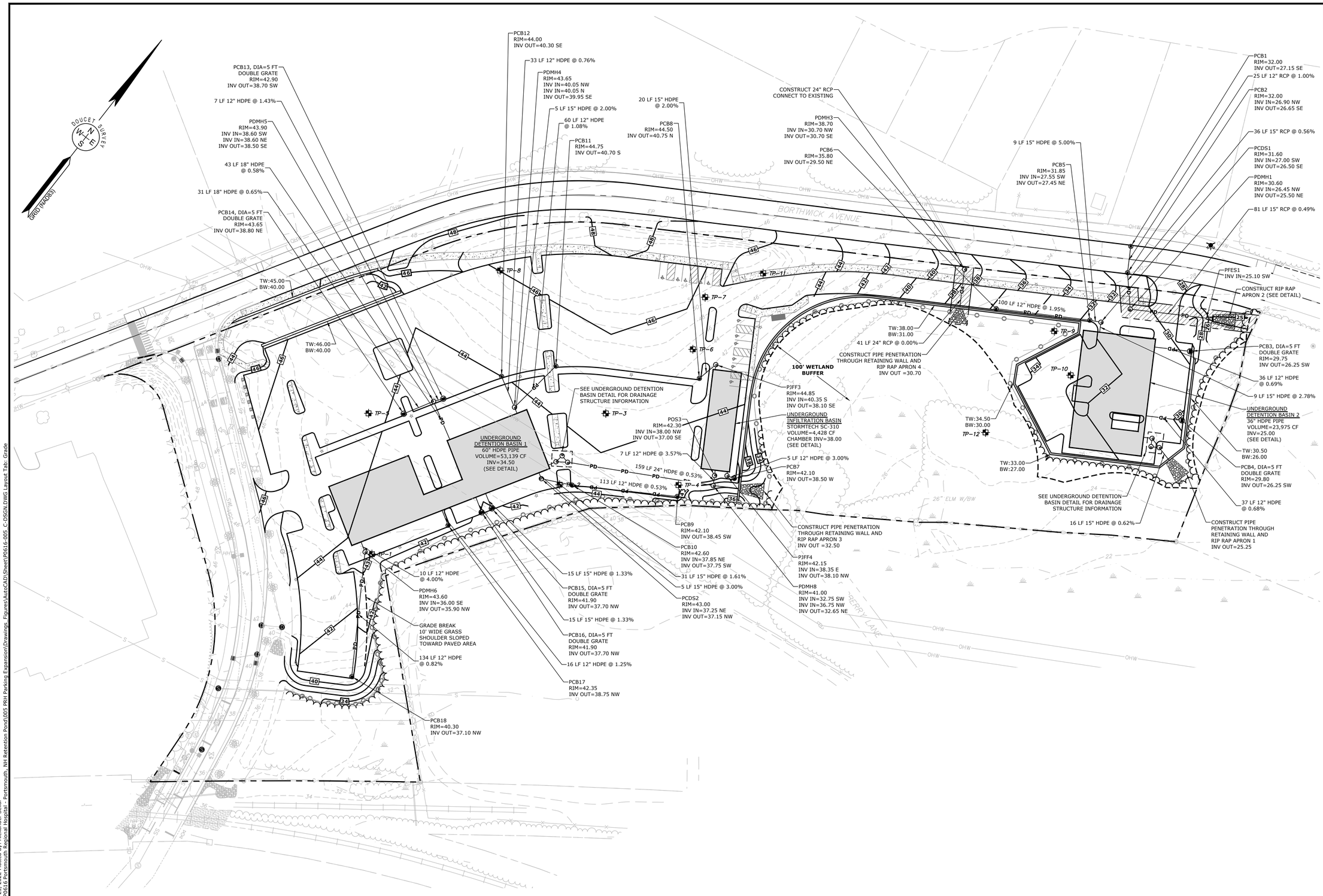
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CML/AFS/MKF
CHECKED:	PMC
APPROVED:	BLM

SITE PLAN

SCALE: AS SHOWN

C-102.1

Last Save Date: May 17, 2022, 4:18 PM By: ASELLAR
Plot Date: Tuesday, May 17, 2022, 4:20 PM By: Andrew Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: Site



Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

PATRICK M. CRIMMINS No. 15378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth,
New Hampshire

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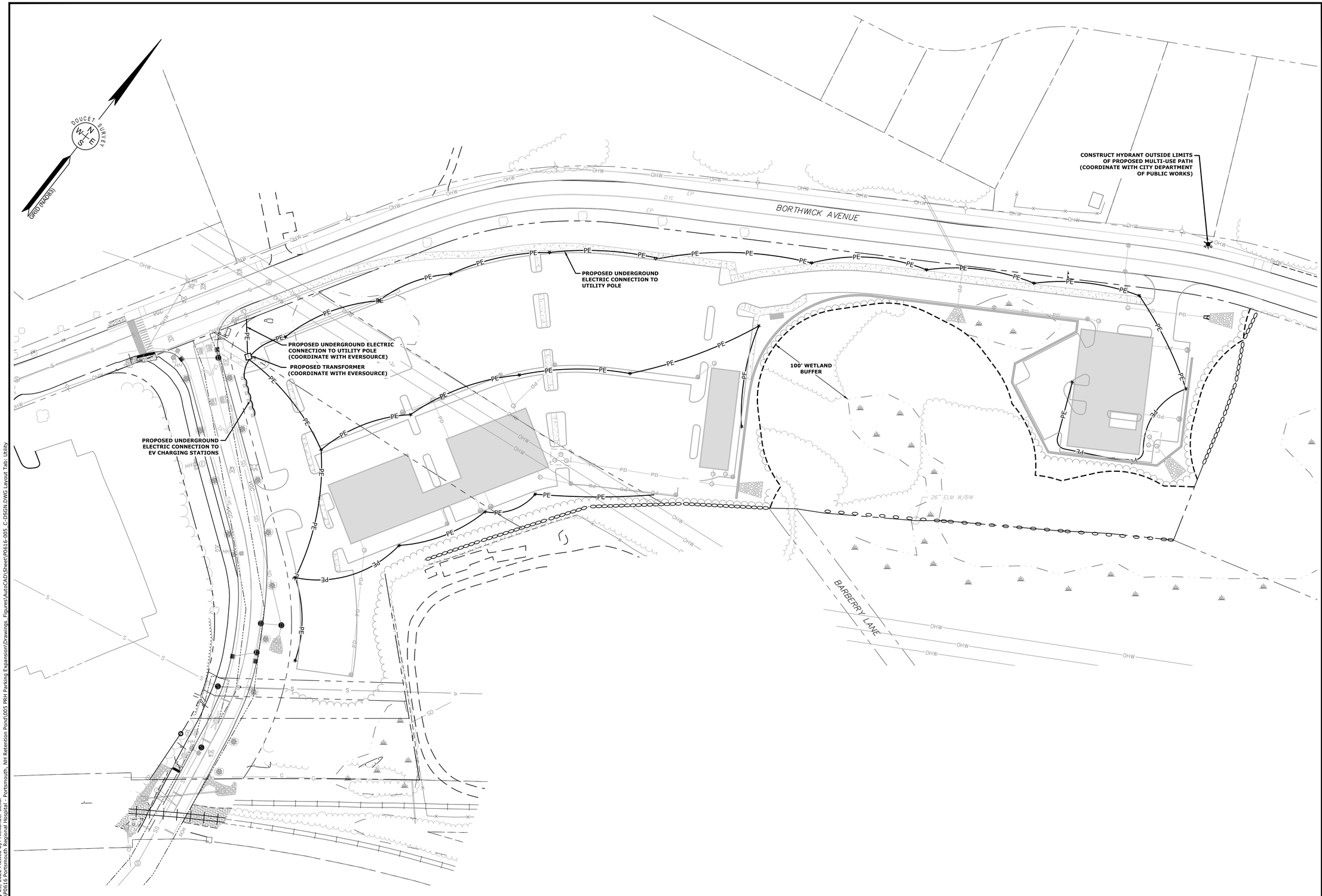
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

GRADING, DRAINAGE, & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Save Date: May 17, 2022 4:19 PM By: ASELLAR
Plot Date: May 17, 2022 4:19 PM By: Alexander Sellar
T&B File Location: J:\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: Grade



Tighe&Bond

STATE OF NEW HAMPSHIRE
BRADLEE MEZQUITA
No. 08830
LICENSED PROFESSIONAL ENGINEER
5/23/22

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
5/23/22

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

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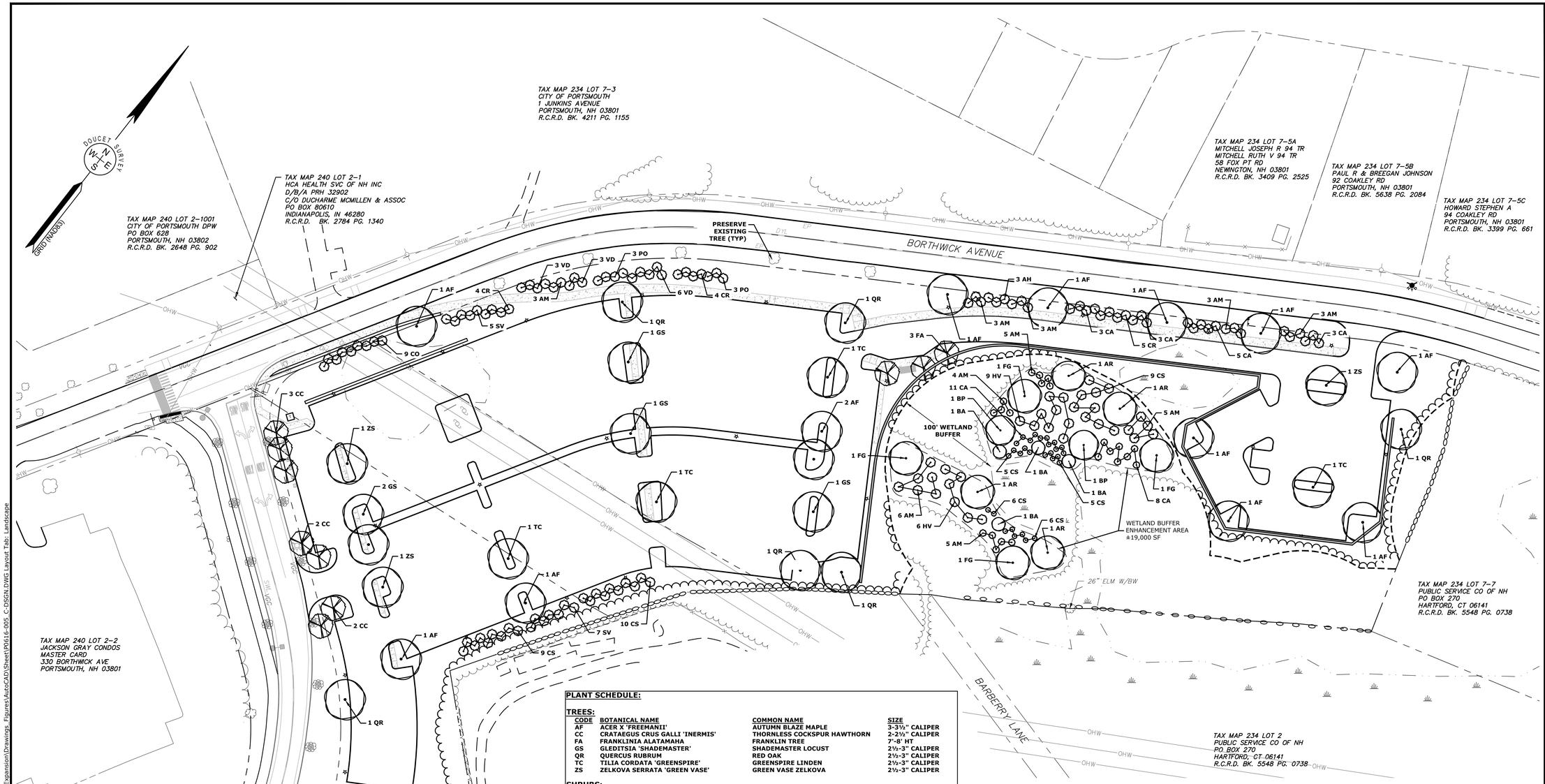
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CML/AFS
CHECKED:	PMC
APPROVED:	BLM

UTILITY PLAN

SCALE: AS SHOWN

C-104

Last Save Date: May 17, 2022 4:19 PM By: ASELLAR
Plot Date/Time: May 23, 2022 12:19 PM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: Utility



PLANT SCHEDULE:

TREES:

CODE	BOTANICAL NAME	COMMON NAME	SIZE
AF	ACER X 'FREEMANII'	AUTUMN BLAZE MAPLE	3-3½" CALIPER
CC	CRATAEGUS CRUS GALLI 'INERMIS'	THORNLESS COCKSPUR HAWTHORN	2-2½" CALIPER
FA	FRANKLINIA ALATAMAHA	FRANKLIN TREE	7'-8' HT
GS	GLEDITSIA 'SHADEMASTER'	SHADEMASTER LOCUST	2½-3" CALIPER
QR	QUERCUS RUBRUM	RED OAK	2½-3" CALIPER
TC	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2½-3" CALIPER
ZS	ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE ZELKOVA	2½-3" CALIPER

SHRUBS:

CODE	BOTANICAL NAME	COMMON NAME	SIZE
AH	CORYLUS AMERICANA	AMERICAN HAZELNUT	5 GAL
AM	ARONIA MELANOCARPA	BLACK CHOKEBERRY	5 GAL
CA	CLETHRA ALNIFOLIA	SUMMER SWEET	5 GAL
CO	CEPHALANTHUS OCCIDENTALIS	BUTTON BUSH	5 GAL
CR	CORNUS RACEMOSA	GRAY DOGWOOD	5 GAL
CS	CORNUS SERICEA 'CARDINAL'	RED TWIG DOGWOOD	5 GAL
PO	PHYSOCARPUS OPULIFOLIUS 'DIABLO'	DIABLO NINEBARK	5 GAL
SV	SYRINGA VULGARIS	COMMON LILAC	5 GAL
VD	VIBURNUM DENTATUM	ARROWWOOD	5 GAL

WETLAND BUFFER ENHANCEMENT PLANTING SCHEDULE:

TREES:

CODE	BOTANICAL NAME	COMMON NAME	SIZE
AR	ACER RUBRUM	RED MAPLE	2-3" CALIPER
FG	FAGUS GRANDIFOLIA	AMERICAN BEECH	2-3" CALIPER
BA	BETULA ALLAGHANIENSIS	YELLOW BIRCH	2-3" CALIPER
BP	BETULA POPULIFOLIA	GREY BIRCH	2-3" CALIPER

SHRUBS:

CODE	BOTANICAL NAME	COMMON NAME	SIZE
AM	ARONIA MELANOCARPA	BLACK CHOKEBERRY	5 GAL
CA	CLETHRA ALNIFOLIA	SUMMER SWEET	5 GAL
CS	CORNUS SERICEA 'CARDINAL'	RED TWIG DOGWOOD	5 GAL
HV	HAMAMELIS VIRGINIANA	WITCH HAZEL	5 GAL

HERBACEOUS SEED MIX

NEW ENGLAND WETLANDS PLANTS - NEW ENGLAND WILDLIFE MIX (OR APPROVED EQUAL)

THE NEW ENGLAND WILDFLOWER MIX PROVIDES A SELECTION OF NATIVE WILDFLOWERS AND GRASSES TO ENSURE THAT A VARIETY OF SPECIES WILL SURVIVE IN CONDITIONS FROM DRY TO MOIST. IT IS AN APPROPRIATE SEED MIX FOR ROADSIDES, COMMERCIAL LANDSCAPING, PARKS, GOLF COURSES, INDUSTRIAL SITES AND AREAS UNDERGOING ECOLOGICAL RESTORATION. THE MIX CAN BE APPLIED BY HYDRO-SEEDING (NO TACKIFIERS), BY MECHANICAL SPREADER, OR BY HAND. LIGHTLY RAKE OR ROLL AFTER SOWING TO INCREASE SEED TO SOIL CONTACT. APPLY ON A CLEAN, WEED FREE SEED BED. BEST RESULTS ARE OBTAINED WITH A SPRING OR LATE FALL DORMANT SEEDING.

APPLICATION RATE: 23 LBS/ACRE | 1900 SQ FT/LB

Tighe&Bond

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

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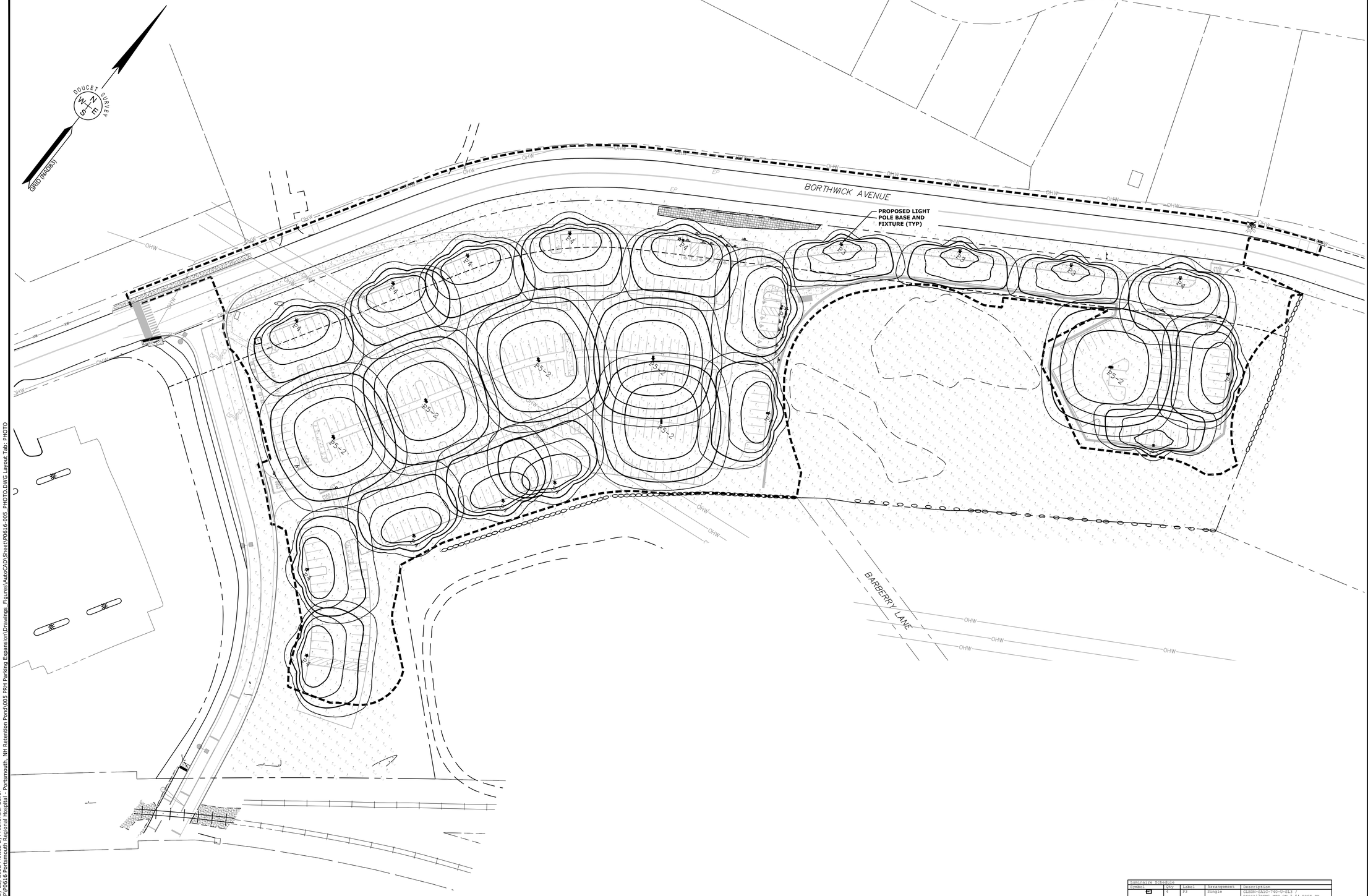
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CML/AFS
CHECKED:	PMC
APPROVED:	BLM

LANDSCAPE PLAN

SCALE: AS SHOWN

C-105

Last Save Date: May 17, 2022 4:19 PM By: ASELLAR
Plot Date: May 23, 2022 2:19 PM By: Andrew Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: Landscape



Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
	4	P3	Single	GLEON-SA1C-740-U-SL3 / SSS4A178FN1 MTD ON 2.5' BASE BY OTHERS (19.5' AOBAFG)
	14	P4	Single	GLEON-SA2C-740-U-SL4 / SSS4A178FN1 MTD ON 2.5' BASE BY OTHERS (19.5' OAH AFG)
	6	P5-2	Back-Back	GLEON-SA2C-740-U-SMQ / SSS4A178FN2 MTD ON 2.5; BASE BY OTHERS (19.5' OAH AFG)

Tighe&Bond

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

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Portsmouth,
New Hampshire

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PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_PHOTO.DWG
DRAWN BY:	MKF
CHECKED:	PMC
APPROVED:	BLM

PHOTOMETRICS PLAN

SCALE: AS SHOWN

C-106

Last Save Date: May 17, 2022 4:50 PM By: ASELLAR
Plot Date/Time: May 23, 2022 4:49 PM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_PHOTO.DWG Layout Tab: PHOTO

GENERAL PROJECT INFORMATION

PROJECT OWNER:	PORTSMOUTH REGIONAL HOSPITAL 333 BORTHWICK AVENUE PORTSMOUTH, NH
PROJECT NAME:	PROPOSED SATELLITE PARKING LOT
PROJECT ADDRESS:	BORTHWICK AVENUE PORTSMOUTH, NH
PROJECT MAP / LOT:	MAP 234 / LOT 7-4A
PROJECT LATITUDE:	43°-03'-56.5"N
PROJECT LONGITUDE:	70°-47'-07.21"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OF A 520 SPOT SATELLITE PARKING LOT TO SERVICE THE EXISTING PORTSMOUTH REGIONAL HOSPITAL. THE WORK IS ANTICIPATED TO START IN FALL 2022, AND BE COMPLETED BY FALL 2023.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 6.24 ACRES.

SOIL CHARACTERISTICS

USCS SITE SPECIFIC SOIL SURVEY CONDUCTED BY TIGHE & BOND INC., ON NOVEMBER 18 & 19, 2021 THE SOILS ON SITE CONSIST OF WOODBRIDGE, BOXFROD,SCITICO, PAXTON, HOLLIS, CHATFIELD AND SCIO SOILS WHICH RANGE FROM WELL DRAINED TO POORLY DRAINED SOILS WITH HYDROLOGIC SOIL GROUP RATING(S) OF B & C.

NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA OVERLAND FLOW TO AN UNNAMED WETLAND AND ULTIMATELY FLOWS TO THE PISCATAQUA RIVER.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

1. CUT AND CLEAR TREES.
2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - DEVELOPMENT OF BORROW PIT AREAS
   - DISPOSAL OF SEDIMENT SPOIL, STUMP AND OTHER SOLID WASTE
   - FLOOD PLAIN EXCAVATION WORK
   - STREAM CHANNEL MODIFICATIONS
   - CONTROL OF DUST
   - CONSTRUCTION OF ACCESS AND HAUL ROAD
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR AND DISPOSE OF DEBRIS.
5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:

1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY 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 INCLUDING BUT NOT LIMITED TO BORTHWICK AVENUE AND ELLEN DONDERO FOLEY AVENUE.

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
CREEPING RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE

   IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.
3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:

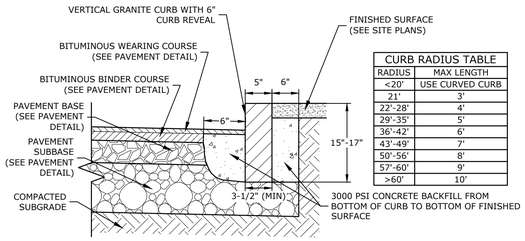
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
      i. ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
      ii. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      iii. SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
      iv. INSPECT FUEL STORAGE AREAS WEEKLY;
      v. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
      vi. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
      vii. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
      viii. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
         (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
         (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
         (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
         (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
         (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
      ix. FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
      HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF
      b. FERTILIZERS:
      i. FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
      ii. ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
      iii. STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
      i. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
      ii. EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
      iii. EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE ENGINEER. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
   A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE ENGINEER 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.

BLASTING NOTES:

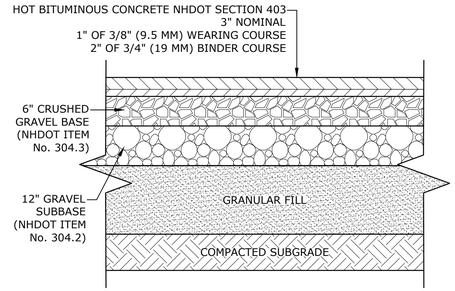
1. CONTRACTOR SHALL CONTACT THE NHDES PRIOR TO COMMENCING ANY BLASTING ACTIVITIES
2. FOR ANY PROJECT FOR WHICH BLASTING OF BEDROCK IS ANTICIPATED, THE APPLICANT SHALL SUBMIT:
   A. A BLASTING PLAN THAT IDENTIFIES:
      a. WHERE THE BLASTING ACTIVITIES ARE ANTICIPATED TO OCCUR;
      b. THE ESTIMATED QUANTITY OF BLAST ROCK IN CUBIC YARDS; AND
      c. SITE-SPECIFIC BLASTING BEST MANAGEMENT PRACTICES.
3. IF MORE THAN 5000 CUBIC YARDS OF BLAST ROCK WILL BE GENERATED AND THERE ARE ONE OR MORE PUBLIC DRINKING WATER WELLS WITHIN 2000 FEET OF THE BLASTING ACTIVITIES, A PLAN TO MONITOR GROUNDWATER TO DETECT ANY CONTAMINATION IN SUFFICIENT TIME TO PROTECT THE WATER SUPPLY WELLS SHALL BE PROVIDED TO THE NHDES. THE GROUNDWATER MONITORING PLAN SHALL INCLUDE:
   A. MONITORING FOR NITRATE AND NITRITE EITHER IN THE DRINKING WATER SUPPLY WELLS OR IN OTHER WELLS THAT ARE REPRESENTATIVE OF THE DRINKING WATER SUPPLY WELLS IN THE AREA:
      a. THE GROUNDWATER SAMPLING PROGRAM MUST BE IMPLEMENTED ONCE APPROVED BY THE NHDES.
   B. THE FOLLOWING BEST MANAGEMENT PROCEDURES FOR BLASTING SHALL BE COMPLIED WITH:
      a. LOADING PRACTICES - THE FOLLOWING BLASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:
      i. DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS;
      ii. EXPLOSIVE PRODUCTS SHALL BE MANAGED ON-SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFF-SITE DISPOSAL;
      iii. SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF-SITE DISPOSAL;
      iv. LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BLASTHOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED;
      v. LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT;
      vi. EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.
      b. EXPLOSIVE SELECTION - THE FOLLOWING BMPS SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUN



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'

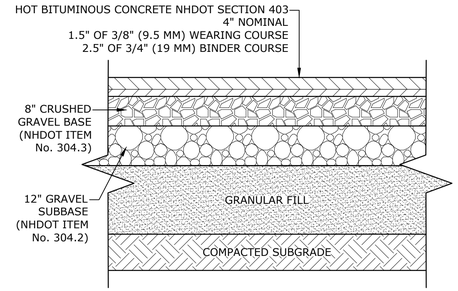
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE 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



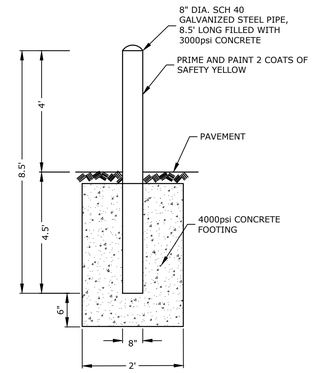
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.
5. CONTRACTOR SHALL CONFIRM THIS PAVEMENT SECTION WITH THE PROJECT'S GEOTECHINCAL ENGINEEER PRIOR TO CONSTRUCTION.

STANDARD DUTY PARKING LOT PAVEMENT SECTION
NO SCALE

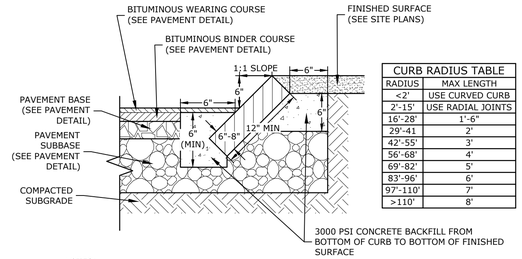


NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.
5. CONTRACTOR SHALL CONFIRM THIS PAVEMENT SECTION WITH THE PROJECT'S GEOTECHINCAL ENGINEEER PRIOR TO CONSTRUCTION.

HEAVY DUTY PARKING LOT PAVEMENT SECTION
NO SCALE



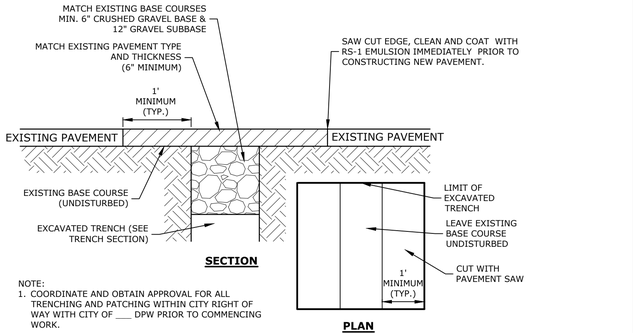
TYPICAL BOLLARD
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

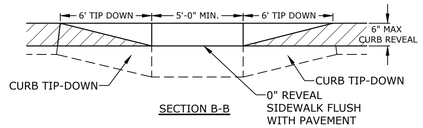
SLOPED GRANITE CURB
NO SCALE



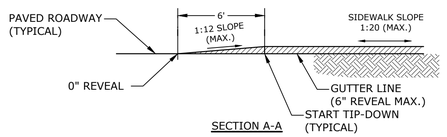
NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF ___ DPW PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE

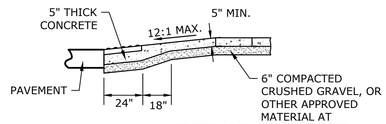
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



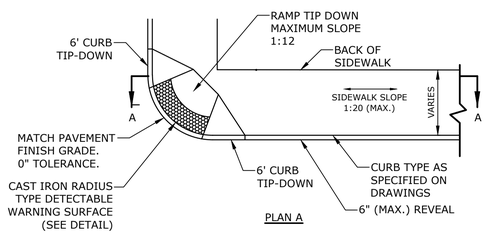
SECTION B-B



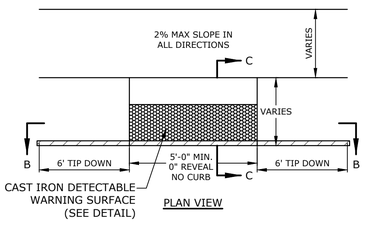
SECTION A-A



SECTION C-C



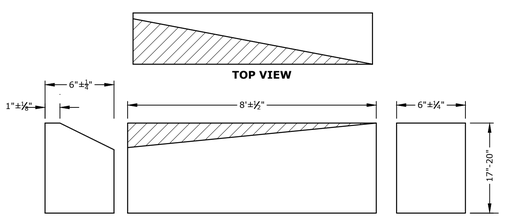
PLAN A



PLAN VIEW

NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
4. PROVIDE DETECTABLE WARNING SURFACES ANYTIME THAT A CURB RAMP, BLENDED TRANSITION, OR LANDING CONNECTS TO A STREET.
5. LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.
6. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
7. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURBLINE.
8. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
9. DETECTABLE WARNING PANELS SHALL BE A MINIMUM OF 2 FEET IN DEPTH. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP, BLENDED TRANSITION, OR LANDING AND THE STREET.
10. THE TEXTURE OF THE DETECTABLE WARNING FEATURE MUST CONTRAST VISUALLY WITH THE SURROUNDING SURFACES (EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT).

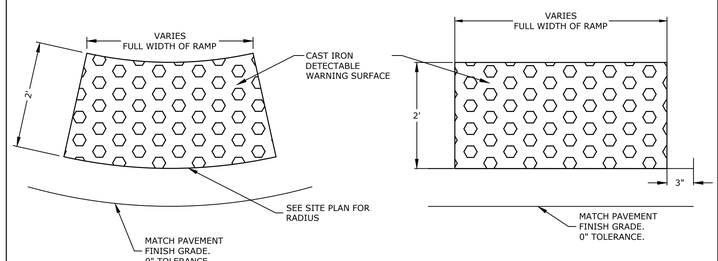
TIP DOWN RAMP
NO SCALE



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



NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
2. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE

Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
5/23/22

PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

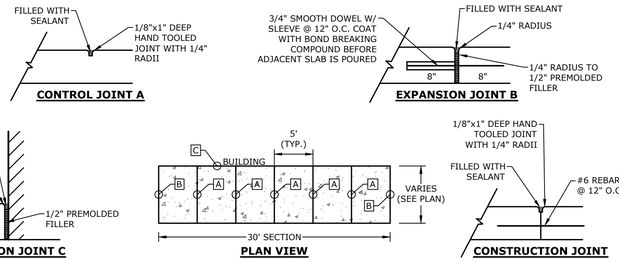
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DETAILS.DWG
DRAWN BY:	MKF
CHECKED:	PMC
APPROVED:	BLM

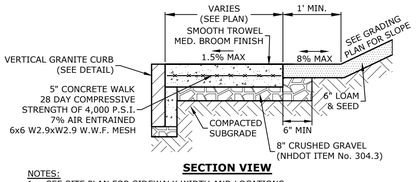
DETAILS SHEET

SCALE: AS SHOWN

C-502

Last Save Date: May 17, 2022 4:27 PM By: ASELLAR
Plot Date: May 17, 2022 4:27 PM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-Details.DWG Layout Tab: C-502



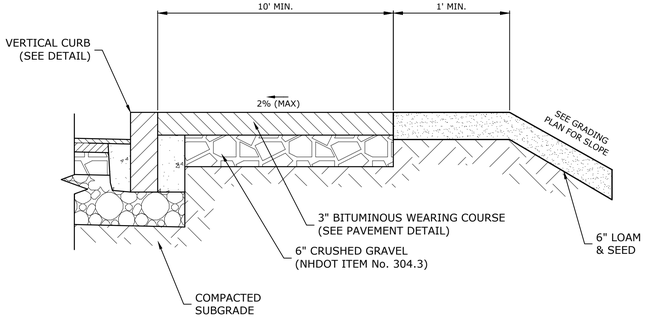


SECTION VIEW

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.

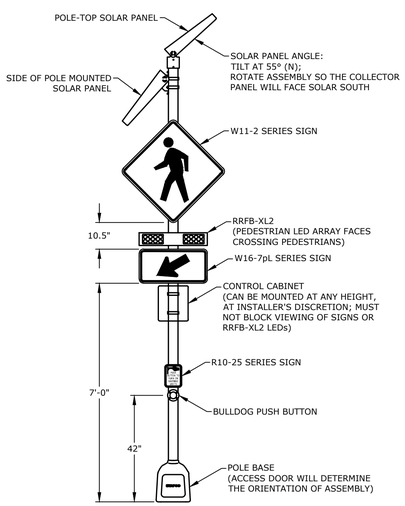
CONCRETE SIDEWALK WITH GRANITE CURB

NO SCALE



MULTI-USE PATH

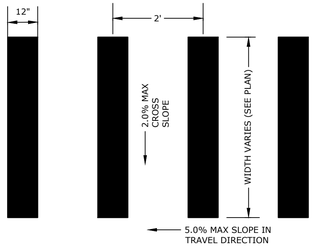
NO SCALE



NOTES:
1. THE POLE AND HOUSING EQUIPMENT SHALL BE THE COLOR BLACK
2. THE POLE DIAMETER SHALL BE 3.5 INCHES

RECTANGULAR RAPID FLASHING BEACON (RRFB)

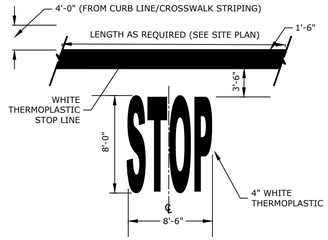
NO SCALE



NOTE:
STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

CROSS WALK STRIPING

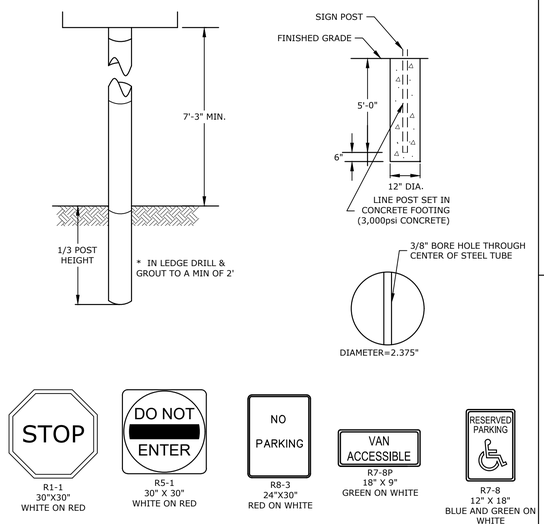
NO SCALE



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

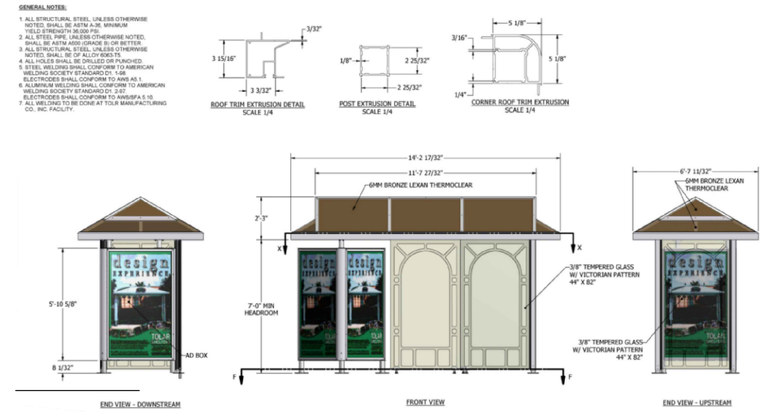
NO SCALE



NOTES:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
FINISH: POST TO BE POWDER COATED GLOSS BLACK
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER (AS REQUIRED)
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070-1080)

SIGN LEGEND & POST

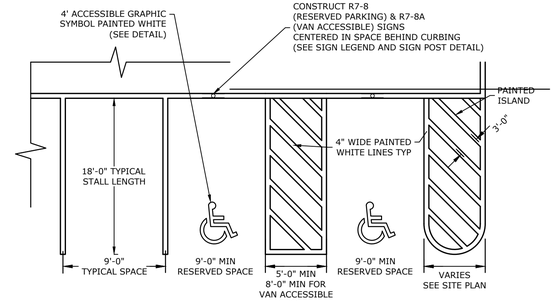
NO SCALE



NOTE:
1. DETAIL SHOWN HEREIN IS ATYPICAL FOR PERMITTING PURPOSED.
2. FINAL BUSH SHELTER TO BE SELECTED BY OWNER PRIOR TO CONSTRUCTION.

TYPICAL BUS SHELTER

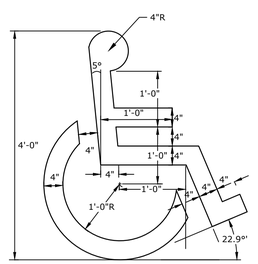
NO SCALE



NOTE:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

PARKING SPACE STRIPING

NO SCALE



NOTES:
1. 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

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER — 5/23/22

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER — 5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
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A	03/22/2022	TAC SUBMISSION

PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DETAILS.DWG
DRAWN BY:	MKF
CHECKED:	PMC
APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

C-503

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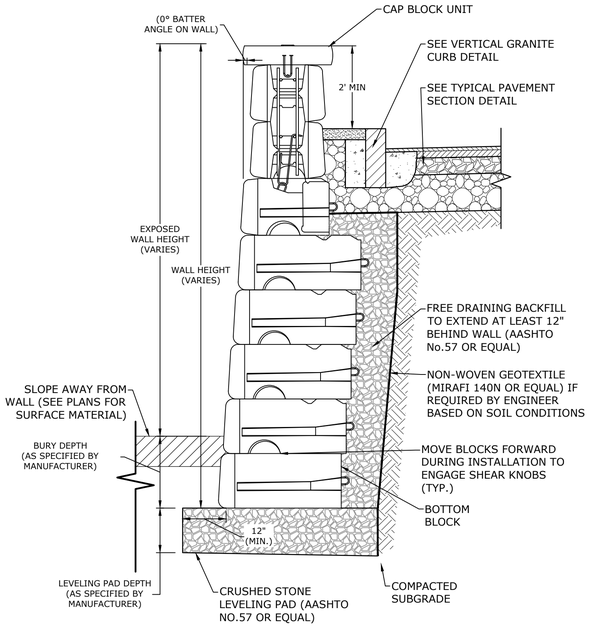
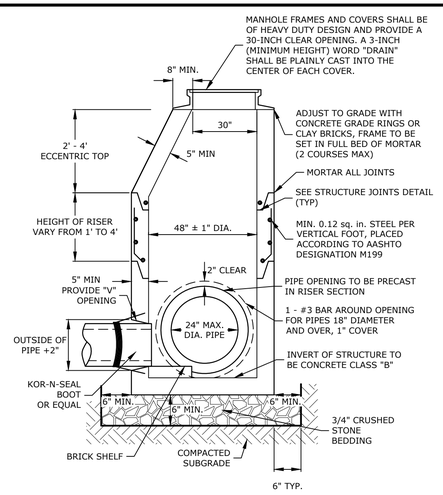


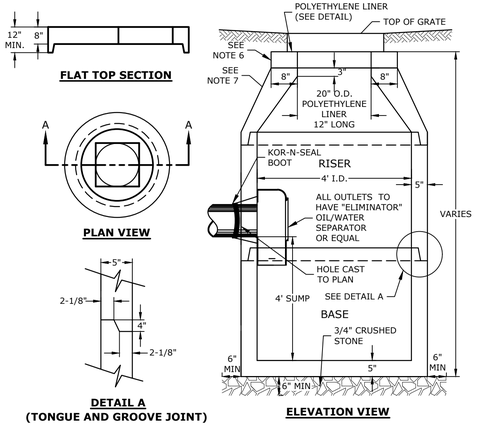
NOTES:
1. RETAINING WALL SHALL BE BY REDI ROCK LEDGESTONE OR APPROVED EQUAL.
2. THE CONTRACTOR SHALL SUBMIT DESIGN AND CALCULATIONS FOR THE RETAINING WALL THAT SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE. CALCULATIONS SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
3. MINIMUM DESIGN PARARMETERS:
   - GLOBAL STABILITY FACTOR OF SAFETY = 1.3
   - OVERTURNING FACTOR OF SAFETY = 2.0
   - SLIDING FACTOR OF SAFETY = 1.5
   - GEOGRID PULLOUT FACTOR OF SAFETY = 1.5
   - SEISMIC FACTOR OF SAFETY = 1.1
4. WALL DESIGNS SHALL CONSIDER EFFECTS OF SLOPE, TRAFFIC LOADS, BUILDING LOADS, GUARDRAIL AND/OR FENCING AS REQUIRED.
5. WALL DESIGN ENGINEER SHALL CONSIDER HEIGHT AND SPECIFY GUARDRAIL WHERE REQUIRED
6. ALL INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION MANUAL AND THE WALL DESIGN ENGINEER'S DESIGN PLANS AND SPECIFICATIONS.
7. THE WALL DESIGN ENGINEER SHALL COMPLETE SUFFICIENT INSPECTIONS DURING CONSTRUCTION TO CERTIFY WORK IS COMPLETED IN ACCORDANCE WITH DESIGN.
8. CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS OF WALL WITH WALL DESIGNER'S CERTIFICATION TO OWNER.
9. CONTRACTOR SHALL DIRECT SURFACE RUNOFF AWAY FROM THE WALL DURING CONSTRUCTION.
10. ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT OR OTHER SURFACE TREATMENT SHALL BE INSTALLED IN THE AREA OF THE WALL IMMEDIATELY AFTER THE WALL IS COMPLETE OR OTHER MEASURES SHALL BE TAKEN TO PROTECT THE WALL FROM RUNOFF.
11. CONTRACTOR SHALL SUPPLY SAMPLE TO THE OWNER FOR APPROVAL PRIOR TO WALL CONSTRUCTION.

TYPICAL EXTENDED BLOCK RETAINING WALL SECTION
NO SCALE



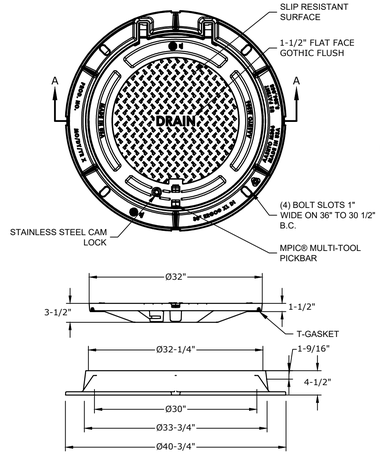
NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL 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



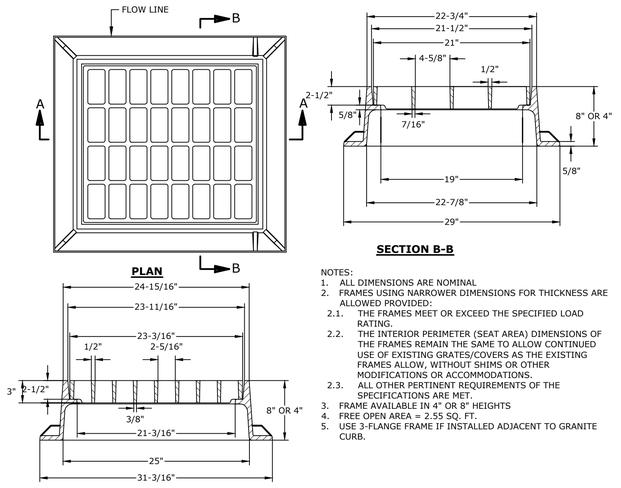
NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 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



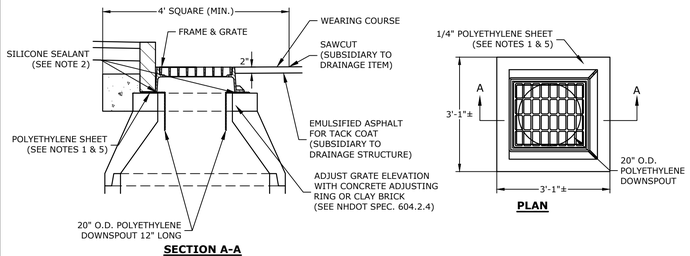
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN 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



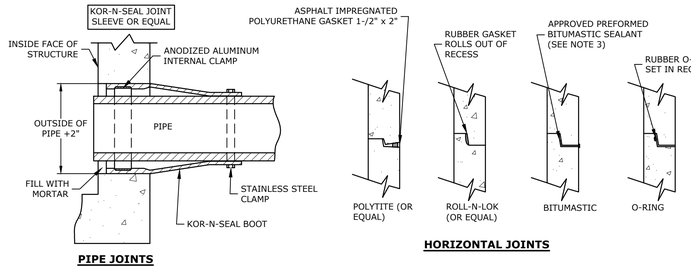
NOTES:
1. ALL DIMENSIONS ARE NOMINAL
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   2.1. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   2.2. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS 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. 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



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

Tighe&Bond

BRADLEE MEZQUITA No. 08530 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DETAILS.DWG
DRAWN BY:	MKF
CHECKED:	PMC
APPROVED:	BLM

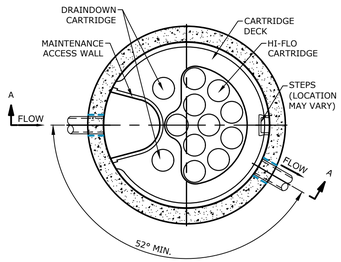
DETAILS SHEET

SCALE: AS SHOWN

C-504

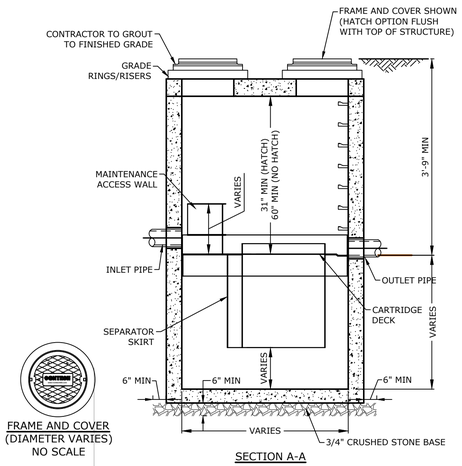
Last Save Date: May 17, 2022 4:27 PM By: ASELLAR
Plot Date: May 17, 2022 4:27 PM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-Details.DWG Layout Tab: C-504

UNIT MODEL SCHEDULE	
PJFF1	4-1-1
PJFF2	4-2-1
PJFF3	4-1-1
PJFF4	4-1-1



PLAN VIEW

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media and bypass condition	One (1) time annually and after any rainfall event exceeding 2.5" in a 24-hr period	Maintenance required for any of the following: - >4" of sediment on the vault floor - >1/4" of sediment on top of the cartridge - .4" of static water above the cartridge bottom more than 24 hours after a rain event - If pore space between media is absent. - If vault is in bypass condition during an average rainfall event.
Replace Cartridges	As required by inspection, 1–5 years.	- Remove filter cartridges per manufacturer methods. - Vacuum sediment from vault. - Install new cartridges per manufacturer methods



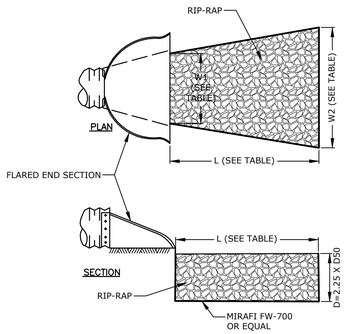
SECTION A-A

FRAME AND COVER (DIAMETER VARIES)
NO SCALE

GENERAL NOTES:
1. TREATMENT UNIT SHALL BE CONTECH JELLYFISH FILTER UNIT OR APPROVED EQUAL.
2. CONTECH TO PROVIDE FINAL DIMENSIONS BASED ON APPROVED FLOWS AND ALL MATERIALS UNLESS NOTED OTHERWISE.
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOADING REQUIREMENTS. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. CONTRACTOR SHALL PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
B. CONTRACTOR SHALL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
C. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

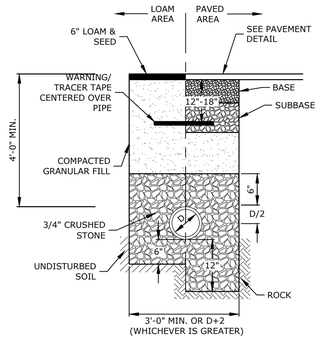
PROPOSED CIRCULAR JELLYFISH FILTER (JFF) UNIT
NO SCALE



FIELD ELEVATIONS					
	WIDTH OF APRON (W_1, FT)	WIDTH OF APRON (W_2, FT)	LENGTH OF APRON (L, FT)	MEDIAN DIAMETER (FT)	MINIMUM DEPTH (FT)
RRA 1	6	20	14	0.50	1.13
RRA 2	6	30	24	0.50	1.13
RRA 3	6	21	15	0.50	1.13
RRA 4	6	22	16	0.50	1.13

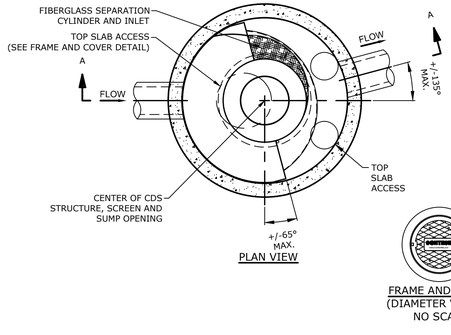
NOTES:
1. STONE SIZE AND MAT DIMENSIONS DETAILED ON PLANS.
2. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
3. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.

RIP-RAP APRON DETAIL
NO SCALE

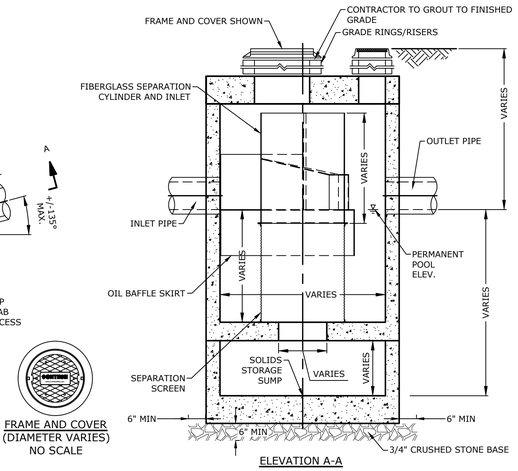


NOTE:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

STORM DRAIN TRENCH
NO SCALE



PLAN VIEW



FRAME AND COVER (DIAMETER VARIES)
NO SCALE

ELEVATION A-A

GENERAL NOTES:
1. PRE-TREATMENT UNIT SHALL BE CONTECH CONTINUOUS DEFLECTIVE SEPARATION (CDS) UNIT OR APPROVED EQUAL.
2. CONTECH TO PROVIDE FINAL DIMENSIONS BASED ON APPROVED FLOWS AND ALL MATERIALS UNLESS NOTED OTHERWISE.
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
4. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING.
5. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES:
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE CONSIDERED BY THE CONTRACTOR PRIOR TO INSTALLATION.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN ON GRADING PLAN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

UNIT MODEL SCHEDULE	
PCDS1	1515-3
PCDS2	1515-3

PROPOSED CONTINUOUS DEFLECTIVE SEPARATION (CDS) UNIT
NO SCALE

Tighe&Bond

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

PROJECT NO:	P0616-001
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CHECKED:	PMC
APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

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Plot Date: Monday, May 23, 2022 4:27 PM By: Alexander Sellar
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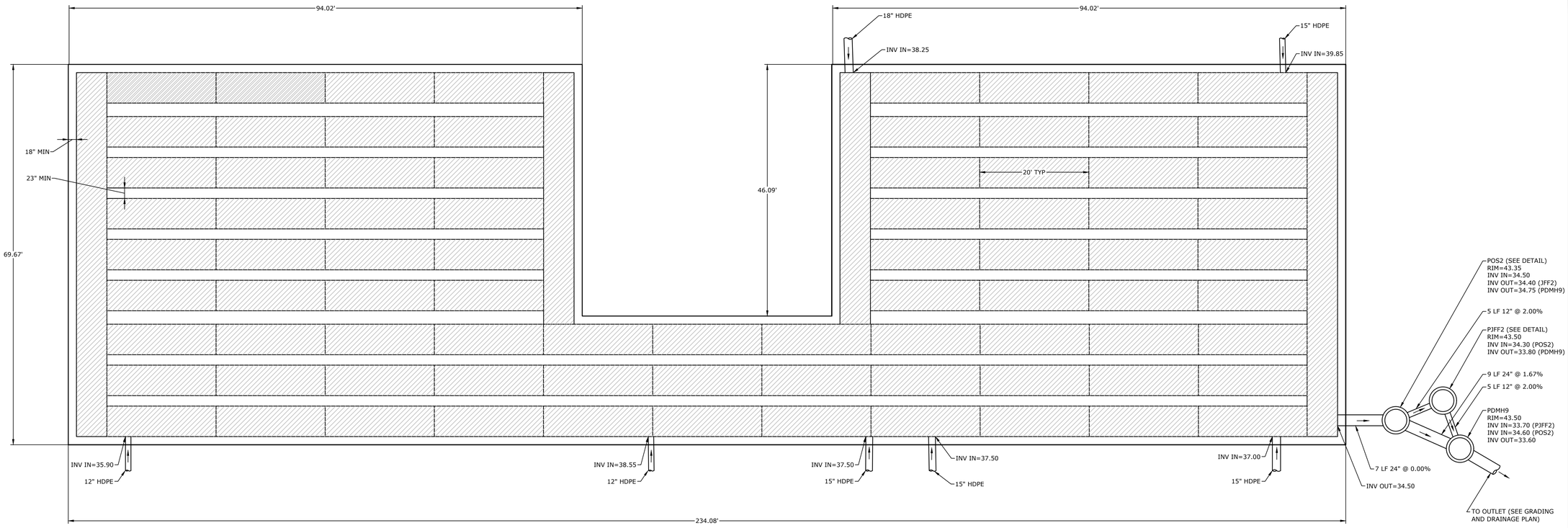
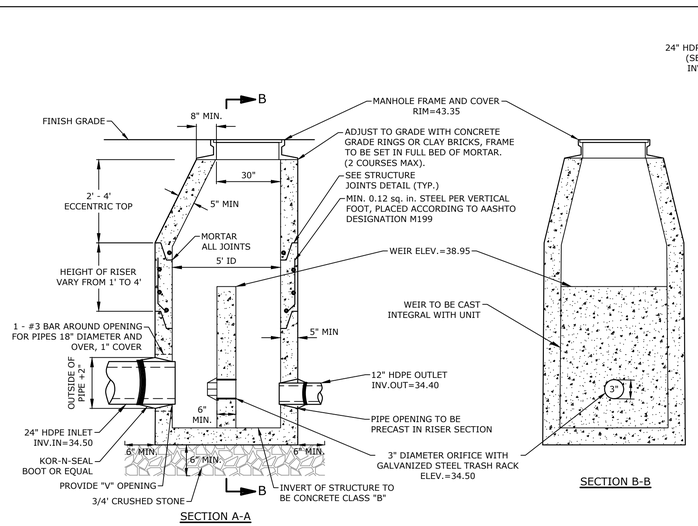
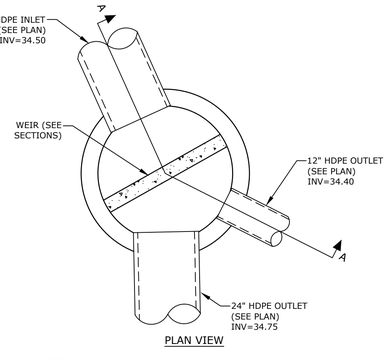




SECTION A-A

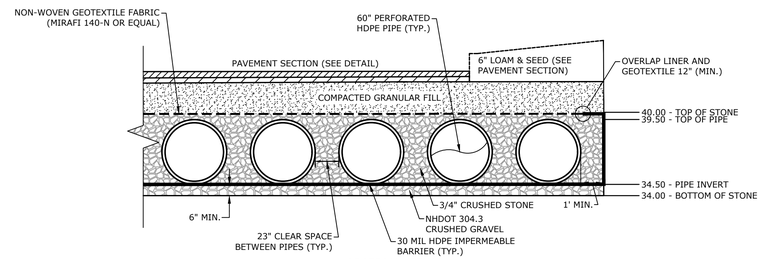


PLAN VIEW

SECTION B-B

OUTLET STRUCTURE (POS2)
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.
11. SEE DRAINAGE MANHOLE DETAIL FOR MORE INFORMATION (CORE HOLE SIZE, MINIMUM FLOOR AND WALL THICKNESS, ETC.)



SECTION VIEW

Underground Infiltration/Detention System Inspection/Maintenance Requirements

Inspection/ Maintenance	Frequency	Action
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catch Basins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

NOTE:
1. THE UNDERGROUND INFILTRATION BASIN (UIB) SYSTEM SHALL BE HIGH DENSITY POLYETHYLENE PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURES DESIGN TO ENGINEER FOR REVIEW AND APPROVAL.
2. THE CONTRACTOR SHALL 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 PROPOSED DESIGN PLAN.
4. THE DESIGN SHALL REQUIRE INSPECTION PORTS/COVERS SUCH THAT SYSTEM CAN BE CLEANED BY VACUUM TRUCK WITH A MINIMUM OF ONE IN EACH CORNER. (FINAL LOCATIONS TO BE COORDINATED PRIOR TO CONSTRUCTION)

60" HDPE UNDERGROUND DETENTION BASIN (UDB-1) DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
BRADLEE MEZQUITA
No. 08830
LICENSED PROFESSIONAL ENGINEER
5/23/22

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
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B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

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CHECKED:	PMC
APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

C-506

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Plot Date: May 17, 2022 4:28 PM By: Alexander Sellar
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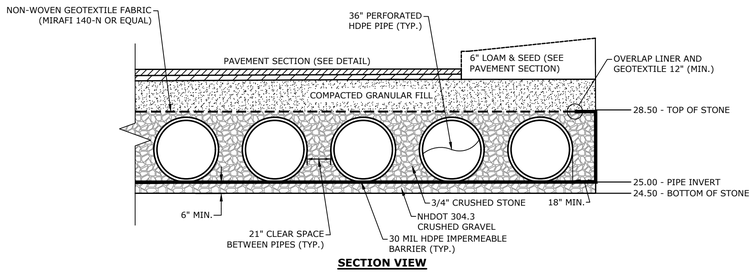
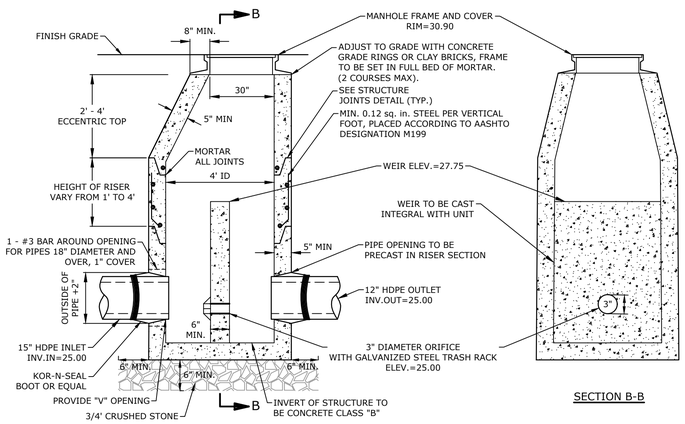


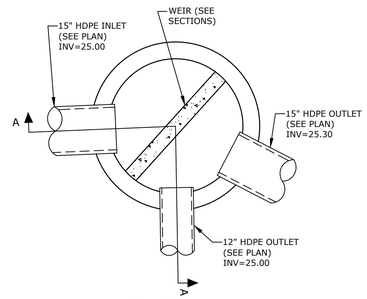
SECTION VIEW

Underground Infiltration/Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catch Basins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

NOTE:
1. THE UNDERGROUND INFILTRATION BASIN (UIB) SYSTEM SHALL BE HIGH DENSITY POLYETHYLENE PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURES DESIGN TO ENGINEER FOR REVIEW AND APPROVAL.
2. THE CONTRACTOR SHALL 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 PROPOSED DESIGN PLAN.
4. THE DESIGN SHALL REQUIRE INSPECTION PORTS/COVERS SUCH THAT SYSTEM CAN BE CLEANED BY VACUUM TRUCK WITH A MINIMUM OF ONE IN EACH CORNER. (FINAL LOCATIONS TO BE COORDINATED PRIOR TO CONSTRUCTION)



SECTION A-A

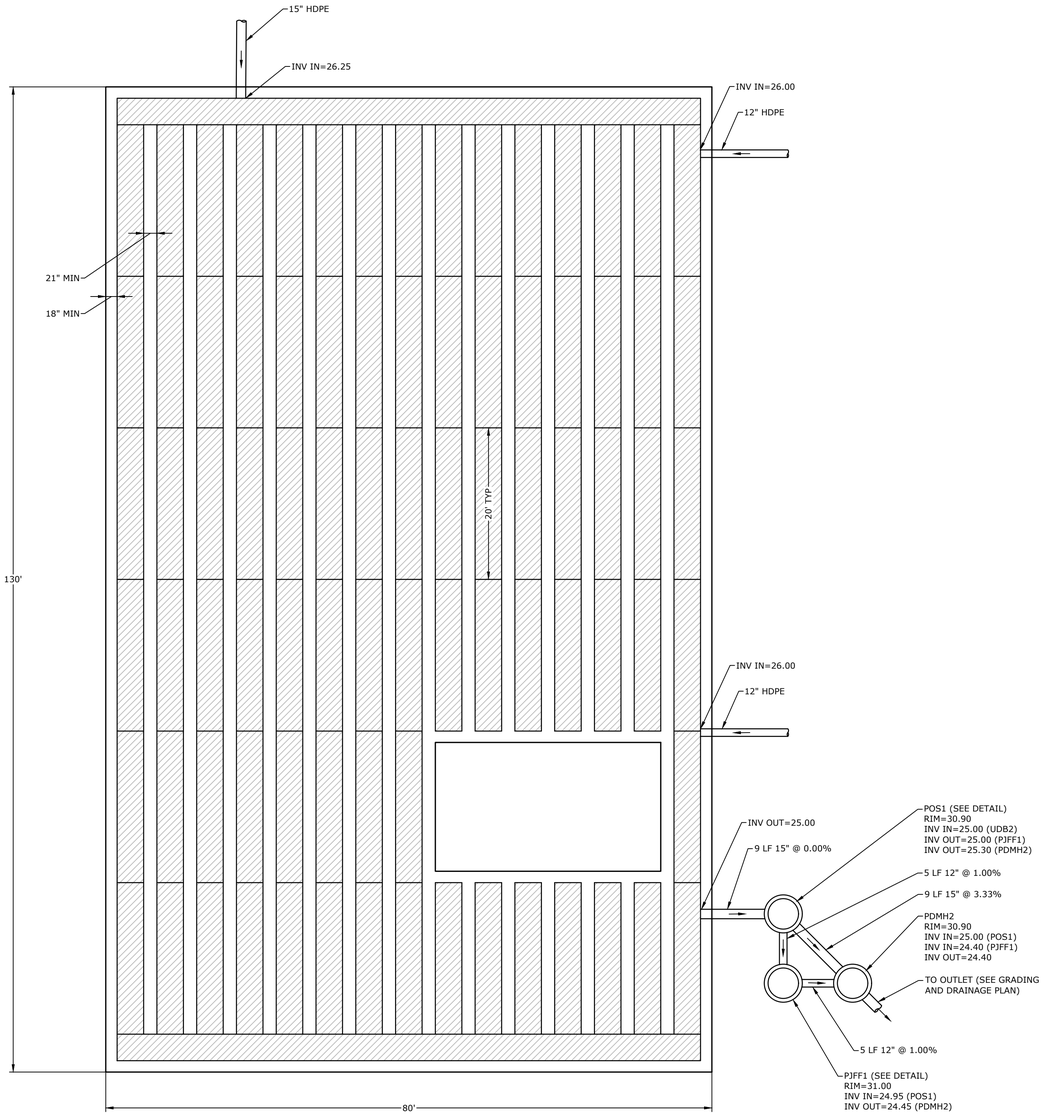


PLAN VIEW

SECTION B-B

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.
11. SEE DRAINAGE MANHOLE DETAIL FOR MORE INFORMATION (CORE HOLE SIZE, MINIMUM FLOOR AND WALL THICKNESS, ETC.)

OUTLET STRUCTURE (POS1)
NO SCALE



36" HDPE UNDERGROUND DETENTION BASIN 2 (UDB-2) DETAIL
NO SCALE

Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
5/23/22

PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
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APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

C-507

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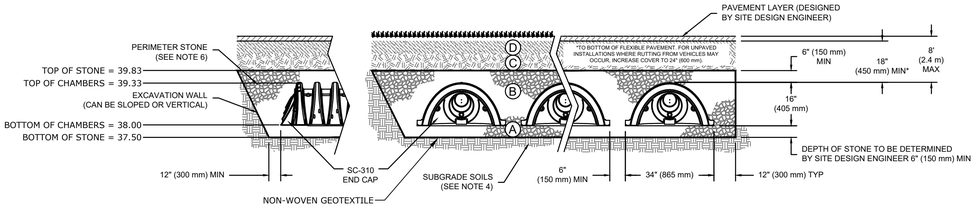
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-Details.DWG Layout Tab: C-507

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2 3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740, SC-310, OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.^]
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".^]
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   - 7.1. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   - 7.2. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   - 7.3. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

NOTES FOR CONSTRUCTION EQUIPMENT^]

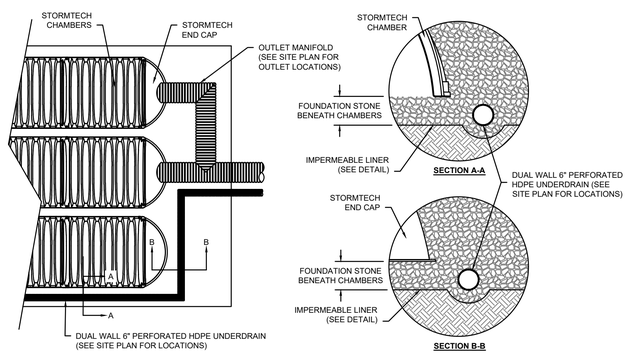
1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".^]
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".^]
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

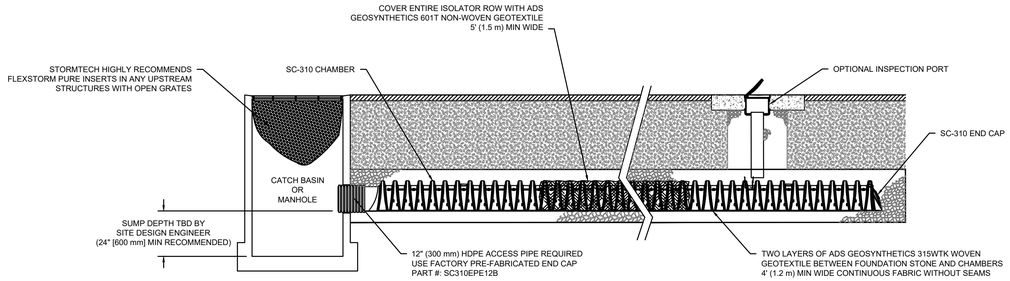
CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.^]
2. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".^]
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.^] STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.^]
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.^]
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.^]
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.^]
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).^]
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.^]
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.



UNDERDRAIN DETAIL
NTS



SC-310 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE/OPEN COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

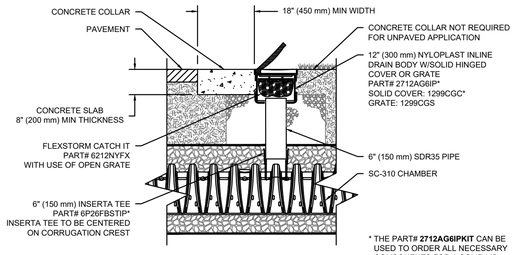
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

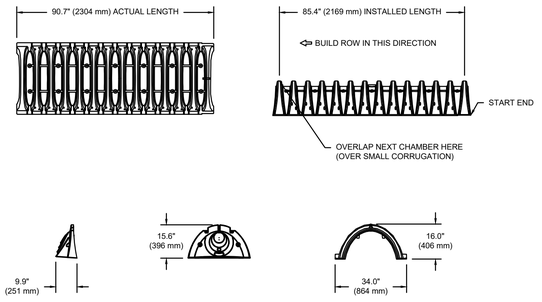
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

SC-310 6" INSPECTION PORT DETAIL
NTS

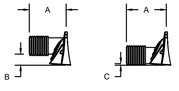
SC-310 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER — 5/23/22

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 16378 LICENSED PROFESSIONAL ENGINEER — 5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

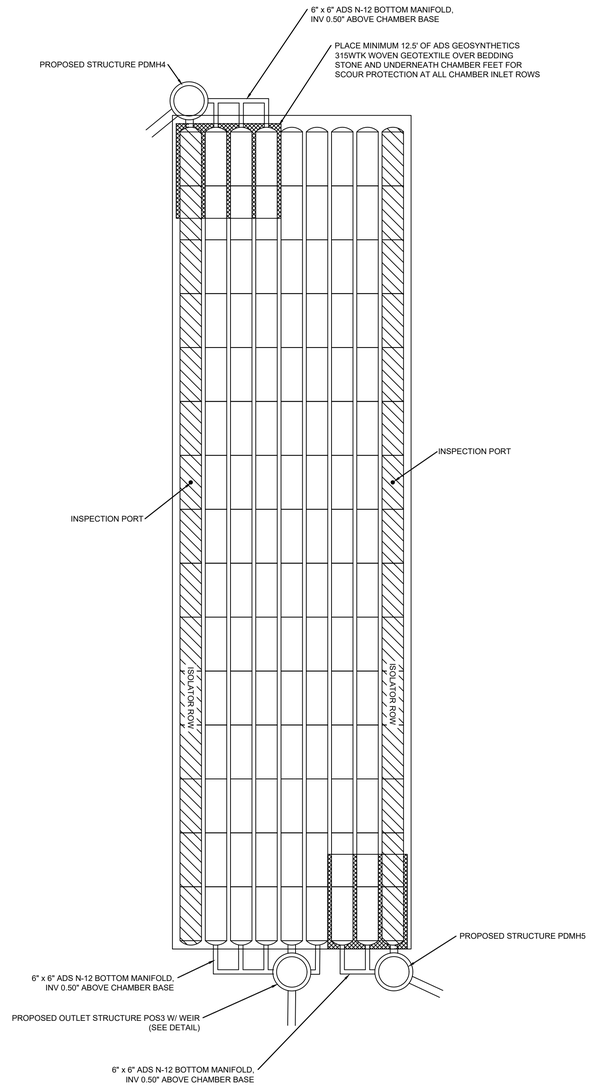
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DETAILS.DWG
DRAWN BY:	MKF
CHECKED:	PMC
APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

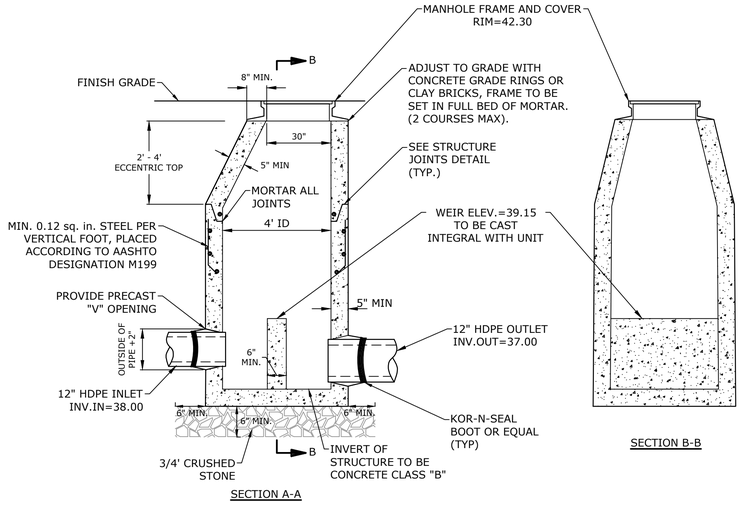
C-508

Last Save Date: May 17, 2022 4:27 PM By: ASELLAR
Plot Date: May 17, 2022 4:27 PM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 RRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_C-Details.DWG Layout Tab: C-508

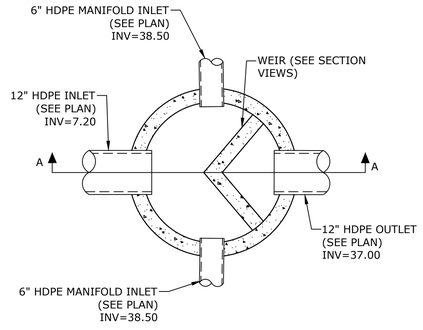


UNDERGROUND DETENTION LAYOUT
(135) STORMTECH SC-310 CHAMBERS
(18) STORMTECH SC-310 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 4,428 CF
AREA OF SYSTEM: 3,465 **FT²**
PERIMETER OF SYSTEM: 283 **FT**

UNDERGROUND INFILTRATION BASIN
STORMTECH SC-310 CHAMBER LAYOUT
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.
11. SEE DRAINAGE MANHOLE DETAIL FOR MORE INFORMATION (CORE HOLE SIZE, MINIMUM FLOOR AND WALL THICKNESS, ETC.)



PLAN VIEW

OUTLET STRUCTURE DETAIL (POS3)
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
BRADLEE MEZQUITA
No. 08830
LICENSED
PROFESSIONAL ENGINEER
5/23/22

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
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Proposed Satellite Parking Lot

Portsmouth Regional Hospital

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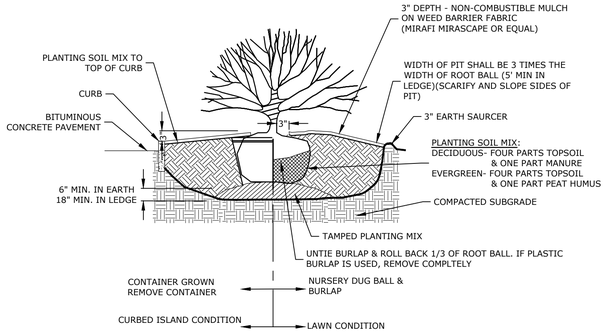
DETAILS SHEET

SCALE: AS SHOWN

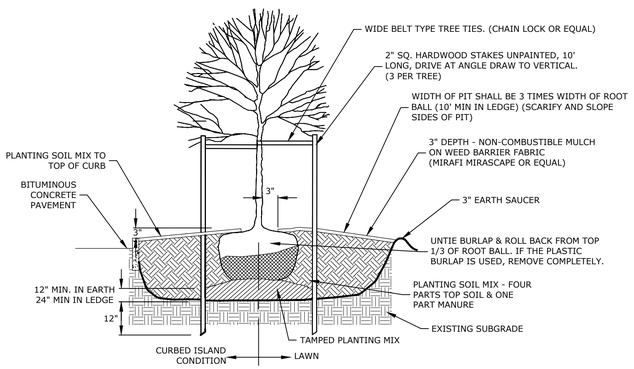
C-509

Last Save Date: May 17, 2022 4:27 PM By: ASELLAR
Plot Date: Tuesday, May 23, 2022 Plotted By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 RRH Parking Expansion\Drawings_ Figures\AutoCAD\Sheet\P0616-005_C-Details.DWG Layout Tab: C-509



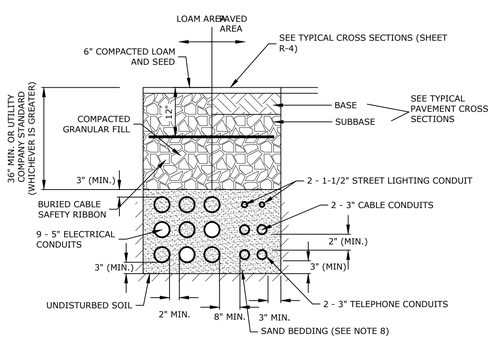
NOTES:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

SHRUB PLANTING
NO SCALE



NOTES:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

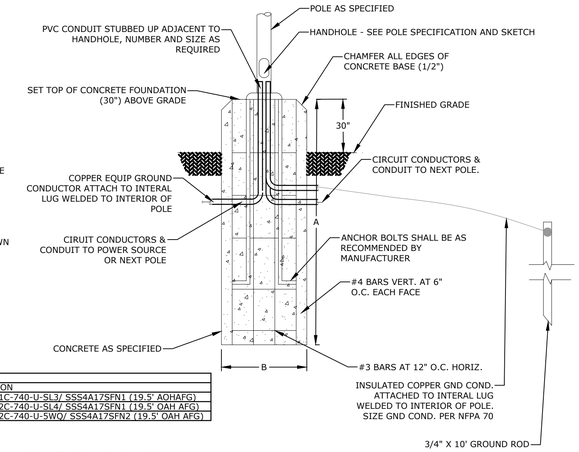
DECIDUOUS TREE PLANTING
NO SCALE



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.

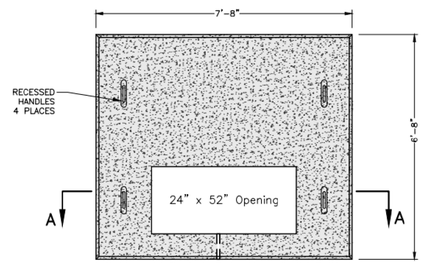
TYPICAL ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE

NOTES:
1. ALL LIGHT POLES, LUMINAIRES, AND WIRE TO BE FURNISHED AND INSTALLED BY THE POWER COMPANY. UNLESS OTHERWISE DIRECTED.
2. ANCHOR BOLTS, GROUND ROD & GROUND WIRE TO BE FURNISHED BY THE POWER COMPANY AND INSTALLED BY THE CONTRACTOR, UNLESS OTHERWISE DIRECTED.
3. BOLT CIRCLE DIAMETER SHALL BE VERIFIED WITH THE POWER COMPANY.
4. ALL BASES SHALL BE LOCATED 10'-0" (TO CENTER) FROM FACE OF CURB OR EDGE OF PAVED SHOULDER, UNLESS OTHERWISE NOTED.
5. REINFORCEMENT SHALL CONFORM TO SECTION 544 OF THE STANDARD SPECIFICATIONS.
6. ANY ANCHOR BOLTS DAMAGED DURING INSTALLATION SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER.
7. UPON INSTALLATION, ANCHOR BOLT THREADS SHALL BE CLEANED WITH A WIRE BRUSH.
8. TERRAIN SURROUNDING BASE MUST BE GRADED AS SHOWN IN DETAIL "A" TO PREVENT IMPACTING VEHICLES FORM SNAGGING ON BASE.

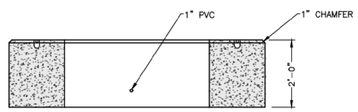


LUMINAIRE SCHEDULE				
SYMBOL	QTY	LABEL	ARRANGEMENT	DESCRIPTION
	3	P3	SINGLE	GLEON-SA1C-740-U-SL3/ SSS4A17SFN1 (19.5' AOHAFG)
	15	P4	SINGLE	GLEON-SA2C-740-U-SL4/ SSS4A17SFN1 (19.5' OAH AFG)
	5	P5-2	BACK-BACK	GLEON-SA2C-740-U-SWQ/ SSS4A17SFN2 (19.5' OAH AFG)

LIGHT POLE BASE
NO SCALE



PLAN



SECTION A–A

NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

3-PHASE TRANSFORMER PAD
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MEZQUITA No. 08830 — LICENSED PROFESSIONAL ENGINEER — 5/23/22

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 12378 — REGISTERED PROFESSIONAL ENGINEER — 5/23/22

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/23/2022	AOT SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

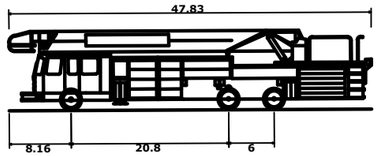
PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_C-DETAILS.DWG
DRAWN BY:	MKF
CHECKED:	PMC
APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

C-510

Last Save Date: May 17, 2022 4:27 PM By: ASELLAR
Plot Date: Monday, May 23, 2022 7:27 AM By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_C-Details.DWG Layout Tab: C-510



LEGEND

WHEEL BASE

OVERHANG

Portsmouth Fire Truck	
Overall Length	**47.830ft**
Overall Width	**8.500ft**
Overall Body Height	**10.432ft**
Min Body Ground Clearance	**0.862ft**
Track Width	**8.000ft**
Lock-to-lock time	**6.00s**
Max Steering Angle (Virtual)	**38.00°**

PROPOSED SATELLITE PARKING LOT
BORTHWICK AVE
PORTSMOUTH, NEW HAMPSHIRE

FIRE TRUCK TURNING PLAN

BORTHWICK AVENUE

EILEEN DONDERO FOLEY AVE

STOP

0 80' 160'

GRAPHIC SCALE

Tighe&Bond

MAY 12, 2022
P0616-005_FIRE.DWG

Last Save Date: April 20, 2022 12:12 PM By: ASELLAR
Plot Date: Wednesday, May 11, 2022 Plotted By: Alexander Sellar
X&B File Location: J:\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet P0616-005_FIRE.DWG Layout Tab: FIRE

Steel Poles

SSS SQUARE STRAIGHT STEEL

Catalog #		**Type**
Project		
Comments		**Date**
Prepared by		

FEATURES

- ASTM Grade steel base plate with ASTM A366 base cover
- Hand hole assembly 3" x 5" on 5" and 6" pole; and 2" x 4" on 4" pole
- 10'-39' mounting heights
- Drilled or tenon (specify)

DESIGN CONSIDERATIONS

Wind induced vibrations resulting from steady, unidirectional winds and other aerodynamic forces, as well as vibration and coefficient of height factors for non-grounded mounted installations (e.g., installations on bridges or buildings) are not included in this document. The information contained herein is for general guidance only and is not a replacement for professional judgement. Consult with a professional, and local and federal standards, before ordering to ensure product is appropriate for the intended purpose and installation location. Also, please review Eaton's Light Pole White Paper for risk factors and design considerations. Learn more.

Specifications and dimensions subject to change without notice. Consult your lighting representative at Eaton or visit www.eaton.com/lighting for available options, accessories and ordering information.

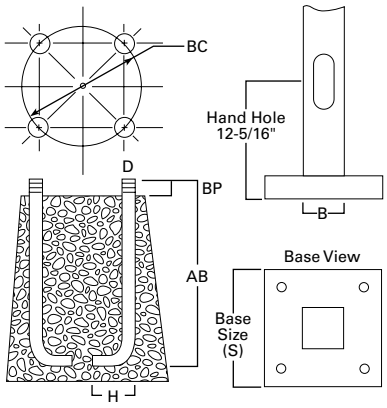
ORDERING INFORMATION

SAMPLE NUMBER: SSA5A20SFM1XG

Product Family	Shaft Size (Inches)[1]	Wall Thickness (Inches)	Mounting Height (Feet)	Base Type	Finish	Mounting Type	Number and Location of Arms	Arm Lengths (Feet)	Options (Add as Suffix)
SSS=Square Straight Steel	**4**=4" **5**=5" **6**=6"	**A**=0.120" **M**=0.188" **X**=0.250"	**10**=10' **15**=15' **20**=20' **25**=25' **30**=30' **35**=35' **39**=39'	**S**=Square Steel Base	**F**=Dark Bronze **G**=Galvanized Steel **J**=Summit White **K**=Carbon Bronze **L**=Dark Platinum **R**=Hartford Green **S**=Silver **T**=Graphite Metallic **V**=Grey **W**=White **X**=Custom Color **Y**=Black	**2**=2-3/8" O.D. Tenon (4" Long) **3**=3-1/2" O.D. Tenon (5" Long) **4**=4" O.D. Tenon (6" Long) **9**=3" O.D. Tenon (4" Long) **6**=2-3/8" O.D. Tenon (6" Long) **7**=4" O.D. Tenon (10" Long) **A**=Type A Drilling **C**=Type C Drilling **E**=Type E Drilling **F**=Type F Drilling **G**=Type G Drilling **J**=Type J Drilling **K**=Type K Drilling **M**=Type M Drilling **N**=Type N Drilling **R**=Type R Drilling **S**=Standard Upsweep Arm **Z**=Type Z Drilling	**1**=Single **2**=2 at 180° **3**=Triple[2] **4**=4 at 90° **5**=2 at 90° **X**=None	**X**=None **2**=2' **3**=2.5' **4**=4' **6**=6' **8**=8'	**A**=1/2" Tapped Hub[3] **B**=3/4" Tapped Hub[3] **C**=Convenience Outlet[4] **E**=GFCI Convenience Outlet[4] **G**=Ground Lug **H**=Additional Hand Hole[5] **V**=Vibration Dampener

NOTES: 1. All shaft sizes nominal. **2.** Square poles are 3 at 90°, round poles are 3 at 120°. **3.** Tapped Hub is located 5' below the pole top and on the same side of pole as hand hole, unless specified otherwise. **4.** Outlet is located 4' above base and on same side of pole as hand hole, unless specified otherwise. Receptacle not included, provision only. **5.** Additional hand hole is located 12" below pole top and 90° from standard hand hole location, unless otherwise specified.

DIMENSIONS



See technical information.

Effective Projected Area (At Pole Top)

Mounting Height (Feet)	Catalog Number [1, 2]	Wall Thickness (Inches)	Base Square [3] (Inches)	Bolt Circle Diameter (Inches)	Anchor Bolt Projection [3] (Inches)	Shaft Size [3] (Inches)	Anchor Bolt Diameter x Length x Hook (Inches)	Net Weight (Pounds)	Maximum Effective Projected Area (Square Feet) [4]				Max. Fixture Load - Includes Bracket (Pounds)
MH			**S**	**BC**	**BP**	**B**	**D x AB x H**		**80 mph**	**90 mph**	**100 mph**	**110 mph**	
10	SSS4A10S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	85	30.0	22.0	17.0	13.0	100
15	SSS4A15S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	118	15.0	11.5	8.7	6.5	100
20	SSS4A20S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	150	8.7	5.9	3.9	2.5	150
20	SSS5A20S	0.120	10-1/2	11	4-1/2	5	3/4 x 25 x 3	183	15.4	11.1	7.9	5.5	150
25	SSS4A25S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	181	3.7	1.7	0.3	--	200
25	SSS5A25S	0.120	10-1/2	11	5	5	3/4 x 25 x 3	222	9.3	6.0	3.5	1.6	200
25	SSS6A25S	0.120	12-1/2	12-1/2	5	6	1 x 36 x 4	284	9.9	6.1	3.5	1.2	200
30	SSS5A30S	0.120	10-1/2	11	4-1/2	5	3/4 x 25 x 3	260	4.7	2.1	--	--	200
30	SSS5M30S	0.188	10-1/2	11	4-1/2	5	3/4 x 25 x 3	392	10.4	6.4	3.5	1.5	200
30	SSS6A30S	0.120	12-1/2	12-1/2	5	6	1 x 36 x 4	330	4.3	1.4	--	--	200
30	SSS6M30S	0.188	12-1/2	12-1/2	5	6	1 x 36 x 4	489	19.0	13.0	8.7	5.6	200
35	SSS5M35S	0.188	10-1/2	11	4-1/2	5	3/4 x 25 x 3	453	5.8	2.8	--	--	200
35	SSS6M35S	0.188	12-1/2	12-1/2	5	6	1 x 36 x 4	564	12.8	7.2	3.7	1.0	200
35	SSS6X35S	0.250	12-1/2	12-1/2	5	6	1 x 36 x 4	738	16.5	11.0	6.8	3.5	200
39	SSS6M39S	0.188	12-1/2	12-1/2	5	6	1 x 36 x 4	618	7.3	3.0	--	--	300
39	SSS6X39S	0.250	12-1/2	12-1/2	5	6	1 x 36 x 4	816	13.0	7.0	3.7	0.8	300

Effective Projected Area (Two Feet Above Pole Top)

Mounting Height (Feet)	Catalog Number [1, 2]	Wall Thickness (Inches)	Base Square [3] (Inches)	Bolt Circle Diameter (Inches)	Anchor Bolt Projection [3] (Inches)	Shaft Size [3] (Inches)	Anchor Bolt Diameter x Length x Hook (Inches)	Net Weight (Pounds)	Maximum Effective Projected Area (Square Feet) [4]				Max. Fixture Load - Includes Bracket (Pounds)
MH			**S**	**BC**	**BP**	**B**	**D x AB x H**		**80 mph**	**90 mph**	**100 mph**	**110 mph**	
10	SSS4A10S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	85	23.0	17.5	14.0	11.0	100
15	SSS4A15S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	118	13.4	10.0	7.5	5.7	100
20	SSS4A20S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	150	7.6	5.2	3.4	2.1	150
20	SSS5A20S	0.120	10-1/2	11	4-1/2	5	3/4 x 25 x 3	183	13.8	9.9	7.1	4.9	150
25	SSS4A25S	0.120	10-1/2	11	4-1/2	4	3/4 x 25 x 3	181	3.4	1.6	0.3	--	200
25	SSS5A25S	0.120	10-1/2	11	5	5	3/4 x 25 x 3	222	8.5	5.5	3.2	1.5	200
25	SSS6A25S	0.120	12-1/2	12-1/2	5	6	1 x 36 x 4	284	9.1	5.6	3.0	1.2	200
30	SSS5A30S	0.120	10-1/2	11	4-1/2	5	3/4 x 25 x 3	260	1.8	--	--	--	200
30	SSS5M30S	0.188	10-1/2	11	4-1/2	5	3/4 x 25 x 3	392	9.6	5.9	1.9	0.2	200
30	SSS6A30S	0.120	12-1/2	12-1/2	5	6	1 x 36 x 4	330	4.1	1.3	--	--	200
30	SSS6M30S	0.188	12-1/2	12-1/2	5	6	1 x 36 x 4	489	18.5	12.5	8.4	5.3	200
35	SSS5M35S	0.188	10-1/2	11	4-1/2	5	3/4 x 25 x 3	453	5.5	2.4	--	--	200
35	SSS6M35S	0.188	12-1/2	12-1/2	5	6	1 x 36 x 4	564	11.8	7.0	3.5	1.0	200
35	SSS6X35S	0.250	12-1/2	12-1/2	5	6	1 x 36 x 4	738	16.0	10.5	6.4	3.4	200
39	SSS6M39S	0.188	12-1/2	12-1/2	5	6	1 x 36 x 4	618	7.0	2.4	--	--	300
39	SSS6X39S	0.250	12-1/2	12-1/2	5	6	1 x 36 x 4	816	12.0	6.7	3.0	0.5	300

NOTES:

1. Catalog number includes pole with hardware kit. Anchor bolts not included. Before installing, make sure proper anchor bolts and templates are obtained.

2. Tenon size or machining for rectangular arms must be specified. Hand hole position relative to drill location.

3. Shaft size, base square, anchor bolts and projections may vary slightly. All dimensions nominal.

4. EPAs based on shaft properties with wind normal to flat. EPAs calculated using base wind velocity as indicated plus 30% gust factor.

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

Specifications and dimensions subject to change without notice.

Project		Catalog #		Type	
Prepared by		Notes		Date	

McGraw-Edison

GLEON Galleon

Area / Site Luminaire

Typical Applications

Outdoor • Parking Lots • Walkways • Roadways • Building Areas

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Distributions page 4
- Product Specifications page 4
- Energy and Performance Data page 4
- Control Options page 9

Product Certifications

Product Features

LumenSafe Technology · Enlighted · WaveLinx · Light ARchitect™

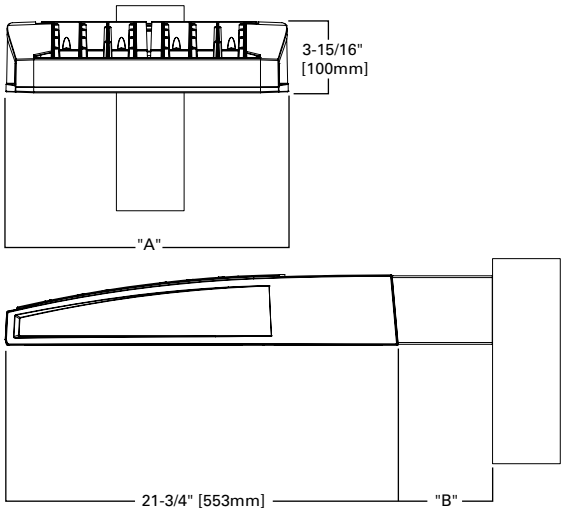
Quick Facts

- Lumen packages range from 4,200 - 80,800 (34W - 640W)
- Efficacy up to 156 lumens per watt

Connected Systems

- WaveLinx
- Enlighted

Dimensional Details



Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Extended Arm Length [1]	"B" Quick Mount Arm Length	"B" Quick Mount Extended Arm Length
1-4	15-1/2"	7"	10"	10-5/8"	16-9/16"
5-6	21-5/8"	7"	10"	10-5/8"	16-9/16"
7-8	27-5/8"	7"	13"	10-5/8"	--
9-10	33-3/4"	7"	16"	--	--

NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

Ordering Information

SAMPLE NUMBER: **GLEON-SA4C-740-U-T4FT-GM**

Product Family [1, 2]	Light Engine		Color Temperature	Voltage	Distribution	Mounting	Finish
	Configuration	Drive Current					
GLEON=Galleon	**SA1**=1 Square **SA2**=2 Squares **SA3**=3 Squares **SA4**=4 Squares **SA5**=5 Squares [4] **SA6**=6 Squares **SA7**=7 Squares [5] **SA8**=8 Squares [5] **SA9**=9 Squares [6] **SA0**=10 Squares [6]	**A**=600mA **B**=800mA **C**=1000mA **D**=1200mA [16]	**722**=70CRI, 2200K **727**=70CRI, 2700K **730**=70CRI, 3000K **735**=70CRI, 3500K **740**=70CRI, 4000K **750**=70CRI, 5000K **760**=70CRI, 6000K **827**=80CRI, 2700K **830**=80CRI, 3000K **AMB**=Amber, 590nm [14, 16]	**U**=120-277V **1**=120V **2**=208V **3**=240V **4**=277V **8**=480V [7, 8] **9**=347V [7]	**T2**=Type II **T2R**=Type II Roadway **T3**=Type III **T3R**=Type III Roadway **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **5NQ**=Type V Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **AFL**=Automotive Frontline	**[Blank]**=Arm for Round or Square Pole **EA**=Extended Arm [9] **MA**=Mast Arm Adapter [10] **WM**=Wall Mount **QM**=Quick Mount Arm (Standard Length) [11] **QMEA**=Quick Mount Arm (Extended Length) [12]	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White

Options (Add as Suffix)	Controls and Systems Options (Add as Suffix)	Accessories (Order Separately)
DIM=External 0-10V Dimming Leads [19, 20] **F**=Single Fuse (120, 277 or 347V Specify Voltage) **FF**=Double Fuse (208, 240 or 480V Specify Voltage) **20K**=Series 20kV UL 1449 Surge Protective Device **2L**=Two Circuits [17, 18] **HA**=50°C High Ambient **HSS**=Installed House Side Shield [28] **GRSBK**=Glare Reducing Shield, Black [23] **GRSWH**=Glare Reducing Shield, White [23] **LCF**=Light Square Trim Painted to Match Housing [27] **MT**=Installed Mesh Top **TH**=Tool-less Door Hardware **CC**=Coastal Construction finish [3] **L90**=Optics Rotated 90° Left **R90**=Optics Rotated 90° Right **CE**=CE Marking [29] **AHD145**=After Hours Dim, 5 Hours [22] **AHD245**=After Hours Dim, 6 Hours [22] **AHD255**=After Hours Dim, 7 Hours [22] **AHD355**=After Hours Dim, 8 Hours [22] **DALI**=DALI Drivers	**BPC**=Button Type Photocontrol **PR**=NEMA 3-PIN Photocontrol Receptacle **PR7**=NEMA 7-PIN Photocontrol Receptacle [21] **SPB2**=Dimming Occupancy Sensor with Bluetooth Interface, 8' - 20' Mounting [34] **SPB4**=Dimming Occupancy Sensor with Bluetooth Interface, 21' - 40' Mounting [34] **MS-L20**=Motion Sensor for ON/OFF Operation, 9' - 20' Mounting Height [24] **MS-L40W**=Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height [24] **MS/X-L20**=Bi-Level Motion Sensor, 9' - 20' Mounting Height [24, 25] **MS/X-L40W**=Bi-Level Motion Sensor, 21' - 40' Mounting Height [24, 25] **MS/DIM-L20**=Motion Sensor for Dimming Operation, 9' - 20' Mounting Height [24] **MS/DIM-L40W**=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height [24] **ZW**=WaveLinx Module and 4-PIN Receptacle **ZD**=WaveLinx Module with DALI driver and 4-PIN Receptacle **SWPD4XX**=WaveLinx Sensor Only, 7'-15' [13, 32, 33] **SWPD5XX**=WaveLinx Sensor Only, 15'-40' [13, 32, 33] **WOBXX**=WaveLinx Sensor with Bluetooth, 7'-15' [13, 32] **WOFXX**=WaveLinx Sensor with Bluetooth, 15'-40' [13, 32] **LWR-LW**=Enlighted Sensor, 8'–16' Mounting Height [26] **LWR-LN**=Enlighted Sensor, 16'–40' Mounting Height [26] **DIM10-MS/DIM-L08**=Synapse Occupancy Sensor (<8' Mounting) [19] **DIM10-MS/DIM-L20**=Synapse Occupancy Sensor (9'-20' Mounting) [19] **DIM10-MS/DIM-L40**=Synapse Occupancy Sensor (21'-40' Mounting) [19]	**OA/RA1016**=NEMA Photocontrol Multi-Tap - 105-285V **OA/RA1027**=NEMA Photocontrol - 480V **OA/RA1201**=NEMA Photocontrol - 347V **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=120V Photocontrol **MA1252**=10kV Surge Module Replacement **MA1036-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1037-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **MA1197-XX**=3@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1188-XX**=4@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1189-XX**=2@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1190-XX**=3@90° Tenon Adapter for 2-3/8" O.D. Tenon **MA1191-XX**=2@120° Tenon Adapter for 2-3/8" O.D. Tenon **MA1038-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1039-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1192-XX**=3@120° Tenon Adapter for 3-1/2" O.D. Tenon **MA1193-XX**=4@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1194-XX**=2@90° Tenon Adapter for 3-1/2" O.D. Tenon **MA1195-XX**=3@90° Tenon Adapter for 3-1/2" O.D. Tenon **FSIR-100**=Wireless Configuration Tool for Occupancy Sensor [24] **GLEON-MT1**=Field Installed Mesh Top for 1-4 Light Squares **GLEON-MT2**=Field Installed Mesh Top for 5-6 Light Squares **GLEON-MT3**=Field Installed Mesh Top for 7-8 Light Squares **GLEON-MT4**=Field Installed Mesh Top for 9-10 Light Squares **GLEON-QM**=Quick Mount Arm Kit [11] **GLEON-QMEA**=Quick Mount Extended Arm Kit [12] **LS/HSS**=Field Installed House Side Shield [28, 30] **LS/GRSBK**=Glare Reducing Shield, Black [23, 30] **LS/GRSWH**=Glare Reducing Shield, White [23, 30] **LS/PFS**=Perimeter Shield, Black [15] **WOLC-7P-10A**=WaveLinx Outdoor Control Module [19, 31] **SWPD4-XX**=Wavelinx Wireless Sensor, 7'–15' Mounting Height [13, 19, 32, 33] **SWPD5-XX**=Wavelinx Wireless Sensor, 15'–40' Mounting Height [13, 19, 32, 33]

NOTES:

1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
3. Coastal construction finish salt spray tested to over 5,000-hours per ASTM B117, with a scribe rating of 9 per ASTM D1654. Not available with TH option.
4. Not compatible with MS/4-LXX or MS/1-LXX sensors.
5. Not compatible with extended quick mount arm (QMEA).
6. Not compatible with standard quick mount arm (QM) or extended quick mount arm (QMEA).
7. Requires the use of an internal step down transformer when combined with sensor options. Not available with sensor at 1200mA. Not available in combination with the HA high ambient and sensor options at 1A.
8. 480V must utilize Wye system only. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems.)
9. May be required when two or more luminaires are oriented on a 90° or 120° drilling pattern. Refer to arm mounting requirement table.
10. Factory installed.
11. Maximum 8 light squares.
12. Maximum 6 light squares.
13. Requires ZW or ZD receptacle.
14. Narrow-band 590nm +/- 5nm for wildlife and observatory use. Choose drive current A; supplied at 500mA drive current only. Available with 5WQ, 5MQ, SL2, SL3 and SL4 distributions. Can be used with HSS option.
15. Set of 4 pcs. One set required per Light Square.
16. Not available with HA option.
17. 2L is not available with MS, MS/X or MS/DIM at 347V or 480V. 2L in SA2 through SA4 requires a larger housing, normally used for SA5 or SA6. Extended arm option may be required when mounting two or more fixtures per pole at 90° or 120°. Refer to arm mounting requirement table.
18. Not available with Enlighted wireless sensors.
19. Cannot be used with other control options.
20. Low voltage control lead brought out 18" outside fixture.
21. Not available if any "MS" sensor is selected. Motion sensor has an integral photocell.
22. Requires the use of BPC photocontrol or the PR7 or PR photocontrol receptacle with photocontrol accessory. See After Hours Dim supplemental guide for additional information.
23. Not for use with T4FT, T4W or SL4 optics. See IES files for details.
24. The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Cooper Lighting Solutions for more information.
25. Replace X with number of Light Squares operating in low output mode.
26. Enlighted wireless sensors are factory installed only requiring network components LWP-EM-1, LWP-GW-1 and LWP-PoE8 in appropriate quantities.
27. Not available with house side shield (HSS).
28. Not for use with 5NQ, 5MQ, 5WQ or RW optics. A black trim plate is used when HSS is selected.
29. CE is not available with the LWR, MS, MS/X, MS/DIM, BPC, PR or PR7 options. Available in 120-277V only.
30. One required for each Light Square.
31. Requires PR7.
32. Replace XX with sensor color (WH, BZ or BK.)
33. WAC Gateway required to enable field-configurability: Order WAC-PoE and WPOE-120 (10V to PoE injector) power supply if needed.
34. Smart device with mobile application required to change system defaults. See controls section for details.

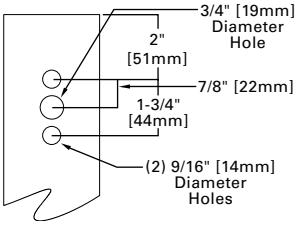
LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology	**D**=Standard Dome Camera **H**=Hi-Res Dome Camera **Z**=Remote PTZ Camera	**C**=Cellular, No SIM **A**=Cellular, AT&T **V**=Cellular, Verizon **S**=Cellular, Sprint	**R**=Cellular, Rogers **W**=Wi-Fi Networking w/ Omni-Directional Antenna **E**=Ethernet Networking

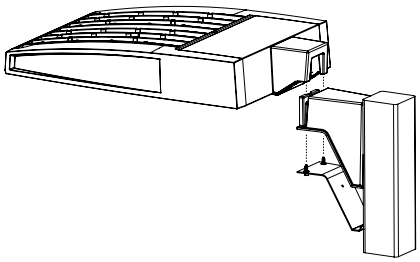
Mounting Details

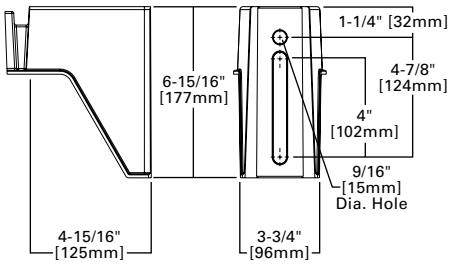
Standard Arm (Drilling Pattern)

TYPE "N"

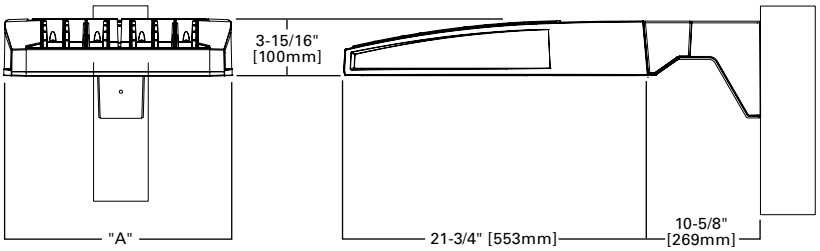


Quick Mount Arm (Includes fixture adapter)

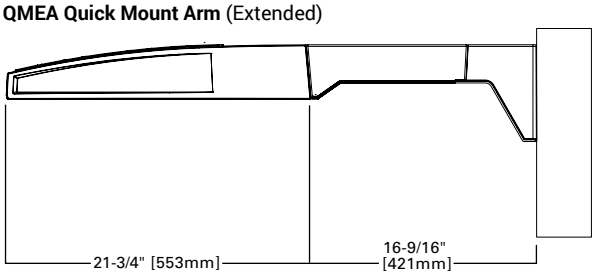




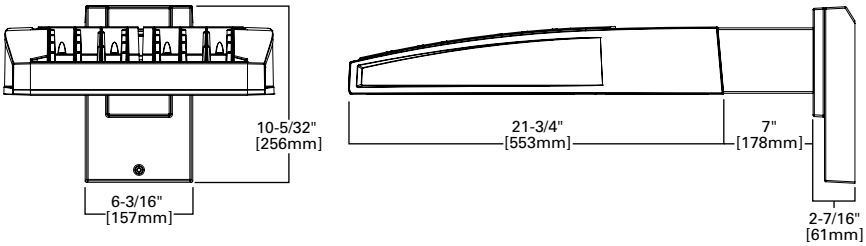
QM Quick Mount Arm (Standard)



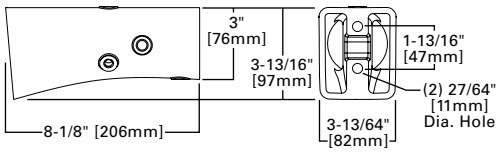
QMEA Quick Mount Arm (Extended)



Standard Wall Mount

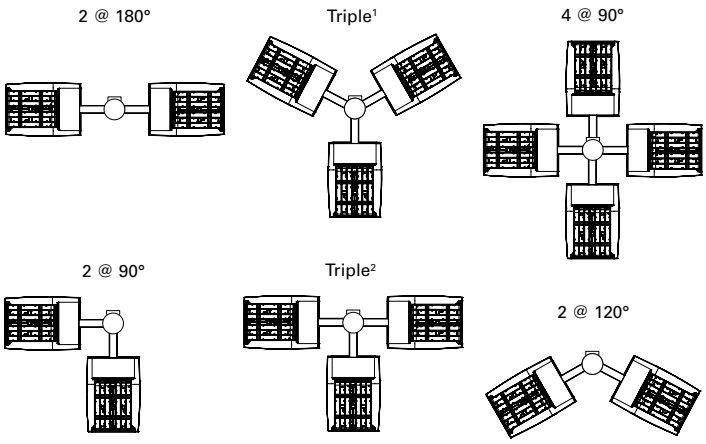


Mast Arm Mount



Arm Mounting Requirements

Number of Light Squares	Standard Arm @ 90° Apart	Standard Arm @ 120° Apart	Quick Mount Arm @ 90° Apart	Quick Mount Arm @ 120° Apart
1	Standard	Standard	QM Extended	Quick Mount
2	Standard	Standard	QM Extended	Quick Mount
3	Standard	Standard	QM Extended	Quick Mount
4	Standard	Standard	QM Extended	Quick Mount
5	Extended	Standard	QM Extended	Quick Mount
6	Extended	Standard	QM Extended	Quick Mount
7	Extended	Extended	--	Quick Mount
8	Extended	Extended	--	Quick Mount
9	Extended	Extended	--	--
10	Extended	Extended	--	--



NOTES: 1 Round poles are 3 @ 120°. Square poles are 3 @ 90°. **2** Round poles are 3 @ 90°.

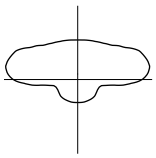
Fixture Weights and EPAs

Number of Light Squares	Weight with Standard and Extended Arm (lbs.)	EPA with Standard and Extended Arm (Sq. Ft.)	Weight with Quick Mount Arm (lbs.)	EPA with Quick Mount Arm (Sq. Ft.)	Weight with Quick Mount Extended Arm (lbs.)	EPA with Quick Mount Extended Arm (Sq. Ft.)
1-4	33	0.96	35	1.11	38	1.11
5-6	44	1.00	46	1.11	49	1.11
7-8	54	1.07	56	1.11	--	--
9-10	63	1.12	--	--	--	--

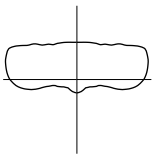
Optical Distributions

Asymmetric Area Distributions

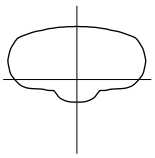
T2 (Type II)



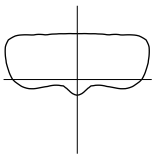
SL2 (Type II with Spill Control)



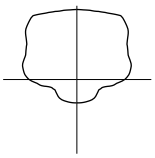
T3 (Type III)



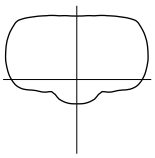
SL3 (Type III with Spill Control)



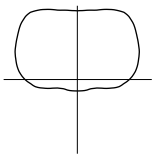
T4FT (Type IV Forward Throw)



T4W (Type IV Wide)

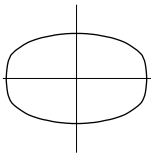


SL4 (Type IV with Spill Control)

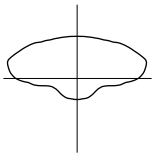


Asymmetric Roadway Distributions

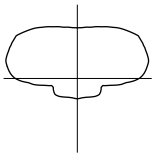
RW (Rectangular Wide Type I)



T2R (Type II Roadway)

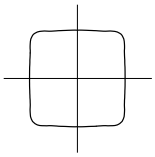


T3R (Type III Roadway)

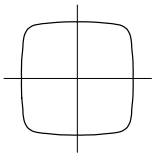


Symmetric Distributions

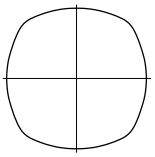
5NQ (Type V Square Narrow)



5MQ (Type V Square Medium)

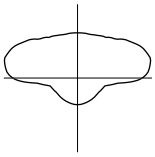


5WQ (Type V Square Wide)

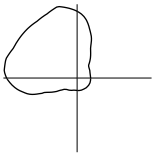


Specialized Distributions

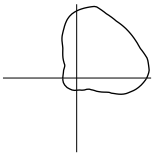
AFL (Automotive Frontline)



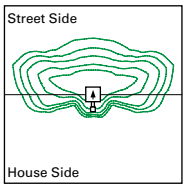
SLL (90° Spill Light Eliminator Left)



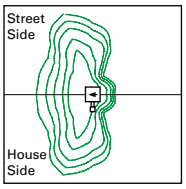
SLR (90° Spill Light Eliminator Right)



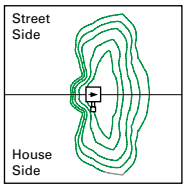
Rotated Optics



Standard



Optics Rotated Left @ 90° [L90]



Optics Rotated Right @ 90° [R90]

Product Specifications

Construction

- Extruded aluminum driver enclosure
- Heavy-wall, die-cast aluminum end caps
- Die-cast aluminum heat sinks
- Patent pending interlocking housing and heat sink

Optics

- Patented, high-efficiency injection-molded AccuLED Optics technology
- 16 optical distributions
- 3 shielding options including HSS, GRS and PFS
- IDA Certified (3000K CCT and warmer only)

Electrical

- LED drivers are mounted to removable tray assembly for ease of maintenance
- Standard with 0-10V dimming
- Standard with Cooper Lighting Solutions proprietary circuit module designed to withstand 10kV of transient line surge
- Suitable for operation in -40°C to 40°C ambient environments. Optional 50°C high ambient (HA) configuration.

Mounting

- Standard extruded arm includes internal bolt guides and round pole adapter
- Extended arms (EA and QMEA) may be required in 90° or 120° pole mount configurations, see arm mounting requirements table
- Mast arm (MA) factory installed
- Wall mount (WM) option available
- Quick mount arm (QM and QMEA) includes pole adapter and factory installed fixture mount for fast installation to square or round poles

Finish

- Super housing durable TGIC polyester powder coat paint, 2.5 mil nominal thickness
- Heat sink is powder coated black
- RAL and custom color matches available
- Coastal Construction (CC) option available

Warranty

- Five year warranty

Energy and Performance Data

Lumen Maintenance (TM-21)

Drive Current	Ambient Temperature	25,000 hours*	50,000 hours*	60,000 hours*	100,000 hours**	Theoretical L70 hours**
Up to 1A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.7%	98.3%	98.1%	97.4%	> 1.9M
	50°C	98.2%	97.2%	96.8%	95.2%	> 851,000
1.2A	25°C	99.4%	99.0%	98.9%	98.3%	> 2.4M
	40°C	98.5%	97.9%	97.7%	96.7%	> 1.3M

* Supported by IES TM-21 standards
** Theoretical values represent estimations commonly used; however, refer to the IES position on LED Product Lifetime Prediction, IES PS-10-18, explaining proper use of IES TM-21 and LM-80.

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
0ºC	1.02
10ºC	1.01
25ºC	1.00
40ºC	0.99
50ºC	0.97

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Nominal Power Lumens (1.2A)

Supplemental Performance Guide**

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		67	129	191	258	320	382	448	511	575	640
Input Current @ 120V (A)		0.58	1.16	1.78	2.31	2.94	3.56	4.09	4.71	5.34	5.87
Input Current @ 208V (A)		0.33	0.63	0.93	1.27	1.57	1.87	2.22	2.52	2.8	3.14
Input Current @ 240V (A)		0.29	0.55	0.80	1.10	1.35	1.61	1.93	2.18	2.41	2.71
Input Current @ 277V (A)		0.25	0.48	0.70	0.96	1.18	1.39	1.69	1.90	2.09	2.36
Input Current @ 347V (A)		0.20	0.39	0.57	0.78	0.96	1.15	1.36	1.54	1.72	1.92
Input Current @ 480V (A)		0.15	0.30	0.43	0.60	0.73	0.85	1.03	1.16	1.28	1.45
Optics											
T2	4000K Lumens	7,972	15,580	23,245	30,714	38,056	45,541	53,857	61,024	68,072	75,366
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	121	122	119	119	119	120	119	118	118
T2R	4000K Lumens	8,462	16,539	24,680	32,609	40,401	48,348	57,176	64,783	72,266	80,010
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	128	129	126	126	127	128	127	126	125
T3	4000K Lumens	8,125	15,879	23,693	31,307	38,787	46,417	54,893	62,197	69,381	76,818
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	123	124	121	121	122	123	122	121	120
T3R	4000K Lumens	8,306	16,232	24,220	32,001	39,651	47,447	56,114	63,580	70,924	78,523
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	124	126	127	124	124	124	125	124	123	123
T4FT	4000K Lumens	8,173	15,970	23,831	31,488	39,014	46,686	55,212	62,558	69,783	77,261
	BUG Rating	B1-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	122	124	125	122	122	122	123	122	121	121
T4W	4000K Lumens	8,067	15,764	23,522	31,080	38,510	46,082	54,499	61,751	68,881	76,263
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B5-U0-G5
	Lumens per Watt	120	122	123	120	120	121	122	121	120	119
SL2	4000K Lumens	7,958	15,552	23,206	30,662	37,989	45,462	53,763	60,920	67,952	75,235
	BUG Rating	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	119	121	121	119	119	119	120	119	118	118
SL3	4000K Lumens	8,124	15,877	23,690	31,302	38,784	46,410	54,885	62,189	69,372	76,805
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	121	123	124	121	121	121	123	122	121	120
SL4	4000K Lumens	7,719	15,085	22,510	29,741	36,850	44,097	52,148	59,089	65,913	72,977
	BUG Rating	B1-U0-G3	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	115	117	118	115	115	115	116	116	115	114
5NQ	4000K Lumens	8,380	16,375	24,436	32,287	40,003	47,870	56,610	64,144	71,552	79,221
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	125	127	128	125	125	125	126	126	124	124
5MQ	4000K Lumens	8,534	16,676	24,885	32,881	40,739	48,752	57,653	65,326	72,868	80,679
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	127	129	130	127	127	128	129	128	127	126
5WQ	4000K Lumens	8,556	16,723	24,951	32,968	40,847	48,881	57,808	65,499	73,063	80,894
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	128	130	131	128	128	128	129	128	127	126
SLL/ SLR	4000K Lumens	7,140	13,951	20,817	27,506	34,081	40,783	48,231	54,649	60,959	67,492
	BUG Rating	B1-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	107	108	109	107	107	107	108	107	106	105
RW	4000K Lumens	8,304	16,228	24,215	31,994	39,641	47,437	56,100	63,566	70,907	78,504
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	124	126	127	124	124	124	125	124	123	123
AFL	4000K Lumens	8,335	16,287	24,302	32,110	39,784	47,610	56,303	63,796	71,163	78,790
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4	B4-U0-G5
	Lumens per Watt	124	126	127	124	124	125	126	125	124	123

*** Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.**

Nominal Power Lumens (1A)

Supplemental Performance Guide**

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		59	113	166	225	279	333	391	445	501	558
Input Current @ 120V (A)		0.51	1.02	1.53	2.03	2.55	3.06	3.56	4.08	4.60	5.07
Input Current @ 208V (A)		0.29	0.56	0.82	1.11	1.37	1.64	1.93	2.19	2.46	2.75
Input Current @ 240V (A)		0.26	0.48	0.71	0.96	1.19	0.41	1.67	1.89	2.12	2.39
Input Current @ 277V (A)		0.23	0.42	0.61	0.83	1.03	1.23	1.45	1.65	1.84	2.09
Input Current @ 347V (A)		0.17	0.32	0.50	0.64	0.82	1.00	1.14	1.32	1.50	1.68
Input Current @ 480V (A)		0.14	0.24	0.37	0.48	0.61	0.75	0.91	0.99	1.12	1.28
Optics											
T2	4000K Lumens	7,267	14,201	21,190	28,000	34,692	41,515	49,096	55,627	62,053	68,703
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	126	128	124	124	125	126	125	124	123
T2R	4000K Lumens	7,715	15,077	22,497	29,725	36,829	44,073	52,122	59,056	65,876	72,937
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	131	133	136	132	132	132	133	133	131	131
T3	4000K Lumens	7,408	14,475	21,598	28,539	35,358	42,313	50,039	56,698	63,246	70,024
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	128	130	127	127	127	128	127	126	125
T3R	4000K Lumens	7,571	14,798	22,078	29,172	36,145	43,253	51,153	57,959	64,653	71,581
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	128	131	133	130	130	130	131	130	129	128
T4FT	4000K Lumens	7,451	14,559	21,725	28,703	35,564	42,558	50,330	57,027	63,613	70,430
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	129	131	128	127	128	129	128	127	126
T4W	4000K Lumens	7,354	14,371	21,442	28,333	35,105	42,007	49,681	56,291	62,792	69,521
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	125	127	129	126	126	126	127	126	125	125
SL2	4000K Lumens	7,254	14,178	21,155	27,951	34,631	41,443	49,011	55,533	61,944	68,584
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	123	125	127	124	124	124	125	125	124	123
SL3	4000K Lumens	7,406	14,474	21,596	28,534	35,355	42,307	50,033	56,690	63,237	70,014
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	126	128	130	127	127	127	128	127	126	125
SL4	4000K Lumens	7,037	13,751	20,519	27,112	33,592	40,198	47,538	53,864	60,087	66,524
	BUG Rating	B1-U0-G3	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	119	122	124	120	120	121	122	121	120	119
5NQ	4000K Lumens	7,640	14,928	22,275	29,431	36,465	43,637	51,606	58,472	65,226	72,218
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	129	132	134	131	131	131	132	131	130	129
5MQ	4000K Lumens	7,779	15,203	22,684	29,973	37,137	44,441	52,555	59,549	66,427	73,545
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	132	135	137	133	133	133	134	134	133	132
5WQ	4000K Lumens	7,800	15,243	22,744	30,052	37,236	44,560	52,697	59,708	66,603	73,742
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	132	135	137	134	133	134	135	134	133	132
SLL/ SLR	4000K Lumens	6,510	12,719	18,977	25,075	31,067	37,176	43,967	49,817	55,569	61,525
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	110	113	114	111	111	112	112	112	111	110
RW	4000K Lumens	7,570	14,793	22,073	29,165	36,137	43,243	51,140	57,945	64,637	71,564
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5
	Lumens per Watt	128	131	133	130	130	130	131	130	129	128
AFL	4000K Lumens	7,598	14,847	22,154	29,272	36,267	43,400	51,326	58,156	64,872	71,824
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4	B4-U0-G4
	Lumens per Watt	129	131	133	130	130	130	131	131	129	129

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Nominal Power Lumens (800mA)

Supplemental Performance Guide**

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		44	85	124	171	210	249	295	334	374	419
Input Current @ 120V (A)		0.39	0.77	1.13	1.54	1.90	2.26	2.67	3.03	3.39	3.80
Input Current @ 208V (A)		0.22	0.44	0.62	0.88	1.06	1.24	1.50	1.68	1.87	2.12
Input Current @ 240V (A)		0.19	0.38	0.54	0.76	0.92	1.08	1.30	1.46	1.62	1.84
Input Current @ 277V (A)		0.17	0.36	0.47	0.72	0.83	0.95	1.19	1.31	1.42	1.67
Input Current @ 347V (A)		0.15	0.24	0.38	0.49	0.63	0.77	0.87	1.01	1.15	1.52
Input Current @ 480V (A)		0.11	0.18	0.29	0.37	0.48	0.59	0.66	0.77	0.88	0.96
Optics											
T2	4000K Lumens	5,871	11,474	17,121	22,622	28,029	33,542	39,667	44,944	50,134	55,508
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	133	135	138	132	133	135	134	135	134	132
T2R	4000K Lumens	6,233	12,181	18,176	24,016	29,756	35,608	42,111	47,714	53,224	58,929
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5
	Lumens per Watt	142	143	147	140	142	143	143	143	142	141
T3	4000K Lumens	5,986	11,695	17,450	23,057	28,568	34,186	40,430	45,809	51,099	56,576
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	136	138	141	135	136	137	137	137	137	135
T3R	4000K Lumens	6,117	11,955	17,838	23,569	29,203	34,946	41,328	46,827	52,235	57,832
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	139	141	144	138	139	140	140	140	140	138
T4FT	4000K Lumens	6,019	11,763	17,551	23,190	28,734	34,384	40,663	46,074	51,396	56,904
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	137	138	142	136	137	138	138	138	137	136
T4W	4000K Lumens	5,942	11,610	17,324	22,891	28,363	33,940	40,138	45,480	50,732	56,169
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	135	137	140	134	135	136	136	136	136	134
SL2	4000K Lumens	5,862	11,454	17,091	22,583	27,980	33,484	39,598	44,867	50,048	55,411
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	133	135	138	132	133	134	134	134	134	132
SL3	4000K Lumens	5,985	11,694	17,447	23,053	28,565	34,182	40,424	45,804	51,092	56,568
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	136	138	141	135	136	137	137	137	137	135
SL4	4000K Lumens	5,685	11,111	16,577	21,905	27,140	32,478	38,409	43,520	48,546	53,748
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	129	131	134	128	129	130	130	130	130	128
5NQ	4000K Lumens	6,172	12,061	17,997	23,778	29,462	35,256	41,694	47,242	52,699	58,347
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	140	142	145	139	140	142	141	141	141	139
5MQ	4000K Lumens	6,285	12,283	18,328	24,217	30,004	35,907	42,462	48,112	53,669	59,421
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	143	145	148	142	143	144	144	144	144	142
5WQ	4000K Lumens	6,303	12,317	18,377	24,281	30,085	36,001	42,575	48,241	53,812	59,579
	BUG Rating	B3-U0-G1	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	143	145	148	142	143	145	144	144	144	142
SLL/ SLR	4000K Lumens	5,260	10,276	15,332	20,259	25,101	30,037	35,522	40,249	44,898	49,708
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	120	121	124	118	120	121	120	121	120	119
RW	4000K Lumens	6,116	11,952	17,834	23,563	29,196	34,938	41,317	46,817	52,224	57,819
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	139	141	144	138	139	140	140	140	140	138
AFL	4000K Lumens	6,139	11,996	17,899	23,650	29,302	35,064	41,468	46,987	52,412	58,030
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4
	Lumens per Watt	140	141	144	138	140	141	141	141	140	138

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Nominal Power Lumens (600mA)

Supplemental Performance Guide**

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		34	66	96	129	162	193	226	257	290	323
Input Current @ 120V (A)		0.30	0.58	0.86	1.16	1.44	1.73	2.03	2.33	2.59	2.89
Input Current @ 208V (A)		0.17	0.34	0.49	0.65	0.84	0.99	1.14	1.30	1.48	1.63
Input Current @ 240V (A)		0.15	0.30	0.43	0.56	0.74	0.87	1.00	1.13	1.30	1.43
Input Current @ 277V (A)		0.14	0.28	0.41	0.52	0.69	0.81	0.93	1.04	1.22	1.33
Input Current @ 347V (A)		0.11	0.19	0.30	0.39	0.49	0.60	0.69	0.77	0.90	0.99
Input Current @ 480V (A)		0.08	0.15	0.24	0.30	0.38	0.48	0.53	0.59	0.71	0.77
Optics											
T2	4000K Lumens	4,787	9,357	13,961	18,448	22,856	27,353	32,347	36,651	40,884	45,265
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	141	142	145	143	141	142	143	143	141	140
T2R	4000K Lumens	5,083	9,934	14,822	19,585	24,266	29,038	34,341	38,911	43,404	48,055
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
	Lumens per Watt	150	151	154	152	150	150	152	151	150	149
T3	4000K Lumens	4,880	9,537	14,231	18,803	23,296	27,878	32,970	37,358	41,671	46,137
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	144	145	148	146	144	144	146	145	144	143
T3R	4000K Lumens	4,988	9,749	14,547	19,220	23,814	28,497	33,703	38,188	42,598	47,162
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	147	148	152	149	147	148	149	149	147	146
T4FT	4000K Lumens	4,909	9,591	14,312	18,911	23,432	28,040	33,161	37,574	41,913	46,404
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	144	145	149	147	145	145	147	146	145	144
T4W	4000K Lumens	4,845	9,468	14,128	18,668	23,130	27,678	32,732	37,088	41,371	45,805
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	143	143	147	145	143	143	145	144	143	142
SL2	4000K Lumens	4,779	9,341	13,937	18,416	22,818	27,305	32,292	36,589	40,813	45,188
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	Lumens per Watt	141	142	145	143	141	141	143	142	141	140
SL3	4000K Lumens	4,879	9,536	14,229	18,800	23,294	27,874	32,965	37,351	41,666	46,130
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	144	144	148	146	144	144	146	145	144	143
SL4	4000K Lumens	4,637	9,059	13,519	17,863	22,132	26,486	31,322	35,490	39,589	43,831
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	136	137	141	138	137	137	139	138	137	136
5NQ	4000K Lumens	5,033	9,835	14,676	19,392	24,026	28,751	34,002	38,526	42,975	47,581
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
	Lumens per Watt	148	149	153	150	148	149	150	150	148	147
5MQ	4000K Lumens	5,126	10,015	14,946	19,747	24,468	29,281	34,628	39,236	43,766	48,457
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
	Lumens per Watt	151	152	156	153	151	152	153	153	151	150
5WQ	4000K Lumens	5,139	10,043	14,985	19,801	24,533	29,359	34,721	39,339	43,883	48,586
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
	Lumens per Watt	151	152	156	153	151	152	154	153	151	150
SLL/ SLR	4000K Lumens	4,289	8,380	12,502	16,520	20,469	24,494	28,967	32,823	36,613	40,537
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
	Lumens per Watt	126	127	130	128	126	127	128	128	126	126
RW	4000K Lumens	4,987	9,746	14,543	19,215	23,808	28,491	33,695	38,178	42,587	47,151
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
	Lumens per Watt	147	148	151	149	147	148	149	149	147	146
AFL	4000K Lumens	5,007	9,782	14,597	19,285	23,896	28,594	33,817	38,317	42,742	47,322
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
	Lumens per Watt	147	148	152	149	148	148	150	149	147	147

* Nominal data for 70 CRI. ** For additional performance data, please reference the Galleon Supplemental Performance Guide.

Control Options

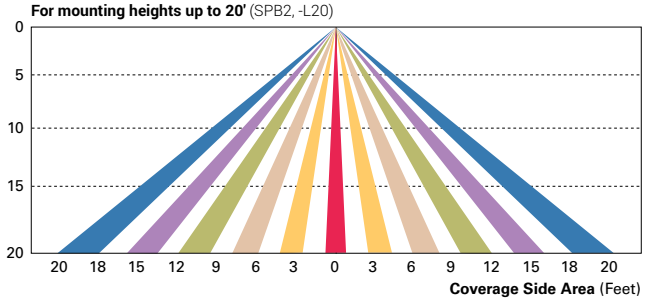
0-10V (DIM)
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (BPC, PR and PR7)
Optional button-type photocontrol (BPC) and photocontrol receptacles (PR and PR7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PR7 receptacle.

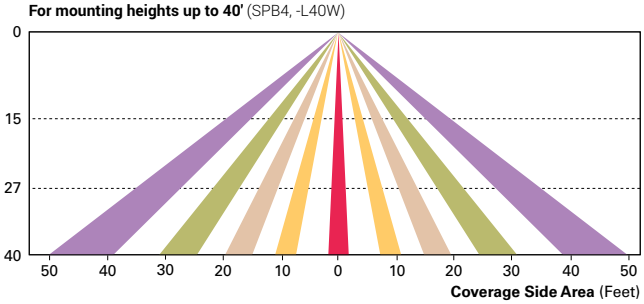
After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

Dimming Occupancy Sensor (SPB, MS/DIM-LXX, MS/X-LXX and MS-LXX)
These sensors are factory installed in the luminaire housing. When the SPB or MS/DIM sensor options are selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MS/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of five minutes. The MS-LXX sensor is factory preset to turn the luminaire off after five minutes of no activity. The MS/X-LXX is also preset for five minutes and only controls the specified number of light engines to maintain steady output from the remaining light engines. SPB motion sensors require the Sensor Configuration mobile application by Wattstopper to change factory default dimming level, time delay, sensitivity and other parameters. Available for iOS and Android devices. The SPB sensor is factory preset to dim down to approximately 10% power with a time delay of five minutes. The MS/DIM occupancy sensors require the FSIR-100 programming tool to adjust factory defaults.

For mounting heights up to 20' (SPB2, -L20)

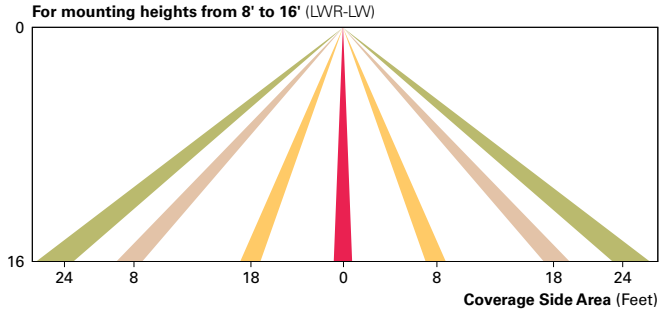


For mounting heights up to 40' (SPB4, -L40W)

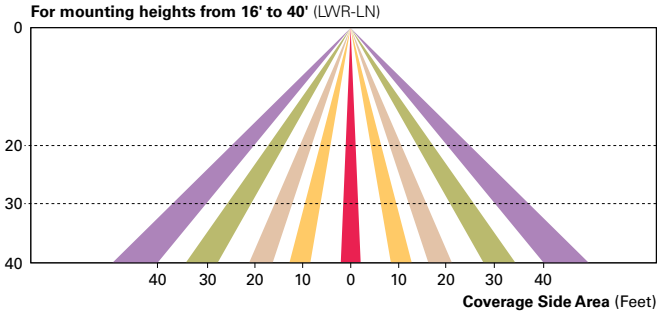


Enlighted Wireless Control and Monitoring System (LWR-LW and LWR-LN)
Enlighted is a connected lighting solution that combines a broad selection of energy-efficient LED luminaires with a powerful integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of building resources, beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)



For mounting heights from 16' to 40' (LWR-LN)



WaveLinx Wireless Outdoor Lighting Control Module (WOLC-7P-10A)
The 7-pin wireless outdoor lighting control module enables WaveLinx to control outdoor area, site and flood lighting. WaveLinx controls outdoor lighting using schedules to provide ON, OFF and dimming controls based on astronomic or time schedules based on a 7 day week.

LumenSafe Integrated Network Security Camera (LD)
Cooper Lighting Solutions brings ease of camera deployment to a whole new level. No additional wiring is needed beyond providing line power to the luminaire. A variety of networking options allows security integrators to design the optimal solution for active surveillance. As the ideal solution to meet the needs for active surveillance, the LumenSafe integrated network camera is a streamlined, outdoor-ready fixed dome that provides HDTV 1080p video. This IP camera is optimally designed for deployment in the video management system or security software platform of choice.

Synapse (DIM10)
SimplySNAP integrated wireless controls system by Synapse. Includes factory installed DIM10 Synapse control module and MS/DC motion sensor; requires additional Synapse system components for operation. Contact Synapse at www.synapsewireless.com for product support, warranty and terms and conditions.

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com

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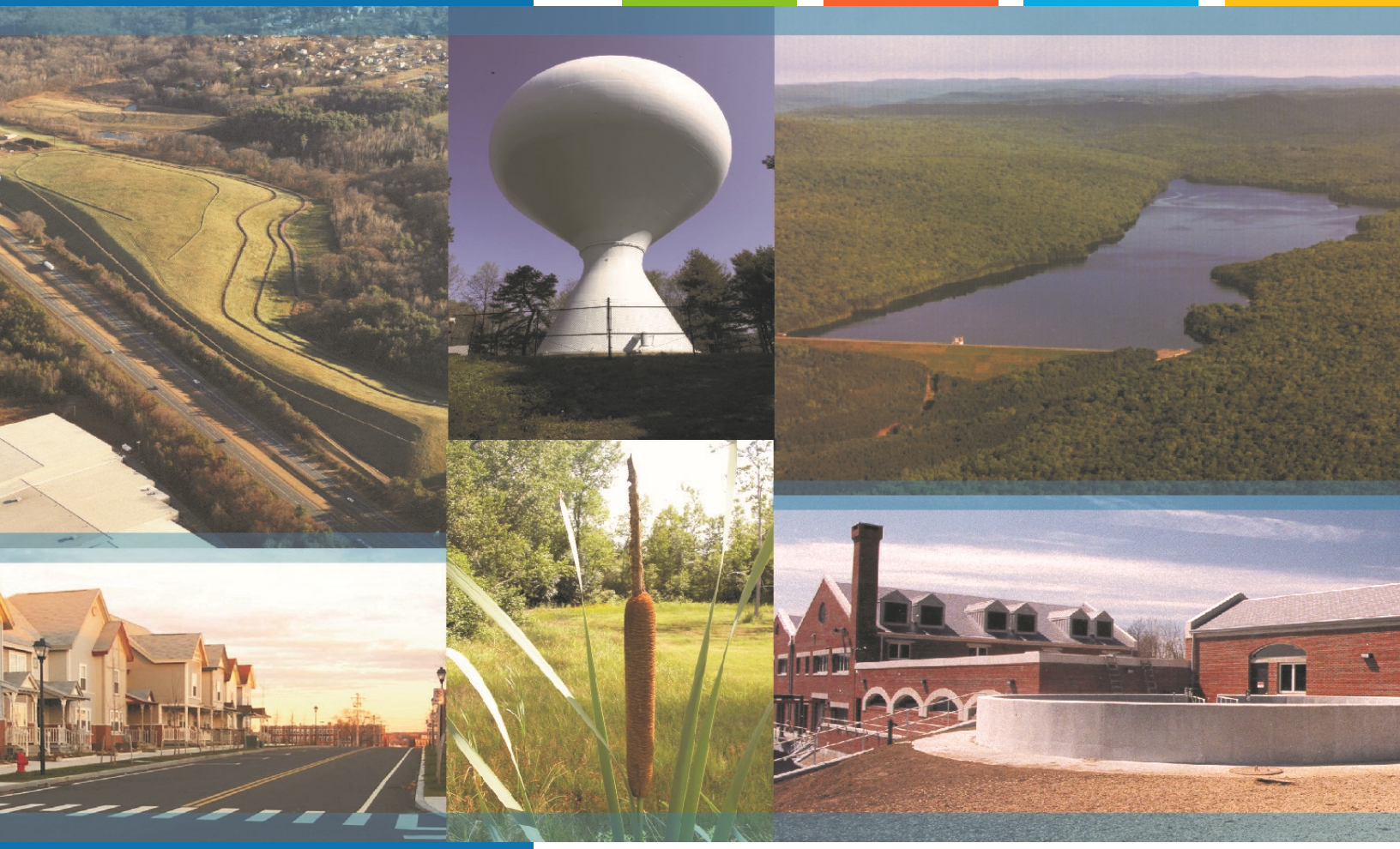
Specifications and dimensions
subject to change without notice.



Proposed Satellite Parking Lot
Borthwick Ave
Portsmouth, NH

Drainage Analysis

Portsmouth Regional Hospital

March 22, 2022
Last Revised May 23, 2022

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
5-23-22

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A Site-Specific Soils Report
B Extreme Precipitation Tables

Section 1
Project Description

The proposed project is located at the East corner of Borthwick Ave and Eileen Dondero Foley Ave which is identified as Map 234 Lot 7-4A on the City of Portsmouth Tax Maps. The proposed project is to expand Portsmouth Regional Hospital parking to support the existing hospital and its growing services to the New Hampshire Seacoast region.

The proposed project includes the construction of a new 520 space satellite parking lot across the street from the existing hospital. The project will include associated site improvements such as paving, lighting, security cameras, stormwater management and landscaping.

1.1 On-Site Soil Description

The site is forested with some thick brush underneath the existing power transmission line. The existing property has a variety of high points that shed water in two general directions. The southern portion of the property sheds stormwater to an existing wetland along that edge of the property boundary. The central and northeastern portion of the property's stormwater discharges to a larger wetland that extends off the property to the east.

A site-specific soils survey was conducted by Leonard Lord, PhD, CSS, CWS of Tighe & Bond, Inc and can be found in Appendix A of this Report. Based on the soil survey, the runoff analyzed within this study has been modeled using mostly Hydrologic Soil Group C soils and some portions of Hydrologic Soil Group B soils. Much of the site is comprised of Woodbridge, Boxford and Chatfield soils with three drainage classifications, moderately well drained, somewhat poorly drained, and portions of well drained soils respectively.

1.2 Pre- and Post-Development Comparison

The watershed areas have been modeled at three (3) points of analysis (PA-1, PA-2, and PA-3). PA-1 and PA-2 remain at the same location from pre-development to post-development. PA-1 assesses flows that discharge directly to an existing wetland along the southern knob of the property line. PA-2 analyzes flows discharging to an existing wetland located in and extending beyond the eastern portion of the project area. PA-3 was used to evaluate the minimal increase in flows directed toward Borthwick Avenue to the west of the project area. The overall area analyzed as part of this drainage analysis was held constant.

1.3 Calculation Methods

The design storms analyzed in this study include the 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

Section 2
Pre-Development Conditions

To analyze the pre-development condition, the site has been divided into three (3) distinct points of analysis (PA-1, PA-2 and PA-3). These points of analysis and watersheds are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

The points of analysis and their contributing watersheds areas are described below:

Point of Analysis (PA-1)

Pre-development Watershed 1.1 (PRE 1.1) is comprised completely of wooded area, modeled as HSG C and some potions of HSG B. Runoff travels via overland flow to the existing wetland in the corner of the watershed.

Point of Analysis (PA-2)

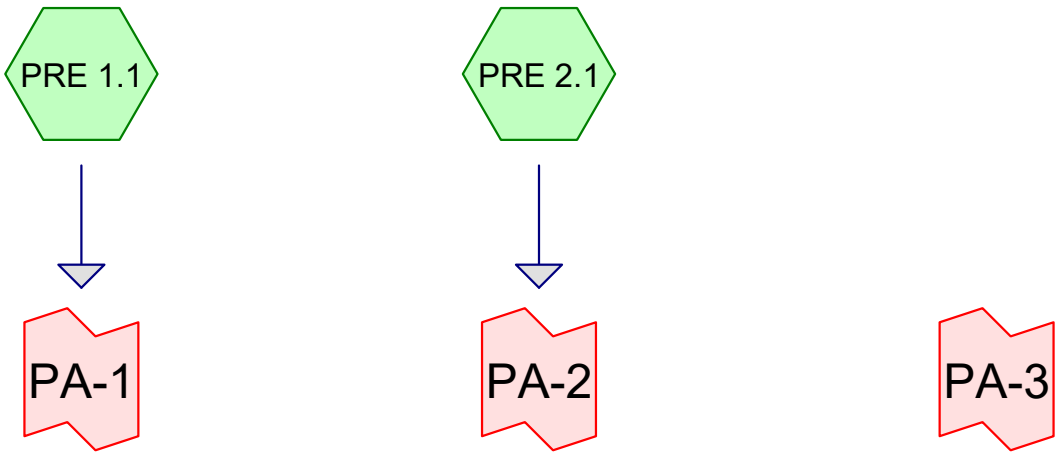
Pre-development Watershed 2.1 (PRE 2.1) is comprised of the remainder of the development area. Groundcover in this watershed is modeled as wooded and brushed areas, classified as HSG C and HSG B. Runoff from this watershed travels via overland flow to the existing wetland located to the East of the project site.

Point of Analysis (PA-3)

PA-3 does not have any contributing areas in the pre-development condition.

2.1 Pre-Development Calculations

2.2 Pre-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for P0616-005_Pre
Prepared by Tighe & Bond, Printed 5/11/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
64,234	HSG B	PRE 1.1, PRE 2.1
287,478	HSG C	PRE 1.1, PRE 2.1
0	HSG D	
0	Other	
351,712		**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 1.1: Runoff Area=31,588 sf 0.00% Impervious Runoff Depth>0.66"
Flow Length=251' Tc=14.7 min CN=68 Runoff=0.35 cfs 1,724 cf

SubcatchmentPRE 2.1: Runoff Area=320,124 sf 0.00% Impervious Runoff Depth>0.53"
Flow Length=750' Tc=27.0 min CN=65 Runoff=2.09 cfs 14,108 cf

Link PA-1: Inflow=0.35 cfs 1,724 cf
Primary=0.35 cfs 1,724 cf

Link PA-2: Inflow=2.09 cfs 14,108 cf
Primary=2.09 cfs 14,108 cf

Link PA-3:
Primary=0.00 cfs 0 cf

Total Runoff Area = 351,712 sf Runoff Volume = 15,833 cf Average Runoff Depth = 0.54"
100.00% Pervious = 351,712 sf 0.00% Impervious = 0 sf

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

SubcatchmentPRE 1.1: Runoff Area=31,588 sf 0.00% Impervious Runoff Depth>1.01"
Flow Length=251' Tc=14.7 min CN=68 Runoff=0.59 cfs 2,658 cf

SubcatchmentPRE 2.1: Runoff Area=320,124 sf 0.00% Impervious Runoff Depth>0.85"
Flow Length=750' Tc=27.0 min CN=65 Runoff=3.75 cfs 22,591 cf

Link PA-1: Inflow=0.59 cfs 2,658 cf
Primary=0.59 cfs 2,658 cf

Link PA-2: Inflow=3.75 cfs 22,591 cf
Primary=3.75 cfs 22,591 cf

Link PA-3:
Primary=0.00 cfs 0 cf

Total Runoff Area = 351,712 sf Runoff Volume = 25,249 cf Average Runoff Depth = 0.86"
100.00% Pervious = 351,712 sf 0.00% Impervious = 0 sf

Summary for Subcatchment PRE 1.1:

Runoff = 1.47 cfs @ 12.21 hrs, Volume= 6,082 cf, Depth> 2.31"

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
4,638	55	Woods, Good, HSG B
26,950	70	Woods, Good, HSG C
31,588	68	Weighted Average
31,588		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	25	0.0200	0.04		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.69"
3.2	226	0.0570	1.19		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
14.7	251	Total			

Summary for Subcatchment PRE 2.1:

Runoff = 10.17 cfs @ 12.40 hrs, Volume= 54,723 cf, Depth> 2.05"

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
157,565	70	Woods, Good, HSG C
102,963	65	Brush, Good, HSG C
39,653	55	Woods, Good, HSG B
19,943	48	Brush, Good, HSG B
320,124	65	Weighted Average
320,124		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	25	0.1800	0.09		**Sheet Flow, woods sheet** Woods: Dense underbrush n= 0.800 P2= 3.69"
1.3	78	0.0380	0.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.5	350	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.4	297	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
27.0	750	Total			

Summary for Link PA-1:

Inflow Area = 31,588 sf, 0.00% Impervious, Inflow Depth > 2.31" for 10-Year event
Inflow = 1.47 cfs @ 12.21 hrs, Volume= 6,082 cf
Primary = 1.47 cfs @ 12.21 hrs, Volume= 6,082 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2:

Inflow Area = 320,124 sf, 0.00% Impervious, Inflow Depth > 2.05" for 10-Year event
Inflow = 10.17 cfs @ 12.40 hrs, Volume= 54,723 cf
Primary = 10.17 cfs @ 12.40 hrs, Volume= 54,723 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-3:

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

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

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 1.1: Runoff Area=31,588 sf 0.00% Impervious Runoff Depth>3.48"
Flow Length=251' Tc=14.7 min CN=68 Runoff=2.24 cfs 9,164 cf

SubcatchmentPRE 2.1: Runoff Area=320,124 sf 0.00% Impervious Runoff Depth>3.16"
Flow Length=750' Tc=27.0 min CN=65 Runoff=16.02 cfs 84,329 cf

Link PA-1: Inflow=2.24 cfs 9,164 cf
Primary=2.24 cfs 9,164 cf

Link PA-2: Inflow=16.02 cfs 84,329 cf
Primary=16.02 cfs 84,329 cf

Link PA-3:
Primary=0.00 cfs 0 cf

Total Runoff Area = 351,712 sf Runoff Volume = 93,492 cf Average Runoff Depth = 3.19"
100.00% Pervious = 351,712 sf 0.00% Impervious = 0 sf

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

SubcatchmentPRE 1.1: Runoff Area=31,588 sf 0.00% Impervious Runoff Depth>4.65"
Flow Length=251' Tc=14.7 min CN=68 Runoff=3.01 cfs 12,252 cf

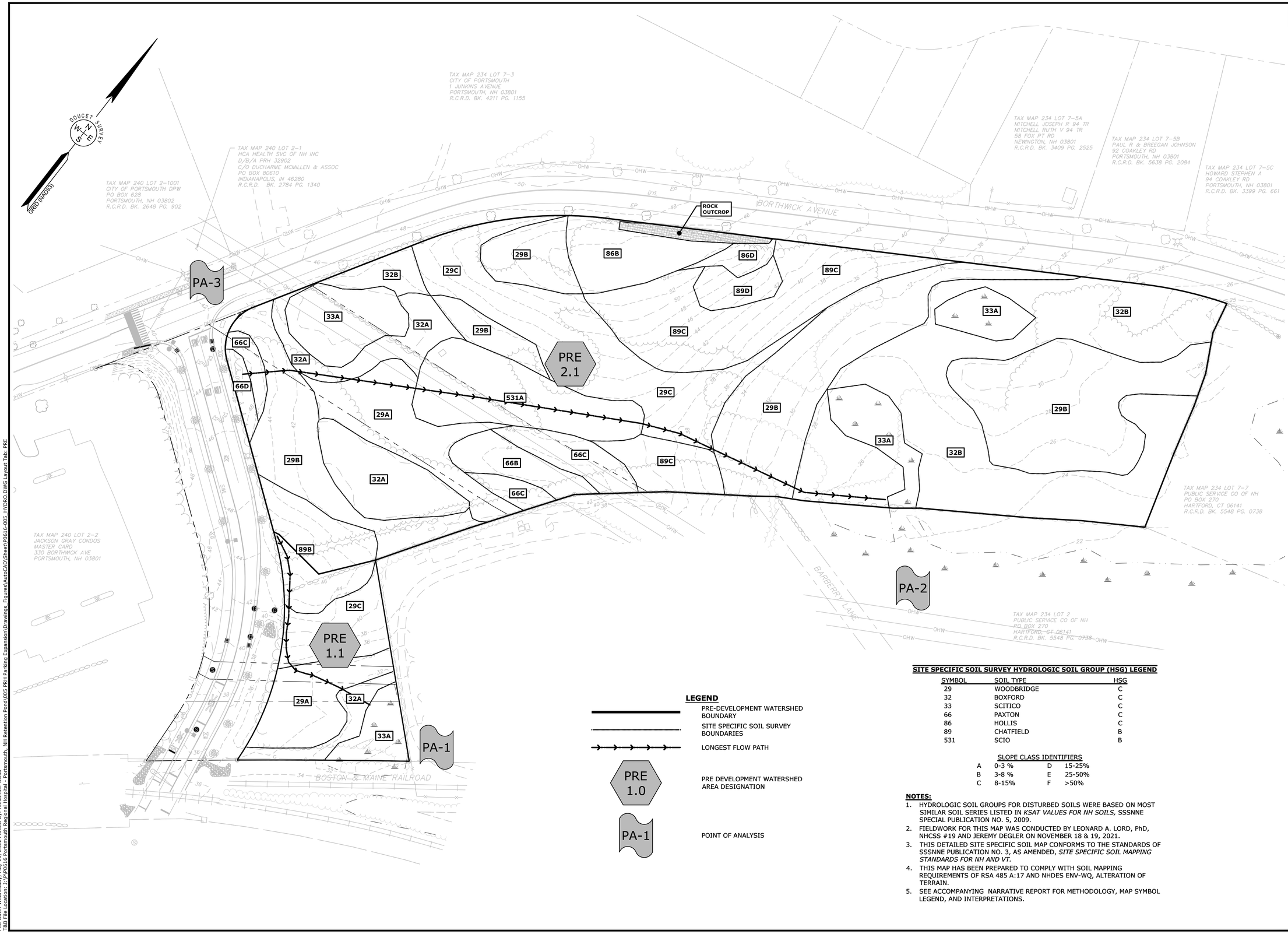
SubcatchmentPRE 2.1: Runoff Area=320,124 sf 0.00% Impervious Runoff Depth>4.29"
Flow Length=750' Tc=27.0 min CN=65 Runoff=21.90 cfs 114,348 cf

Link PA-1: Inflow=3.01 cfs 12,252 cf
Primary=3.01 cfs 12,252 cf

Link PA-2: Inflow=21.90 cfs 114,348 cf
Primary=21.90 cfs 114,348 cf

Link PA-3:
Primary=0.00 cfs 0 cf

Total Runoff Area = 351,712 sf Runoff Volume = 126,600 cf Average Runoff Depth = 4.32"
100.00% Pervious = 351,712 sf 0.00% Impervious = 0 sf



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 (HSG) LEGEND

SYMBOL	SOIL TYPE	HSG
29	WOODBRIDGE	C
32	BOXFORD	C
33	SCITICO	C
66	PAXTON	C
86	HOLLIS	C
89	CHATFIELD	B
531	SCIO	B

SLOPE CLASS IDENTIFIERS

A	0-3 %	D	15-25%
B	3-8 %	E	25-50%
C	8-15%	F	>50%

NOTES:

1. HYDROLOGIC SOIL GROUPS FOR DISTURBED SOILS WERE BASED ON MOST SIMILAR SOIL SERIES LISTED IN *KSAT VALUES FOR NH SOILS,* SSSNNE SPECIAL PUBLICATION NO. 5, 2009.
2. FIELDWORK FOR THIS MAP WAS CONDUCTED BY LEONARD A. LORD, PhD, NHCSS #19 AND JEREMY DEGLER ON NOVEMBER 18 & 19, 2021.
3. THIS DETAILED SITE SPECIFIC SOIL MAP CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, AS AMENDED, *SITE SPECIFIC SOIL MAPPING STANDARDS FOR NH AND VT.*
4. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENTS OF RSA 485 A:17 AND NHDES ENV-WQ, ALTERATION OF TERRAIN.
5. SEE ACCOMPANYING NARRATIVE REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS.

Tighe&Bond

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_HYDRO.DWG
DRAWN BY:	CML/AFS
CHECKED:	PMC
APPROVED:	BLM

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Save Date: May 10, 2022 2:01 PM By: ASELLAR
Plot Date: Wednesday, May 11, 2022 7:57 AM By: Alexander Sellar
T&B File Location: I:\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_HYDRO.DWG Layout Tab: PRE

Section 3
Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into five (5) watershed areas. Stormwater runoff from these sub-catchment areas flow via either overland flow or subsurface drainage systems prior to discharging to various existing wetlands on site. Flows from these sub-catchment areas are modeled at the same three (3) points of analysis (PA-1, PA-2, and PA-3), depicted in the pre-development watershed plan.

An underground detention system is proposed for the purpose of mitigating peak flows per the requirements of Env-Wq 1507.06. Additionally, an infiltration basin is included to detain and infiltrate stormwater for the purpose of mitigating peak flows and channel protection requirements of Env-Wq 1507.05. The detention system and its respective outlet structures have been sized to detain the WQV prior to discharging to the treatment unit. Flows greater than the 2-year storm event are designed to bypass the treatment unit. The infiltration system has been designed to provide GRV requirements as established in Env-Wq 1504.12, after the stormwater has been treated by two separate treatment units.

The points of analysis and their sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802. The points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA-1)

Post-development Watershed 1.1 (POST 1.1) is comprised of a combination of woods and grass cover directly to the southeast of the southern portion of the satellite parking lot expansion. The area was modeled with mainly HSG C soils and small portions of HSG B soils. Runoff from this watershed sheets via overland flow to the existing wetland located in the eastern corner of the subcatchment.

Point of Analysis (PA-2)

Post-development Watershed 2.1 (POST 2.1) is comprised of the western portion of the upper parking lot. This area has been modeled with mainly HSG C soils and some portions of HSG B soils. Runoff from this watershed area travels via overland flow to various catch basins. The runoff is pre-treated by off-line deep sump catch basins prior to entering the underground detention basin (UDB-1.) The detention basin and outlet structure (POS 2) have been sized to detain the WQV prior to discharging to the treatment unit, a Contech Jellyfish Stormwater Filter (JFF1). Flow from this watershed then eventually discharges to the adjacent wetland identified as Point of Analysis 2 (PA-2).

Post-development watershed 2.2 (POST 2.2) is comprised of a small portion of the upper parking area which is primarily HSG C soils with portions of HSG B soils. Stormwater runoff from this area flows overland and is captured by catch basins and is conveyed via piping to a proprietary pretreatment device (PCDS2) prior to entering the underground detention basin (UDB-1.) The detention basin and outlet structure (POS 1) have been sized to direct the water quality flow to the proprietary treatment unit, a Contech Jellyfish Stormwater

Filter (PJFF2). Flow from this watershed then eventually discharges to the adjacent wetland identified as Point of Analysis 2 (PA-2).

Post-development watershed 2.3 (POST 2.3) and 2.4 (POST 2.4) are comprised of small portions of the upper parking area which is primarily HSG C soils with portions of HSG B soils. Stormwater runoff from these area flows overland, and each are captured by a single deep sump and hooded catch basin for purposes of pretreatment. These flows are conveyed via piping to a proprietary treatment device specified as a Contech Jellyfish Filter (PJFF3 & PJFF4). The treated flow then enters the Underground Infiltration Basin where it will infiltrate into the existing soils for purposes of meeting groundwater recharge requirements and peak flow mitigation. Any flow above and beyond the capabilities of the infiltration basin will be discharged and conveyed via piping to the adjacent wetland identified as Point of Analysis 2 (PA-2).

Post-development Watershed 2.5 (POST 2.5) is comprised mainly of the existing wetland and wetland buffer area. This area also contains various sections surrounding the proposed parking lot area that is either downhill of the large proposed retaining wall or granite curbing. This area contains a combination of grass, brush, paved parking, and woods, with the major cover being woods and grass. Soils in this subcatchment were also modeled with mainly HSG C and small portions of HSG B soils. Runoff from this watershed sheets via overland flow to the existing wetland (PA-2) located in the central and eastern portion of the project area.

Post-development Watershed 2.6 (POST 2.6) is comprised of the paved access aisle and its surrounding contributing areas, including sidewalks, shuttle stop, and some landscaped areas. Runoff from this watershed area flows overland and is captured by catch basins where it is conveyed via piping to proprietary pretreatment device (PCDS1) prior to entering the underground detention basin (UDB-2). The detention basin and outlet structure (POS1) have been sized to direct the water quality flow to the proprietary treatment unit, a Contech Jellyfish Stormwater Filter (PJFF1). Flow from this watershed then eventually discharges to the adjacent wetland identified as Point of Analysis 2 (PA-2).

Post-development Watershed 2.7 (POST 2.3) is comprised of the eastern paved parking area. Runoff from this watershed area travels via overland flow to various deep sump catch basins and is conveyed via piping to an underground detention basin (UDB-2). The detention basin and outlet structure (POS1) have been sized to direct the water quality flow to the proprietary treatment unit, a Contech Jellyfish Stormwater Filter (PJFF1). Flow from this watershed then eventually discharges to the adjacent wetland identified as Point of Analysis 2 (PA-2).

Point of Analysis (PA-3)

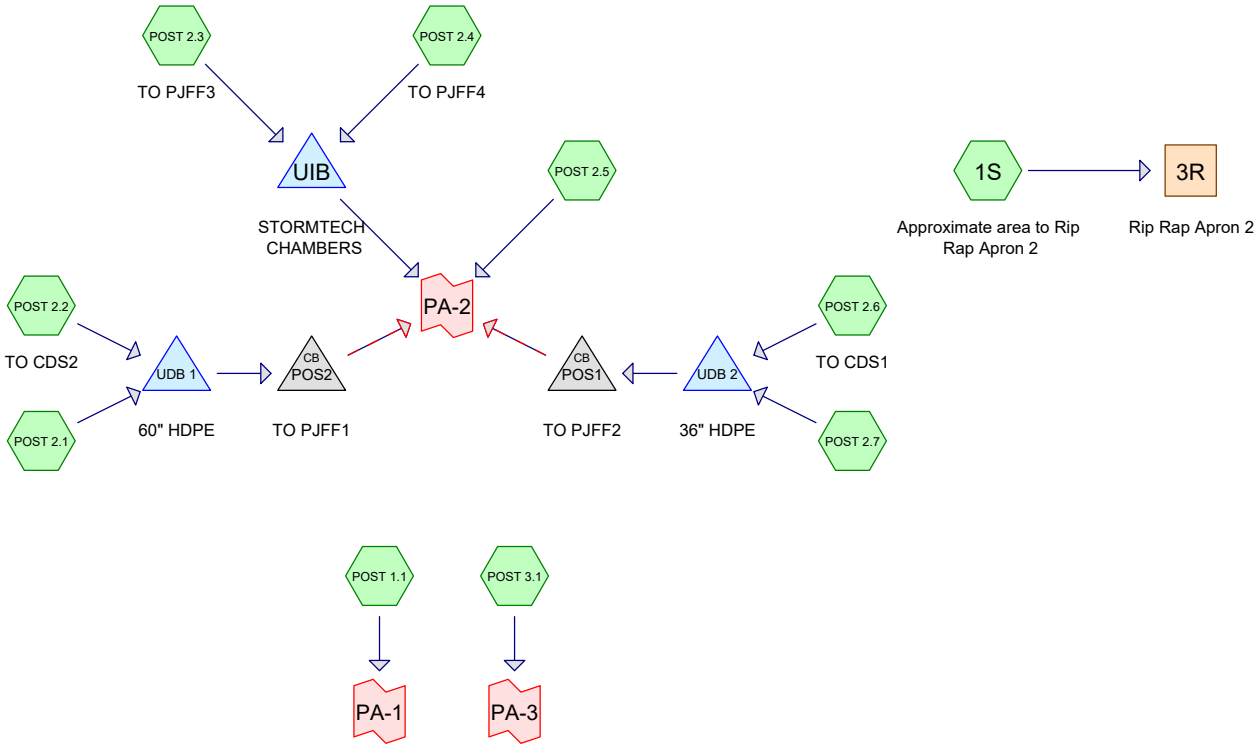
Post-development Watershed 3.1 (POST 3.1) is in the southwestern portion of the proposed project. This area includes a small area of land in between the proposed parking lot and Borthwick Ave and Ellen Dondero Foley Ave. The groundcover in the watershed has been modeled as mostly grass cover with small portion of concrete sidewalk. Runoff from this watershed travels via overland flow offsite to the west of the project area.

This point of analysis experiences a negligible increase in peak flows from the pre-development condition which are attributed to the proposed improvements within the

City's Right of Way. The minor increase is necessary to reduce impacts on the existing wetlands as much as feasibly possible.

3.1 Post-Development Calculations

3.2 Post-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for P0616-005_Post
Prepared by Tighe & Bond, Printed 5/25/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.252	61	>75% Grass cover, Good, HSG B (POST 1.1, POST 2.1, POST 2.4, POST 2.5, POST 2.6)
1.003	74	>75% Grass cover, Good, HSG C (POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.5, POST 2.6, POST 2.7, POST 3.1)
0.035	48	Brush, Good, HSG B (POST 2.5)
1.046	65	Brush, Good, HSG C (POST 2.5)
1.117	98	Paved parking, HSG B (POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.6)
3.760	98	Paved parking, HSG C (1S, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.5, POST 2.6, POST 2.7, POST 3.1)
0.071	55	Woods, Good, HSG B (POST 1.1, POST 2.5)
1.594	70	Woods, Good, HSG C (POST 1.1, POST 2.5)
8.878	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.475	HSG B	POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.5, POST 2.6
7.403	HSG C	1S, POST 1.1, POST 2.1, POST 2.2, POST 2.3, POST 2.4, POST 2.5, POST 2.6, POST 2.7, POST 3.1
0.000	HSG D	
0.000	Other	
8.878		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Approximatearea to Runoff Area=35,000 sf 100.00% Impervious Runoff Depth>3.45"
Tc=6.0 min CN=98 Runoff=2.82 cfs 0.231 af

SubcatchmentPOST 1.1: Runoff Area=22,056 sf 0.00% Impervious Runoff Depth>1.12"
Flow Length=96' Slope=0.0250 '/' Tc=10.4 min CN=70 Runoff=0.53 cfs 0.047 af

SubcatchmentPOST 2.1: Runoff Area=119,050 sf 84.92% Impervious Runoff Depth>3.02"
Tc=6.0 min CN=94 Runoff=8.97 cfs 0.688 af

SubcatchmentPOST 2.2: TO CDS2 Runoff Area=12,586 sf 96.70% Impervious Runoff Depth>3.34"
Tc=6.0 min CN=97 Runoff=1.00 cfs 0.080 af

SubcatchmentPOST 2.3: TO PJFF3 Runoff Area=10,532 sf 95.51% Impervious Runoff Depth>3.34"
Tc=6.0 min CN=97 Runoff=0.84 cfs 0.067 af

SubcatchmentPOST 2.4: TO PJFF4 Runoff Area=14,917 sf 81.48% Impervious Runoff Depth>2.82"
Tc=6.0 min CN=92 Runoff=1.07 cfs 0.080 af

SubcatchmentPOST 2.5: Runoff Area=107,875 sf 0.58% Impervious Runoff Depth>0.95"
Flow Length=542' Tc=26.0 min CN=67 Runoff=1.50 cfs 0.196 af

SubcatchmentPOST 2.6: TO CDS1 Runoff Area=27,197 sf 65.00% Impervious Runoff Depth>2.44"
Tc=6.0 min CN=88 Runoff=1.74 cfs 0.127 af

SubcatchmentPOST 2.7: Runoff Area=30,043 sf 78.52% Impervious Runoff Depth>2.92"
Tc=6.0 min CN=93 Runoff=2.21 cfs 0.168 af

SubcatchmentPOST 3.1: Runoff Area=7,456 sf 1.21% Impervious Runoff Depth>1.37"
Tc=6.0 min CN=74 Runoff=0.26 cfs 0.020 af

Reach 3R: Rip Rap Apron 2 Avg. Flow Depth=0.55' Max Vel=4.04 fps Inflow=2.82 cfs 0.231 af
24.0" Round Pipe n=0.012 L=81.0' S=0.0049 '/' Capacity=17.22 cfs Outflow=2.83 cfs 0.231 af

Pond POS1: TO PJFF2 Peak Elev=25.28' Inflow=0.24 cfs 0.229 af
Primary=0.24 cfs 0.229 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.229 af

Pond POS2: TO PJFF1 Peak Elev=34.72' Inflow=0.36 cfs 0.388 af
Primary=0.36 cfs 0.388 af Secondary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.388 af

Pond UDB 1: 60" HDPE Peak Elev=36.99' Storage=21,837 cf Inflow=9.98 cfs 0.768 af
Outflow=0.36 cfs 0.388 af

Pond UDB 2: 36" HDPE Peak Elev=26.34' Storage=7,165 cf Inflow=3.95 cfs 0.295 af
Outflow=0.24 cfs 0.229 af

Pond UIB: STORMTECH CHAMBERS Peak Elev=39.22' Storage=3,565 cf Inflow=1.91 cfs 0.148 af
Discarded=0.02 cfs 0.037 af Primary=0.19 cfs 0.032 af Outflow=0.22 cfs 0.069 af

Link PA-1: Inflow=0.53 cfs 0.047 af
Primary=0.53 cfs 0.047 af

Link PA-2: Inflow=2.05 cfs 0.845 af
Primary=2.05 cfs 0.845 af

Link PA-3: Inflow=0.26 cfs 0.020 af
Primary=0.26 cfs 0.020 af

Total Runoff Area = 8.878 ac Runoff Volume = 1.705 af Average Runoff Depth = 2.30"
45.06% Pervious = 4.000 ac 54.94% Impervious = 4.877 ac

Summary for Subcatchment 1S: Approximate area to Rip Rap Apron 2

Runoff = 4.30 cfs @ 12.09 hrs, Volume= 0.359 af, Depth> 5.36"

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
35,000	98	Paved parking, HSG C
35,000		100.00% Impervious Area

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

Summary for Subcatchment POST 1.1:

Runoff = 1.25 cfs @ 12.15 hrs, Volume= 0.105 af, Depth> 2.49"

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
2	55	Woods, Good, HSG B
1,270	61	>75% Grass cover, Good, HSG B
4,375	74	>75% Grass cover, Good, HSG C
16,409	70	Woods, Good, HSG C
22,056	70	Weighted Average
22,056		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	20	0.0250	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.69"
1.6	76	0.0250	0.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	96	Total			

Summary for Subcatchment POST 2.1:

Runoff = 14.16 cfs @ 12.09 hrs, Volume= 1.115 af, Depth> 4.90"

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
79,986	98	Paved parking, HSG C
14,243	74	>75% Grass cover, Good, HSG C
3,711	61	>75% Grass cover, Good, HSG B
21,110	98	Paved parking, HSG B
119,050	94	Weighted Average
17,954		15.08% Pervious Area
101,096		84.92% Impervious Area

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

Summary for Subcatchment POST 2.2: TO CDS2

Runoff = 1.54 cfs @ 12.09 hrs, Volume= 0.126 af, Depth> 5.24"

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
6,105	98	Paved parking, HSG C
415	74	>75% Grass cover, Good, HSG C
0	61	>75% Grass cover, Good, HSG B
6,066	98	Paved parking, HSG B
12,586	97	Weighted Average
415		3.30% Pervious Area
12,171		96.70% Impervious Area

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

Summary for Subcatchment POST 2.3: TO PJFF3

Runoff = 1.29 cfs @ 12.09 hrs, Volume= 0.106 af, Depth> 5.24"

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
3,761	98	Paved parking, HSG C
473	74	>75% Grass cover, Good, HSG C
6,298	98	Paved parking, HSG B
0	61	>75% Grass cover, Good, HSG B
10,532	97	Weighted Average
473		4.49% Pervious Area
10,059		95.51% Impervious Area

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

Summary for Subcatchment POST 2.4: TO PJFF4

Runoff = 1.73 cfs @ 12.09 hrs, Volume= 0.133 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.60"

Area (sf)	CN	Description
5,784	98	Paved parking, HSG C
1,400	74	>75% Grass cover, Good, HSG C
6,371	98	Paved parking, HSG B
1,362	61	>75% Grass cover, Good, HSG B
14,917	92	Weighted Average
2,762		18.52% Pervious Area
12,155		81.48% Impervious Area

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

Summary for Subcatchment POST 2.5:

Runoff = 3.80 cfs @ 12.38 hrs, Volume= 0.458 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.60"

Area (sf)	CN	Description
3,075	55	Woods, Good, HSG B
53,021	70	Woods, Good, HSG C
1,504	48	Brush, Good, HSG B
920	61	>75% Grass cover, Good, HSG B
623	98	Paved parking, HSG C
3,157	74	>75% Grass cover, Good, HSG C
45,575	65	Brush, Good, HSG C
107,875	67	Weighted Average
107,252		99.42% Pervious Area
623		0.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	25	0.0200	0.04		**Sheet Flow, woods** Woods: Dense underbrush n= 0.800 P2= 3.69"
4.5	164	0.0150	0.61		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.2	79	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	274	0.0430	0.52		**Shallow Concentrated Flow, woods** Forest w/Heavy Litter Kv= 2.5 fps
26.0	542	Total			

Summary for Subcatchment POST 2.6: TO CDS1

Runoff = 2.95 cfs @ 12.09 hrs, Volume= 0.221 af, Depth> 4.24"

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
5,807	74	>75% Grass cover, Good, HSG C
8,845	98	Paved parking, HSG C
3,713	61	>75% Grass cover, Good, HSG B
8,832	98	Paved parking, HSG B
27,197	88	Weighted Average
9,520		35.00% Pervious Area
17,677		65.00% Impervious Area

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

Summary for Subcatchment POST 2.7:

Runoff = 3.53 cfs @ 12.09 hrs, Volume= 0.275 af, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.60"

Area (sf)	CN	Description
6,452	74	>75% Grass cover, Good, HSG C
23,591	98	Paved parking, HSG C
0	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
30,043	93	Weighted Average
6,452		21.48% Pervious Area
23,591		78.52% Impervious Area

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

Summary for Subcatchment POST 3.1:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.041 af, Depth> 2.85"

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
90	98	Paved parking, HSG C
7,366	74	>75% Grass cover, Good, HSG C
7,456	74	Weighted Average
7,366		98.79% Pervious Area
90		1.21% Impervious Area

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

Summary for Reach 3R: Rip Rap Apron 2

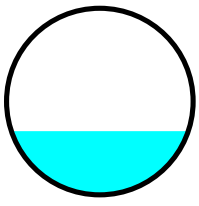
[52] Hint: Inlet/Outlet conditions not evaluated
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.803 ac,100.00% Impervious, Inflow Depth > 5.36" for 10-Year event
Inflow = 4.30 cfs @ 12.09 hrs, Volume= 0.359 af
Outflow = 4.32 cfs @ 12.09 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Max. Velocity= 4.55 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 0.9 min

Peak Storage= 77 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 17.22 cfs

24.0" Round Pipe
n= 0.012
Length= 81.0' Slope= 0.0049 '/'
Inlet Invert= 25.50', Outlet Invert= 25.10'



Summary for Pond POS1: TO PJFF2

Inflow Area = 1.314 ac, 72.10% Impervious, Inflow Depth > 2.99" for 10-Year event
Inflow = 0.32 cfs @ 14.46 hrs, Volume= 0.327 af
Outflow = 0.32 cfs @ 14.46 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 14.46 hrs, Volume= 0.326 af
Secondary = 0.00 cfs @ 14.46 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 25.32' @ 14.46 hrs
Flood Elev= 42.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**12.0" Round TREATMENT** L= 5.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.00' / 24.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	25.30'	**15.0" Round BYPASS** L= 9.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.30' / 25.00' S= 0.0333 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.32 cfs @ 14.46 hrs HW=25.32' TW=0.00' (Dynamic Tailwater)
↑—**1=TREATMENT** (Barrel Controls 0.32 cfs @ 2.15 fps)

Secondary OutFlow Max=0.00 cfs @ 14.46 hrs HW=25.32' TW=0.00' (Dynamic Tailwater)
↑—**2=BYPASS** (Inlet Controls 0.00 cfs @ 0.53 fps)

Summary for Pond POS2: TO PJFF1

Inflow Area = 3.022 ac, 86.05% Impervious, Inflow Depth > 2.04" for 10-Year event
Inflow = 0.45 cfs @ 16.02 hrs, Volume= 0.515 af
Outflow = 0.45 cfs @ 16.02 hrs, Volume= 0.515 af, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 16.02 hrs, Volume= 0.514 af
Secondary = 0.00 cfs @ 16.02 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 34.76' @ 16.02 hrs
Flood Elev= 42.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**12.0" Round TREATMENT** L= 5.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.40' / 34.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	34.75'	**24.0" Round BYPASS** L= 9.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.75' / 34.60' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=0.45 cfs @ 16.02 hrs HW=34.76' TW=0.00' (Dynamic Tailwater)
1=TREATMENT (Barrel Controls 0.45 cfs @ 2.62 fps)

Secondary OutFlow Max=0.00 cfs @ 16.02 hrs HW=34.76' TW=0.00' (Dynamic Tailwater)
2=BYPASS (Barrel Controls 0.00 cfs @ 0.49 fps)

Summary for Pond UDB 1: 60" HDPE

Inflow Area = 3.022 ac, 86.05% Impervious, Inflow Depth > 4.93" for 10-Year event
Inflow = 15.69 cfs @ 12.09 hrs, Volume= 1.242 af
Outflow = 0.45 cfs @ 16.02 hrs, Volume= 0.515 af, Atten= 97%, Lag= 235.9 min
Primary = 0.45 cfs @ 16.02 hrs, Volume= 0.515 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 38.43' @ 16.02 hrs Surf.Area= 14,202 sf Storage= 37,309 cf
Flood Elev= 40.00' Surf.Area= 14,202 sf Storage= 49,875 cf

Plug-Flow detention time= 367.2 min calculated for 0.514 af (41% of inflow)
Center-of-Mass det. time= 233.0 min (1,001.2 - 768.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	34.50'	5,370 cf	**46.09'W x 94.17'L x 6.08'H Field A** 26,403 cf Overall - 12,977 cf Embedded = 13,426 cf x 40.0% Voids
#2A	34.50'	10,927 cf	**ADS N-12 60"** x 24 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 6 Rows of 4 Chambers 43.09' Header x 19.30 sf x 2 = 1,663.1 cf Inside
#3D	34.50'	5,370 cf	**46.09'W x 94.17'L x 6.08'H Field D** 26,403 cf Overall - 12,977 cf Embedded = 13,426 cf x 40.0% Voids
#4C	34.50'	7,011 cf	**23.58'W x 234.17'L x 6.08'H Field C** 33,600 cf Overall - 16,071 cf Embedded = 17,528 cf x 40.0% Voids
#5C	34.50'	13,533 cf	**ADS N-12 60"** x 33 Inside #4 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 3 Rows of 11 Chambers 20.58' Header x 19.30 sf x 2 = 794.6 cf Inside
#6D	34.50'	10,927 cf	**ADS N-12 60"** x 24 Inside #3 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 6 Rows of 4 Chambers 43.09' Header x 19.30 sf x 2 = 1,663.1 cf Inside
		53,139 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group D created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**24.0" Round Culvert** L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.50' / 34.50' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	34.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	38.95'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.45 cfs @ 16.02 hrs HW=38.43' TW=34.76' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.45 cfs of 25.88 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 9.22 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond UDB 2: 36" HDPE

Inflow Area = 1.314 ac, 72.10% Impervious, Inflow Depth > 4.53" for 10-Year event
Inflow = 6.47 cfs @ 12.09 hrs, Volume= 0.496 af
Outflow = 0.32 cfs @ 14.46 hrs, Volume= 0.327 af, Atten= 95%, Lag= 142.5 min
Primary = 0.32 cfs @ 14.46 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 27.15' @ 14.46 hrs Surf.Area= 9,717 sf Storage= 12,838 cf
Flood Elev= 28.50' Surf.Area= 9,717 sf Storage= 20,088 cf

Plug-Flow detention time= 329.1 min calculated for 0.327 af (66% of inflow)
Center-of-Mass det. time= 233.2 min (1,016.1 - 782.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	25.00'	9,085 cf	**74.75'W x 130.00'L x 4.00'H Field A** 38,870 cf Overall - 16,158 cf Embedded = 22,712 cf x 40.0% Voids
#2A	25.00'	12,947 cf	**ADS N-12 36"** x 84 Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf 14 Rows of 6 Chambers 71.75' Header x 7.10 sf x 2 = 1,018.8 cf Inside
		22,032 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**15.0" Round Culvert** L= 8.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.00' / 25.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	25.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	27.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.32 cfs @ 14.46 hrs HW=27.15' TW=25.32' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.32 cfs of 7.20 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 6.51 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond UIB: STORMTECH CHAMBERS

Inflow Area = 0.584 ac, 87.29% Impervious, Inflow Depth > 4.91" for 10-Year event
Inflow = 3.02 cfs @ 12.09 hrs, Volume= 0.239 af
Outflow = 2.46 cfs @ 12.16 hrs, Volume= 0.159 af, Atten= 18%, Lag= 4.5 min
Discarded = 0.02 cfs @ 6.90 hrs, Volume= 0.041 af
Primary = 2.44 cfs @ 12.16 hrs, Volume= 0.119 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 39.50' @ 12.16 hrs Surf.Area= 3,465 sf Storage= 3,972 cf
Flood Elev= 39.83' Surf.Area= 3,465 sf Storage= 4,423 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 57.6 min (825.0 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	37.50'	2,438 cf	**31.50'W x 110.00'L x 2.33'H Field A** 8,085 cf Overall - 1,990 cf Embedded = 6,095 cf x 40.0% Voids
#2A	38.00'	1,990 cf	**ADS_StormTech SC-310 +Cap** x 135 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 9 Rows of 15 Chambers
		4,428 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**12.0" Round Culvert** L= 7.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.00' / 36.75' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Discarded	37.50'	**0.300 in/hr Exfiltration over Surface area**
#3	Device 1	39.15'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 6.90 hrs HW=37.52' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.32 cfs @ 12.16 hrs HW=39.49' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.32 cfs of 5.34 cfs potential flow)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 2.32 cfs @ 1.69 fps)

Summary for Link PA-1:

Inflow Area = 0.506 ac, 0.00% Impervious, Inflow Depth > 2.49" for 10-Year event
Inflow = 1.25 cfs @ 12.15 hrs, Volume= 0.105 af
Primary = 1.25 cfs @ 12.15 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2:

Inflow Area = 7.397 ac, 55.05% Impervious, Inflow Depth > 2.30" for 10-Year event
Inflow = 5.69 cfs @ 12.33 hrs, Volume= 1.419 af
Primary = 5.69 cfs @ 12.33 hrs, Volume= 1.419 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-3:

Inflow Area = 0.171 ac, 1.21% Impervious, Inflow Depth > 2.85" for 10-Year event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.041 af
Primary = 0.56 cfs @ 12.09 hrs, Volume= 0.041 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 x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Approximatearea to Runoff Area=35,000 sf 100.00% Impervious Runoff Depth>6.86"
Tc=6.0 min CN=98 Runoff=5.47 cfs 0.459 af

SubcatchmentPOST 1.1: Runoff Area=22,056 sf 0.00% Impervious Runoff Depth>3.69"
Flow Length=96' Slope=0.0250 '/' Tc=10.4 min CN=70 Runoff=1.88 cfs 0.156 af

SubcatchmentPOST 2.1: Runoff Area=119,050 sf 84.92% Impervious Runoff Depth>6.38"
Tc=6.0 min CN=94 Runoff=18.18 cfs 1.454 af

SubcatchmentPOST 2.2: TO CDS2 Runoff Area=12,586 sf 96.70% Impervious Runoff Depth>6.74"
Tc=6.0 min CN=97 Runoff=1.96 cfs 0.162 af

SubcatchmentPOST 2.3: TO PJFF3 Runoff Area=10,532 sf 95.51% Impervious Runoff Depth>6.74"
Tc=6.0 min CN=97 Runoff=1.64 cfs 0.136 af

SubcatchmentPOST 2.4: TO PJFF4 Runoff Area=14,917 sf 81.48% Impervious Runoff Depth>6.15"
Tc=6.0 min CN=92 Runoff=2.24 cfs 0.175 af

SubcatchmentPOST 2.5: Runoff Area=107,875 sf 0.58% Impervious Runoff Depth>3.37"
Flow Length=542' Tc=26.0 min CN=67 Runoff=5.88 cfs 0.695 af

SubcatchmentPOST 2.6: TO CDS1 Runoff Area=27,197 sf 65.00% Impervious Runoff Depth>5.69"
Tc=6.0 min CN=88 Runoff=3.89 cfs 0.296 af

SubcatchmentPOST 2.7: Runoff Area=30,043 sf 78.52% Impervious Runoff Depth>6.27"
Tc=6.0 min CN=93 Runoff=4.55 cfs 0.360 af

SubcatchmentPOST 3.1: Runoff Area=7,456 sf 1.21% Impervious Runoff Depth>4.13"
Tc=6.0 min CN=74 Runoff=0.81 cfs 0.059 af

Reach 3R: Rip Rap Apron 2 Avg. Flow Depth=0.78' Max Vel=4.86 fps Inflow=5.47 cfs 0.459 af
24.0" Round Pipe n=0.012 L=81.0' S=0.0049 '/' Capacity=17.22 cfs Outflow=5.48 cfs 0.459 af

Pond POS1: TO PJFF2 Peak Elev=25.40' Inflow=0.52 cfs 0.406 af
Primary=0.47 cfs 0.396 af Secondary=0.05 cfs 0.011 af Outflow=0.52 cfs 0.406 af

Pond POS2: TO PJFF1 Peak Elev=35.01' Inflow=1.48 cfs 0.748 af
Primary=1.09 cfs 0.686 af Secondary=0.39 cfs 0.062 af Outflow=1.48 cfs 0.748 af

Pond UDB 1: 60" HDPE Peak Elev=39.12' Storage=44,038 cf Inflow=20.14 cfs 1.616 af
Outflow=1.48 cfs 0.748 af

Pond UDB 2: 36" HDPE Peak Elev=27.81' Storage=17,100 cf Inflow=8.44 cfs 0.656 af
Outflow=0.52 cfs 0.406 af

Pond UIB: STORMTECH CHAMBERS Peak Elev=39.61' Storage=4,112 cf Inflow=3.88 cfs 0.311 af
Discarded=0.02 cfs 0.042 af Primary=3.64 cfs 0.189 af Outflow=3.66 cfs 0.231 af

Link PA-1: Inflow=1.88 cfs 0.156 af
Primary=1.88 cfs 0.156 af

Link PA-2: Inflow=8.21 cfs 2.039 af
Primary=8.21 cfs 2.039 af

Link PA-3: Inflow=0.81 cfs 0.059 af
Primary=0.81 cfs 0.059 af

Total Runoff Area = 8.878 ac Runoff Volume = 3.952 af Average Runoff Depth = 5.34"
45.06% Pervious = 4.000 ac 54.94% Impervious = 4.877 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Approximatearea to Runoff Area=35,000 sf 100.00% Impervious Runoff Depth>8.26"
Tc=6.0 min CN=98 Runoff=6.56 cfs 0.553 af

SubcatchmentPOST 1.1: Runoff Area=22,056 sf 0.00% Impervious Runoff Depth>4.90"
Flow Length=96' Slope=0.0250 '/' Tc=10.4 min CN=70 Runoff=2.49 cfs 0.207 af

SubcatchmentPOST 2.1: Runoff Area=119,050 sf 84.92% Impervious Runoff Depth>7.78"
Tc=6.0 min CN=94 Runoff=21.95 cfs 1.773 af

SubcatchmentPOST 2.2: TO CDS2 Runoff Area=12,586 sf 96.70% Impervious Runoff Depth>8.14"
Tc=6.0 min CN=97 Runoff=2.35 cfs 0.196 af

SubcatchmentPOST 2.3: TO PJFF3 Runoff Area=10,532 sf 95.51% Impervious Runoff Depth>8.14"
Tc=6.0 min CN=97 Runoff=1.97 cfs 0.164 af

SubcatchmentPOST 2.4: TO PJFF4 Runoff Area=14,917 sf 81.48% Impervious Runoff Depth>7.54"
Tc=6.0 min CN=92 Runoff=2.71 cfs 0.215 af

SubcatchmentPOST 2.5: Runoff Area=107,875 sf 0.58% Impervious Runoff Depth>4.52"
Flow Length=542' Tc=26.0 min CN=67 Runoff=7.94 cfs 0.934 af

SubcatchmentPOST 2.6: TO CDS1 Runoff Area=27,197 sf 65.00% Impervious Runoff Depth>7.06"
Tc=6.0 min CN=88 Runoff=4.77 cfs 0.367 af

SubcatchmentPOST 2.7: Runoff Area=30,043 sf 78.52% Impervious Runoff Depth>7.66"
Tc=6.0 min CN=93 Runoff=5.50 cfs 0.440 af

SubcatchmentPOST 3.1: Runoff Area=7,456 sf 1.21% Impervious Runoff Depth>5.38"
Tc=6.0 min CN=74 Runoff=1.05 cfs 0.077 af

Reach 3R: Rip Rap Apron 2 Avg. Flow Depth=0.86' Max Vel=5.11 fps Inflow=6.56 cfs 0.553 af
24.0" Round Pipe n=0.012 L=81.0' S=0.0049 '/' Capacity=17.22 cfs Outflow=6.57 cfs 0.553 af

Pond POS1: TO PJFF2 Peak Elev=25.73' Inflow=2.18 cfs 0.540 af
Primary=1.34 cfs 0.483 af Secondary=0.85 cfs 0.058 af Outflow=2.18 cfs 0.540 af

Pond POS2: TO PJFF1 Peak Elev=35.59' Inflow=6.11 cfs 1.072 af
Primary=2.94 cfs 0.858 af Secondary=3.17 cfs 0.214 af Outflow=6.11 cfs 1.072 af

Pond UDB 1: 60" HDPE Peak Elev=39.47' Storage=46,934 cf Inflow=24.30 cfs 1.969 af
Outflow=6.11 cfs 1.072 af

Pond UDB 2: 36" HDPE Peak Elev=28.04' Storage=18,416 cf Inflow=10.27 cfs 0.808 af
Outflow=2.18 cfs 0.540 af

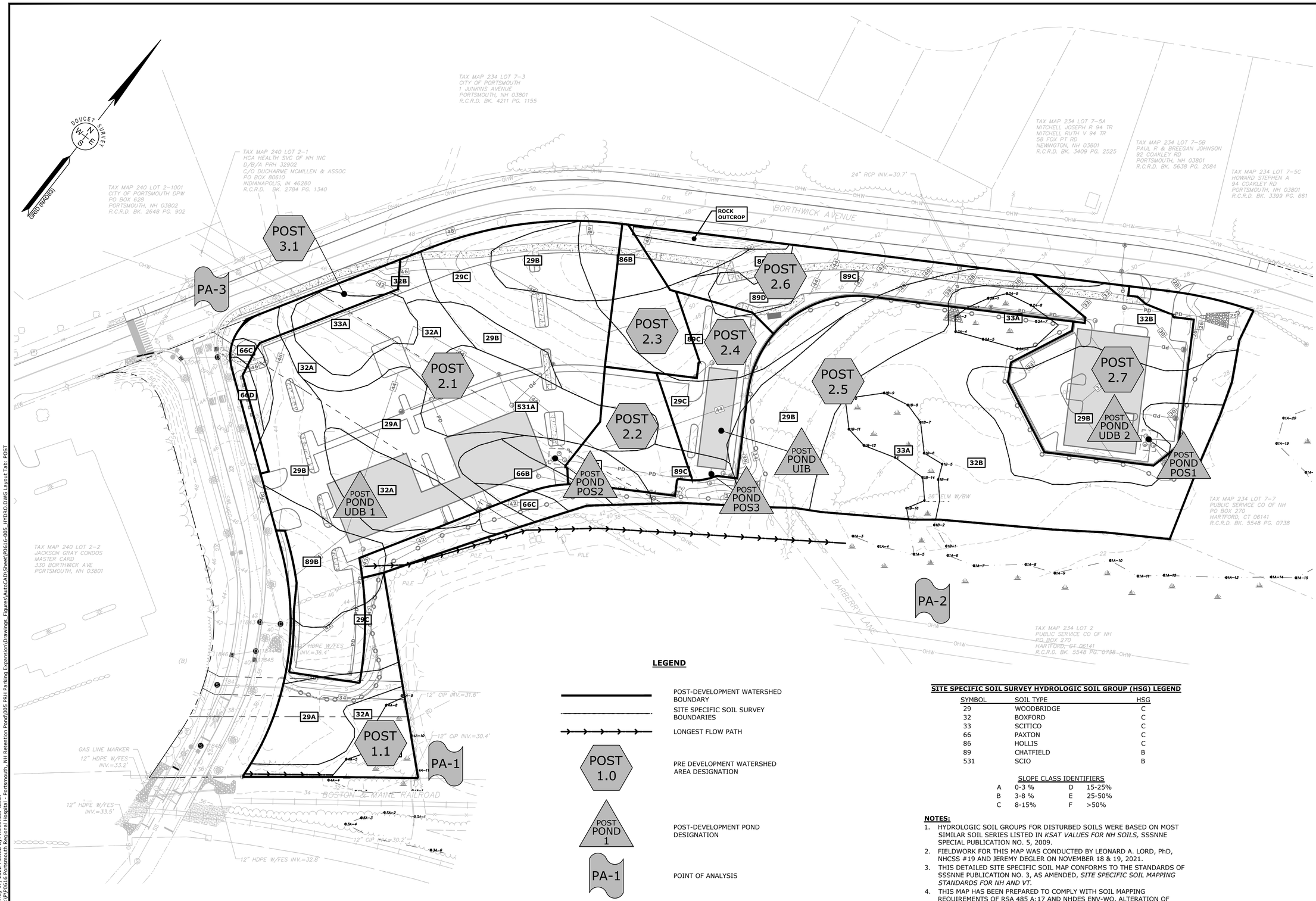
Pond UIB: STORMTECH CHAMBERS Peak Elev=39.66' Storage=4,194 cf Inflow=4.68 cfs 0.379 af
Discarded=0.02 cfs 0.043 af Primary=4.44 cfs 0.256 af Outflow=4.46 cfs 0.299 af

Link PA-1: Inflow=2.49 cfs 0.207 af
Primary=2.49 cfs 0.207 af

Link PA-2: Inflow=17.11 cfs 2.802 af
Primary=17.11 cfs 2.802 af

Link PA-3: Inflow=1.05 cfs 0.077 af
Primary=1.05 cfs 0.077 af

Total Runoff Area = 8.878 ac Runoff Volume = 4.927 af Average Runoff Depth = 6.66"
45.06% Pervious = 4.000 ac 54.94% Impervious = 4.877 ac



LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE	HSG
29	WOODBRIDGE	C
32	BOXFORD	C
33	SCITICO	C
66	PAXTON	C
86	HOLLIS	C
89	CHATFIELD	B
531	SCIO	B

SLOPE CLASS IDENTIFIERS

A	0-3 %	D	15-25%
B	3-8 %	E	25-50%
C	8-15%	F	>50%

NOTES:

1. HYDROLOGIC SOIL GROUPS FOR DISTURBED SOILS WERE BASED ON MOST SIMILAR SOIL SERIES LISTED IN *KSAT VALUES FOR NH SOILS,* SSSNNE SPECIAL PUBLICATION NO. 5, 2009.
2. FIELDWORK FOR THIS MAP WAS CONDUCTED BY LEONARD A. LORD, PhD, NHCSS #19 AND JEREMY DEGLER ON NOVEMBER 18 & 19, 2021.
3. THIS DETAILED SITE SPECIFIC SOIL MAP CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, AS AMENDED, *SITE SPECIFIC SOIL MAPPING STANDARDS FOR NH AND VT.*
4. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENTS OF RSA 485 A:17 AND NHDES ENV-WQ, ALTERATION OF TERRAIN.
5. SEE ACCOMPANYING NARRATIVE REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS.

Tighe&Bond

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
D	05/24/2022	NHDES SUBMISSION
C	05/12/2022	TAC RESUBMISSION 2
B	04/21/2022	TAC RESUBMISSION
A	03/22/2022	TAC SUBMISSION

PROJECT NO:	P0616-001
DATE:	3/22/22
FILE:	P0616-005_HYDRO.DWG
DRAWN BY:	CML/AFS
CHECKED:	PMC
APPROVED:	BLM

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Save Date: May 17, 2022 11:33 AM By: ASELLAR
Plot Date: Tuesday, May 17, 2022 Plotted By: Alexander Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings, Figures\AutoCAD\Sheet\P0616-005_HYDRO.DWG Layout Tab: POST

Section 4
Peak Rate Comparison

The following table summarizes and compares the pre- and post-development peak runoff rates from the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis.

Table 4.1

Comparison of Pre- and Post-Development Flows (CFS)

	1-Year Storm	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed					
PA-1		0.59	1.47	2.24	3.01
PA-2	2.09	3.75	10.17	16.02	21.90
PA-3		-	-	-	-
Post-Development Watershed					
PA-1		0.53	1.25	1.88	2.49
PA-2		2.05	5.69	8.21	17.11
PA-3		0.26	0.56	0.81	1.05

The Peak Runoff Control Requirements of Env-Wq 1507.06 are required to be met for all points of analysis. As shown in Table 1.2 the Post-development flows are decreased from the Pre-development flows for points of analysis PA-1 and PA-2. PA-3 does not have any flows contributing to it in the pre-development, however the post-development flows have been minimized to the greatest extent practicable.

The Channel Protection requirements of Env-Wq 1507.05 are met for point of analysis 1 per the requirements established in Env-Wq 1507.05.b.1.a.

The Channel Protection requirements of Env-Wq 1507.05 are met for point of analysis 2 per the requirements established in Env-Wq 1507.05.b.3.

Section 5
Mitigation Description

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and NHDES AoT Regulations (Env-Wq 1500).

5.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consist of deep sump catch basins and Contech's proprietary CDS units.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated by various Contech Jellyfish stormwater filtration systems. These Jellyfish systems are sized to treat the Water Quality Flows of their respective subcatchment areas. Each system is outfitted with an internal bypass that diverts peak flows away from treatment.

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/ Deep Sump Catch Basin Pretreatment[1]	90%	53%	61%
Jellyfish Filter w/ CDS Pretreatment[2]	92%	55%	61%

1. Pollutant removal calculations for Jellyfish Filter with deep sump catch basin pretreatment shown in Table 5.2.
2. Pollutant removal calculations for Jellyfish Filter with CDS pretreatment shown in Table 5.3

Table 5.2 – Pollutant Removal Calculations				
Contech Jellyfish Filter w/ Deep Sump Pretreatment				
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[2]	0.89	0.85	0.75	0.10
	Total Suspended Solids Removed:			**90%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catch Basin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.51	0.95	0.48	0.47
	Total Nitrogen Removed:			**53%**
	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[2]	0.59	0.95	0.56	0.39
	Total Phosphorus Removed:			**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E.
2. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment performance testing results.

Table 5.3 – Pollutant Removal Calculations				
Contech Jellyfish Filter w/ CDS Pretreatment				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
CDS Hydrodynamic Separator[1]	0.35	1.00	0.35	0.65
Jellyfish Filter[2]	0.89	0.65	0.57	0.08
	Total Suspended Solids Removed:			**92%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
CDS Hydrodynamic Separator[1]	0.10	1.00	0.10	0.90
Jellyfish Filter[2]	0.51	0.90	0.45	0.45
	Total Nitrogen Removed:			**55%**
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
CDS Hydrodynamic Separator[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.59	0.95	0.56	0.39
	Total Phosphorus Removed:			**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E.
2. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment performance testing results

Section 6
Rip Rap Apron Sizing

Tighe&Bond

Engineers | Environmental Specialists

Project: Proposed Satellite Parking Lot
Location: Borthwick Ave Portsmouth, NH
T&B #: P-0616-005
Calculations By: CJK/AFS
Checked By: PMC
Date: 4/21/2022

APRON DESIGN

Terms: RipRap 1

length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do $L_a = \frac{1.8(Q)}{Do^{(3/2)}} + 7Do$

when Tw >= .5*Do $L_a = \frac{3(Q)}{Do^{(3/2)}} + 7Do$

Width of Apron (W1)

$W1 = 3Do$

Width of Apron (W2)

when Tw < .5*Do $W2 = 3Do + La$

when Tw >= .5*Do $W2 = 3Do + 0.4La$

Median Diameter $d_{50} = \frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$

Input:

Q (cfs)	0.48	cfs
Do (ft.)	2.00	ft
T_w (ft.)	0.80	ft

Output:

Width of Apron (W1)	6	ft.
Width of Apron (W2)	20	ft.
Length of Apron (L_a)	14	ft.
Median Diameter	0.50	ft.
Riprap min. depth	1.13	ft.

Tighe&Bond

Engineers | Environmental Specialists

Project: Proposed Satellite Parking Lot
Location: Borthwick Ave Portsmouth, NH
T&B #: P-0616-005
Calculations By: CJK/AFS
Checked By: PMC
Date: 4/21/2022

APRON DESIGN

Terms: RipRap 2

length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do $L_a = \frac{1.8(Q)}{Do^{(3/2)}} + 7Do$

when Tw >= .5*Do $L_a = \frac{3(Q)}{Do^{(3/2)}} + 7Do$

Width of Apron (W1)

$W1 = 3Do$

Width of Apron (W2)

when Tw < .5*Do $W2 = 3Do + La$

when Tw >= .5*Do $W2 = 3Do + 0.4La$

Median Diameter $d_{50} = \frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$

Input:

Q (cfs)	5.48	cfs
Do (ft.)	2.00	ft
T_w (ft.)	0.80	ft

Output:

Width of Apron (W1)	6	ft.
Width of Apron (W2)	23	ft.
Length of Apron (L_a)	17	ft.
Median Diameter	0.50	ft.
Riprap min. depth	1.13	ft.

Tighe&Bond

Engineers | Environmental Specialists

Project: Proposed Satellite Parking Lot
Location: Borthwick Ave Portsmouth, NH
T&B #: P-0616-005
Calculations By: CJK/AFS
Checked By: PMC
Date: 4/21/2022

APRON DESIGN

Terms: RipRap 3

length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do $L_a = \frac{1.8(Q)}{Do^{(3/2)}} + 7Do$

when Tw >= .5*Do $L_a = \frac{3(Q)}{Do^{(3/2)}} + 7Do$

Width of Apron (W1)

$W1 = 3Do$

Width of Apron (W2)

when Tw < .5*Do $W2 = 3Do + La$

when Tw >= .5*Do $W2 = 3Do + 0.4La$

Median Diameter $d_{50} = \frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$

Input:

Q (cfs)	1.54	cfs
Do (ft.)	2.00	ft
T_w (ft.)	0.80	ft

Output:

Width of Apron (W1)	6	ft.
Width of Apron (W2)	21	ft.
Length of Apron (L_a)	15	ft.
Median Diameter	0.50	ft.
Riprap min. depth	1.13	ft.

Tighe&Bond

Engineers | Environmental Specialists

Project: Proposed Satellite Parking Lot
Location: Borthwick Ave Portsmouth, NH
T&B #: P-0616-005
Calculations By: AFS
Checked By: PMC
Date: 4/21/2022

APRON DESIGN

Terms: RipRap 4

length of apron (ft.)	L_a	
discharge from pipe (cfs)	Q	(25 YR STORM EVENT)
pipe dia. or channel width (ft.)	Do	
tailwater depth (ft.)	T_w	
width of apron (at outlet)(ft)	W1	
width of apron (downstream)(ft)	W2	
median stone diameter (ft.)	d_{50}	

Equations Used:

Length of Apron (L_a)

when Tw < .5*Do $L_a = \frac{1.8(Q)}{Do^{(3/2)}} + 7Do$

when Tw >= .5*Do $L_a = \frac{3(Q)}{Do^{(3/2)}} + 7Do$

Width of Apron (W1)

$W1 = 3Do$

Width of Apron (W2)

when Tw < .5*Do $W2 = 3Do + La$

when Tw >= .5*Do $W2 = 3Do + 0.4La$

Median Diameter $d_{50} = \frac{0.02 * Q^{(1.3)}}{(Tw * Do)}$

Input:

Q (cfs)	2.94	cfs
Do (ft.)	2.00	ft
T_w (ft.)	0.80	ft

Output:

Width of Apron (W1)	6	ft.
Width of Apron (W2)	22	ft.
Length of Apron (L_a)	16	ft.
Median Diameter	0.50	ft.
Riprap min. depth	1.13	ft.

Section 7
Route 1 By-Pass Culvert Review

7.1 Introduction

Based on their feedback at the Technical Advisory Committee meeting on April 5, 2022, the City requested that Tighe & Bond review the larger watershed area that contributes stormwater flow to an existing 30" culvert under Borthwick Avenue at the Route 1 By-Pass intersection. The City expressed concern that the stormwater from the development of the proposed satellite parking lot would impact this existing culvert and create the potential for flooding the adjacent substation at the Route 1 By-Pass.

On April 18, 2022, Tighe & Bond had provided an analysis of the area to the City for review. On April 27, 2022, the City's Department of Public Works provided additional comments regarding the analysis which have been addressed in the enclosed calculations. The comments and responses are listed below.

Comment: There doesn't seem to be any change in volume pre vs post for S-5 (new lot). I don't see that you are infiltrating so where is that volume delta?

Response: The volume in the post-development condition is slightly increased from the pre-development condition. As shown in the enclosed calculations. The project is proposing groundwater recharge in accordance with the NHDES Alteration of Terrain regulations.

Comment: You are assuming no tail water out of the 24" RCP. On site evidence would suggest that the tail water caused by the proximity of the brook may be in excess of 1' above the outfall invert during a major event.

Response: The analysis has been updated to include a 1' tailwater condition above the outlet invert. There was no significant change to the peak elevation of the 50 year storm event.

Comment: Is exfiltration of ½" per hour really anticipated in the swamp or is that the average for the entire contributing area? Please explain.

Response: The applicant acknowledges that removing exfiltration from the model altogether would create a more conservative analysis. The calculations have been updated to exclude exfiltration in the analysis. There was no significant change to the peak elevation of the 50 year storm event.

Comment: Lastly, I saw that you added an area of the Coakley road subdivision into the contributing area that I sent you. I am almost 100% sure that is incorrect.

Response: This area was added to the watershed because there is an existing culvert under Borthwick Avenue directing flow from that area to the south side of Borthwick Avenue. See the existing conditions plan provided in the project plans for evidence of this culvert.

Tighe & Bond analyzed the approximate watershed area and used NRCS Web Soil Survey to provide Hydrologic Soil Group Ratings for the area. The watershed area was broken out into several subcatchment areas described further below.

7.2 Watershed Description

Subcatchment S-1 is an 18.0 acre area located on the southeast portion of the larger watershed and is primarily a small lot residential area. Flow from this subcatchment is restricted by an assumed 12" RCP pipe R-1 located using City GIS. This pipe could not be located in a field verification due to overgrown vegetation in that area. This flow eventually combines with subcatchment S-2 flow.

Subcatchment S-2 is 0.85 acres of primarily small residential lots on the north side of Barberry Lane that is captured by a small ponding area P-1. P-1 discharges via a 12" RCP pipe which was located via City GIS and approximately sized. Field verification could not locate the pipe due to overgrown vegetation. Stormwater flow generated from this subcatchment combines with flow from subcatchment S-3 further downgradient.

Subcatchment S-3 is 14.1 acres and is located on the eastern boundary of the watershed along the Route 1 By-Pass. This area is predominantly smaller residential lots that flow into an adjacent ponding area identified as P-2. Flow from this pond is detained and is further restricted by a 12" HDPE culvert.

Subcatchment S-4 is 28.01 acres and is the largest area of the watershed which contains the largest wetland upstream of the 30" culvert under review. This area contains both small lot residential and wooded areas which all ultimately flow to the wetland which is modeled as pond P-3.

Subcatchment S-5 is 8.07 acres along Borthwick Avenue and is the project parcel where the satellite parking lot is being proposed. This catchment has been linked to the project calculations. This area ultimately discharges to the same point as the surrounding subcatchment S-4, the wetland pond P-3. Refer to the Pre- and Post-Development Calculations provided in Sections 2 and 3 for the detailed breakdown of this subcatchment.

Subcatchment S-6 is a 23.08 acre area comprised primarily of mid-sized developed lots and small residential lots. The stormwater from this subcatchment flows west before crossing the railroad bed through a culvert with an upgradient ponding area P-4. This flow is directed through a wide vegetated channel R-2 before reaching the wetland pond P-3 upgradient of the 30" culvert under review.

Subcatchment S-7 is a 3.26 acre area comprised of both woods and small lot residential area. The stormwater generated by this subcatchment flows overland until it reaches a 24" culvert that crosses under Borthwick Avenue at the location identified at R-3. This flow then is conveyed to pond P-3 just upgradient of the 30" culvert by the Route 1 By-Pass.

7.3 Pre- and Post-Development Comparison

The City requested to review the elevation in the post development condition with respect to the elevation given of the adjacent substation. The table below summarizes the Pre- and Post-Development results of the analysis. The only change from the Pre- to the Post-Development conditions is the change proposed within the site shown in the calculations

within Sections 2 and 3 of this report and summarized in the Link S-5 in this overall analysis.

Table 7.3
Borthwick Culvert - Comparison of Pre- and Post-Development

	10-Year Storm	50-Year Storm
Pre-Development		
P-3 Peak Elevation	18.53	19.35
Post-Development Watershed		
P-3 Peak Elevation	18.46	19.32

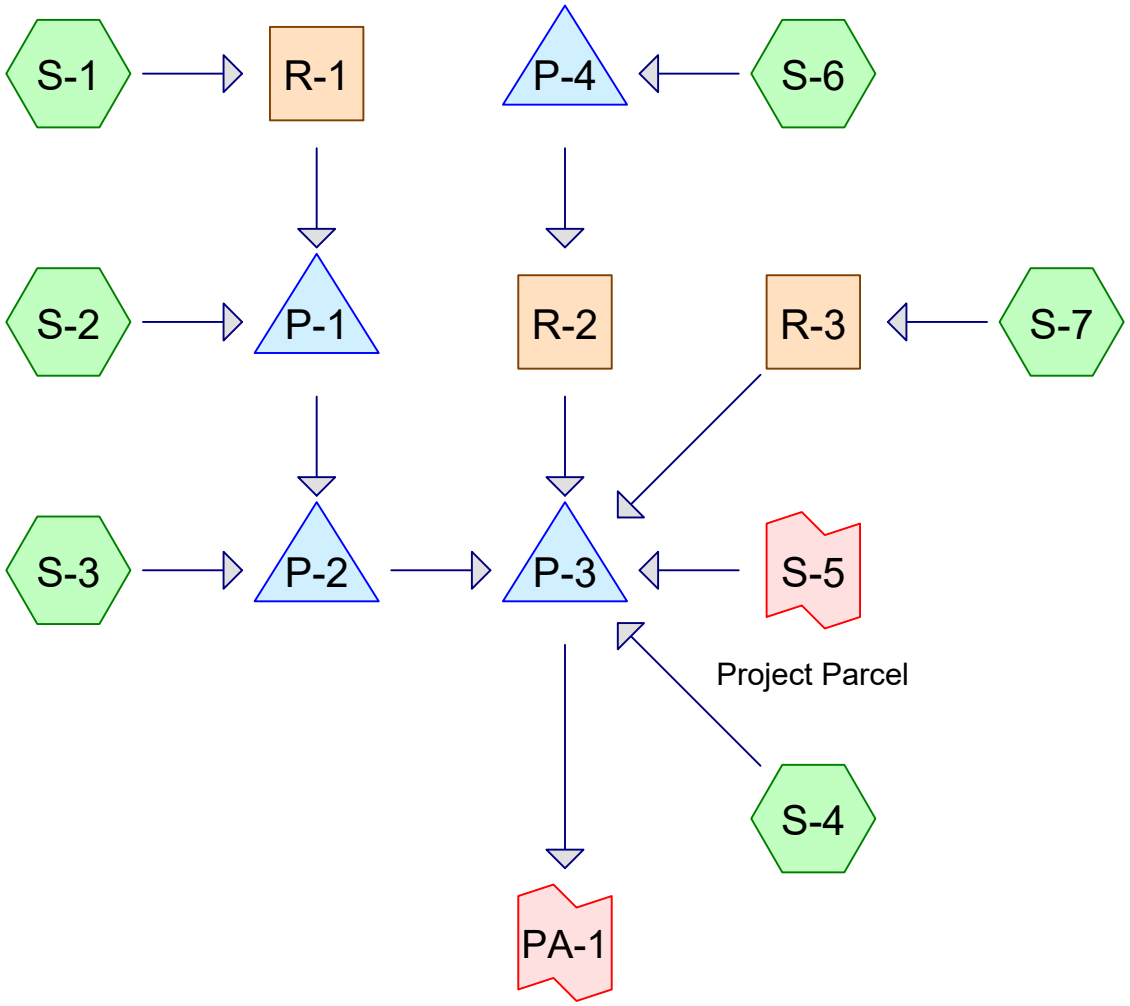
7.4 Summary

The flood elevation of 20.00' is not reached at the 50 year storm event for Pond P-3. This represents the 30" culvert under the gravel utility access road connecting Bayberry and Route 1 By-Pass. Based on the conditions provided and the analysis performed, the project as proposed does not negatively impact the flood elevation directly upstream of the 30" culvert at the intersection of Borthwick Avenue and Route 1 By-Pass.

7.5 Calculations & Watershed Plan

Tighe&Bond

Pre Development Calculations



Subcat Reach Pond Link

Routing Diagram for P0616-005_Borthwick Culvert_Pre
Prepared by Tighe & Bond, Printed 5/11/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
30.490	61	1/4 acre lots, 38% imp, HSG A (S-1, S-2, S-3, S-4, S-6)
19.110	75	1/4 acre lots, 38% imp, HSG B (S-1, S-2, S-3, S-4, S-7)
2.800	83	1/4 acre lots, 38% imp, HSG C (S-3)
22.400	65	2 acre lots, 12% imp, HSG B (S-6)
12.500	70	Woods, Good, HSG C (S-4, S-7)
87.300	**67**	**TOTAL AREA**

Summary for Subcatchment S-1:

Runoff = 43.87 cfs @ 12.55 hrs, Volume= 6.235 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
14.500	61	1/4 acre lots, 38% imp, HSG A
0.000	30	Woods, Good, HSG A
3.500	75	1/4 acre lots, 38% imp, HSG B
18.000	64	Weighted Average
11.160		62.00% Pervious Area
6.840		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
33.9	1,439	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.1	1,489	Total			

Summary for Subcatchment S-2:

Runoff = 3.79 cfs @ 12.17 hrs, Volume= 0.330 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
0.450	61	1/4 acre lots, 38% imp, HSG A
0.400	75	1/4 acre lots, 38% imp, HSG B
0.850	68	Weighted Average
0.527		62.00% Pervious Area
0.323		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
6.9	294	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.1	344	Total			

Summary for Subcatchment S-3:

Runoff = 51.49 cfs @ 12.28 hrs, Volume= 5.462 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
8.500	61	1/4 acre lots, 38% imp, HSG A
2.800	75	1/4 acre lots, 38% imp, HSG B
2.800	83	1/4 acre lots, 38% imp, HSG C
14.100	68	Weighted Average
8.742		62.00% Pervious Area
5.358		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
15.1	847	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.3	897	Total			

Summary for Subcatchment S-4:

Runoff = 93.77 cfs @ 12.39 hrs, Volume= 11.389 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
6.360	61	1/4 acre lots, 38% imp, HSG A
10.380	75	1/4 acre lots, 38% imp, HSG B
11.270	70	Woods, Good, HSG C
28.010	70	Weighted Average
21.649		77.29% Pervious Area
6.361		22.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
22.8	968	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
28.0	1,018	Total			

Summary for Subcatchment S-6:

Runoff = 77.63 cfs @ 12.29 hrs, Volume= 8.257 af, Depth> 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
0.680	61	1/4 acre lots, 38% imp, HSG A
22.400	65	2 acre lots, 12% imp, HSG B
23.080	65	Weighted Average
20.134		87.23% Pervious Area
2.946		12.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
15.1	847	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.3	897	Total			

Summary for Subcatchment S-7:

Runoff = 17.24 cfs @ 12.15 hrs, Volume= 1.428 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
2.030	75	1/4 acre lots, 38% imp, HSG B
1.230	70	Woods, Good, HSG C
3.260	73	Weighted Average
2.489		76.34% Pervious Area
0.771		23.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
5.0	847	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	897	Total			

Summary for Reach R-1:

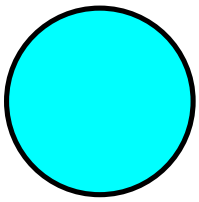
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 824% of Manning's capacity
[76] Warning: Detained 2.846 af (Pond w/culvert advised)

Inflow Area = 18.000 ac, 38.00% Impervious, Inflow Depth > 4.16" for 50-Year event
Inflow = 43.87 cfs @ 12.55 hrs, Volume= 6.235 af
Outflow = 5.67 cfs @ 11.86 hrs, Volume= 5.689 af, Atten= 87%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.71 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 6.36 fps, Avg. Travel Time= 0.3 min

Peak Storage= 82 cf @ 11.90 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.33 cfs

12.0" Round Pipe
n= 0.012
Length= 105.0' Slope= 0.0190 '/'
Inlet Invert= 44.00', Outlet Invert= 42.00'



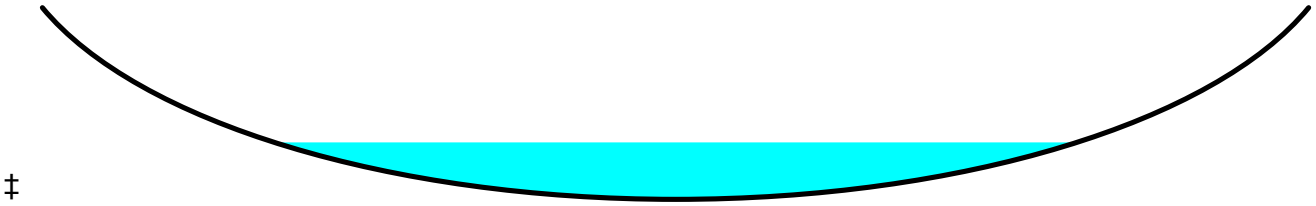
Summary for Reach R-2:

Inflow Area = 23.080 ac, 12.77% Impervious, Inflow Depth > 4.07" for 50-Year event
Inflow = 16.47 cfs @ 13.00 hrs, Volume= 7.827 af
Outflow = 15.19 cfs @ 13.87 hrs, Volume= 7.619 af, Atten= 8%, Lag= 52.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.35 fps, Min. Travel Time= 38.9 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 58.6 min

Peak Storage= 35,458 cf @ 13.87 hrs
Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 4.00' Flow Area= 266.7 sf, Capacity= 209.78 cfs

100.00' x 4.00' deep Parabolic Channel, n= 0.400 Sheet flow: Woods+light brush
Length= 820.0' Slope= 0.0122 '/'
Inlet Invert= 30.00', Outlet Invert= 20.00'



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Summary for Reach R-3:

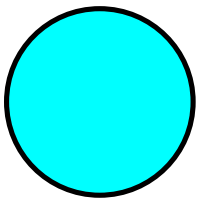
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 597% of Manning's capacity
[76] Warning: Detained 0.432 af (Pond w/culvert advised)

Inflow Area = 3.260 ac, 23.66% Impervious, Inflow Depth > 5.26" for 50-Year event
Inflow = 17.24 cfs @ 12.15 hrs, Volume= 1.428 af
Outflow = 3.08 cfs @ 11.76 hrs, Volume= 1.427 af, Atten= 82%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.04 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 1.8 min

Peak Storage= 226 cf @ 11.80 hrs
Average Depth at Peak Storage= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 2.89 cfs

24.0" Round Pipe
n= 0.012
Length= 72.0' Slope= 0.0001 '/'
Inlet Invert= 30.71', Outlet Invert= 30.70'



Summary for Pond P-1:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=112)
[62] Hint: Exceeded Reach R-1 OUTLET depth by 2.00' @ 0.00 hrs

Inflow Area = 18.850 ac, 38.00% Impervious, Inflow Depth > 3.83" for 50-Year event
Inflow = 9.11 cfs @ 12.17 hrs, Volume= 6.019 af
Outflow = 8.27 cfs @ 12.28 hrs, Volume= 6.019 af, Atten= 9%, Lag= 6.6 min
Primary = 8.27 cfs @ 12.28 hrs, Volume= 6.019 af

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

Peak Elev= 44.28' @ 12.28 hrs Surf.Area= 2,386 sf Storage= 419 cf
Flood Elev= 45.50' Surf.Area= 10,190 sf Storage= 8,063 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,040.5 - 1,040.5)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	13,960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.00	560	0	0
46.00	13,400	13,960	13,960

Device	Routing	Invert	Outlet Devices
#1	Primary	39.00'	**12.0" Round Culvert** L= 96.0' Ke= 0.500 Inlet / Outlet Invert= 39.00' / 34.00' S= 0.0521 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	45.50'	**25.0' long x 30.0' 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

Primary OutFlow Max=8.27 cfs @ 12.28 hrs HW=44.28' TW=20.00' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 8.27 cfs @ 10.53 fps)
└ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P-2:

[58] Hint: Peaked 1.46' above defined flood level

Inflow Area = 32.950 ac, 38.00% Impervious, Inflow Depth > 4.18" for 50-Year event
Inflow = 59.76 cfs @ 12.28 hrs, Volume= 11.481 af
Outflow = 6.56 cfs @ 21.82 hrs, Volume= 6.196 af, Atten= 89%, Lag= 572.2 min
Primary = 6.56 cfs @ 21.82 hrs, Volume= 6.196 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 21.51' @ 21.82 hrs Surf.Area= 125,117 sf Storage= 231,263 cf
Flood Elev= 20.05' Surf.Area= 78,985 sf Storage= 82,750 cf

Plug-Flow detention time= 323.1 min calculated for 6.196 af (54% of inflow)
Center-of-Mass det. time= 141.0 min (1,084.7 - 943.7)

Volume	Invert	Avail.Storage	Storage Description
#1	18.00'	297,040 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.00	1,440	0	0
20.00	77,400	78,840	78,840
22.00	140,800	218,200	297,040

Device	Routing	Invert	Outlet Devices
#1	Primary	18.00'	**12.0" Round Culvert** L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 18.00' / 17.75' S= 0.0069 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=6.56 cfs @ 21.82 hrs HW=21.51' TW=16.77' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.56 cfs @ 8.35 fps)

Summary for Pond P-3:

Inflow Area = 95.374 ac, 23.70% Impervious, Inflow Depth > 3.72" for 50-Year event
Inflow = 129.58 cfs @ 12.39 hrs, Volume= 29.537 af
Outflow = 41.52 cfs @ 13.51 hrs, Volume= 29.524 af, Atten= 68%, Lag= 66.7 min
Primary = 41.52 cfs @ 13.51 hrs, Volume= 29.524 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 19.35' @ 13.51 hrs Surf.Area= 247,695 sf Storage= 222,545 cf
Flood Elev= 20.05' Surf.Area= 344,200 sf Storage= 413,539 cf

Plug-Flow detention time= 48.2 min calculated for 29.524 af (100% of inflow)
Center-of-Mass det. time= 48.0 min (977.8 - 929.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	413,539 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	688	0	0
17.00	1,300	994	994
18.00	45,130	23,215	24,209
20.00	344,200	389,330	413,539

Device	Routing	Invert	Outlet Devices
#1	Primary	15.00'	**30.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.75' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=41.52 cfs @ 13.51 hrs HW=19.35' TW=16.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 41.52 cfs @ 8.46 fps)

Summary for Pond P-4:

[58] Hint: Peaked 12.94' above defined flood level

Inflow Area = 23.080 ac, 12.77% Impervious, Inflow Depth > 4.29" for 50-Year event
Inflow = 77.63 cfs @ 12.29 hrs, Volume= 8.257 af
Outflow = 16.47 cfs @ 13.00 hrs, Volume= 7.827 af, Atten= 79%, Lag= 42.9 min
Primary = 16.47 cfs @ 13.00 hrs, Volume= 7.827 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 32.99' @ 13.00 hrs Surf.Area= 91,958 sf Storage= 151,958 cf
Flood Elev= 20.05' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 134.6 min calculated for 7.827 af (95% of inflow)
Center-of-Mass det. time= 107.1 min (950.3 - 843.2)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	565,156 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	14,150	0	0
32.00	61,550	75,700	75,700
34.00	122,761	184,311	260,011
36.00	182,384	305,145	565,156

Device	Routing	Invert	Outlet Devices
#1	Primary	30.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.00' / 29.90' S= 0.0010 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=16.47 cfs @ 13.00 hrs HW=32.99' TW=31.07' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 16.47 cfs @ 5.24 fps)

Summary for Link PA-1:

Inflow Area = 95.374 ac, 23.70% Impervious, Inflow Depth > 3.71" for 50-Year event
Inflow = 41.52 cfs @ 13.51 hrs, Volume= 29.524 af
Primary = 41.52 cfs @ 13.51 hrs, Volume= 29.524 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Fixed water surface Elevation= 16.00'

Summary for Link S-5: Project Parcel

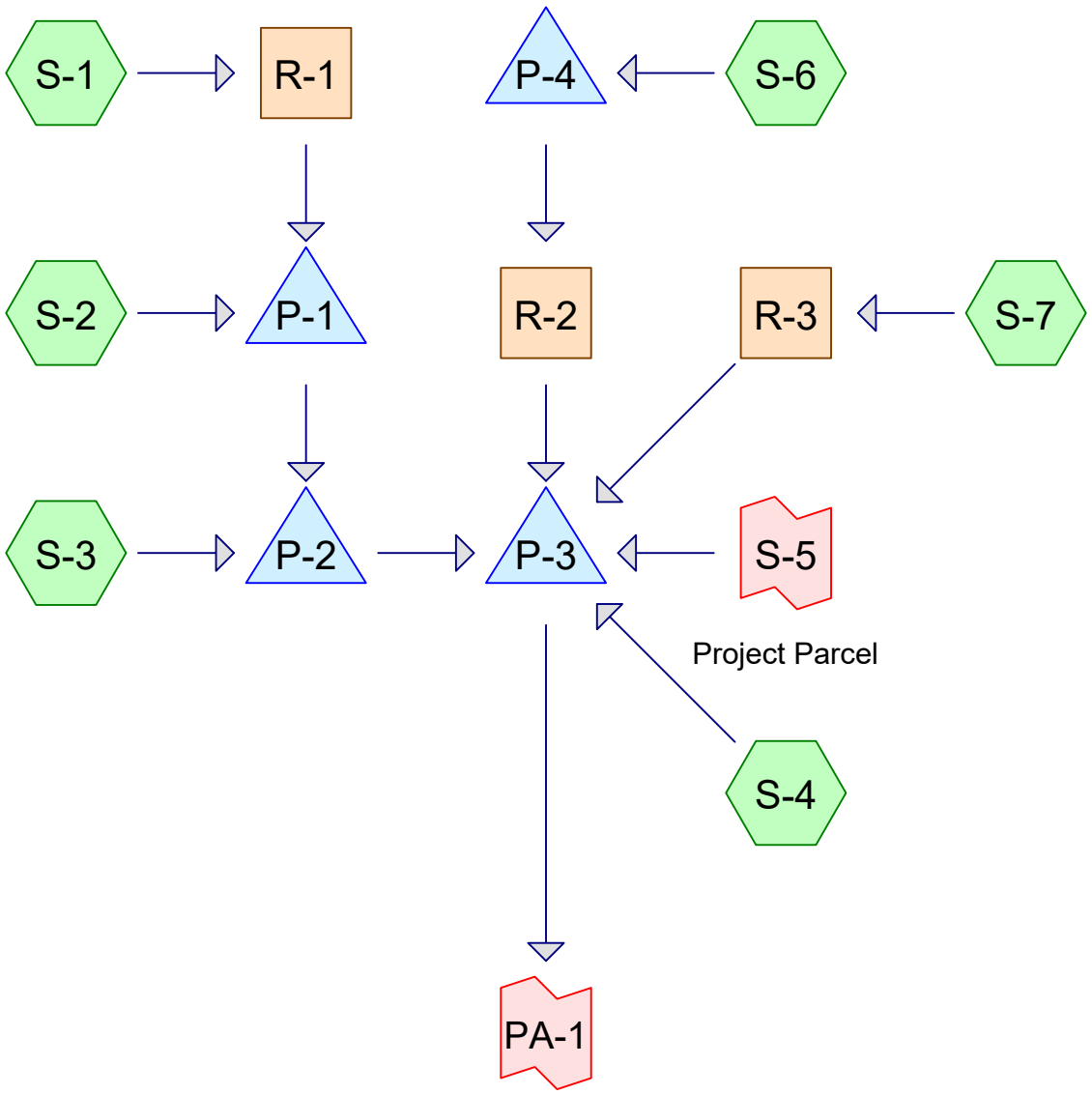
Inflow Area = 8.074 ac, 0.00% Impervious, Inflow Depth > 4.32" for 50-Year event
Inflow = 24.02 cfs @ 12.37 hrs, Volume= 2.906 af
Primary = 24.02 cfs @ 12.37 hrs, Volume= 2.906 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

50-Year Primary Outflow Imported from P0616-005_Pre~Link 1L.hce

Tighe&Bond

Post Development Calculations



Subcat Reach Pond Link

Routing Diagram for P0616-005_Borthwick Culvert_PostREV1
Prepared by Tighe & Bond, Printed 5/11/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
30.490	61	1/4 acre lots, 38% imp, HSG A (S-1, S-2, S-3, S-4, S-6)
19.110	75	1/4 acre lots, 38% imp, HSG B (S-1, S-2, S-3, S-4, S-7)
2.800	83	1/4 acre lots, 38% imp, HSG C (S-3)
22.400	65	2 acre lots, 12% imp, HSG B (S-6)
12.500	70	Woods, Good, HSG C (S-4, S-7)
87.300	**67**	**TOTAL AREA**

Summary for Subcatchment S-1:

Runoff = 43.87 cfs @ 12.55 hrs, Volume= 6.235 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
14.500	61	1/4 acre lots, 38% imp, HSG A
0.000	30	Woods, Good, HSG A
3.500	75	1/4 acre lots, 38% imp, HSG B
18.000	64	Weighted Average
11.160		62.00% Pervious Area
6.840		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
33.9	1,439	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.1	1,489	Total			

Summary for Subcatchment S-2:

Runoff = 3.79 cfs @ 12.17 hrs, Volume= 0.330 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
0.450	61	1/4 acre lots, 38% imp, HSG A
0.400	75	1/4 acre lots, 38% imp, HSG B
0.850	68	Weighted Average
0.527		62.00% Pervious Area
0.323		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
6.9	294	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.1	344	Total			

Summary for Subcatchment S-3:

Runoff = 51.49 cfs @ 12.28 hrs, Volume= 5.462 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
8.500	61	1/4 acre lots, 38% imp, HSG A
2.800	75	1/4 acre lots, 38% imp, HSG B
2.800	83	1/4 acre lots, 38% imp, HSG C
14.100	68	Weighted Average
8.742		62.00% Pervious Area
5.358		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
15.1	847	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.3	897	Total			

Summary for Subcatchment S-4:

Runoff = 93.77 cfs @ 12.39 hrs, Volume= 11.389 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
6.360	61	1/4 acre lots, 38% imp, HSG A
10.380	75	1/4 acre lots, 38% imp, HSG B
11.270	70	Woods, Good, HSG C
28.010	70	Weighted Average
21.649		77.29% Pervious Area
6.361		22.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
22.8	968	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
28.0	1,018	Total			

Summary for Subcatchment S-6:

Runoff = 77.63 cfs @ 12.29 hrs, Volume= 8.257 af, Depth> 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
0.680	61	1/4 acre lots, 38% imp, HSG A
22.400	65	2 acre lots, 12% imp, HSG B
23.080	65	Weighted Average
20.134		87.23% Pervious Area
2.946		12.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
15.1	847	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.3	897	Total			

Summary for Subcatchment S-7:

Runoff = 17.24 cfs @ 12.15 hrs, Volume= 1.428 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=8.51"

Area (ac)	CN	Description
2.030	75	1/4 acre lots, 38% imp, HSG B
1.230	70	Woods, Good, HSG C
3.260	73	Weighted Average
2.489		76.34% Pervious Area
0.771		23.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
5.0	847	0.0350	2.81		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.2	897	Total			

Summary for Reach R-1:

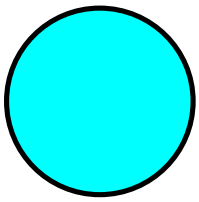
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 824% of Manning's capacity
[76] Warning: Detained 2.846 af (Pond w/culvert advised)

Inflow Area = 18.000 ac, 38.00% Impervious, Inflow Depth > 4.16" for 50-Year event
Inflow = 43.87 cfs @ 12.55 hrs, Volume= 6.235 af
Outflow = 5.67 cfs @ 11.86 hrs, Volume= 5.689 af, Atten= 87%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.71 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 6.36 fps, Avg. Travel Time= 0.3 min

Peak Storage= 82 cf @ 11.90 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.33 cfs

12.0" Round Pipe
n= 0.012
Length= 105.0' Slope= 0.0190 '/'
Inlet Invert= 44.00', Outlet Invert= 42.00'



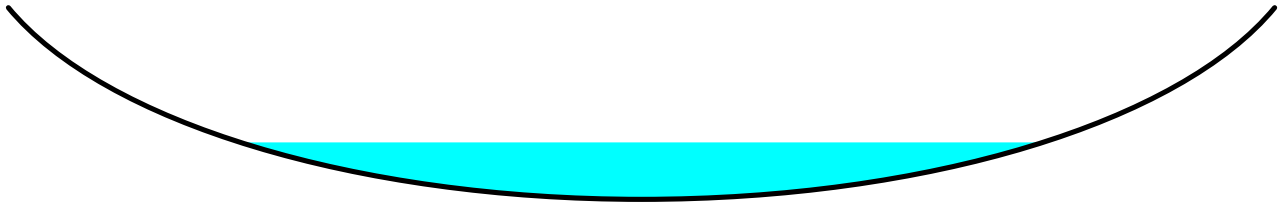
Summary for Reach R-2:

Inflow Area = 23.080 ac, 12.77% Impervious, Inflow Depth > 4.07" for 50-Year event
Inflow = 16.47 cfs @ 13.00 hrs, Volume= 7.827 af
Outflow = 15.19 cfs @ 13.87 hrs, Volume= 7.619 af, Atten= 8%, Lag= 52.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.35 fps, Min. Travel Time= 38.9 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 58.6 min

Peak Storage= 35,458 cf @ 13.87 hrs
Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 4.00' Flow Area= 266.7 sf, Capacity= 209.78 cfs

100.00' x 4.00' deep Parabolic Channel, n= 0.400 Sheet flow: Woods+light brush
Length= 820.0' Slope= 0.0122 '/'
Inlet Invert= 30.00', Outlet Invert= 20.00'



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Summary for Reach R-3:

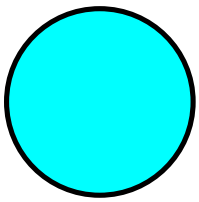
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 597% of Manning's capacity
[76] Warning: Detained 0.432 af (Pond w/culvert advised)

Inflow Area = 3.260 ac, 23.66% Impervious, Inflow Depth > 5.26" for 50-Year event
Inflow = 17.24 cfs @ 12.15 hrs, Volume= 1.428 af
Outflow = 3.08 cfs @ 11.76 hrs, Volume= 1.427 af, Atten= 82%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.04 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 1.8 min

Peak Storage= 226 cf @ 11.80 hrs
Average Depth at Peak Storage= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 2.89 cfs

24.0" Round Pipe
n= 0.012
Length= 72.0' Slope= 0.0001 '/'
Inlet Invert= 30.71', Outlet Invert= 30.70'



Summary for Pond P-1:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=112)
[62] Hint: Exceeded Reach R-1 OUTLET depth by 2.00' @ 0.00 hrs

Inflow Area = 18.850 ac, 38.00% Impervious, Inflow Depth > 3.83" for 50-Year event
Inflow = 9.11 cfs @ 12.17 hrs, Volume= 6.019 af
Outflow = 8.27 cfs @ 12.28 hrs, Volume= 6.019 af, Atten= 9%, Lag= 6.6 min
Primary = 8.27 cfs @ 12.28 hrs, Volume= 6.019 af

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

Peak Elev= 44.28' @ 12.28 hrs Surf.Area= 2,386 sf Storage= 419 cf
Flood Elev= 45.50' Surf.Area= 10,190 sf Storage= 8,063 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,040.5 - 1,040.5)

Volume	Invert	Avail.Storage	Storage Description
#1	44.00'	13,960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.00	560	0	0
46.00	13,400	13,960	13,960

Device	Routing	Invert	Outlet Devices
#1	Primary	39.00'	**12.0" Round Culvert** L= 96.0' Ke= 0.500 Inlet / Outlet Invert= 39.00' / 34.00' S= 0.0521 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	45.50'	**25.0' long x 30.0' 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

Primary OutFlow Max=8.27 cfs @ 12.28 hrs HW=44.28' TW=20.00' (Dynamic Tailwater)
↑ **1=Culvert** (Inlet Controls 8.27 cfs @ 10.53 fps)
└ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P-2:

[58] Hint: Peaked 1.45' above defined flood level

Inflow Area = 32.950 ac, 38.00% Impervious, Inflow Depth > 4.18" for 50-Year event
Inflow = 59.76 cfs @ 12.28 hrs, Volume= 11.481 af
Outflow = 6.55 cfs @ 21.85 hrs, Volume= 6.206 af, Atten= 89%, Lag= 574.1 min
Primary = 6.55 cfs @ 21.85 hrs, Volume= 6.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 21.50' @ 21.85 hrs Surf.Area= 125,003 sf Storage= 230,812 cf
Flood Elev= 20.05' Surf.Area= 78,985 sf Storage= 82,750 cf

Plug-Flow detention time= 322.4 min calculated for 6.206 af (54% of inflow)
Center-of-Mass det. time= 140.5 min (1,084.2 - 943.7)

Volume	Invert	Avail.Storage	Storage Description
#1	18.00'	297,040 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.00	1,440	0	0
20.00	77,400	78,840	78,840
22.00	140,800	218,200	297,040

Device	Routing	Invert	Outlet Devices
#1	Primary	18.00'	**12.0" Round Culvert** L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 18.00' / 17.75' S= 0.0069 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=6.55 cfs @ 21.85 hrs HW=21.50' TW=16.80' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.55 cfs @ 8.34 fps)

Summary for Pond P-3:

Inflow Area = 95.374 ac, 27.97% Impervious, Inflow Depth > 3.74" for 50-Year event
Inflow = 124.35 cfs @ 12.40 hrs, Volume= 29.728 af
Outflow = 41.17 cfs @ 13.61 hrs, Volume= 29.715 af, Atten= 67%, Lag= 72.2 min
Primary = 41.17 cfs @ 13.61 hrs, Volume= 29.715 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 19.32' @ 13.61 hrs Surf.Area= 242,419 sf Storage= 213,897 cf
Flood Elev= 20.05' Surf.Area= 344,200 sf Storage= 413,539 cf

Plug-Flow detention time= 46.9 min calculated for 29.653 af (100% of inflow)
Center-of-Mass det. time= 46.5 min (978.7 - 932.2)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	413,539 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	688	0	0
17.00	1,300	994	994
18.00	45,130	23,215	24,209
20.00	344,200	389,330	413,539

Device	Routing	Invert	Outlet Devices
#1	Primary	15.00'	**30.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.75' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=41.17 cfs @ 13.61 hrs HW=19.32' TW=16.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 41.17 cfs @ 8.39 fps)

Summary for Pond P-4:

[58] Hint: Peaked 12.94' above defined flood level

Inflow Area = 23.080 ac, 12.77% Impervious, Inflow Depth > 4.29" for 50-Year event
Inflow = 77.63 cfs @ 12.29 hrs, Volume= 8.257 af
Outflow = 16.47 cfs @ 13.00 hrs, Volume= 7.827 af, Atten= 79%, Lag= 42.9 min
Primary = 16.47 cfs @ 13.00 hrs, Volume= 7.827 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 32.99' @ 13.00 hrs Surf.Area= 91,958 sf Storage= 151,958 cf
Flood Elev= 20.05' Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 134.6 min calculated for 7.827 af (95% of inflow)
Center-of-Mass det. time= 107.1 min (950.3 - 843.2)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	565,156 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	14,150	0	0
32.00	61,550	75,700	75,700
34.00	122,761	184,311	260,011
36.00	182,384	305,145	565,156

Device	Routing	Invert	Outlet Devices
#1	Primary	30.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.00' / 29.90' S= 0.0010 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=16.47 cfs @ 13.00 hrs HW=32.99' TW=31.07' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 16.47 cfs @ 5.24 fps)

Summary for Link PA-1:

Inflow Area = 95.374 ac, 27.97% Impervious, Inflow Depth > 3.74" for 50-Year event
Inflow = 41.17 cfs @ 13.61 hrs, Volume= 29.715 af
Primary = 41.17 cfs @ 13.61 hrs, Volume= 29.715 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Fixed water surface Elevation= 16.00'

Summary for Link S-5: Project Parcel

Inflow Area = 8.074 ac, 50.46% Impervious, Inflow Depth > 4.59" for 50-Year event
Inflow = 18.64 cfs @ 12.42 hrs, Volume= 3.088 af
Primary = 18.64 cfs @ 12.42 hrs, Volume= 3.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

50-Year Primary Outflow Imported from P0616-005_Post_Rev-01~Link 1L.hce

799
S-7
R-3
140C
S-5
33A
P-3
P-2
S-3
S-4
299
R-2
S-2
P-1
R-1
299
799
S-1
P-4
S-6
140B
140C
140C
1000 ft
N
N
0
150'
300'
GRAPHIC SCALE

BORTHWICK AVENUE CULVERT
PORTSMOUTH, NEW HAMPSHIRE

WATERSHED PLAN

FIGURE:	1 OF 1
DATE:	5/11/2022
DRAWN BY:	AFS
CHECKED:	PMC
APPROVED:	PMC

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Last Save Date: May 11, 2022 1:58 PM By: ASELLAR
Plot Date: Wednesday, May 11, 2022 Plotted By: Alexander Sellar
File Location: J:\PO\0162 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings - Figures\AutoCAD\Sheet\WORKING\borthwick culvert review.dwg Layout Tab: Layout1

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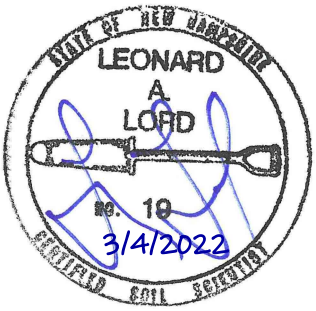
APPENDICES

PRH Parking Expansion
Borthwick Avenue, Portsmouth, NH

SITE SPECIFIC SOIL MAP

Portsmouth Regional Hospital

March 2022



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100% Recyclable

1.0 Introduction

This report is provided in conjunction with a nine +/- acre Site Specific Soil Map (SSSM) prepared by Tighe & Bond along Borthwick Avenue in Portsmouth, NH. The purpose of the mapping was to assist in the evaluation of drainage and other soil-related uses associated with site improvements, and may be used as part of an Alteration of Terrain (AoT) permit application.

2.0 Methods

Fieldwork for the soil mapping was completed November 18-19, 2021 based on *Site-Specific Soil Mapping Standards for New Hampshire and Vermont*, *Version 5.0,* (Society of Soil Scientists of Northern New England [SSSNNE] Special Publication No. 3, December 2017). The poorly and very poorly drained soil types under this system are based on the most recent version of *Field Indicators for Identifying Hydric Soils in New England*, *Version 4* (New England Interstate Water Pollution Control Commission, 2018).

The soil legend for this map is based on the soil series currently mapped in the State of New Hampshire as published in the *New Hampshire State-Wide Numerical Soils Legend* (USDA Natural Resources Conservation Service, Issue #10, 2011). 3.0 Site Features.

3.0 Soil Map Unit Descriptions

Below are descriptions for the map unit found on the accompanying SSSM. The "*" after the numerical map unit symbol represents a placeholder for the slope class indicators described above. Representative test pit logs for each series mapped are attached.

29*—Woodbridge

Landscape Setting: Mid-slope positions upland hills

Drainage Class: Moderately well drained

Parent Material: Basal glacial till

Typical Textures: Fine sandy loam and sandy loam

Hydrologic Soil Group: C

Dissimilar Inclusions: Estimated up to 15% Charlton and Paxton inclusions

Limiting Inclusions: None noted

Representative Test Pit(s): 5, 8

Inclusion Test Pit(s): 10

32*—Boxford

Landscape Setting: Low areas at slightly higher positions than wetlands

Drainage Class: Somewhat poorly drained

Parent Material: Marine silts and clays

Typical Textures: Silt loams and silty clay loams

Hydrologic Soil Group: C

Dissimilar Inclusions: None noted

Limiting Inclusions: None noted

Representative Test Pit(s): 12

33*—Scitico

Landscape Setting: Low areas along the eastern edge of the site

Drainage Class: Pooly drained

Parent Material: Marine silts and clays

Typical Textures: Silt loams and silty clay loams

Hydrologic Soil Group: C

Dissimilar Inclusions: None noted

Limiting Inclusions: None noted

Representative Test Pit(s): 9

66*—Paxton

Landscape Setting: Upper slope positions upland hills

Drainage Class: Well drained

Parent Material: Basal glacial till

Typical Textures: Fine sandy loam and sandy loam

Hydrologic Soil Group: C

Dissimilar Inclusions: None noted

Limiting Inclusions: None noted

Representative Test Pit(s): 2, 10

86*—Hollis

Landscape Setting: Upper slope position adjacent to a bedrock outcrop along Borthwick Avenue

Drainage Class: Somewhat excessively drained

Parent Material: Basal glacial till 10-20 inches over bedrock

Typical Textures: Fine sandy loam and sandy loam

Hydrologic Soil Group: C

Dissimilar Inclusions: None noted

Limiting Inclusions: None noted

Representative Test Pit(s): 11

89*—Chatfield

Landscape Setting: Upper slope positions upland hills

Drainage Class: Well drained

Parent Material: Basal glacial till over bedrock at 20-40 inches

Typical Textures: Fine sandy loam and sandy loam

Hydrologic Soil Group:

Dissimilar Inclusions: Estimated 15% Woodbridge and Charlton inclusions

Limiting Inclusions: None noted

Representative Test Pit(s): 1, 4, 6

Inclusion Test Pit(s): 7

531*—Scio

Landscape Setting: One map unit in a concave area in a lower position between hills

Drainage Class: Moderately well drained

Parent Material: Estuarine silts

Typical Textures: Silt loams

Hydrologic Soil Group: B

Dissimilar Inclusions: None noted

Limiting Inclusions: None noted

Representative Test Pit(s): 3

Notes: Observations along the edge of this map unit are underlain by glacial till with a densipan beneath the 40-inch (1m) depth used to classify the series (e.g., TP-3).

Site Specific Soil Map Legend

Portsmouth Regional Hospital
Parking Expansion Project

Slope Class Identifiers

A	0-3%	D	15-25%
B	3-8%	E	25-50%
C	8-15%	F	>50%

Map Unit Symbols

Map Symbol	Soil Map Unit Name	Hydrologic Soil Group
29	Woodbridge	C
32	Boxford	C
33	Scitico	C
66	Paxton	C
86	Hollis	C
89	Chatfield	B
531	Scio	B

Soil Mapping Notes:

1. Hydrologic soil groups for disturbed soils were based on most similar soil series listed in *Ksat Values for NH Soils*, SSSNNE Special Publication No. 5, 2009.
2. Fieldwork for this map was conducted by Leonard A. Lord, PhD, NHCSS #19 and Jeremy Degler on November 18-19, 2021.
3. This detailed Site Specific Soil Map conforms to the standards of SSSNNE Publication No. 3, as amended, *Site Specific Soil Mapping Standards for NH and VT.*
4. This map has been prepared to comply with soil mapping requirements of RSA 485 A:17 and NHDES Env-Wq, Alteration of Terrain.
5. See accompanying narrative report for methodology, map symbol legend, and interpretations.

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-1
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-16	10YR 4/4	gravelly fine sandy loam	granular	friable		20% gravel
Bw	16-39	10YR 4/6	gravelly fine sandy loam	granular	friable		20% gravel

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): None
Bedrock/Refusal (in): 39"

Soil Series: Chatfield
Drainage Class: Well drained
Hydrologic Group: B
Limiting Ksat of C (in./hr.): 0.6-6.0
Ksat of C at depth (in.): N/A
Series used as basis for Ksat:
(if different)

Notes:

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-2
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-10	10YR 3/3	fine sandy loam	granular	friable		
Bw	10-22	10YR 4/4	gravelly fine sandy loam	subangular blocky	friable		30% gravel
BC	22-33	10YR 4/3	very gravelly fine sandy loam	subangular blocky	friable		40% gravel
Cd	33-68	10YR 4/3	very gravelly fine sandy loam	platy	firm		40% gravel

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): 33"
Bedrock/Refusal (in): 68"

Soil Series: Paxton
Drainage Class: Well drained
Hydrologic Group: C
Limiting Ksat of C (in./hr.): 0.0-0.2
Ksat of C at depth (in.): 33-68
Series used as basis for Ksat:
(if different)

Notes:
Roots to 44"

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-3
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-16	10YR 2/2	fine sandy loam	granular	friable		
Bw	16-29	2.5Y 5/3	silt loam	subangular blocky	friable		
BC	29-43	2.5Y 5/3	silt loam	angular blocky	friable	25% 10YR 4/6 conc. 25% 2.5Y 5/2 depl.	
2Cd	43-58	10YR 3/4	gravelly sandy loam	angular blocky	friable	10% 7.5YR 4/4 conc. 10% 2.5Y 4/1 depl.	20% gravel

		Apparent/Perched
Seasonal High Water (in):	29"	Perched
Observed Water (in):	56"	Perched
Restrictive Layer (in):	43"	
Bedrock/Refusal (in):	58"	

Soil Series: Scio
Drainage Class: Moderately well drained
Hydrologic Group: B
Limiting Ksat of C (in./hr.): 0.6-2.0
Ksat of C at depth (in.): 43-58
Series used as basis for Ksat:
(if different)

Notes:

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-4
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-9	10YR 3/2	fine sandy loam	granular	friable		3% gravel
Bw	9-14	10YR 3/4	fine sandy loam	subangular blocky	friable		13% gravel
C	14-35	2.5Y 4/4	gravelly fine sandy loam	subangular blocky	friable		20% gravel

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): None
Bedrock/Refusal (in): 35"

Soil Series: Chatfield
Drainage Class: Well drained
Hydrologic Group: B
Limiting Ksat of C (in./hr.): 0.6-6.0
Ksat of C at depth (in.): 14-35
Series used as basis for Ksat:
(if different)

Notes:

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-5
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-11	10YR 3/2	loam	granular	friable		3% gravel
BC	11-18	2.5Y 4/3	gravelly fine sandy loam	angular blocky	friable		20% gravel
Cd	18-60	2.5Y 4/3	gravelly fine sandy loam	angular blocky	firm	20% 7.5YR 3/2 conc. 25% 5Y 5/3 conc.	30% gravel

		Apparent/Perched
Seasonal High Water (in):	18"	Perched
Observed Water (in):	35"	Perched
Restrictive Layer (in):	18"	
Bedrock/Refusal (in):	None	

Soil Series: Woodbridge
Drainage Class: Moderately well drained
Hydrologic Group: C
Limiting Ksat of C (in./hr.): 0.0-0.6
Ksat of C at depth (in.): 18-60
Series used as basis for Ksat:
(if different)

Notes:

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-6
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-10	10YR 3/2	fine sandy loam	granular	friable		3% gravel
Bw	10-20	10YR 4/6	fine sandy loam	subangular blocky	friable		10% gravel
C	20-35	2.5Y 4/3	gravelly fine sandy loam	subangular blocky	friable		20% gravel

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): None
Bedrock/Refusal (in): 35"

Soil Series: Chatfield
Drainage Class: Well drained
Hydrologic Group: B
Limiting Ksat of C (in./hr.): 0.6-6.0
Ksat of C at depth (in.): 20-35
Series used as basis for Ksat:
(if different)

Notes:

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-7
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-6	10YR 3/2	fine sandy loam	granular	friable		
Bw	6-17	10YR 3/4	very gravelly fine sandy loam	subangular blocky	friable		40% gravel & cobbles
C	17-44	2.5Y 4/4	very gravelly fine sandy loam	subangular blocky	friable		40% gravel & cobbles

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): None
Bedrock/Refusal (in): 44"

Soil Series: Charlton
Drainage Class: Well drained
Hydrologic Group: B
Limiting Ksat of C (in./hr.): 0.6-6.0
Ksat of C at depth (in.): 17-44
Series used as basis for Ksat:
(if different)

Notes:

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PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-8
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-19	10YR 3/3	fine sandy loam	granular	friable		
Bw	19-26	10YR 4/4	fine sandy loam	subangular blocky	friable		10% gravel
BC	26-39	2.5Y 4/4	fine sandy loam	subangular blocky	friable		10% gravel
Cd	39-54	2.5Y 4/4	fine sandy loam	angular blocky	firm	5% 7.5YR 4.4 conc. 5% 2.5Y 6/1 depl.	10% gravel

		Apparent/Perched
Seasonal High Water (in):	39"	Perched
Observed Water (in):	None	
Restrictive Layer (in):	39"	
Bedrock/Refusal (in):	54"	

Soil Series: Woodbridge
Drainage Class: Moderately well drained
Hydrologic Group: C
Limiting Ksat of C (in./hr.): 0.0-0.6
Ksat of C at depth (in.): 39-54
Series used as basis for Ksat:
(if different)

Notes:

Tighe&Bond

PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-9
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-10	10YR 3/2	silt loam	granular	friable		
Bg	10-15	5Y 6/1	silty clay loam	subangular blocky	friable	15% 5YR 4/6 conc.	10% gravel
Cg	15-49	5Y 5/1	silty clay loam	blocky	firm	30% 2.5YR 4/6 conc.	

		Apparent/Perched
Seasonal High Water (in):	10"	Perched
Observed Water (in):	13"	Perched
Restrictive Layer (in):	15"	
Bedrock/Refusal (in):	None	

Soil Series: Scitico
Drainage Class: Poorly drained
Hydrologic Group: C
Limiting Ksat of C (in./hr.): 0.0-0.2
Ksat of C at depth (in.): 15-49
Series used as basis for Ksat:
(if different)

Notes:

Roots to 24", seep at 13"
Rusty drain pipe (8") in north end of pit

Tighe&Bond

PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-10
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-8	10YR 3/3	fine sandy loam	granular	friable		3% gravel
Bw	8-18	2.5Y 4/4	fine sandy loam	subangular blocky	friable		10% gravel
Cd	18-60	2.5Y 4/4	gravelly fine sandy loam	blocky	firm with friable lenses		20% gravel & cobbles

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): 18"
Bedrock/Refusal (in): None

Soil Series: Paxton
Drainage Class: Well drained
Hydrologic Group: C
Limiting Ksat of C (in./hr.): 0.0-0.2
Ksat of C at depth (in.): 18-60
Series used as basis for Ksat:
(if different)

Notes:

Tighe&Bond

PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/18/2021
Test Pit No.: TP-11
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-9	10YR 3/3	gravelly fine sandy loam	granular	friable		25% gravel
Bw	9-18	10YR 4/6	very gravelly fine sandy loam	subangular blocky	friable		40% gravel

Apparent/Perched

Seasonal High Water (in): None
Observed Water (in): None
Restrictive Layer (in): None
Bedrock/Refusal (in): 18"

Soil Series: Hollis
Drainage Class: Somewhat excessively drained
Hydrologic Group: C/D
Limiting Ksat of C (in./hr.): 0.6-6.0
Ksat of C at depth (in.): N/A
Series used as basis for Ksat:
(if different)

Notes:
Bedrock at 18" sloping to 30"

Tighe&Bond

PORTSMOUTH REGIONAL HOSPITAL
BORTHWICK AVENUE
PORTSMOUTH, NH

Date: 11/19/2021
Test Pit No.: TP-12
Page No.:
Tighe & Bond Project No.: P0616-005

Observed by: Leonard Lord, PhD, CSS, CWS, DSDS

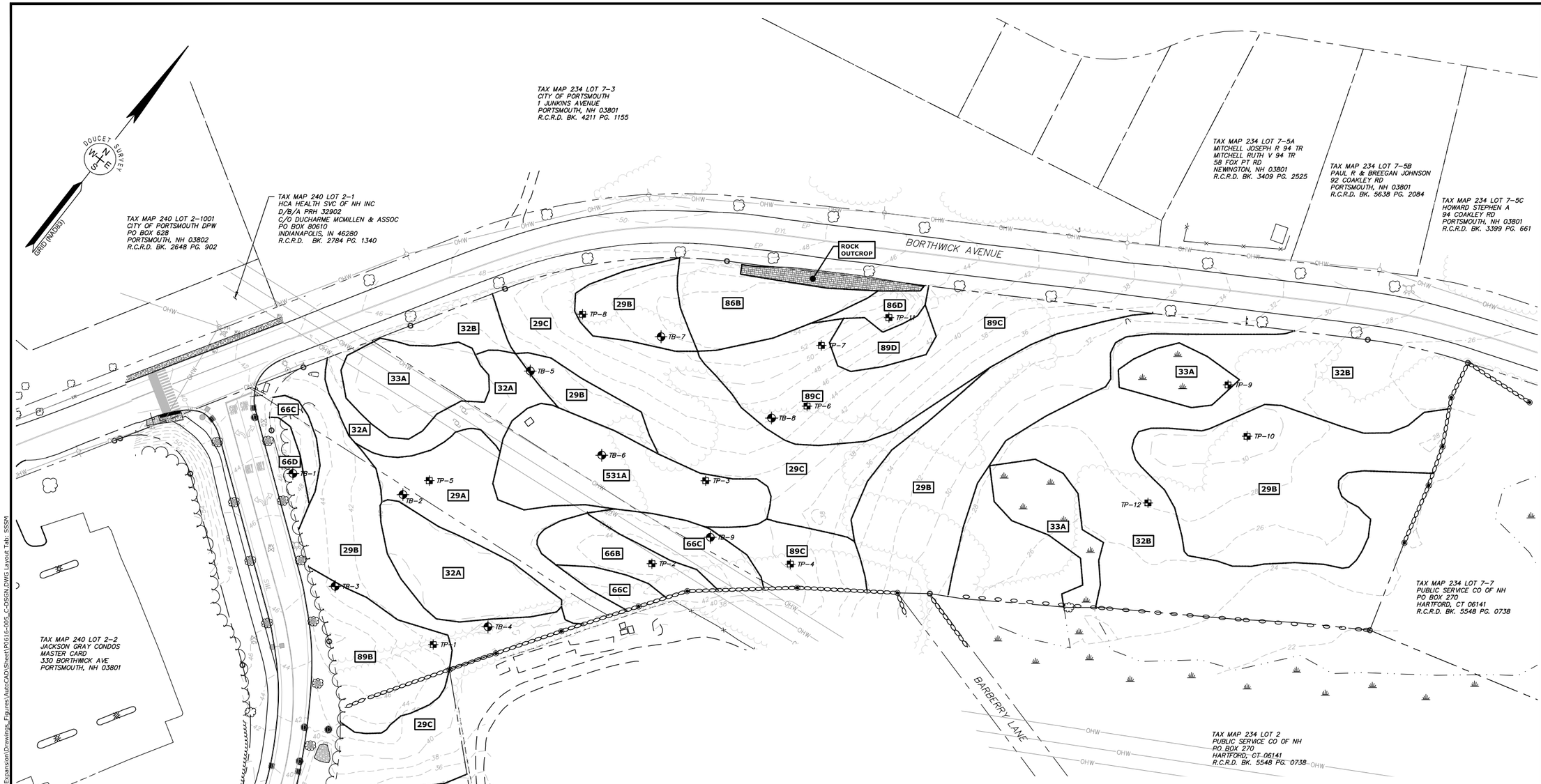
Horizon	Depth (in.)	Color	Texture	Structure	Consistence	Redox Features	Fragments
Ap	0-8	10YR 4/2	silt loam	granular	friable		
Bw	8-12	2.5Y 4/3	silt loam	subangular blocky	friable		
Bg	12-16	2.5Y 5/2	silt loam	angular blocky	friable	10% 10YR 4/6 conc. 10% 5Y 5/2 depl.	
Cg	16-36	5Y 5/2	silty clay loam	blocky	firm	25% 10YR 4/6 conc. 25% 5Y 5/1 depl.	

		Apparent/Perched
Seasonal High Water (in):	12"	Perched
Observed Water (in):	14"	Perched
Restrictive Layer (in):	16"	
Bedrock/Refusal (in):	None	

Soil Series: Boxford
Drainage Class: Somewhat poorly drained
Hydrologic Group: C
Limiting Ksat of C (in./hr.): 0.0-0.2
Ksat of C at depth (in.): 16-36
Series used as basis for Ksat:
(if different)

Notes:

Test pit conducted with hand tools



SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND

SYMBOL	SOIL TYPE	HSG
29	WOODBRIDGE	C
32	BOXFORD	C
33	SCITICO	C
66	PAXTON	C
86	HOLLIS	C
89	CHATFIELD	B
531	SCIO	B

SLOPE CLASS IDENTIFIERS

A	0-3 %	D	15-25%
B	3-8 %	E	25-50%
C	8-15%	F	>50%

NOTES:

1. HYDROLOGIC SOIL GROUPS FOR DISTURBED SOILS WERE BASED ON MOST SIMILAR SOIL SERIES LISTED IN *KSAT VALUES FOR NH SOILS,* SSSNNE SPECIAL PUBLICATION NO. 5, 2009.
2. FIELDWORK FOR THIS MAP WAS CONDUCTED BY LEONARD A. LORD, PhD, NHCSS #19 AND JEREMY DEGLER ON NOVEMBER 18 & 19, 2021.
3. THIS DETAILED SITE SPECIFIC SOIL MAP CONFORMS TO THE STANDARDS OF SSSNNE PUBLICATION NO. 3, AS AMENDED, *SITE SPECIFIC SOIL MAPPING STANDARDS FOR NH AND VT.*
4. THIS MAP HAS BEEN PREPARED TO COMPLY WITH SOIL MAPPING REQUIREMENTS OF RSA 485 A:17 AND NHDES ENV-WQ, ALTERATION OF TERRAIN.
5. SEE ACCOMPANYING NARRATIVE REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS.

Tighe&Bond

STATE OF NEW HAMPSHIRE
LEONARD A. LORD
No. 19
CERTIFIED SOIL SCIENTIST
3/4/2022

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

Proposed Satellite Parking Lot

Portsmouth Regional Hospital

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
A		

PROJECT NO:	P0616-001
DATE:	March 4, 2022
FILE:	P0616-005_C-DSGN.DWG
DRAWN BY:	CMI/AFS
CHECKED:	LAL
APPROVED:	LAL

SITE SPECIFIC SOIL PLAN

SCALE: AS SHOWN

1 OF 1

Last Save Date: March 3, 2022 4:56 PM By: ASELLAR
Plot Date: March 4, 2022 2:20 PM By: Andrew Sellar
T&B File Location: J:\P\P0616 Portsmouth Regional Hospital - Portsmouth, NH Retention Pond\005 PRH Parking Expansion\Drawings_Figures\AutoCAD\Sheet\P0616-005_C-DSGN.DWG Layout Tab: SSSM

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Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.808 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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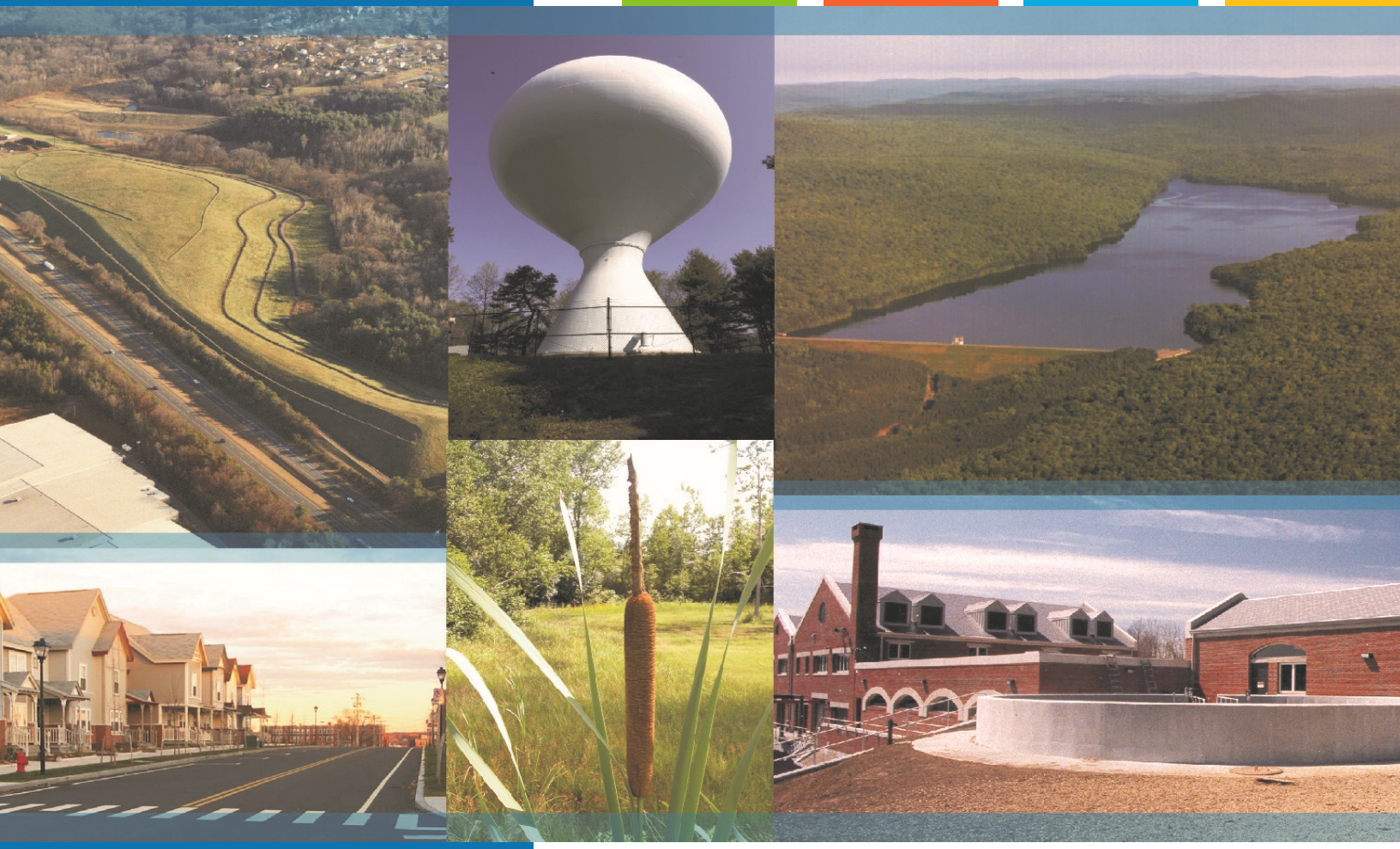

Proposed Satellite Parking Lot
Borthwick Ave
Portsmouth, NH

Long-Term Operation & Maintenance Plan

Portsmouth Regional Hospital

March 22, 2022
Last Revised May 12, 2022

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Section 1 Long-Term Operation & Maintenance Plan

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Section 3 Invasive Species

Section 4 Annual Updates and Log Requirements

Section 1
Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

Portsmouth Regional Hospital
333 Borthwick Avenue
Portsmouth, New Hampshire 03801

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Underground Detention System
- Contech Jellyfish Filtration System
- Contech CDS System
- ADS Stormtech System with Isolator Row

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Bi-Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Jelly Fish Units	Annually/ In accordance with Manufacturer's Recommendations (See section 1.5 for I&M Manuals)
CDS Units	Twice Annually/ In accordance with Manufacturer's Recommendations (See section 1.6 for I&M Manuals)
Underground Detention Basin - Visual observation of sediment levels within system	Bi-Annually
ADS Stormtech System with Isolator Row - Visual observation of sediment levels within system	In accordance with Manufacturer's Recommendations

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.4 Underground Detention/Infiltration System Maintenance Requirements

Underground Detention/Infiltration System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catchbasins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

1.5 ADS Stormtech System with Isolator Row

ADS Stormtech System w/Isolator Row Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Inspect Isolator Row for sediment	6 months for the first year, then adjust based on previous observations	- Inspect inside the isolator row through inspection ports (if provided) or through the upstream structure.
Jetting and Vacuuming	Annually or as required by inspection.	- If sediment is 3" or above, then clean out isolator row using the jetvac process. - Vacuum structure sump as required.

1.6 Contech Jellyfish Filter System Maintenance Requirements and O&M Manual

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media and bypass condition	One (1) time annually and after any rainfall event exceeding 2.5" in a 24-hr period	Maintenance required for any of the following: - >4" of sediment on the vault floor - >1/4" of sediment on top of the cartridge - .4" of static water above the cartridge bottom more than 24 hours after a rain event - If pore space between media is absent. - If vault is in bypass condition during an average rainfall event.
Replace Cartridges	As required by inspection, 1–5 years.	- Remove filter cartridges per manufacturer methods. - Vacuum sediment from vault. - Install new cartridges per manufacturer methods

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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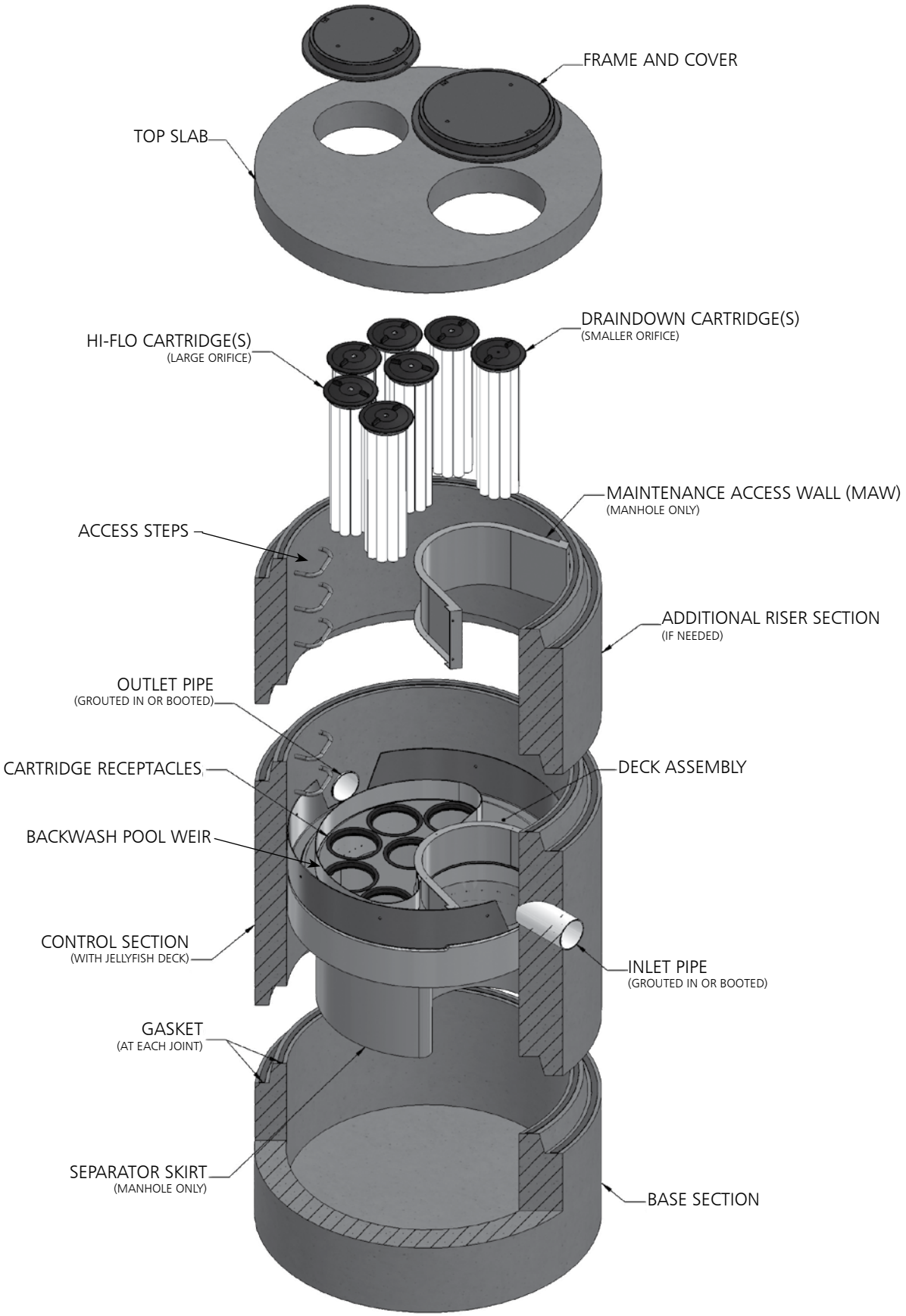
Jellyfish Filter Inspection and Maintenance Log 12

THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project's stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

Contech Engineered Solutions
9025 Centre Pointe Drive, Suite 400 | West Chester, OH 45069
513-645-7000 | 800-338-1122
www.ContechES.com
info@conteches.com


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

WARNINGS / CAUTION

1. FALL PROTECTION may be required.
2. WATCH YOUR STEP if standing on the Jellyfish Filter Deck at any time; Great care and safety must be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Filter Deck at all times to prevent stepping onto a lid, into or through a cartridge hole or slipping on the deck.
3. The Jellyfish Filter Deck can be SLIPPERY WHEN WET.
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK. The Jellyfish Filter Deck and Cartridge Receptacle Rings can be damaged under high impact loads. This type of activity voids all warranties. All damaged items to be replaced at owner's expense.
5. Maximum deck load 2 persons, total weight 450 lbs.

Safety Notice

Jobsite safety is a topic and practice addressed comprehensively by others. The inclusions here are intended to be reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Contech Engineered Solutions.

Confined Space Entry

Secure all equipment and perform all training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is staffed with trained and/or certified personnel, and all equipment is checked for proper operation and safety features prior to use.

- Fall protection equipment
- Eye protection
- Safety boots
- Ear protection
- Gloves
- Ventilation and respiratory protection
- Hard hat
- Maintenance and protection of traffic plan

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

Below you will find a reference page that can be filled out according to your Jellyfish Filter specification to help you easily inspect, maintain and order parts for your system.

Owner Name:	
Phone Number:	
Site Address:	
Site GPS Coordinates/unit location:	
Unit Location Description:	
Jellyfish Filter Model No.:	
Contech Project & Sequence Number	
No. of Hi-Flo Cartridges	
No. of Cartridges:	
Length of Draindown Cartridges:	
No. of Blank Cartridge Lids:	
Bypass Configuration (Online/Offline):	

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

The Jellyfish Filter is an engineered stormwater quality treatment technology that removes a high level and wide variety of stormwater pollutants. Each Jellyfish Filter cartridge consists of eleven membrane - encased filter elements ("filtration tentacles") attached to a cartridge head plate. The filtration tentacles provide a large filtration surface area, resulting in high flow and high pollutant removal capacity.

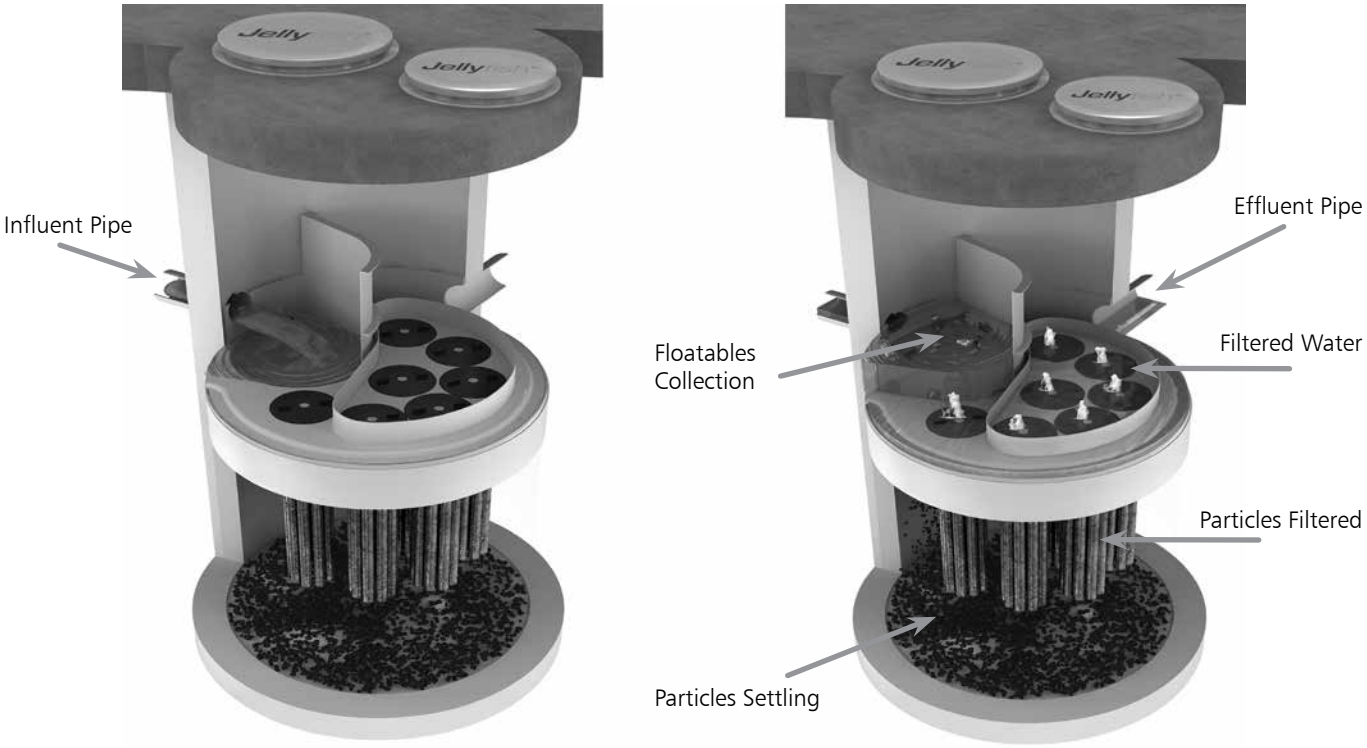
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



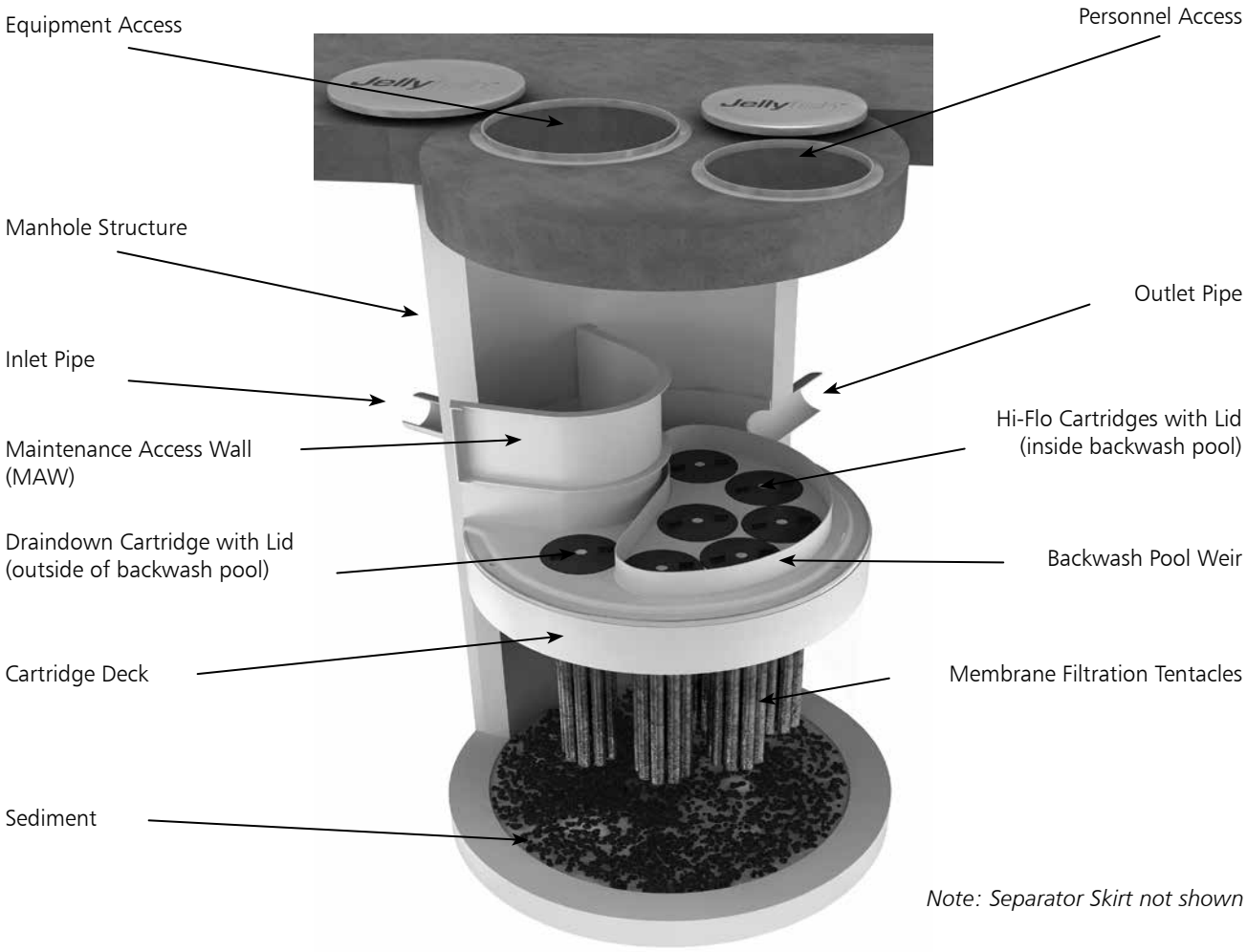
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at www.ContechES.com.

2.1 – Components and Cartridges

The Jellyfish Filter and components are depicted in Figure 2 below.

FIGURE 2 **Jellyfish Filter Components**



Tentacles are available in various lengths as depicted in Table 1 below.

Table 1 – Cartridge Lengths / Weights and Cartridge Lid Orifice Diameters

Cartridge Lengths	Dry Weight	Hi-Flo Orifice Diameter	Draindown Orifice Diameter
15 inches (381 mm)	10 lbs (4.5 kg)	35 mm	20 mm
27 inches (686 mm)	14.5 lbs (6.6 kg)	45 mm	25 mm
40 inches (1,016 mm)	19.5 lbs (8.9 kg)	55 mm	30 mm
54 inches (1,372 mm)	25 lbs (11.4 kg)	70 mm	35 mm

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

The Jellyfish Filter utilizes multiple membrane filtration cartridges. Each cartridge consists of removable cylindrical filtration "tentacles" attached to a cartridge head plate. Each filtration tentacle has a threaded pipe nipple and o-ring. To attach, insert the top pipe nipples with the o-ring through the head plate holes and secure with locking nuts. Hex nuts to be hand tightened and checked with a wrench as shown below.

2.3 – Jellyfish Membrane Filtration Cartridge Installation

- Cartridge installation will be performed by trained individuals and coordinated with the installing site Contractor. Flow diversion devices are required to be in place until the site is stabilized (final paving and landscaping in place). Failure to address this step completely will reduce the time between required maintenance.
- Descend to the cartridge deck (see Safety Notice and page 3).
- Refer to Contech's submittal drawings to determine proper quantity and placement of Hi-Flo, Draindown and Blank cartridges with appropriate lids. Lower the Jellyfish membrane filtration cartridges into the cartridge receptacles within the cartridge deck. It is possible that not all cartridge receptacles will be filled with a filter cartridge. In that case, a blank headplate and blank cartridge lid (no orifice) would be installed.

Cartridge Assembly

Do not force the tentacles down into the cartridge receptacle, as this may damage the membranes. Apply downward pressure on the cartridge head plate to seat the lubricated rim gasket (thick circular gasket surrounding the circumference of the head plate) into the cartridge receptacle. (See Figure 3 for details on approved lubricants for use with rim gasket.)

- Examine the cartridge lids to differentiate lids with a small orifice, a large orifice, and no orifice.
  - Lids with a small orifice are to be inserted into the Draindown cartridge receptacles, outside of the backwash pool weir.
  - Lids with a large orifice are to be inserted into the Hi-Flo cartridge receptacles within the backwash pool weir.
  - Lids with no orifice (blank cartridge lids) and a blank headplate are to be inserted into unoccupied cartridge receptacles.
- To install a cartridge lid, align both cartridge lid male threads with the cartridge receptacle female threads before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation.

3.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.
Inspection activities are typically conducted from surface observations and include:

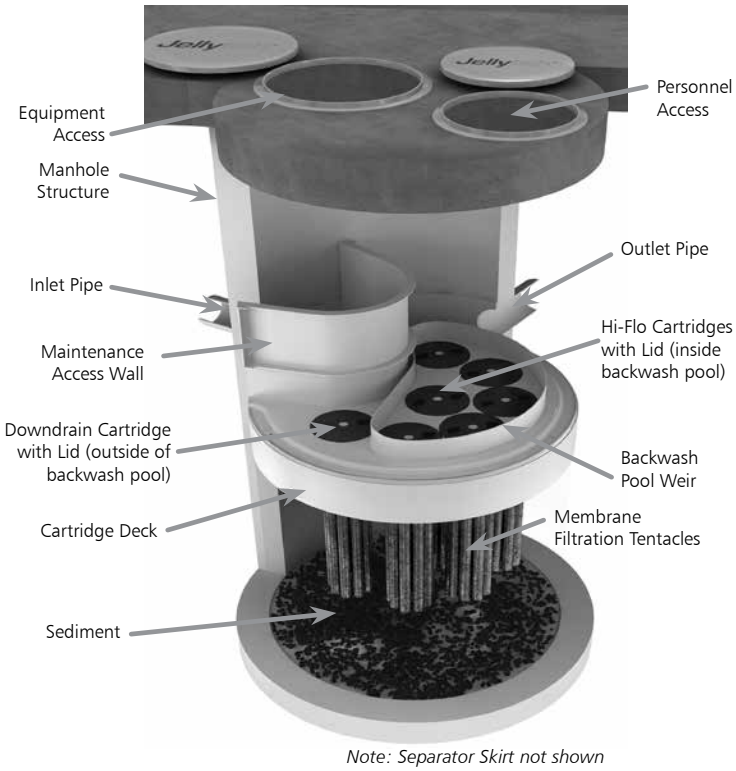
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed

4.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.



Note: Separator Skirt not shown

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

5.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.

Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

5.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

6.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

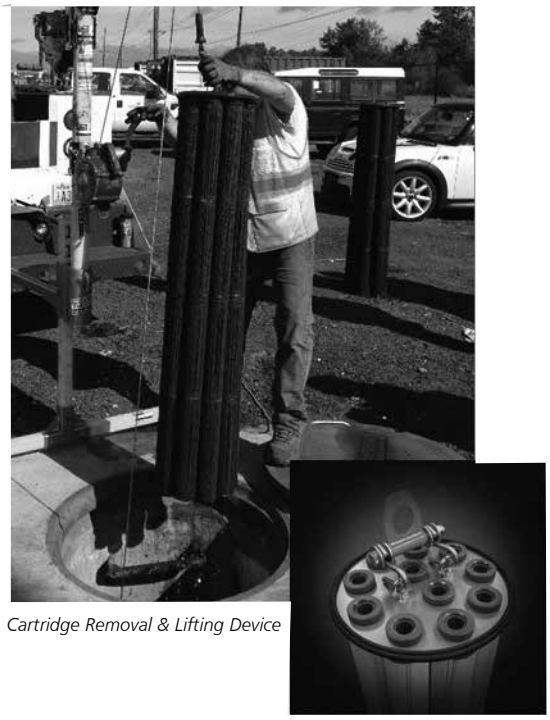
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs*.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane*.
4. Collected rinse water is typically removed by vacuum hose.

5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

7.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.
3. Pressure wash cartridge deck and receptacles to remove all

Rinsing Cartridge with Contech Rinse Tool

sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.

4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.
6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some

Vacuuming Sump Through MAW

vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

7.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. *Caution: Do not force the cartridge downward; damage may occur.*
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

7.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

7.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

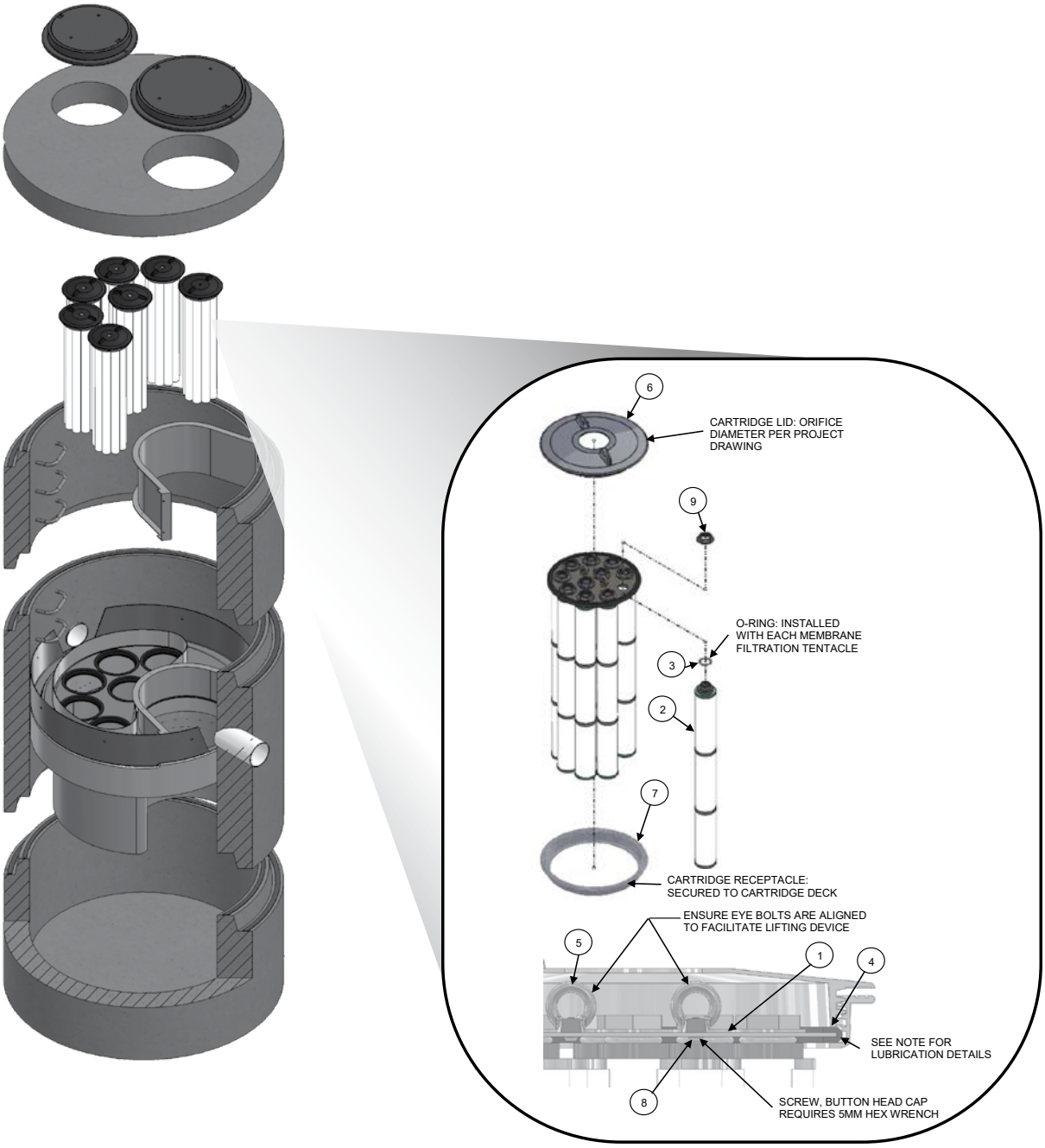


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lid (Item 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

Land Use: Commercial:_____ Industrial: _____ Service Station:_____

Road/Highway:____ Airport: _____ Residential: _____ Parking Lot:_____

Date/Time:					
Inspector:					
Maintenance Contractor:					
Visible Oil Present: (Y/N)					
Oil Quantity Removed					
Floatable Debris Present: (Y/N)					
Floatable Debris removed: (Y/N)					
Water Depth in Backwash Pool					
Cartridges externally rinsed/re-commissioned: (Y/N)					
New tentacles put on Cartridges: (Y/N)					
Sediment Depth Measured: (Y/N)					
Sediment Depth (inches or mm):					
Sediment Removed: (Y/N)					
Cartridge Lids intact: (Y/N)					
Observed Damage:					
Comments:					

1.7 Contech CDS O&M Manual

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.

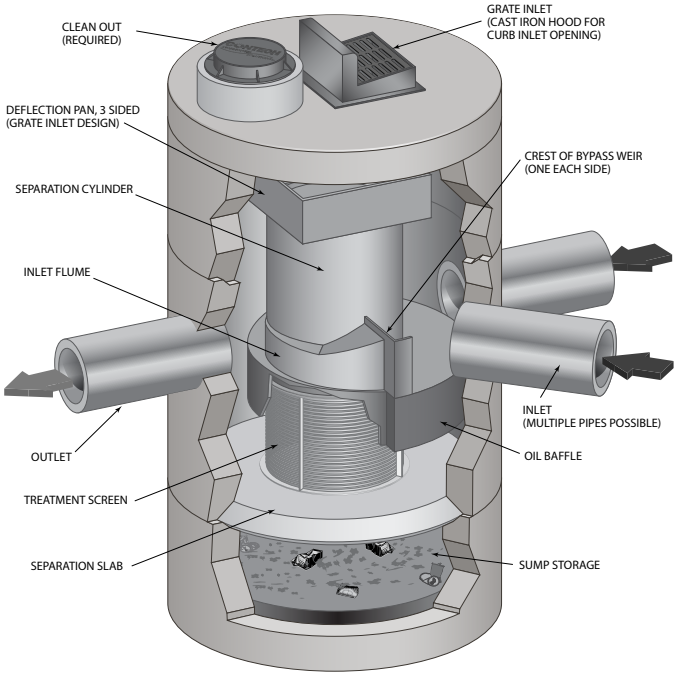
Operation Overview

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.

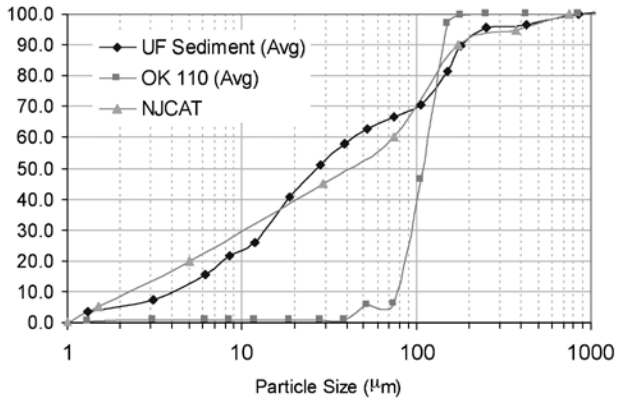


Figure 1. Particle size distributions

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.

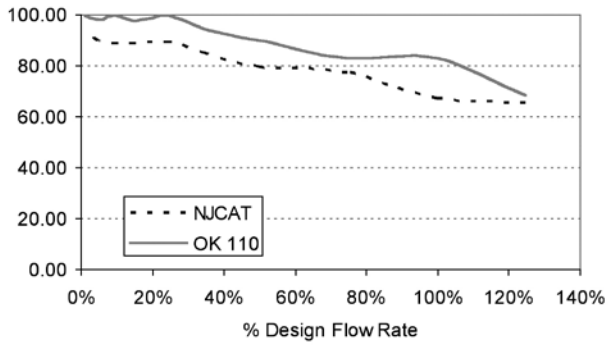


Figure 2. CDS stormwater treatment predictive performance for various particle gradations as a function of operating rate.

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).

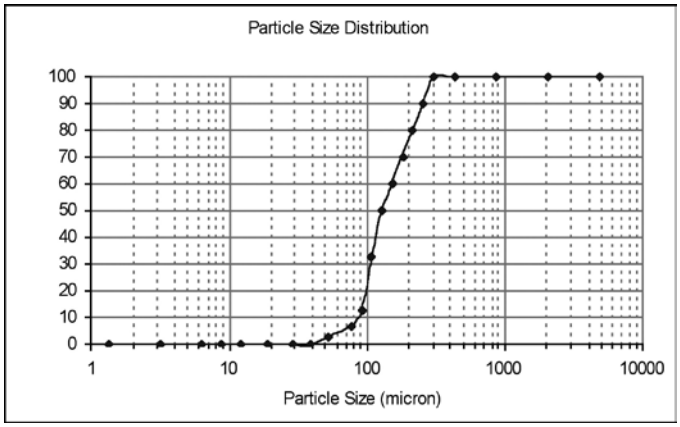


Figure 3. WASDOE PSD

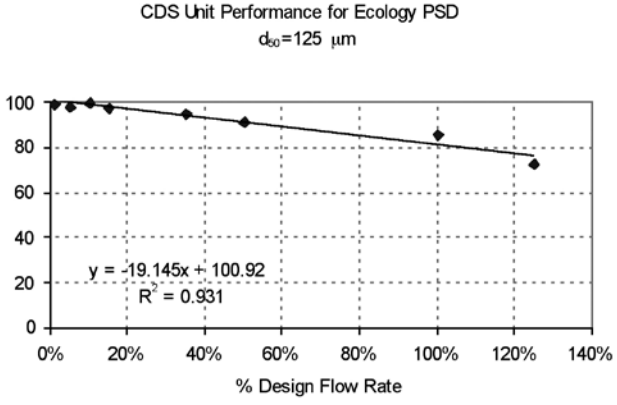


Figure 4. Modeled performance for WASDOE PSD.

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.

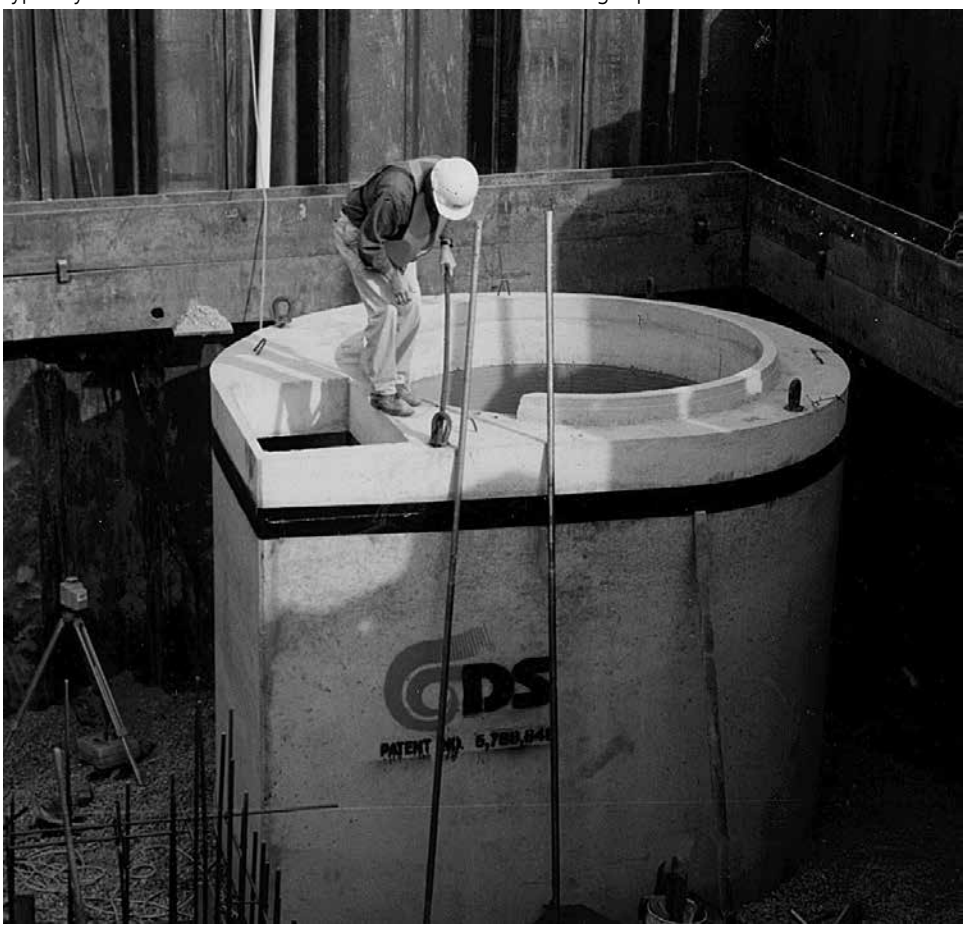
In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should 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

RECYCLED PAPER

1.8 Snow & Ice Management for Standard Asphalt and Walkways

As shown on the Site Plans, the site has reasonable accommodations for on-site snow storage. If required, the property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. All snow removal will be hauled off-site and legally disposed of. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt storage is not permitted withing the 100' wetland buffer. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Section 2
Chloride Management Plan

Winter Operational Guidelines

The following Chloride Management Plan is for the Borthwick Avenue, Satellite Parking Lot in Portsmouth, New Hampshire. The Plan includes operational guidelines including winter operator certification requirements, weather monitoring, equipment calibration requirements, mechanical removal, and salt usage evaluation and monitoring. Due to the evolving nature of chloride management efforts, the Chlorides Management Plan will be reviewed annually, in advance of the winter season, to reflect the current management standards.

2.1 Background Information

The Borthwick Avenue, Satellite Parking Lot is located within the Borthwick Ave Tributary in Portsmouth, New Hampshire. This tributary has been identified as a chloride impaired.

2.2 Operational Guidelines – Chloride Management

All private contractors engaged at the development site for the purposes of winter operational snow removal and surface maintenance, are responsible for assisting in meeting compliance for the following protocols. Private contractors are expected to minimize the effects of the use of de-icing, anti-icing and pretreatment materials by adhering to the strict guidelines outlined below.

The winter operational de-icing, anti-icing and pretreatment materials will adhere to the following protocols:

2.2.1 Winter Operator Certification Requirements

All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance must be current UNHT2 Green SnowPro Certified operators or equivalent and will use only pre-approved methods for spreading abrasives on private roadways and parking lots. All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance shall provide to the property management two copies of the annual UNHT2 Green SnowPro certificate or equivalent for each operator utilized on the premises. The annual UNHT2 Green SnowPro certificate or equivalent for each operator will be available on file in the Facilities Management office and be present in the vehicle/carrier at all times.

2.2.2 Improved Weather Monitoring

The property manager will coordinate weather information for use by winter

maintenance contractors. This information in conjunction with site specific air/ground surface temperature monitoring will ensure that private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance will make more informed decisions as to when and to what extent de-icing, anti-icing and pretreatment materials are applied to private roadways, sidewalks, and parking lots.

2.2.3 Equipment Calibration Requirements

All equipment utilized on the premises for the purpose of winter operational snow removal and surface maintenance will conform to the following calibration requirements.

2.2.3.1 Annual Calibration Requirements

All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of the annual calibration report for each piece of equipment utilized on the premises. Each calibration report shall include the vehicle/carrier VIN number and the serial numbers for each component including, but not limited to, spreader control units, salt aggregate spreader equipment, brining/pre-wetting equipment, ground speed orientation unit, and air/ground surface temperature monitor. Annual calibration reports will be available on file in the Facilities Management office and be present in the vehicle/carrier at all times.

Prior to each use, each vehicle/carrier operator will perform a systems check to verify that unit settings remain within the guidelines established by the Management Team in order to accurately dispense material. All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance will be subject to spot inspections by members of the Property Management Team to ensure that each vehicle/carrier is operating in a manner consistent with the guidelines set herein or State and Municipal regulations. All units will be recalibrated, and the updated calibration reports will be provided each time repairs or maintenance procedures affect the hydraulic system of the vehicle/carrier.

2.2.4 Increased Mechanical Removal Capabilities

All private contractors engaged at the premises will endeavor to use mechanical removal means on a more frequent basis for roadways, parking lots and sidewalks. Dedicating more manpower and equipment to increase snow removal frequencies prevents the buildup of snow and the corresponding need for de-icing, anti-icing and pretreatment materials. Shortened maintenance routes, with shorter service intervals, will be used to stay ahead of snowfall. Minimized snow and ice packing will reduce the need for abrasives, salt aggregates, and/or brining solution to restore surfaces back to bare surface states after winter precipitation events.

After storm events the management team will be responsible for having the streets swept to recapture un-melted de-icing materials, when practical.

2.3 Salt Usage Evaluation and Monitoring

All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of a storm report, which includes detailed information regarding treatment areas and the use of de-icing, anti-icing and pretreatment materials applied for the removal of snow and surface maintenance on the premises. The property manager will maintain copies of Summary Documents, including copies of the Storm Reports, operator certifications, equipment used for roadway and sidewalk winter maintenance, calibration reports and amount of de-icing materials used.

2.4 Summary

The above-described methodologies are incorporated into the Operational Manual and are to be used to qualify and retain all private contractors engaged at the Borthwick Avenue premises for the purpose of winter operational snow removal and surface maintenance. This section of the Manual is intended to be an adaptive management document that is modified as required based on experience gained from past practices and technological advancements that reflect chloride BMP standards. All employees directly involved with winter operational activities are required to review this document and the current standard Best Management Practices published by the UNH Technology Transfer (T2) program annually. All employees directly involved with winter operational activities, and all private contractors engaged at the premises for the purposes of winter operational snow removal and surface maintenance, must be current UNHT2 Green SnowPro Certified operators or equivalent and undergo the necessary requirements to maintain this certification annually.

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

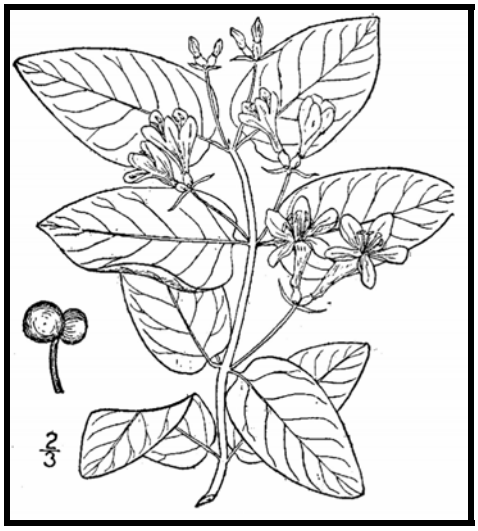
Section 3
Invasive Species

With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem is classified as an invasive species. Refer to the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

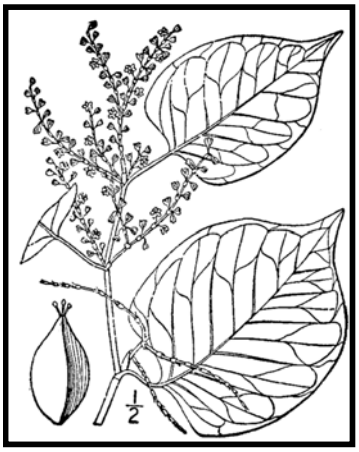
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
 </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
 </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time … but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.

Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

4. **Dry it/cook it**—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. ***Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.*** Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

   ME: Department of Environmental Protection
   www.state.me.us/dep/blwq/docstand/nrpapage.htm

   NH: Department of Environmental Services
   www.des.state.nh.us/wetlands/

   VT: Department of Environmental Conservation
   www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

   MA: Consult your local town conservation commission

   RI: Department of Environmental Management
   www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

   CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

Section 4
Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth on an annual basis.

Stormwater Management Report						
Satellite Parking Lot		**Borthwick Avenue**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Underground Detention Basin 1			❑Yes ❑No			
Underground Detention Basin 2			❑Yes ❑No			
Underground Infiltration Basin			❑Yes ❑No			
Jellyfish Filter 1			❑Yes ❑No			
Jellyfish Filter 2			❑Yes ❑No			
CDS 1			❑Yes ❑No			
CDS 2			❑Yes ❑No			

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100% Recyclable

PROPOSED SATELLITE PARKING LOT
BORTHWICK AVE
PORTSMOUTH, NEW HAMPSHIRE

SITE DISTANCE EXHIBIT

TAX MAP 234 LOT 7-5A
MITCHELL JOSEPH R 94 TR
MITCHELL RUTH V 94 TR
58 FOX PT RD
NEWINGTON, NH 03801
R.C.R.D. BK. 3409 PG. 2525

TAX MAP 234 LOT 7-5B
PAUL R & BREEGAN JOHNSON
92 COAKLEY RD
PORTSMOUTH, NH 03801
R.C.R.D. BK. 5638 PG. 2084

TAX MAP 234 LOT 7-5C
HOWARD STEPHEN A
94 COAKLEY RD
PORTSMOUTH, NH 03801
R.C.R.D. BK. 3399 PG. 661

TAX MAP 234 LOT 7-5D
KRUKOFF-BERNIER PATRICIA
96 COAKLEY RD
PORTSMOUTH, NH 03801
R.C.R.D. BK. 6134 PG. 2201

CK AVENUE

OHW

360'

14.5'

360'

STOP

STOP

26" ELM W/BW

TAX MAP 234 LOT 7-7
PUBLIC SERVICE CO OF NH
PO BOX 270
HARTFORD, CT 06141
R.C.R.D. BK. 5548 PG. 0738

SIGHT DISTANCE CALCULATIONS

BORTHWICK AVE POSTED SPEED LIMIT	**35 MPH**
DESIGN SPEED	**45 MPH**
STOPPING SIGHT DISTANCE AT INTERSECTIONS	**360 FT**

TABLE 9-21 STOPPING SIGHT DISTANCE FOR TURNING ROADWAYS (AASHTO THE GREEN BOOK 2011)

0 50' 100'

GRAPHIC SCALE

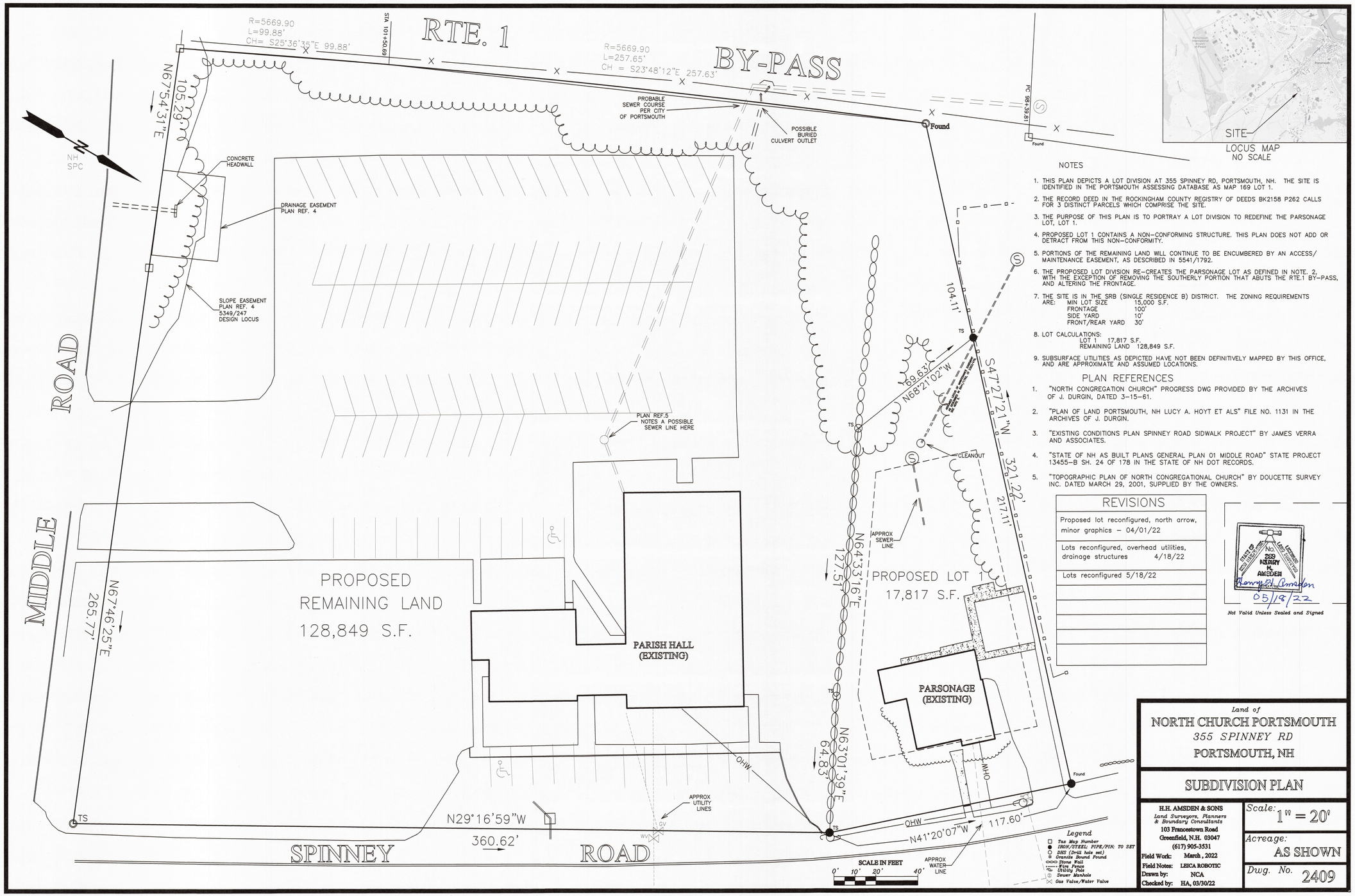
Tighe&Bond

MAY 12, 2022
P0616-005_C-DSGN.DWG

0 Borthwick - City of Portsmouth TAC COMMENT RESPONSE Date: April 21, 2022

City of Portsmouth TAC, May 3, 2022:			
	TAC Stipulation	**Applicant Response**	**Sheet**
TAC Comments from 5/2/2022 Correspondence:			
1	Please note the redirection of drainage flow may dry out the wetland in the central area of the lot.	There is an existing culvert that crosses south across Borthwick Avenue and discharges toward this central lot wetland. This central lot wetland is part of a larger wetland area that extends east along Borthwick Avenue on the abutting parcel. The prior TAC submission re-directed flow through this culvert to the same larger wetland area but discharged at different portion of the wetland along the east property line. The enclosed Grading & Drainage Plans has been revised such that flow in the culvert crossing Borthwick Avenue will be discharged in the direction the the central lot wetland.	C-103
2	There is at least 1 tree shown being planted over a subsurface drainage detention system.	Landscaping has been reviewed and adjusted as required.	C-105
3	Drainage study to be reviewed and approved including the calculations submitted for the Culvert at the intersection of Borthwick and Rt1 Bypass.	Acknowledged. See comment response 16 below.	
4	Please add a note that all work in the City ROW is subject to DPW review and approval.	Site Note 8 has been updated as required.	G-101
5	Near the top of the hill on Borthwick, the applicant is showing re-grading the edge of the ROW which will kill the existing street trees. Is this necessary?	The re-grading in this area is minor but also required due to the proposed curbing requested along Borthwick Avenue. The proposed grading has been updated to reduce impacts to existing trees to the extent practical. Additionally, a note has been added to the Demolition Plan to protect trees within the City's Right of Way.	C-101 & C-103
6	Please address pavement thicknesses as the specified are insufficient for modern pavements.	Pavement sections have been modifed to provide heavy duty sections in high travel areas and to provide typical NHDOT base material and pavement specifications.	C-502
7	The RRFB's will require a maintenance agreement for the owner to maintain in perpetuity.	Acknowledged	
8	It looks like the hydrant on Borthwick will need to get pushed back about 2'.	The hydrant has been updated.	
9	Add curb to the other side of Borthwick as well (parking lot side) to control drainage along the steep portion from elevation 46 to the driveway of the smaller lot. Add an additional catch basin just prior to the driveway to intercept the concentrated flow created by the curbing.	Vertical granite curbing has been added to the site side of Borthwick and a catch basin has been added as required.	C-102.1 & C-103
10	Please address if the PJFF1 structure should be uphill of the infiltration basin to clean the flow before infiltration.	The previously proposed infiltration basin has been revised to a detention basin and the treatment structure has been moved to be downstream of the detention basin. Groundwater recharge will be achieved with a new infiltration basin that has been added to the design.	C-103
11	Internal sidewalk on islands should have tip down ramps.	The sidewalks have been updated as required.	C-102.1
12	Aisles intersecting driveway at entrance should have stop signs and stop lines.	These intersections have been updated as required.	C-102.1
13	If possible, HP access aisles should have NO PARKING signs at front of aisle.	No Parking signs have been added to the HP access aisles.	C-102.1
14	Driveway at EDF Avenue should have double yellow center line and stop sign and stop line.	This driveway has been updated as required.	C-102.1
15	Provide test pits for ledge and groundwater near the two stormwater detention areas. This is critical to prove the drainage design will function properly.	Applicable test pit locations have been added to the Grading & Drainage Plan and the test pit logs can be found in the Drainage Analysis.	C-103
16	Staff are still waiting for the third party review of the project.	Agreed. The applicant still has not received a third party agreement for execution despite the City's request for a peer review at the April 5, 2022 TAC meeting. The applicant respectfully requests the City expedite this process in order to not further delay the project review.	

17	Remove curbed island in turnaround area at dead parking and square off the pavement.	Dead end parking area has been updated as required.	C-102.1
18	Review soil under the proposed infiltration basin to avoid restrictive layers.	The location of the infiltration basin has been updated as required. The soil data for the proposed area has been provided on the plans.	C-103
19	Prior to construction, there are multiple City street trees being effected, the removal of them will require permission from the Trees and Greenery Committee.	A note has been added to the Demolition Plan to coordinate with the Committee.	C-101
20	Buffer plantings shall be equal to the amount of fill proposed (received 4/4/2022)	As stated in the previous submission to the Technical Advisory Committee, the applicant has provided a buffer enhancement area within the wetland buffer of the project to more than offset the area of impacted wetlands. The project proposes approximately 9,000 SF of wetland impacts and provides 19,000 SF of buffer enhancment area within the 100 ft buffer. The applicant has since further developed the proposed planting layout of this area and species list for consideration. See the Landscape Plan.	C-105



NOTES

1. THIS PLAN DEPICTS A LOT DIVISION AT 355 SPINNEY RD, PORTSMOUTH, NH. THE SITE IS IDENTIFIED IN THE PORTSMOUTH ASSESSING DATABASE AS MAP 169 LOT 1.
2. THE RECORD DEED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS BK2158 P262 CALLS FOR 3 DISTINCT PARCELS WHICH COMPRISE THE SITE.
3. THE PURPOSE OF THIS PLAN IS TO PORTRAY A LOT DIVISION TO REDEFINE THE PARSONAGE LOT, LOT 1.
4. PROPOSED LOT 1 CONTAINS A NON-CONFORMING STRUCTURE. THIS PLAN DOES NOT ADD OR DETRACT FROM THIS NON-CONFORMITY.
5. PORTIONS OF THE REMAINING LAND WILL CONTINUE TO BE ENCUMBERED BY AN ACCESS/ MAINTENANCE EASEMENT, AS DESCRIBED IN 5541/1792.
6. THE PROPOSED LOT DIVISION RE-CREATES THE PARSONAGE LOT AS DEFINED IN NOTE. 2, WITH THE EXCEPTION OF REMOVING THE SOUTHERLY PORTION THAT ABUTS THE RTE.1 BY-PASS, AND ALTERING THE FRONTAGE.
7. THE SITE IS IN THE SRB (SINGLE RESIDENCE B) DISTRICT. THE ZONING REQUIREMENTS ARE:

MIN LOT SIZE	15,000 S.F.
FRONTAGE	100'
SIDE YARD	10'
FRONT/REAR YARD	30'

8. LOT CALCULATIONS:
   LOT 1 17,817 S.F.
   REMAINING LAND 128,849 S.F.
9. SUBSURFACE UTILITIES AS DEPICTED HAVE NOT BEEN DEFINITIVELY MAPPED BY THIS OFFICE, AND ARE APPROXIMATE AND ASSUMED LOCATIONS.

PLAN REFERENCES

1. "NORTH CONGREGATION CHURCH" PROGRESS DWG PROVIDED BY THE ARCHIVES OF J. DURGIN, DATED 3-15-61.
2. "PLAN OF LAND PORTSMOUTH, NH LUCY A. HOYT ET ALS" FILE NO. 1131 IN THE ARCHIVES OF J. DURGIN.
3. "EXISTING CONDITIONS PLAN SPINNEY ROAD SIDWALK PROJECT" BY JAMES VERRA AND ASSOCIATES.
4. "STATE OF NH AS BUILT PLANS GENERAL PLAN 01 MIDDLE ROAD" STATE PROJECT 13455-B SH. 24 OF 178 IN THE STATE OF NH DOT RECORDS.
5. "TOPOGRAPHIC PLAN OF NORTH CONGREGATIONAL CHURCH" BY DOUCETTE SURVEY INC. DATED MARCH 29, 2001, SUPPLIED BY THE OWNERS.

REVISIONS

Proposed lot reconfigured, north arrow, minor graphics – 04/01/22
Lots reconfigured, overhead utilities, drainage structures 4/18/22
Lots reconfigured 5/18/22

STATE OF NEW HAMPSHIRE — No. 259 — HENRY N. AMSDEN — REGISTERED LAND SURVEYOR

Henry N. Amsden
05/18/22

Not Valid Unless Sealed and Signed

Land of

NORTH CHURCH PORTSMOUTH

355 SPINNEY RD

PORTSMOUTH, NH

SUBDIVISION PLAN

H.H. AMSDEN & SONS
Land Surveyors, Planners & Boundary Consultants
103 Francestown Road
Greenfield, N.H. 03047
(617) 905-3531

Field Work:	March , 2022
Field Notes:	LEICA ROBOTIC
Drawn by:	NCA
Checked by:	HA, 03/30/22

Scale: 1" = 20'

Acreage: AS SHOWN

Dwg. No. 2409

K0076-038
May 24, 2022

Ms. Beverly M. Zendt, Planning Director
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Site Plan Review & Wetlands Conditional Use Permit Applications**
Proposed 2-story Building, 230 Commerce Way, Portsmouth, NH

Dear Beverly:

On behalf of 230 Commerce Way, LLC (owner/applicant), we are pleased to submit via the City of Portsmouth online permitting system the following information to support a request for a Site Plan Review and Wetland Conditional Use Permit for the above referenced project:

- One (1) full size & one (1) half size copy of the Site Plan Set last, dated May 24, 2022;
- Site Review Checklist dated, May 24, 2022;
- Drainage Analysis Memorandum, dated May 24, 2022;
- Long-Term Operation & Maintenance Plan, dated May 24, 2022;
- Fire Truck Turning Exhibit dated, May 24, 2022;
- Trip Generation Analysis Memorandum, dated May 24, 2022;
- Eversource Will Service Letter dated, May 24, 2022;
- Unitil Will Service Letter dated, May 12, 2022;
- 100' Wetland Buffer Impact Exhibit dated May 24, 2022;
- Green Building Statement, dated May 24, 2022;
- Application fee calculation form for the Site Review and Wetland Conditional Use Permit application fees;
- Cheek in the amount of $6,240.00 for the Site Plan Review & Wetland Conditional Use Permit application fee

The proposed project is located at 230 Commerce Way on the corner of Portsmouth Boulevard and Commerce way, on property identified as Map 216 Lot 1-5 on the City of Portsmouth Tax Maps. The existing site currently consists of a 3-story office building with a large associated parking lot. The proposed project consists of a new 2-story building for veterinary care uses within the limits of the existing parking lot, modifications to the parking lot, and associated site improvements. The associated site improvements include the site lighting, underground utilities, stormwater treatment/management system, and wetland buffer enhancements.

Land Use Permit Applications

Site Plan Review Permit

The project will require a Site Plan Review Permit for the site improvements described above in the project summary. The project has previously been before the Planning Board for Conceptual Consultation, and Conservation Commission and the Technical Advisory Committee for work sessions.

Wetland Conditional Use Permit

A portion of the proposed work is located in the 100-foot wetland buffer thus requiring a Conditional Use Permit per Section 10.1017 of the Zoning Ordinance. As a result of the project there is going to be a reduction of existing impervious area within the wetland buffer of approximately 5,070 SF. The project is also proposing 9,250 SF of buffer enhancement area.

Conditional Use Permit Criteria

Based on the above described and enclosed materials, the following addresses how the proposed project warrants the granting of a Wetland Conditional Use Permit by satisfying the following six (6) criteria for approval in Section 10.1017.50 of the Zoning Ordinance:

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

The land is currently a previously disturbed site which consists of an office building and parking lot and is suited for enhancement. The proposed project site lies partially within a previously wetland buffer area. The proposed project will result in impervious surface reduction in the buffer and buffer enhancement. Advanced stormwater treatment is also part of the proposed project which will improve the quality of the runoff to the wetland from the project site.

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

The placement of the proposed building is limited by the 75-foot side yard setbacks that are required in the Office Research (OR) zone. The proposed project design reduces the impervious surface within the 100' buffer and proposes to replace existing pavement and lawn areas with wetland buffer seed mix and plant native shrubs and trees.

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

There will be no adverse impact on the wetland functional values of the site as the existing condition is previously disturbed and consists of building, parking area and no existing stormwater treatment. The proposed project designs site and landscape plans enhance the previously disturbed buffer area given the existing condition and provide treatment of stormwater runoff where none currently exists.

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

The proposed project design proposes no alteration to any natural woodland or wetlands area. The area impacted consists of mainly of impervious surfaces. Any temporary disturbances of the wetland buffer for construction of the stormwater outlet and removal of existing pavement will be restored following construction.

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

The proposed project design is not an adverse impact to the site as it would enhance the buffer by reducing overall impervious surface on the site and improve water quality through stormwater treatment. Impervious surfaces have been reduced from the existing condition. The proposed project will reduce the impervious area within the 100-foot wetland buffer.

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

The proposed project design within the vegetated buffer strip is limited to construction of the stormwater outlet from the stormwater collection and treatment system. The existing property has no stormwater treatment measures. The proposed project will collect and treat the onsite impervious surfaces prior to discharging to the on-site wetland. Implementing these treatment measures will help improve the water quality runoff discharging to the wetland. In order for this system to work, disturbances with the buffer strip are necessary. Areas temporarily disturbed for the construction of the outlet will be restored following construction. The landscape plan proposes restoring the disturbed areas within the foot wetland buffer with a wetland buffer seed mix, and the addition of several native trees and shrubs.

We respectfully request to be placed on the TAC meeting agenda for June 7, 2022. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

CC: 230 Commerce Way, LLC
Nelson Architecture & Interior, Inc.
City of Portsmouth Technical Advisory Committee
City of Portsmouth Conservation Commission

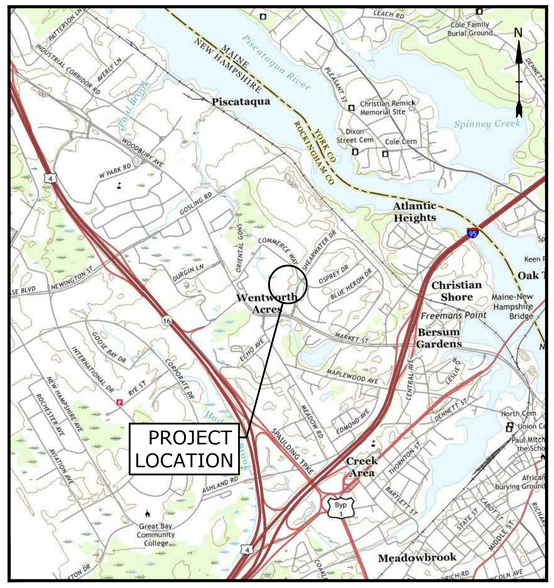
j:\k\k0076 the kane company - general proposals\0076-038 portsmouth blvd\report_evaluation\applications\city of portsmouth\20220524_tac\cover letter.docx

PROPOSED 2-STORY BUILDING

230 COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE
MAY 24, 2022

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	05/24/2022
1 OF 5	TOPOGRAPHIC PLAN	04/19/2022
2 OF 5	TOPOGRAPHIC PLAN	04/19/2022
3 OF 5	TOPOGRAPHIC PLAN	04/19/2022
4 OF 5	TOPOGRAPHIC PLAN	04/19/2022
5 OF 5	TOPOGRAPHIC PLAN	04/19/2022
C-101	DEMOLITION PLAN	05/24/2022
C-102	SITE PLAN	05/24/2022
C-103	GRADING, DRAINAGE & EROSION CONTROL PLAN	05/24/2022
C-104	UTILITY PLAN	05/24/2022
C-105	LANDSCAPE PLAN	05/24/2022
C-501	EROSION CONTROL NOTES & DETAILS SHEET	05/24/2022
C-502	DETAILS SHEET	05/24/2022
C-503	DETAILS SHEET	05/24/2022
C-504	DETAILS SHEET	05/24/2022
C-505	DETAILS SHEET	05/24/2022
C-506	DETAILS SHEET	05/24/2022
C-701	PHOTOMETRICS PLAN	05/24/2022
A-200	ELEVATIONS	05/23/2022
A-201	ELEVATIONS	05/23/2022

LIST OF PERMITS		
FEDERAL	STATUS	DATE
CONSTRUCTION GENERAL PERMIT	PENDING	
LOCAL		
SITE PLAN REVIEW PERMIT	PENDING	



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

PATRICK M. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

APPLICANT / OWNER:
230 Commerce Way, LLC
210 Commerce Way, Suite 300
Portsmouth, NH 03801
603.559.9666

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

ARCHITECT (OWNER):
Nelson Worldwide, LLC
99 Chauncy St 10th Floor
Boston, MA 02111
617.751.5886

WETLAND CONSULTANT:
Gove Environmental Services, INC
8 Continental Dr Bldg 2 Unit H
Exeter, NH 03833
603.778.0644

ARCHITECT (TENANT):
Capone Architecture
18 Shipyard Dr #2a
Hingham, MA 02043
617.875.0786

TAC SUBMISSION SET
COMPLETE SET 20 SHEETS

811 DigSafe MA-ME-NH-RI-VT

Last Save Date: May 24, 2022 10:15 AM By: CML
Plot Date: Tuesday, May 24, 2022 10:16 AM By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings, Figures\AutoCAD\Sheet\K0076-038_CS.dwg Layout Tab: T&B_CS_22x34

DOUCET SURVEY, LLC
NHSPC (NAD83 / 2011)

ABUTTERS
TAX MAP 216, LOT 1–2
COMMERCE CENTER AT PORTMSOUTH
273 CORPORATE DRIVE, SUITE 150
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3507, PAGE 2405

TAX MAP 216, LOT 1–8
195 COMMERCE WAY LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5418, PAGE 1358

TAX MAP 216, LOT 1–8A
BEACON HARBOR TRUST LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5877, PAGE 2905

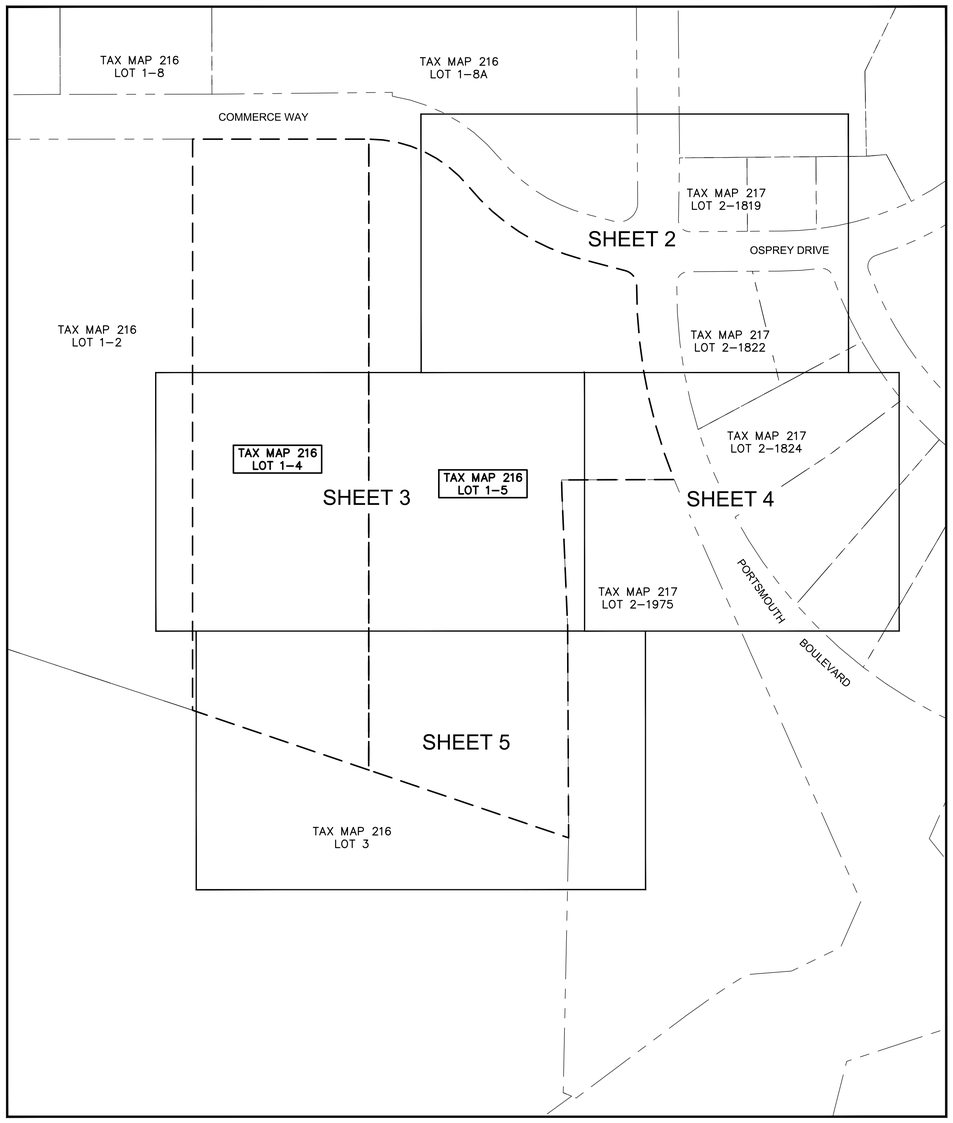
TAX MAP 216, LOT 3
BROMLEY PORTSMOUTH LLC
C/O QUINCY & CO. INC.
57 DEDHAM AVENUE
NEEDHAM, MA 02492
R.C.R.D. BOOK 4486, PAGE 2167

TAX MAP 217, LOT 2–1819
BRORA LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3474, PAGE 866

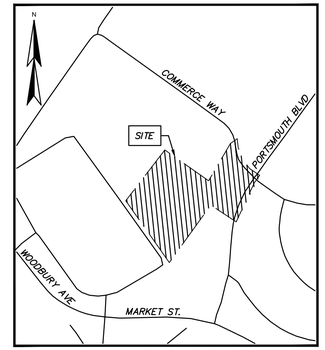
TAX MAP 217, LOT 2–1822
MARTIN A. TORRES REV. TRUST
MARTIN A. TORRES, TRUSTEE
2 OSPREY DRIVE
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3543, PAGE 89

TAX MAP 217, LOT 2–1824
JAMES J. MCGOVERN IRREVOCABLE TRUST
19 SANDERLING WAY
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 4895, PAGE 2707

TAX MAP 217, LOT 2–1975
BRORA LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3507, PAGE 118



KEY MAP



LOCATION MAP (n.t.s.)

LEGEND

APPROXIMATE LOT LINE	PAD MOUNTED TRANSFORMER
APPROXIMATE ABUTTERS LOT LINE	ELECTRIC BOX
STONE WALL	UTILITY BOX
CHAIN LINK FENCE	CATCH BASIN
GUARDRAIL	DRAIN MANHOLE
OVERHEAD WIRE	ELECTRIC MANHOLE
SEWER LINE	TELEPHONE MANHOLE
DRAIN LINE	SEWER MANHOLE
SEWER LINE (PER CITY GIS)	CLEANOUT
DRAIN LINE (PER CITY GIS)	
UNDERGROUND ELECTRIC LINE	CONIFEROUS TREE
MAJOR CONTOUR LINE	DECIDUOUS TREE
MINOR CONTOUR LINE	CONIFEROUS SHRUB
TREE LINE	DECIDUOUS BUSH
SHRUB LINE	
EDGE OF WETLAND	BORING LOCATION
EDGE OF WATER	
WETLAND AREA	ACCESSIBLE PARKING SPACE
CONCRETE	TYP. TYPICAL
LANDSCAPED AREA	CONC. CONCRETE
CRUSHED STONE	HDWL HEADWALL
BRICK	TH THRESHOLD ELEVATION
	EP EDGE OF PAVEMENT
UTILITY POLE & GUY WIRE	VGC VERTICAL GRANITE CURB
UTILITY POLE W/LIGHT	SGC SLOPED GRANITE CURB
LIGHT POLE W/ARM	SWL SINGLE WHITE LINE
LIGHT POLE (MULTI–ARMS)	SYL SINGLE YELLOW LINE
SIGN	DYL DOUBLE YELLOW LINE
BOLLARD	GM GAS METER
FIRE HYDRANT	"HP" HANDICAP PARKING SIGN
	"NP" NO PARKING SIGN
WATER GATE VALVE	"R" RESERVED PARKING SIGN
WATER SHUTOFF VALVE	•A–1 WETLAND FLAG
GAS REGULATOR	
VENT PIPE	

NOTES:

1. REFERENCE:
   TAX MAP 216, LOT 1–4
   210 COMMERCE WAY LLC
   210 COMMERCE WAY, SUITE 300
   PORTSMOUTH, NH 03801
   R.C.R.D. BOOK 5418, PAGE 1360
   D.S. PROJECT NO. 5864

   TAX MAP 216, LOT 1–5
   230 COMMERCE WAY LLC
   210 COMMERCE WAY, SUITE 300
   PORTSMOUTH, NH 03801
   R.C.R.D. BOOK 5418, PAGE 1364
2. FIELD SURVEY PERFORMED BY DOUCET SURVEY DURING FEBRUARY 2022 USING A TRIMBLE S7 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
3. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.
4. VERTICAL DATUM IS BASED ON APPROXIMATE NAVD88(GEOID12A) (±.2') DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.
5. 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, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.
6. WETLANDS WERE NOT DELINEATED ON SITE. ANY FLAGS LOCATED WERE FROM A PREVIOUS DELINEATION.
7. 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.
8. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVED PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON–SITE.
9. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG–SAFE AT 1–888–DIG–SAFE.
10. OVERALL PARCEL BOUNDARIES AS SHOWN HEREON ARE BASED ON NEW HAMPSHIRE'S GRANIT GIS DATA AND ARE IN THEIR ORIGINAL LOCATION. THE PARCEL BOUNDARIES HAVE NOT BEEN ADJUSTED TO MATCH FOUND PROPERTY MONUMENTS OR THE EDGE OF RIGHT OF WAY AS DETERMINED BY THE SURVEYOR.

100 0 100 200
SCALE: 1 INCH = 100 FT.

TOPOGRAPHIC PLAN
FOR
RW NORFOLK HOLDING, LLC
PROPERTIES OF
210 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-4)
&
230 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-5)
COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	04/19/22	ADDITIONAL TOPOGRAPHY (SPRING)	P.C.L

DRAWN BY: P.C.L.	DATE: FEBRUARY 23, 2022
CHECKED BY: M.W.F.	DRAWING NO. 5864A
JOB NO. 5896	SHEET 1 OF 5

DOUCET SURVEY LLC
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Offices in Bedford & Keene, NH and Kennebunk, ME
http://www.doucetsurvey.com

FILE NAME: C:\DATA_S3 FILES\Survey\AutoCad_19905\5864A 2022-04-19.dwg LAYOUT NAME: T1 PLOTTED: Tuesday, April 19, 2022 - 4:29pm

DOUCET SURVEY, LLC

NHSPCS (NAD83/2011)

TBM 6864A
NAIL FND. UP 12"
IN POLE PSNH 316/6 W/COND.
ELEV.=67.19'

CB 3130
RIM ELEV.=59.2'
(2201) 12" RCP INV.=56.0'
SUMP=55.9'

SMH 2154
RIM ELEV.=58.3'
(A) 8" VCP TOP=53.3'
(B) 8" VCP INV.=52.7'
(3127) 8" VCP INV.=52.7'
(2630) 8" VCP INV.=52.6'

CB 2928
RIM ELEV.=58.4'
(2267) 12" RCP INV.=56.1'
SUMP=52.8'

CB 2201
RIM ELEV.=59.2'
(3130) 12" RCP INV.=55.8'
(2184) 12" RCP INV.=55.6'

NO OUTLET /INP

DMH 2184
RIM ELEV.=58.4'
(2201) 12" RCP INV.=55.0'
(2187) 12" RCP INV.=55.0'
(2196) 12" RCP INV.=54.9'

SMH 3127
RIM ELEV.=58.4'
(A) 6" VCP INV.=53.6'
(2185) 8" VCP INV.=53.3'
(2154) 8" VCP INV.=53.2'

CB 2187
RIM ELEV.=58.4'
FILLED WITH ICE

MAYBE PULL? FILLED W/ICE

CB 2187
RIM ELEV.=58.4'
OUT OF SCOPE

SMH 2185
RIM ELEV.=64.7'
(A) 4" PVC INV.=59.9'
(B) 4" PVC INV.=58.0'
(C) 4" PVC OBSTRUCTED
(D) 8" VCP INV.=55.9'
(3127) 8" VCP INV.=55.5'

CB 1915
RIM ELEV.=59.5'
OUT OF SCOPE

CB 1867
RIM ELEV.=60.4'
(1866) 12" RCP RECESSED
SUMP=53.9'

CB 1866
RIM ELEV.=59.7'
(1867) 12" RCP INV.=57.0'
(2267) 12" RCP INV.=56.9'
SUMP=53.8'

CB 2196
RIM ELEV.=57.7'
(2184) 12" RCP INV.=53.9'
(2387) 12" RCP INV.=53.9'
SUMP=50.9'

CB 2267
RIM ELEV.=57.7'
(2928) 12" RCP INV.=55.4'
(1866) 12" RCP RECESSED
(2343) UNK. RECESSED
SUMP=55.5'

TBM 5864B
X-CUT IN BOLT
OVER MAIN OF HYDRANT
ELEV.=58.38'

COMMERCE WAY

OSPREY DRIVE

PORTSMOUTH BOULEVARD

BUILDING

SHEET 2
SHEET 3

SHEET 2
SHEET 4

20 0 20 40

SCALE: 1 INCH = 20 FT.

TOPOGRAPHIC PLAN
FOR
RW NORFOLK HOLDING, LLC
PROPERTIES OF
210 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-4)
&
230 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-5)
COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	04/19/22	ADDITIONAL TOPOGRAPHY (SPRING)	P.C.L

DRAWN BY:	P.C.L.	DATE:	FEBRUARY 23, 2022
CHECKED BY:	M.W.F.	DRAWING NO.	5864A
JOB NO.	5896	SHEET	2 OF 5

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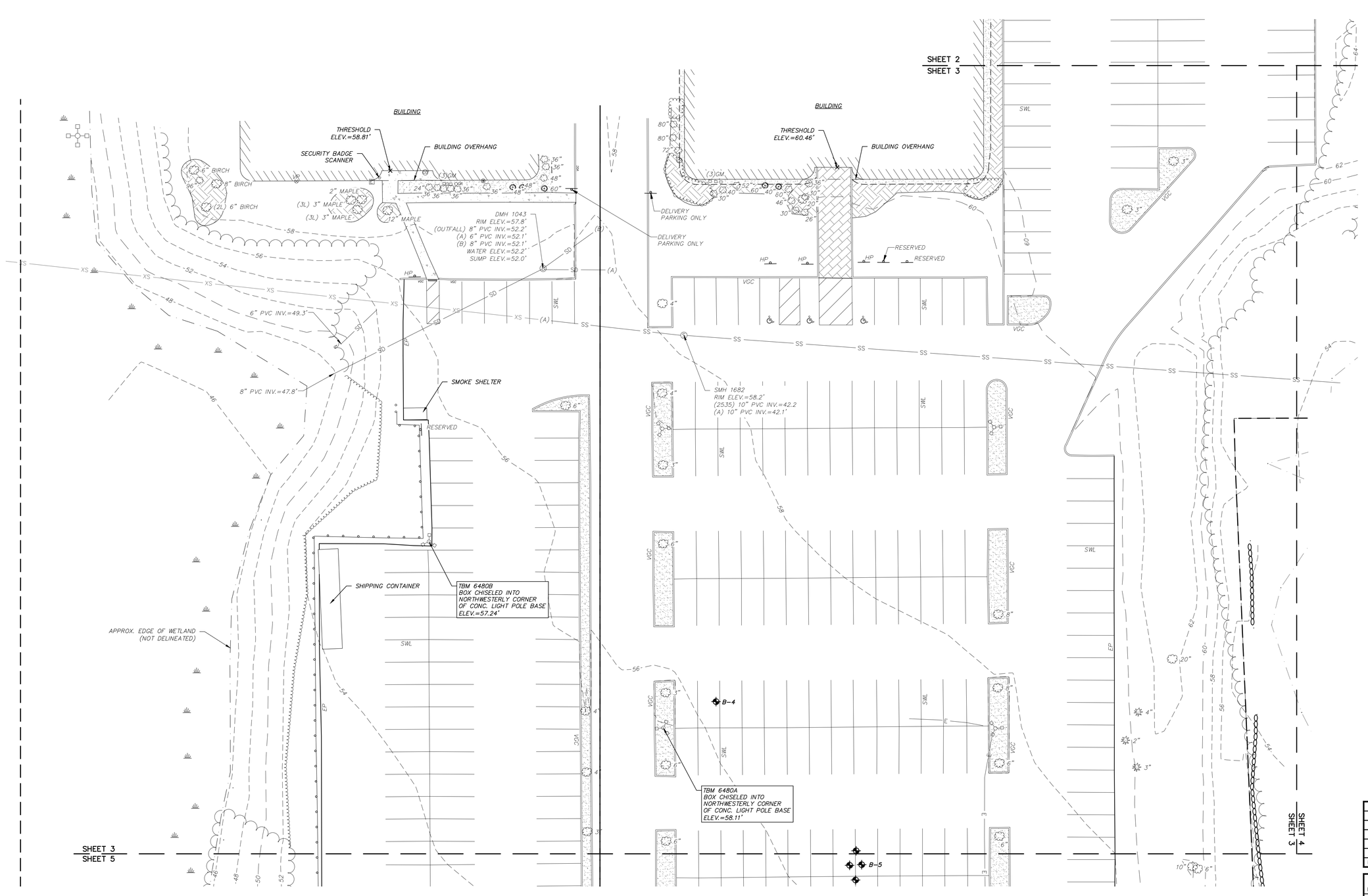

SCALE: 1 INCH = 20 FT.

TOPOGRAPHIC PLAN
FOR
RW NORFOLK HOLDING, LLC
PROPERTIES OF
210 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-4)
&
230 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-5)
COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	04/19/22	ADDITIONAL TOPOGRAPHY (SPRING)	P.C.L

DRAWN BY: P.C.L.		DATE: FEBRUARY 23, 2022	
CHECKED BY: M.W.F.		DRAWING NO. 5864A	
JOB NO. 5896		SHEET 3 OF 5	

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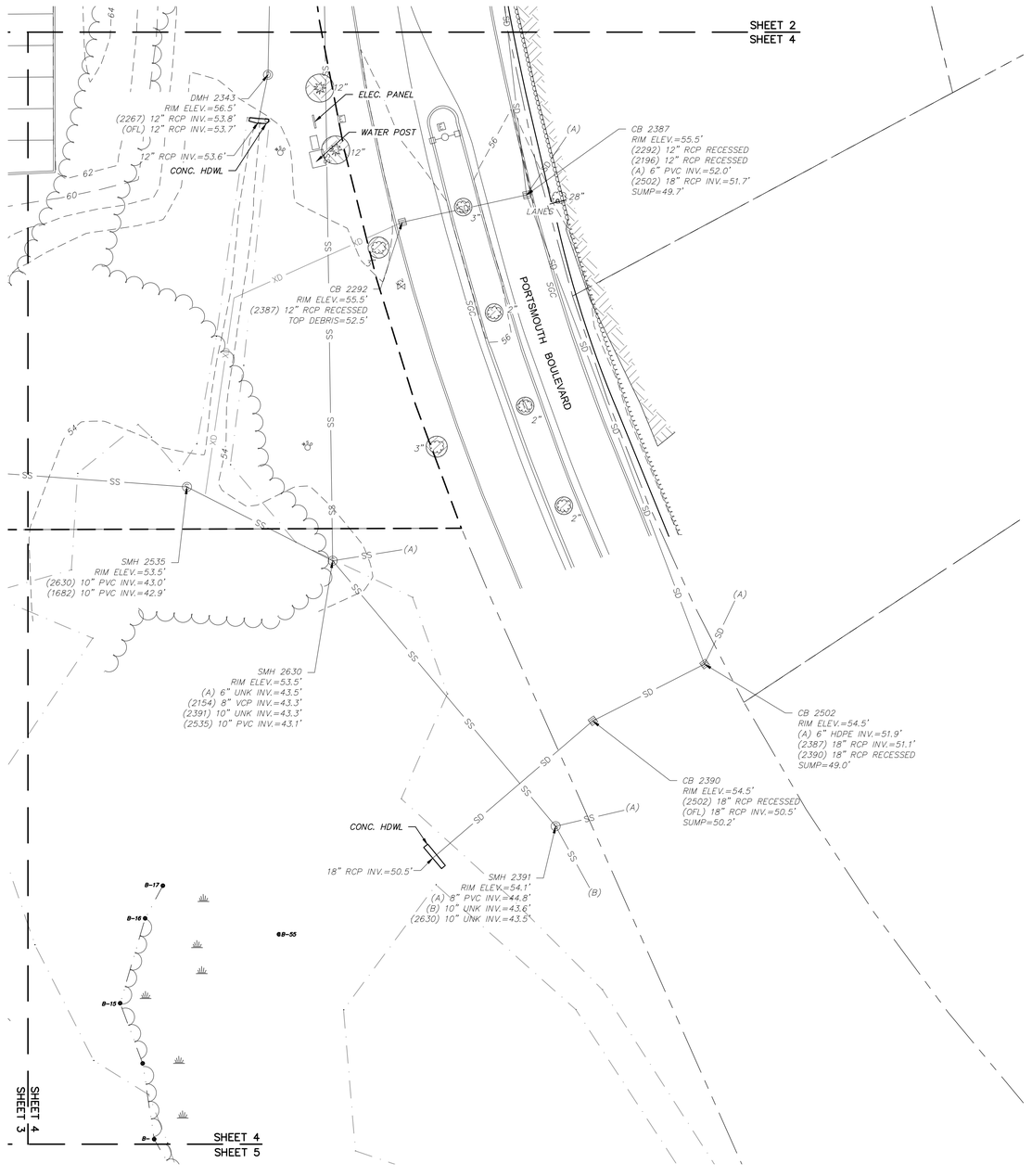

DOUCET SURVEY, LLC
NAD83(2011)
NHSPC

20 0 20 40
SCALE: 1 INCH = 20 FT.

TOPOGRAPHIC PLAN
FOR
RW NORFOLK HOLDING, LLC
PROPERTIES OF
210 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-4)
&
230 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-5)
COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	04/19/22	ADDITIONAL TOPOGRAPHY (SPRING)	P.C.L

DRAWN BY:	P.C.L.	DATE:	FEBRUARY 23, 2022
CHECKED BY:	M.W.F.	DRAWING NO.	5864A
JOB NO.	5896	SHEET	1 OF 5

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FILE NAME: C:\CIVIL 3D FILES\Users\pfurtado_DWGS\5896A4 2022-04-19.dwg LAYOUT NAME: L1 PLOTTED: Tuesday, Apr 19, 2022 - 4:43pm

SHEET 3
SHEET 5

SHEET 4
SHEET 5

SHEET 4
SHEET 3

APPROX. EDGE OF WETLAND
(NOT DELINEATED)

GATE (TYP.)

EP

SWL

VGC

B-5

B-2

CONC BLOCK WALL

6" OAK

HEADWALL
(INVERT NOT FOUND)

APPROX. EDGE OF WETLAND
(NOT DELINEATED)

MH 2768
RIM ELEV.=48.4'
OUT OF SCOPE

HEADWALL
(INVERT NOT FOUND)

B-11

DOUCET SURVEY, LLC

NAD83 (2011)

20 0 20 40

SCALE: 1 INCH = 20 FT.

TOPOGRAPHIC PLAN
FOR
RW NORFOLK HOLDING, LLC
PROPERTIES OF
210 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-4)
&
230 COMMERCE WAY LLC
(TAX MAP 216, LOT 1-5)
COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
1	04/19/22	ADDITIONAL TOPOGRAPHY (SPRING)	P.C.L.

DRAWN BY: P.C.L.	DATE: FEBRUARY 23, 2022
CHECKED BY: M.W.F.	DRAWING NO. 5864A
JOB NO. 5896	SHEET 1 OF 5

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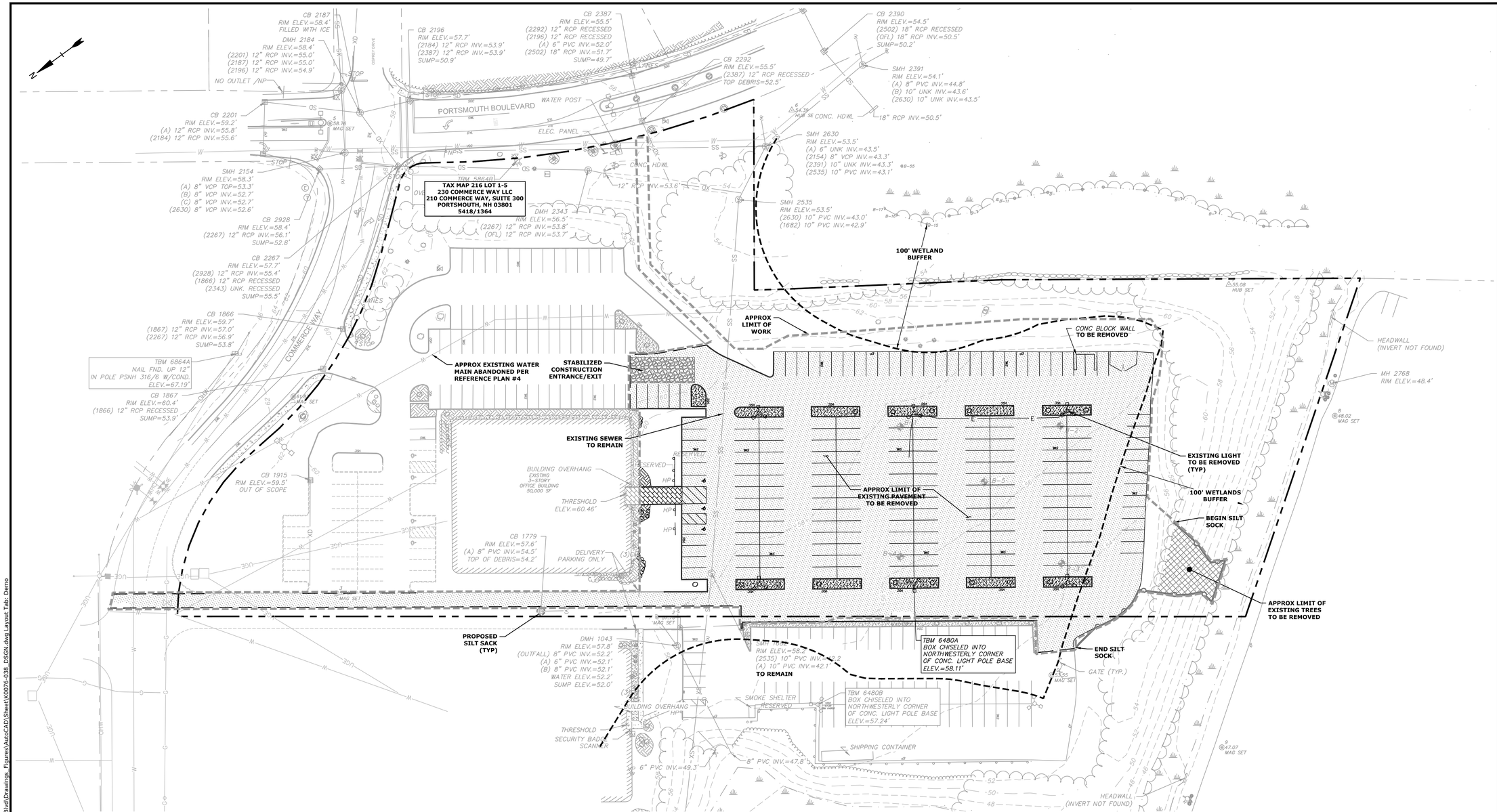

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

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.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. ALL ITEMS WITHIN THE LIMIT OF WORK ARE TO REMAIN UNLESS SPECIFICALLY IDENTIFIED TO BE REMOVED OR OTHERWISE ALTERED BY THE CONTRACTOR. ITEMS TO BE REMOVED INCLUDE, BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, MANHOLES, CATCH BASINS, UNDERGROUND PIPING & UTILITIES, POLES, STAIRS, STRUCTURES, FENCES, RAMPS, BUILDING FOUNDATIONS, TREES, AND LANDSCAPING. THE CONTRACTOR SHALL CONFIRM WITH THE ENGINEER IF THE TREATMENT OF CERTAIN ITEMS IS UNCLEAR.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
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. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

	APPROXIMATE LOT LINE
	APPROXIMATE ABUTTERS LOT LINE
	STONE WALL
	CHAIN LINK FENCE
	GUARDRAIL
OHW	OVERHEAD WIRE
SS	SEWER LINE
SD	DRAIN LINE
XS	SEWER LINE (PER CITY GIS)
XD	DRAIN LINE (PER CITY GIS)
E	UNDERGROUND ELECTRIC LINE
100	MAJOR CONTOUR LINE
98	MINOR CONTOUR LINE
	TREE LINE
	SHRUB LINE
	EDGE OF WETLAND
	EDGE OF WATER
	WETLAND AREA
	CONCRETE
	LANDSCAPED AREA
	CRUSHED STONE
	BRICK
	UTILITY POLE & GUY WIRE
	UTILITY POLE W/LIGHT
	LIGHT POLE W/ARM
	LIGHT POLE (MULTI-ARMS)
	SIGN
	BOLLARD
	FIRE HYDRANT
	WATER GATE VALVE
	WATER SHUTOFF VALVE
	GAS REGULATOR
	VENT PIPE
	PAD MOUNTED TRANSFORMER
	ELECTRIC BOX
	UTILITY BOX
	CATCH BASIN
	DRAIN MANHOLE
	ELECTRIC MANHOLE
	TELEPHONE MANHOLE
	SEWER MANHOLE
	CLEANOUT
	CONIFEROUS TREE
	DECIDUOUS TREE
	CONIFEROUS SHRUB
	DECIDUOUS BUSH
	BORING LOCATION
	ACCESSIBLE PARKING SPACE

GM	GAS METER
"HP"	HANDICAP PARKING SIGN
"NP"	NO PARKING SIGN
"R"	RESERVED PARKING SIGN
• A-1	WETLAND FLAG
TYP.	TYPICAL
CONC.	CONCRETE
HDWL	HEADWALL
TH	THRESHOLD ELEVATION
EP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
SWL	SINGLE WHITE LINE
SYL	SINGLE YELLOW LINE
DYL	DOUBLE YELLOW LINE

DEMOLITION LEGEND

	APPROXIMATE LIMIT OF WORK
	APPROXIMATE LIMIT OF SAW CUT
	EXISTING CURB TO BE REMOVED
	APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
	APPROXIMATE LIMIT OF CLEARING
TBR	TO BE REMOVED
APPROX	APPROXIMATE

EXISTING CONDITIONS PLAN & WETLANDS NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY, DATED FEBRUARY.
2. JAMES GOVE, CERTIFIED WETLAND SCIENTIST #51, OF GOVE ENVIRONMENTAL CONSULTANTS, INC. OF EXETER, NH, PERFORMED THE WETLAND MAPPING FOR FLAGS A-1 THROUGH A-58 AND B-1 THROUGH B-18 ON SEPTEMBER 23, 2020 ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012, US ARMY CORPS OF ENGINEERS.

REFERENCE PLANS:

1. "CONDITIONAL USE PLAN" PREPARED BY ERIC C. MITCHELL & ASSOC. INC., DATED DECEMBER 18, 2020.
2. "LOT LINE ADJUSTMENT PLAN TAX MAP R-17, LOT 2-1975 SHEARWATER DRIVE / DOVECKIE WAY / MARKET STREET PORTSMOUTH, NH SCALE: 1"=40' DATE: AUG. 1999" PREPARED BY CLD CONSULTING ENGINEERS, MANCHESTER, NH R.C.R.D. PLAN #D-28384.
3. "TOPOGRAPHIC PLAN", SHEETS 1 THRU 5, PREPARED BY DOUCET SURVEY, DATED APRIL 19, 2022.
4. "PROPOSED ROADWAY IMPROVEMENTS", PREPARED BY TIGHE & BOND, DATED MARCH 21, 2014.

Tighe&Bond

PATRICK M. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE
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APPROVED:	PMC

Proposed 2-Story Building

230 Commerce Way, LLC

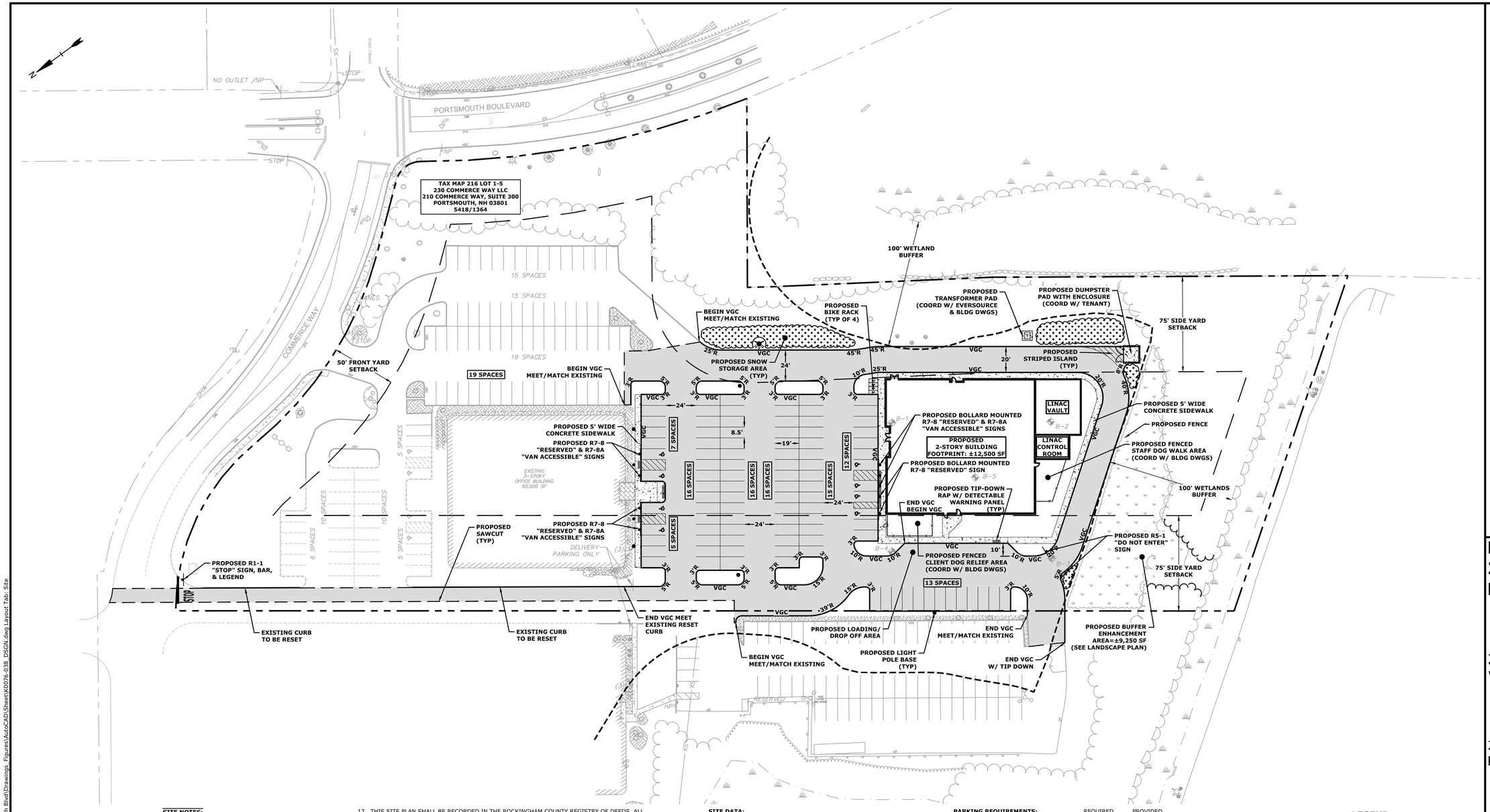
230 Commerce Way
Portsmouth, NH

DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Save Date: May 24, 2022 10:25 AM By: CML
Plot Date: May 24, 2022 10:25 AM By: Christine M. Langton
T&B File Location: J:\K\K0076 The Kane Company_General Proposals\0076-038 Portsmouth Blvd\Drawings, Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Demo



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.
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 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.
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. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
17. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. 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.
18. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES THAT IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
19. ALL TREES TO BE PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
20. THE APPLICATION SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.

SITE DATA:
LOCATION:TAX MAP 216, LOT 5
230 COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE

ZONING DISTRICT: OFFICE RESEARCH
WETLANDS OVERLAY
ALLOWED USE: PROFESSIONAL / BUSINESS OFFICE
VETERINARY CARE[1]

DIMENSIONAL REQUIREMENTS:	REQUIRED	PROVIDED
MINIMUM LOT AREA:	3 ACRES	±5.6 ACRES
MINIMUM STREET FRONTAGE:	300 FT	±675 FT
MAXIMUM BUILDING COVERAGE:	30%	±10%
MINIMUM OPEN SPACE:	30%	±52%
PROPOSED BUILDING MINIMUM SETBACKS:		
• FRONT:	50 FT	±412 FT
• SIDE:	75 FT	±76 FT
• REAR:	50 FT	±172 FT
PROPOSED BUILDING MAXIMUM HEIGHT:	60 FT	<60 FT

(1) - SPECIAL EXCEPTION FROM SECTION 10.440 FOR VETERINARY CARE USE GRANTED ON FEBRUARY 28, 2022.

PARKING REQUIREMENTS:	REQUIRED	PROVIDED
PARKING STALL LAYOUT:		
• STANDARD 90°	8.5' X 19'	8.5' X 19'
DRIVE AISLE WIDTH:		
• 90° (2-WAY TRAFFIC)	24 FT	24 FT
• 1-WAY TRAFFIC	14 FT	20 FT
PARKING SPACE REQUIREMENTS:	REQUIRED	PROVIDED
OFFICE:		
1 / 350 SF		
= 50,000 SF / 350 SF/SPACE =	143 SPACES	
VETERINARY CARE:		
1 / 500 SF		
= 25,000 SF / 500 SF/SPACE =	50 SPACES	
MINIMUM REQUIRED PARKING:	193 SPACES	
MAXIMUM PARKING (120% OF MINIMUM):	232 SPACES	204 SPACES[1]

(1) - INCLUDES 12 ADA PARKING SPACES

LEGEND

	PROPOSED EDGE OF PAVEMENT
	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED PAVEMENT SECTION
	PROPOSED CONCRETE
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	PROPOSED CURB RADIUS
VGC	PROPOSED VERTICAL GRANITE CURB
SGC	PROPOSED SLOPED GRANITE CURB

Tighe&Bond

PATRICK M. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
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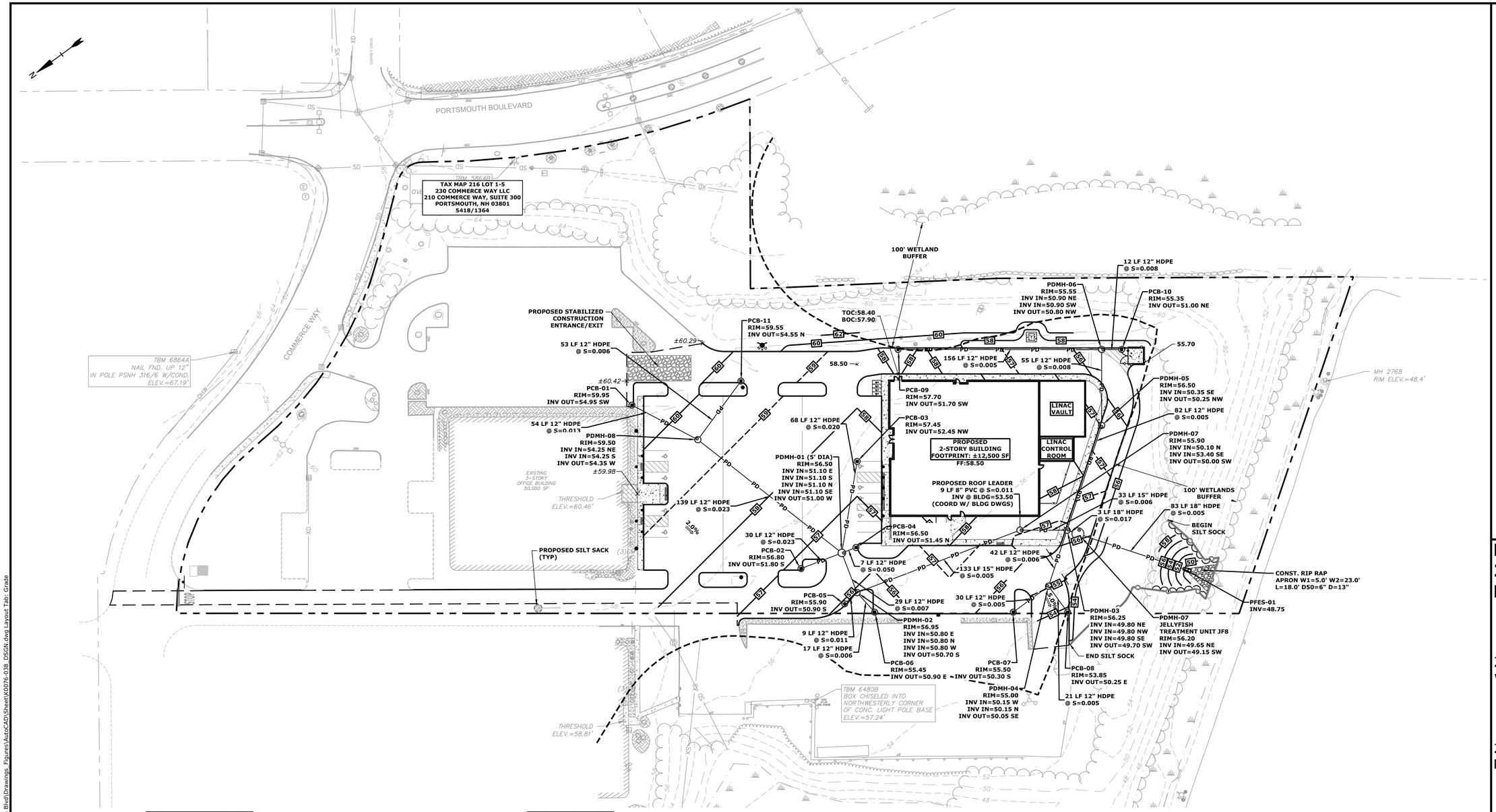
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102

Last Save Date: May 24, 2022 10:25 AM By: CML
Plotted: May 24, 2022 10:26 AM By: Christopher M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Site



GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:
   BELOW PAVED OR CONCRETE AREAS 95%
   TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL 95%
   BELOW LOAM AND SEED AREAS 90%
   * ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. 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 FOR BENCH MARK INFORMATION.
14. AREAS DISTURBED WITHIN THE 25' VEGETATED BUFFER BY HEADWALLS AND CULVERT CONSTRUCTION SHALL BE LOAMED, SEEDED WITH NEW ENGLAND WILDLIFE AND CONSERVATION SEED MIX AND STABILIZED WITH JUTE MESH.

EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
2. SEE GENERAL EROSION CONTROL NOTES ON "EROSION CONTROL NOTES & DETAILS SHEET".
3. PROVIDE INLET PROTECTION AROUND ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. MAINTAIN FOR THE DURATION OF THE PROJECT.
4. INSTALL STABILIZED CONSTRUCTION EXIT(S).
5. INSPECT INLET PROTECTION AND PERIMETER EROSION CONTROL MEASURES DAILY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
6. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. CONSTRUCT EROSION CONTROL BLANKET ON ALL SLOPES STEEPER THAN 3:1.
8. PRIOR TO ANY WORK OR SOIL DISTURBANCE COMMENCING ON THE SUBJECT PROPERTY, INCLUDING MOVING OF EARTH, THE APPLICANT SHALL INSTALL ALL EROSION AND SILTATION MITIGATION AND CONTROL MEASURES AS REQUIRED BY STATE AND LOCAL PERMITS AND APPROVALS.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, SPRINKLING WATER ON UNSTABLE SOILS SUBJECT TO ARID CONDITIONS.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
11. ALL CATCH BASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN FULLY PAVED.
12. TEMPORARY SOIL STOCKPILE SHALL BE SURROUNDED WITH PERIMETER CONTROLS AND SHALL BE STABILIZED BY TEMPORARY EROSION CONTROL SEEDING. STOCKPILE AREAS TO BE LOCATED AS FAR AS POSSIBLE FROM THE DELINEATED EDGE OF WETLANDS.
13. SAFETY FENCING SHALL BE PROVIDED AROUND STOCKPILES OVER 10 FT.
14. CONCRETE TRUCKS WILL BE REQUIRED TO WASH OUT (IF NECESSARY) SHOOTS ONLY WITHIN AREAS WHERE CONCRETE HAS BEEN PLACED. NO OTHER WASH OUT WILL BE ALLOWED.
15. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

- 50 — PROPOSED CONTOUR LINE
- 51 — PROPOSED CONTOUR LINE
- PD PD — PROPOSED DRAIN LINE
- PROPOSED SILT SOCK
- INLET PROTECTION SILT SACK
- PROPOSED CATCHBASIN
- PROPOSED DRAIN MANHOLE

Tighe&Bond

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SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
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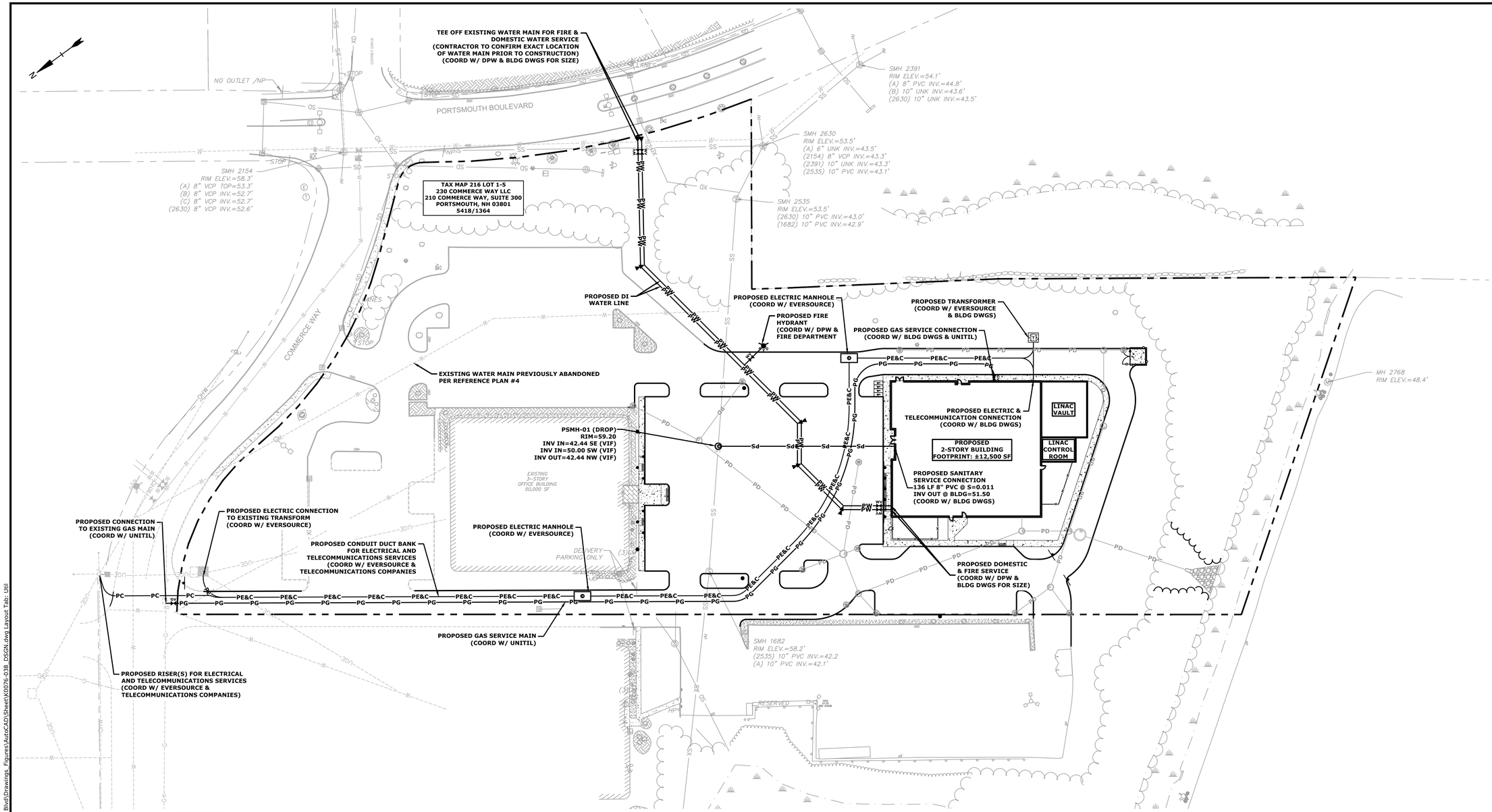
APPROVED:	PMC

GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103

Last Save Date: May 24, 2022 10:25 AM By: CML
Plot Date: May 24, 2022 10:27 AM By: Christine M. Langton
T&B File Location: J:\K\K0076 The Kane Company\ General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Grade



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
   - WATER/SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS & COMCAST
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. THE APPLICANT SHALL COORDINATE WITH THE CITY'S CONSULTANT TO COMPLETE A WATER CAPACITY ANALYSIS USING THE CITY'S CAPACITY MODELING AND SHALL MODIFY THE WATER SERVICE DESIGN AS REQUIRED. THE PRIVATE WATER LINE THAT CURRENTLY FEEDS THE DEVELOPMENT LOT SHALL BE EITHER REPLACED OR ABANDONED DEPENDING ON THE OUTCOME OF THE STUDY. ALL MODIFICATIONS SHALL BE REVIEWED AND APPROVED BY THE DPW AND THE FIRE DEPARTMENT.
6. PROPOSED WATER MAIN WILL REMAIN PRIVATE AND A PRIVATE WATER MAIN MAINTENANCE AGREEMENT WITH THE CITY IS REQUIRED.
7. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
8. 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.
9. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
10. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
11. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
12. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
13. 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.
14. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
15. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
16. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
17. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
18. 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.
19. 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.
20. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
21. 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.
22. 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.
23. CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
24. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
25. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
26. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
27. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
28. 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.
29. 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.
30. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
31. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
32. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

PS PS PS	PROPOSED SANITARY SEWER
PW PW PW	PROPOSED WATER
PG PG PG	PROPOSED GAS
PE&C PE&C	PROPOSED UNDERGROUND ELECTRIC & COMMUNICATIONS
S#	PROPOSED SEWER MANHOLE
W#	PROPOSED WATER VALVE
H#	PROPOSED HYDRANT
G#	PROPOSED GAS VALVE
E	PROPOSED ELECTRIC MANHOLE
●	PROPOSED LIGHT POLE BASE
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VIF	VERIFY IN FIELD

Tighe&Bond

PATRICK M. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

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Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/24/2022	TAC Submission

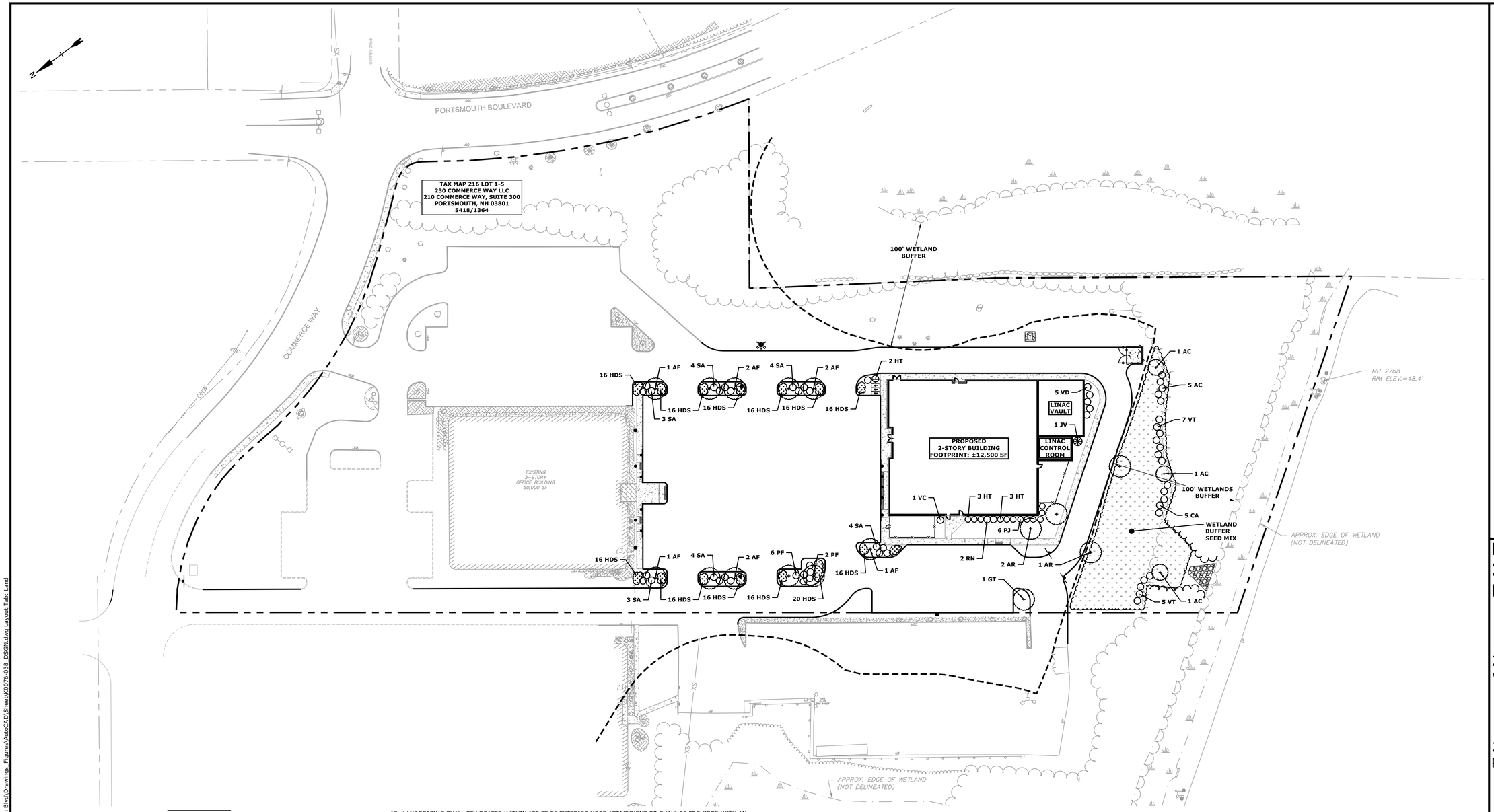
PROJECT NO:	K0076-038
DATE:	5/24/2022
FILE:	K0076-038_DSGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

UTILITY PLAN

SCALE: AS SHOWN

C-104

Last Save Date: May 24, 2022 10:25 AM By: CML
Plot Date: Tuesday, May 24, 2022 10:25 AM By: Christine M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Util



LANDSCAPE NOTES:

1. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR, AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
2. ALL REQUIRED PLANT MATERIALS SHALL BE 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. PLANT MATERIAL SHALL BARE THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
8. 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.
9. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
10. 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.
11. 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.
12. 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.
13. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION SYSTEM.
14. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
15. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
16. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
17. PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION. REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
18. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
19. 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.
20. 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.
21. 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.
22. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
23. 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.
24. 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				
AC	AMELANCHIER CANADENSIS	SERVICEBERRY	5' - 6'	B & B
AF	ACER FREEMANII	AUTUM BLAZE MAPLE	2-1/2" - 3"	CALIPER
GT	GLEDITSIA TRIACANTHOS 'SHADEMASTER'	SHADEMASTER HONEY LOCUST	2.5" - 3"	CALIPER
JV	JUNIPERUS VIRGINIANA 'EMERALD SENTINEL'	EMERALD SENTINEL RED CEDAR	6' - 7'	B & B
SHRUBS				
SA	SPIREA 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	3 GAL	
PF	POTENTILLA FRUTICOSA 'PRIMROSE BEAUTY'	PRIMROSE BEAUTY CINQUEFOIL	3 GAL	
CA	CORNUS AMMOMUM	SILKY DOGWOOD	3 GAL	
VT	VIBURNUM TRILOBUM	AMERICAN CRANBERRY	5 GAL	
VC	VIBURNUM CARLESII 'CAYUGA'	CAYUGA MAYFLOWER	5 GAL	
HT	HYDRANGEA 'TWIST & SHOUT'	TWIST & SHOUT HYDRANGEA	3 GAL	
RN	RHODODENDRON 'NOVA ZEMBLA'	NOVA ZEMBLA RHODODENDRON	2' - 2.5'	B & B
RP	RHODODENDRON 'PJM PINK'	PINK PJM RHODODENDRON	2' - 2.5'	B & B
VD	VIBURNUM DENTATUM	ARROWOOD VIBURNUM	4' - 4.5'	B & B
HSD	HEMEROCALIS 'STELA D'ORO'	STELA D'ORO DAYLILY	1 GAL	18" OC

LEGEND

- PROPOSED DECIDUOUS TREE (W/ BARK MULCH)
- PROPOSED DECICUOUS TREE (W/O BARK MULCH)
- PROPOSED SHRUBS (W/ BARK MULCH)
- PROPOSED SHRUBS (W/O BARK MULCH)
- PROPOSED GROUND COVER
- PROPOSED EVERGREEN TREE
- PROPOSED EVERGREEN SHRUB

WETLAND BUFFER SEED MI: NEW ENGLAND CONSERVATION/WILDLIFE MIX AS PROVIDED BY NEW ENGLAND PLANTS, AMHERST MA (NEWP.COM) SEEDED @ 25 LB/AC

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK M. CUMMINS No. 12377 – LICENSED PROFESSIONAL ENGINEER – 5-24-22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 – LICENSED PROFESSIONAL ENGINEER – 5/24/22

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

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GENERAL PROJECT INFORMATION

PROJECT OWNER: 230 COMMERCE WAY, LLC
210 COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE 03801
PROJECT NAME: PROPOSED 2-STORY BUILDING
PROJECT ADDRESS: 230 COMMERCE WAY
PORTSMOUTH, NEW HAMPSHIRE 03801
PROJECT LATITUDE: 43°-08'-14"N
PROJECT LONGITUDE: 70°-56'-22"W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF 2 STORY BUILDING WITH ASSOCIATED SITE IMPROVEMENTS THE WORK IS ANTICIPATED TO START IN FALL OF 2022, AND BE COMPLETED BY SUMMER OF 2024.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 2.25 ACRES.

SOIL CHARACTERISTICS

BASED ON THE NRCS WEB SOIL SURVEY FOR THE SOILS ON SITE CONSIST OF CHATFIELD-HOLLIS-CANTON COMPLEX AND URBAN LAND SOILS WHICH ARE MODERATELY DRAINED SOILS.

NAME OF RECEIVING WATERS

THE STORM WATER RUNOFF WILL ULTIMATELY DISCHARGE INTO AN UNNAMED WETLAND. PRIOR TO DISCHARGING TO THE WETLAND, STORMWATER RUNOFF WILL BE COLLECTED AND TREATED BY VARIOUS TREATMENT SWALES, SEDIMENTATION BASINS AND A GRAVEL WETLAND.

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:
   - CONTROL OF DUST
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. CLEAR AND DISPOSE OF DEBRIS.
4. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
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. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
5. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
6. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
7. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
8. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
9. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
10. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:

1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER NOVEMBER 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. 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.
5. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY NOVEMBER 15.

DUST CONTROL:

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:

1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:

1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
CREEPING RED FESCUE	50 LBS/ACRE
KENTUCKY BLUEGRASS	100 LBS/ACRE
PERENNIAL RY GRASS	50 LBS/ACRE

      IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.
3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:

1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      g. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      h. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      i. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
         - ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
         - PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      b. FERTILIZERS:
         - FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
         - ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
         - STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
         - ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
         - EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
         - EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      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 EQUIPTMENT/VEHICAL FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

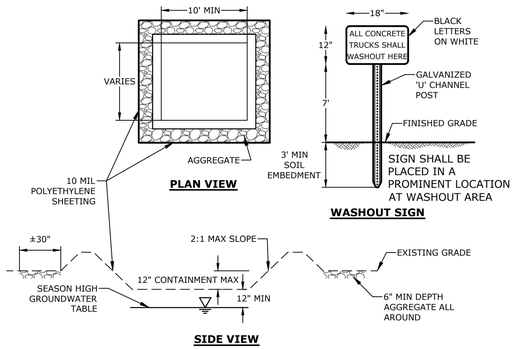
THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE ENGINEER. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:

1. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
2. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
3. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
4. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.

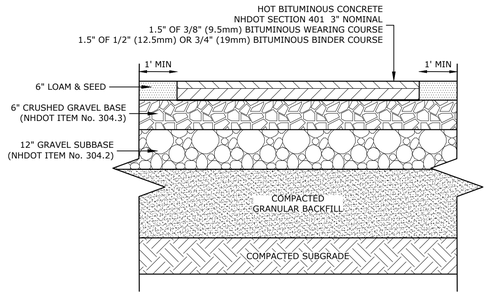
BLASTING NOTES:

1. IF MORE THAN 5000 CUBIC YARDS ARE TO BE BLASTED A BLASTING PLAN SHALL BE PROVIDED. THE BLASTING PLAN SHALL INCLUDE:
   A. LOCATION AND IDENTIFICATION OF DRINKING WATER WELLS LOCATED WITHIN 2000 FEET OF THE PROPOSED BLASTING ACTIVITIES;
   B. A GROUNDWATER QUALITY SAMPLING PROGRAM, APPROVED BY NHDES PRIOR TO INITIATING BLASTING, TO MONITOR FOR NITRATE AND NITRITE EITHER IN THE DRINKING WATER SUPPLY WELLS OR IN OTHER WELLS THAT ARE REPRESENTATIVE OF THE DRINKING WATER SUPPLY WELLS IN THE AREA.
      a. THE GROUNDWATER SAMPLING PROGRAM MUST BE IMPLEMENTED ONCE APPROVED BY NHDES.
2. THE FOLLOWING BEST MANAGEMENT PROCEDURES FOR BLASTING SHALL BE COMPLIED WITH:
   A. LOADING PRACTICES - THE FOLLOWING BLASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:
      a. DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS;
      b. EXPLOSIVE PRODUCTS SHALL BE MANAGED ON-SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFF-SITE DISPOSAL;
      c. SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF-SITE DISPOSAL;
      d. LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BLASTHOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED;
      e. LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT;
      f. EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.
   B. EXPLOSIVE SELECTION - THE FOLLOWING BMPS SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION WHEN EXPLOSIVES ARE USED:
      a. EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION;
      b. EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT TO MINIMIZE THE POTENTIAL FOR HAZARDOUS EFFECT OF THE PRODUCT UPON GROUNDWATER
   C. PREVENTION OF MISFIRES. APPROPRIATE PRACTICES SHALL BE DEVELOPED AND IMPLEMENTED TO PREVENT MISFIRES.
   D. MUCK PILES MANAGEMENT - MUCK PILES (THE BLASTED PIECES OF ROCK) AND ROCK PILES SHALL BE MANAGED IN A MANNER TO REDUCE THE POTENTIAL FOR CONTAMINATION BY IMPLEMENTING THE FOLLOWING MEASURES:
      c. REMOVE THE MUCK PILE FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE;
      d. MANAGE THE INTERACTION OF BLASTED ROCK PILES AND STORMWATER TO PREVENT CONTAMINATION OF WATER SUPPLY WELLS OR SURFACE WATER.
   E. SPILL PREVENTION MEASURES AND SPILL MITIGATION - SPILL PREVENTION AND SPILL MITIGATION MEASURES SHALL BE IMPLEMENTED TO PREVENT THE RELEASE OF FUEL AND OTHER RELATED SUBSTANCES TO THE ENVIRONMENT. THE MEASURES SHALL INCLUDE AT A MINIMUM:
      a. THE FUEL STORAGE REQUIREMENTS SHALL INCLUDE:
         - STORAGE OF REGULATED SUBSTANCES ON AN IMPERVIOUS SURFACE;
         - SECURE STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
         - LABEL REGULATED CONTAINERS CLEARLY AND VISIBLY;
         - INSPECT STORAGE AREAS WEEKLY;
         - COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
         - WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
         - 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.
      b. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
         - EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
         - PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
         - HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
         - USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
         - PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
      c. 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.
      d. 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/ORGANI



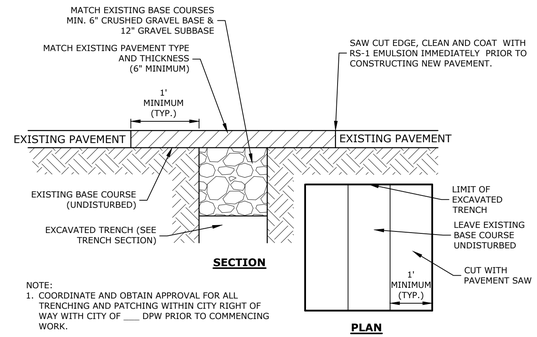
NOTES:
1. CONTAINMENT SHALL BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT SHALL BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY, REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

CONCRETE WASHOUT AREA
NO SCALE



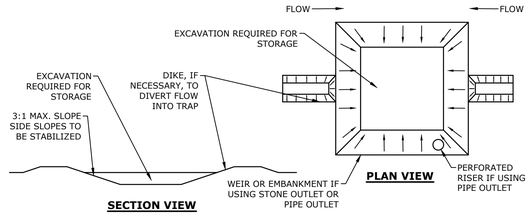
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

TYPICAL PAVEMENT SECTION
NO SCALE



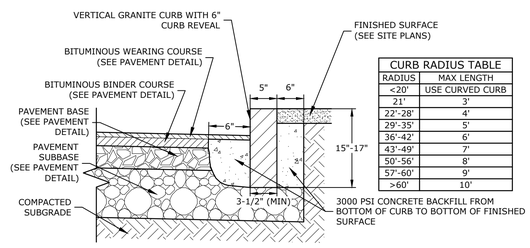
NOTE:
1. COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF ___ DPW PRIOR TO COMMENCING WORK.

ROADWAY TRENCH PATCH
NO SCALE



NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
5. TRAP SHALL DISCHARGE TO A STABILIZED AREA.
6. TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
8. SEDIMENT TRAPS MUST BE USED AS NEEDED TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.

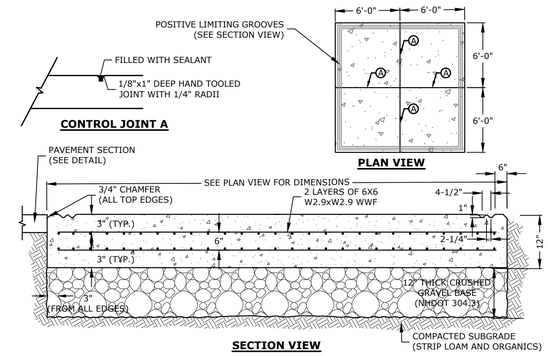
SEDIMENT TRAP
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

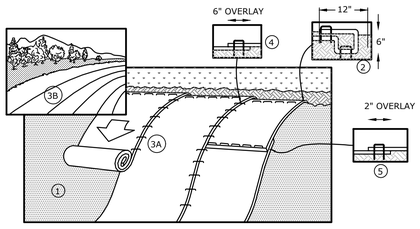
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
7. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

VERTICAL GRANITE CURB
NO SCALE



NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED
2. STANDARD BROOM FINISH.

DUMPSTER PAD
NO SCALE



NOTES:
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES SPACED 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAPLES IN APPROPRIATE LOCATIONS AS SHOWN ON THE STAPLE PATTERN GUIDE.
4. STAPLE LENGTHS SHALL BE A MINIMUM OF 8 INCHES.
5. EROSION CONTROL BLANKET SHALL BE 'EAST COAST EROSION CONTROL ECC-2B™' OR APPROVED EQUAL.

STABILIZATION BLANKET
NO SCALE

Tighe&Bond

PATRICK M. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/25/2022	Planning Board Submission

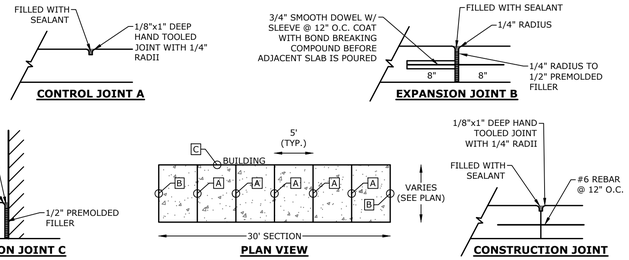
PROJECT NO:	K0076-038
DATE:	5/25/2022
FILE:	K0076-038_DTLS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

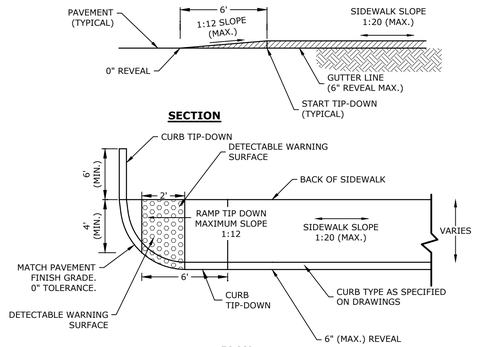
C-502

Last Save Date: May 24, 2022 9:40 AM By: CML
Plot Date: Wednesday, May 25, 2022 Plotted By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings, Figures\AutoCAD\Sheet\K0076-038_DTLS.dwg Layout Tab: C-502



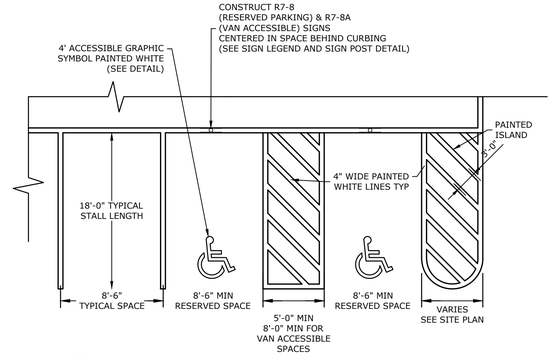
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
3. ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE



NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. PROVIDE 8" COMPACTED CRUSHED GRAVEL BASE BENEATH RAMPS.
3. DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

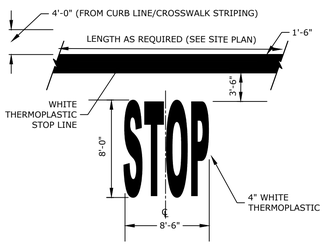
CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



NOTE:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

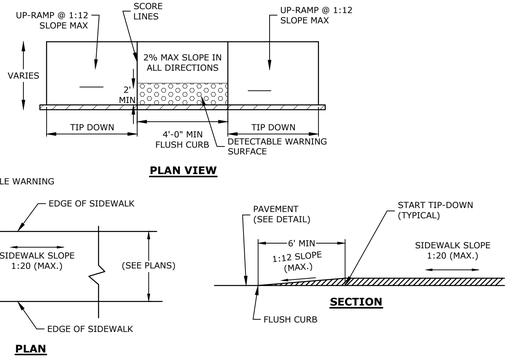
PARKING SPACE STRIPING
NO SCALE

Tighe&Bond



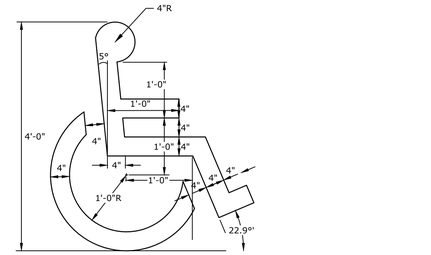
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR & LEGEND
NO SCALE



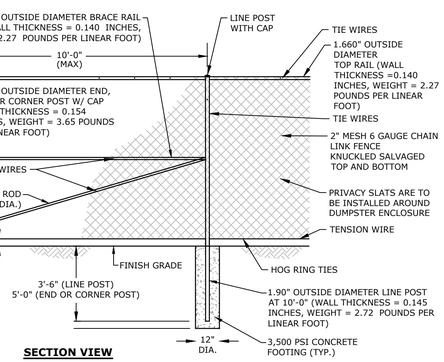
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 8" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON WITH BLACK COATING

CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



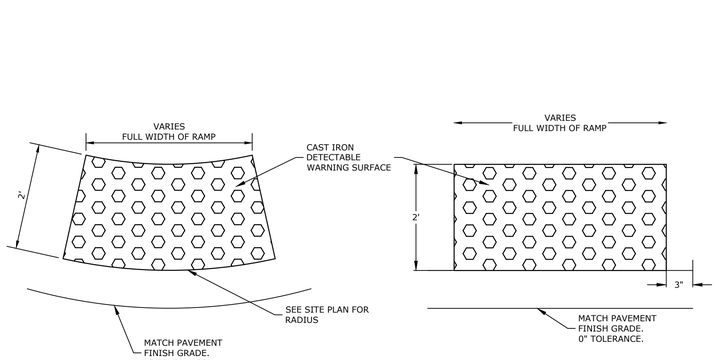
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE



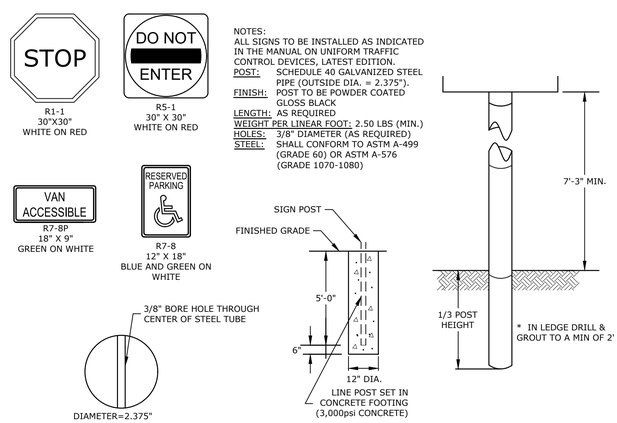
NOTES:
1. CORNER POSTS SHALL BE USED AT SHARP BREAKS IN GRADE AND CHANGES IN HORIZONTAL ALIGNMENT OF 30° OR MORE.
2. POSTS, RAILS & BRACES SHALL BE TYPE I, SCHEDULE 40 PIPE.
3. FABRIC TO BE TOP SELVAGE AND BOTTOM SELVAGE TWISTED TIGHT.
4. TIE WIRE:
   4.1. SHALL BE 6 GAUGE GALVANIZED STEEL WIRE @ 14" O.C. MAXIMUM FOR ATTACHMENT OF FABRIC TO LINE POSTS.
   4.2. TIE WIRES SHALL BE 13 GAUGE GALVANIZED STEEL WIRE @ 24" O.C. MAXIMUM FOR ATTACHMENT OF FABRIC TO RAILS AND BRACES.
5. HOG RING TIES SHALL BE 12- 1/2 GAUGE GALVANIZED STEEL WIRE @ 24" O.C. MAXIMUM FOR ATTACHMENT OF FABRIC TO TENSION WIRE.
6. PRIVACY SLATS SHALL BE VINYL, COLOR TO BE BLACK.

TYPICAL FENCE / ENCLOSURE
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



SIGN LEGEND & POST
NO SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/25/2022	Planning Board Submission

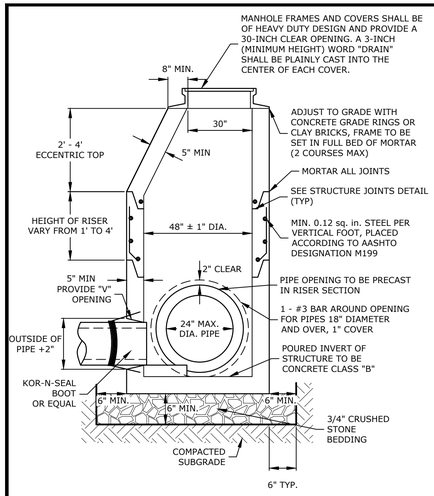
PROJECT NO:	K0076-038
DATE:	5/25/2022
FILE:	K0076-038_DTLS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

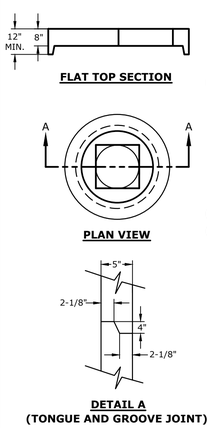
C-503

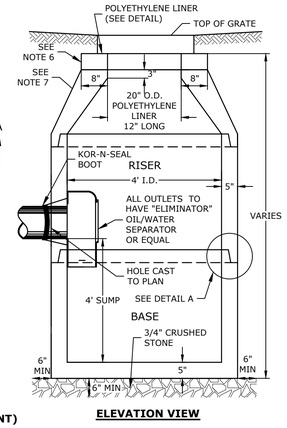
Last Save Date: May 24, 2022 9:40 AM By: CML
Plot Date: Tuesday, May 24, 2022 9:40 AM By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DTLS.dwg Layout Tab: C-503



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.

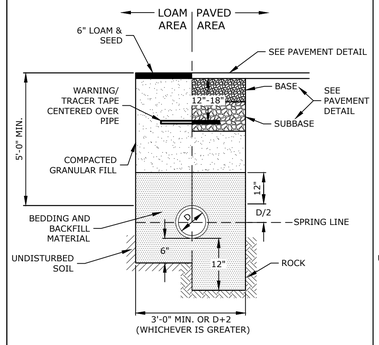
4' DIAMETER DRAIN MANHOLE
NO SCALE





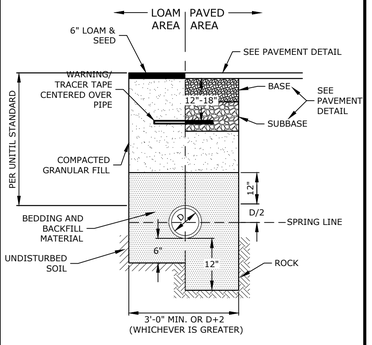
NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 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



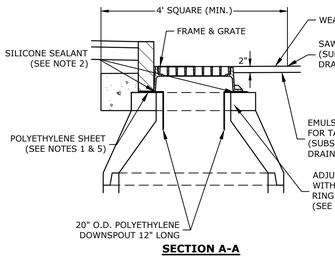
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

TYPICAL WATER TRENCH
NO SCALE



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.

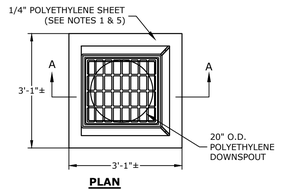
TYPICAL GAS TRENCH
NO SCALE



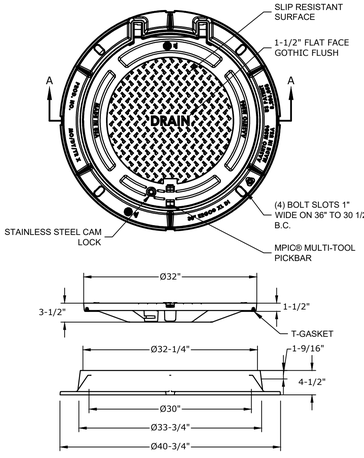
SECTION A-A

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



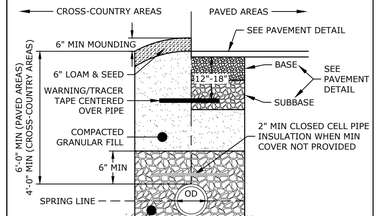
PLAN



SECTION A-A

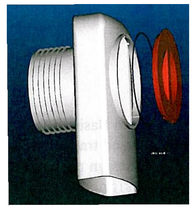
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



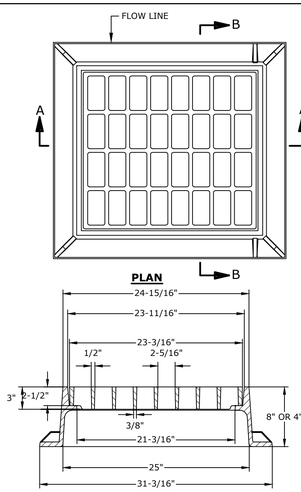
NOTES:
1. 3/4" CRUSHED STONE BEDDING AND BACKFILL MATERIAL FOR FULL WIDTH OF THE TRENCH FROM MINIMUM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO MINIMUM OF 6" OVER THE TOP OF THE PIPE.
2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

TYPICAL SEWER TRENCH
NO SCALE

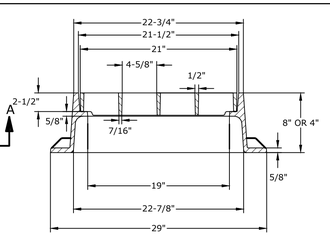


NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE



PLAN

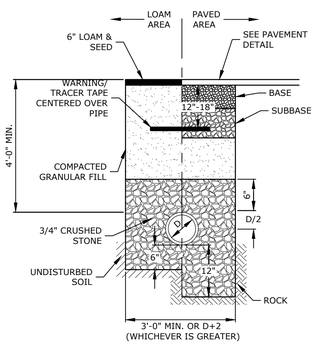


SECTION B-B

SECTION A-A

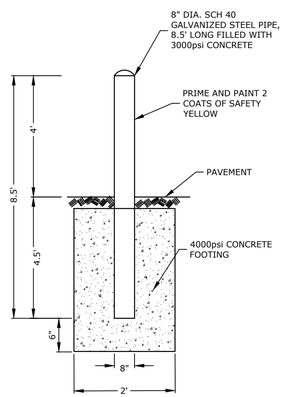
NOTES:
1. ALL DIMENSIONS ARE NOMINAL
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   2.1. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   2.2. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   2.3. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. FRAME AVAILABLE IN 4" OR 8" HEIGHTS
4. FREE OPEN AREA = 2.55 SQ. FT.
5. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

CATCH BASIN FRAME & GRATE
NO SCALE

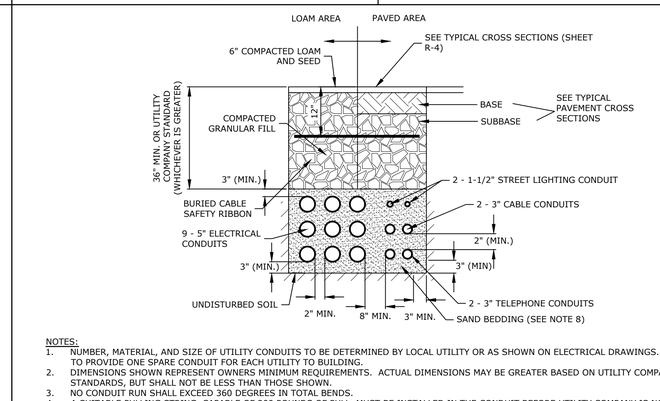


NOTE:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

STORM DRAIN TRENCH
NO SCALE



TYPICAL BOLLARD
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

Tighe&Bond

PATRICK W. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

A	5/25/2022	Planning Board Submission
MARK	DATE	DESCRIPTION

PROJECT NO:	K0076-038
DATE:	5/25/2022
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DRAWN BY:	CML
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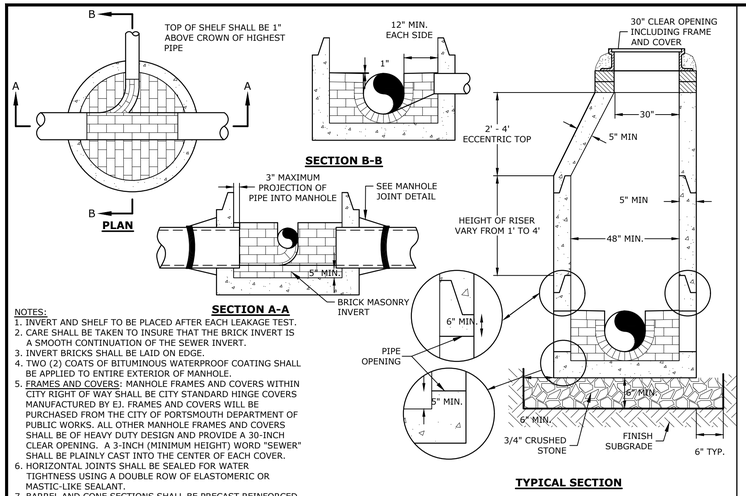
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

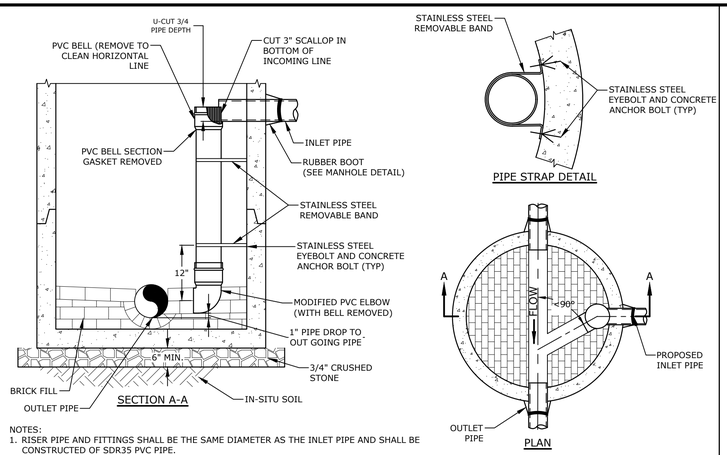
C-504

Last Save Date: May 24, 2022 9:40 AM By: CML
Plot Date: Tuesday, May 24, 2022 9:42 AM By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DTLS.dwg Layout Tab: C-504



NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

SEWER MANHOLE
NO SCALE



NOTES:
1. RISER PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE INLET PIPE AND SHALL BE CONSTRUCTED OF SDR35 PVC PIPE.
2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS.
3. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

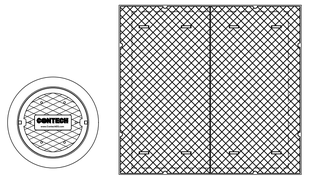
INSIDE DROP SEWER MANHOLE
NO SCALE

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN. Ø96" MANHOLE JELLYFISH PEAK TREATMENT CAPACITY IS 1.96 CFS. IF THE SITE CONDITIONS EXCEED 1.96 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE DEPTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-5"	5'-3"	4'-2"	3'-2"
FLOW RATE HIGH-FLO / DRAINDOWN (cfs) (per cart)	0.18 / 0.09	0.13 / 0.065	0.09 / 0.045	0.05 / 0.025
MAX. CARTS HIGH-FLO / DRAINDOWN	10 / 2			

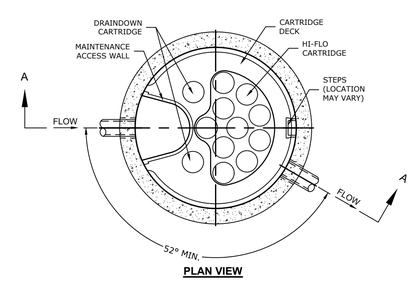


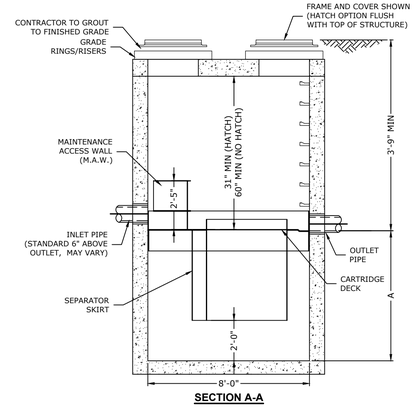
FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

HATCH
(72" x 72" CAST INTO SLAB)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	8'
WATER QUALITY FLOW RATE (cfs)	1.74
PEAK FLOW RATE (cfs)	18.0
RETURN PERIOD OF PEAK FLOW (yrs)	50
# OF CARTRIDGES REQUIRED (HF / DD)	10 / 2
CARTRIDGE SIZE	54"

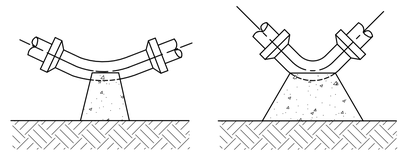




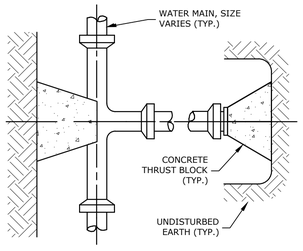
GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

JELLYFISH (JF8) TREATMENT UNIT
NO SCALE

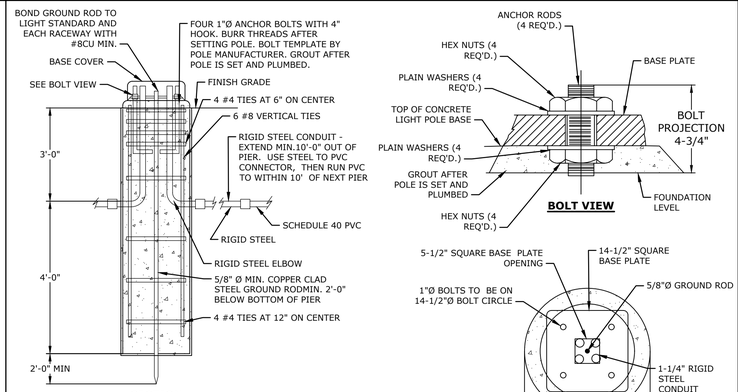


TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38



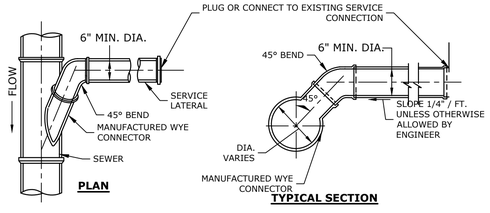
NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT 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

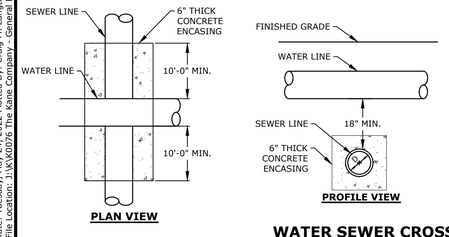


NOTES:
1. PAINT BASE SAFETY YELLOW (UNLESS PROTECTED BY CURBED ISLAND).
2. CONCRETE TO BE CLASS A, 4000 PSI, AIR ENTRAINED STEEL TO BE 60 KSI
3. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.

TYPICAL LIGHT POLE BASE
NO SCALE

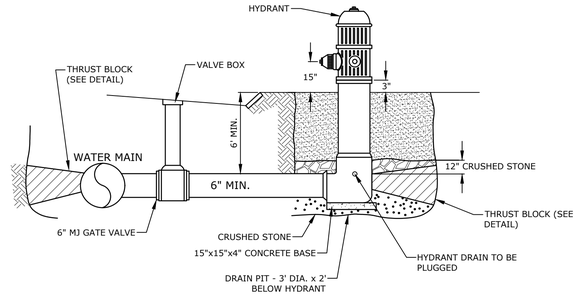


STANDARD SERVICE LATERAL CONNECTION
NO SCALE



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



NOTE:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

FIRE HYDRANT
NO SCALE

Tighe&Bond

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/25/2022	Planning Board Submission

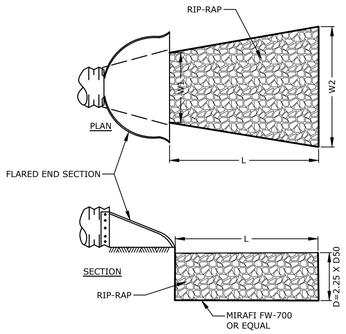
PROJECT NO:	K0076-038
DATE:	5/25/2022
FILE:	K0076-038_DTLS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

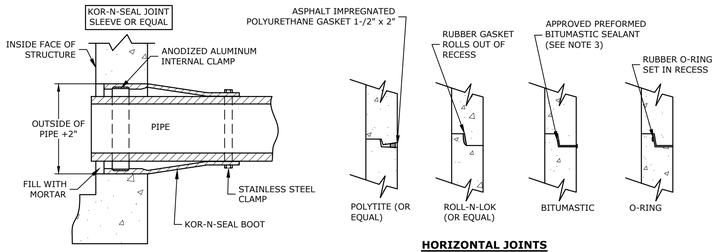
C-505

Last Save Date: May 24, 2022 9:40 AM By: CML
Plot Date: May 24, 2022 9:40 AM By: Philip M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings, Figures\AutoCAD\Sheet\K0076-038_DTLS.dwg Layout Tab: C-505



NOTES:
1. STONE SIZE AND MAT DIMENSIONS DETAILED ON PLANS.
2. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNHEWN QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
3. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.

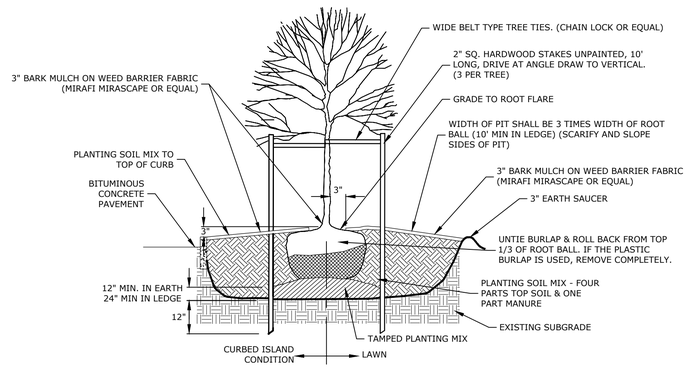
RIP-RAP APRON
NO SCALE



PIPE JOINTS **HORIZONTAL JOINTS**

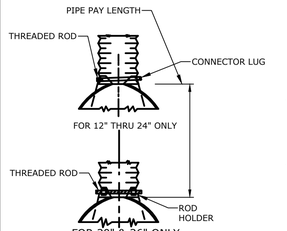
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

STRUCTURE JOINTS
NO SCALE

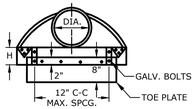


NOTES:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

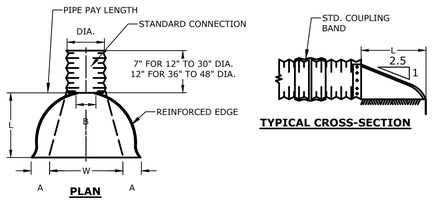
DECIDUOUS TREE PLANTING
NO SCALE



ALTERNATE CONNECTIONS



ELEVATION



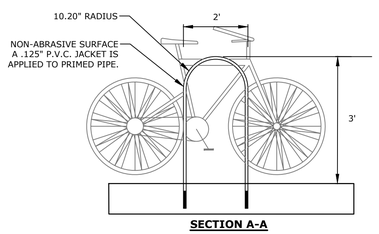
PLAN

TYPICAL CROSS-SECTION

PIPE Ø	METAL GAGE	DIMENSIONS				
		A(1" TOL.)	B MAX	H(1" TOL.)	L(1" TOL.)	W(2" TOL.)
12"	16	6"	6"	6"	21"	24"
15"	16	7"	8"	6"	26"	30"
18"	16	8"	13"	6"	31"	36"
24"	16	10"	16"	6"	41"	48"
30"	14	12"	16"	8"	51"	60"
36"	14	14"	19"	9"	60"	72"
42"	12	16"	22"	11"	69"	84"
48"	12	18"	27"	12"	78"	90"

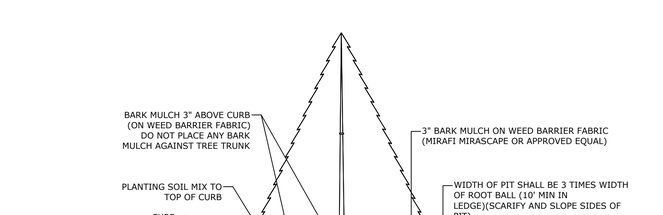
NOTES:
1. END SECTION FOR 12" TO 30" DIA. PIPE IN ONE PIECE, FOR 36" TO 48" DIA. PIPE TO BE MADE FROM TWO SHEETS JOINED BY RIVETING OR BOLTING ON CENTER LINE.
2. CONNECTOR SECTION, CORNER PLATE AND TOE PLATE TO BE SAME THICKNESS AS END SECTION AND EACH TO BE GALVANIZED.

METAL FLARED END SECTION
NO SCALE



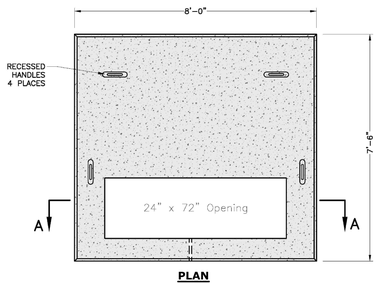
SECTION A-A **PLAN**

BIKE RACK
NO SCALE

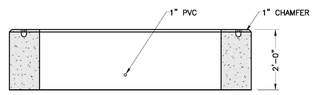


NOTE: PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED IN NURSERY, OR WITHIN 2" ABOVE.

EVERGREEN TREE PLANTING
NO SCALE



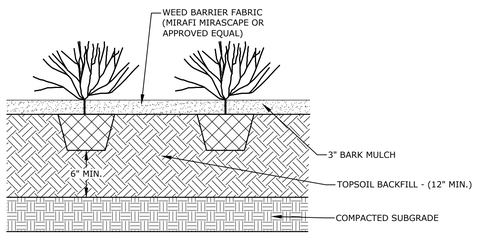
PLAN



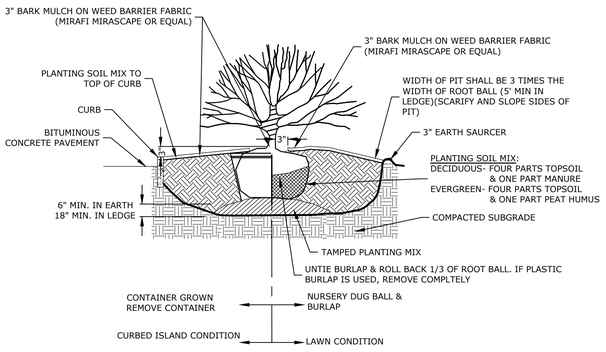
SECTION A-A

NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

3-PHASE TRANSFORMER PAD
NO SCALE



PERENNIAL PLANTING
NO SCALE



NOTES:
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.

SHRUB PLANTING
NO SCALE

Tighe&Bond

PATRICK M. CUMMINS No. 12377 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/25/2022	Planning Board Submission

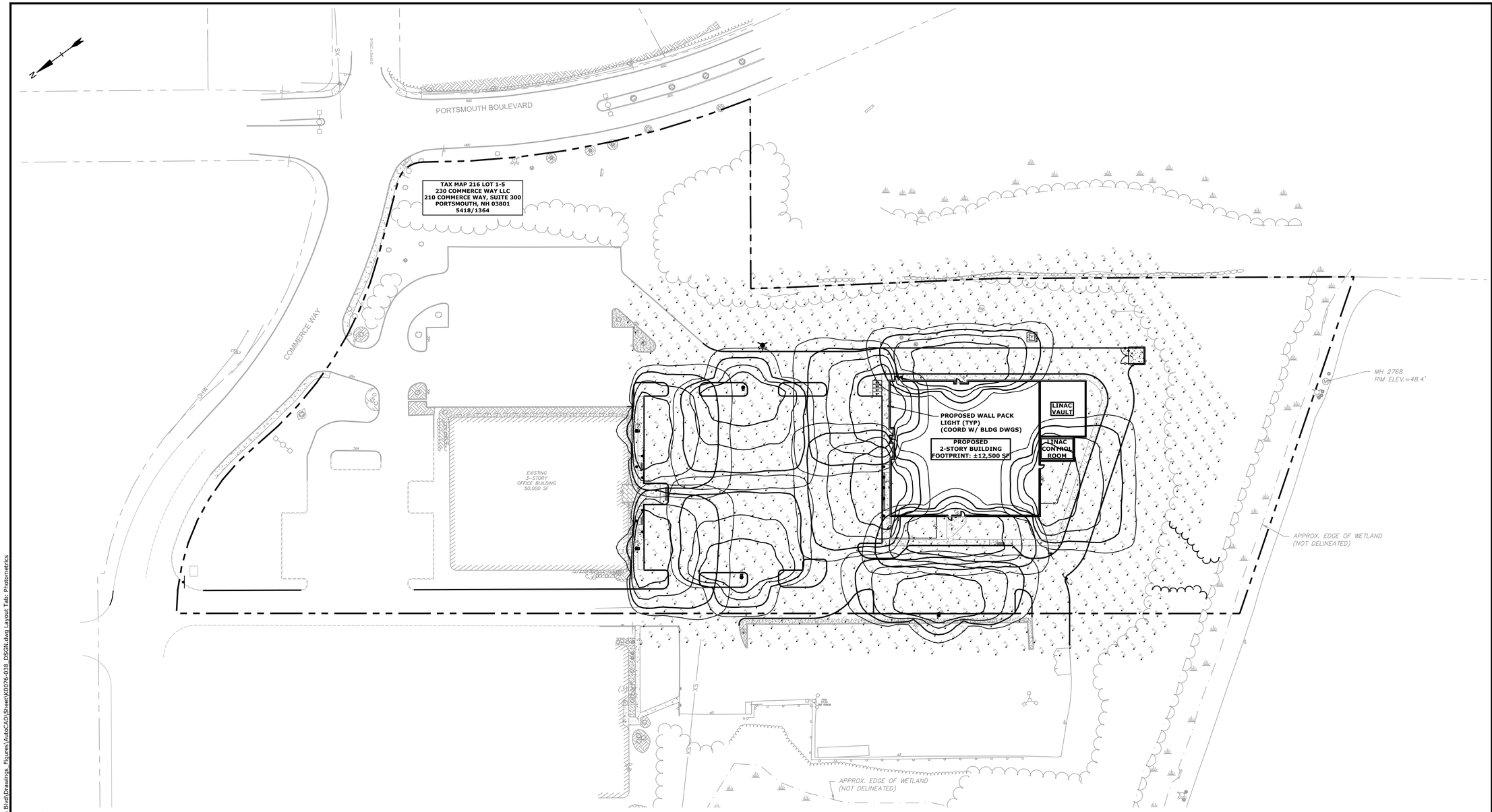
PROJECT NO:	K0076-038
DATE:	5/25/2022
FILE:	K0076-038_DTLS.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-506

Last Save Date: May 24, 2022 9:40 AM By: CML
Plot Date: Tuesday, May 24, 2022 Plotted By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DTLS.dwg Layout Tab: C-506



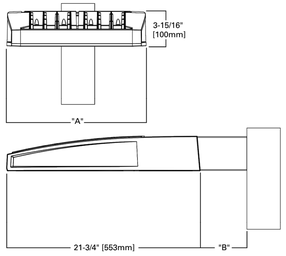
StatArea_1
MAIN PARKING LOT
Illuminance (Fc)
Average = 1.95
Maximum = 5.4
Minimum = 0.6
Avg/Min Ratio = 3.25
Max/Min Ratio = 9.00

StatArea_2
SIDE PARKING LOT AREA
Illuminance (Fc)
Average = 2.33
Maximum = 7.5
Minimum = 0.6
Avg/Min Ratio = 3.88
Max/Min Ratio = 12.50

Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
	1	S3	Single	GLEON-SA2C-740-U-SL3 / SSS4A20SFN1 (20' AFG)
	2	S4	Single	GLEON-SA2C-740-U-T4FT / SSS4A20SFN1 (20' AFG)
	2	S4-HS	Single	GLEON-SA2C-740-U-T4FT-HSS/ SSS4A20SFN1 (20' AFG)
	2	W3	Single	GWC-SA2C-740-U-SL3 / WALL MTD 18' AFG
	3	W4	Single	GWC-SA2C-740-U-T4FT / WALL MTD 18' AFG

NOTE:
1. PROPOSED LIGHT FIXTURES SHALL BE DARK SKY FRIENDLY.

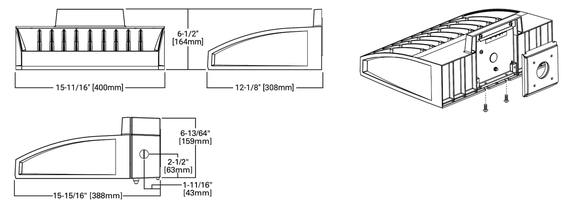
Dimensional Details



Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Extended Arm Length [1]	"B" Quick Mount Arm Length	"B" Quick Mount Extended Arm Length
1-4	15-1/2"	7"	10"	10-5/8"	16-9/16"
5-6	21-5/8"	7"	10"	10-5/8"	16-9/16"
7-8	27-5/8"	7"	13"	10-5/8"	--
9-10	33-3/4"	7"	16"	--	--

NOTES:
For arm selection requirements and additional line art, see Mounting Details section.

Dimensional Details



Tighe&Bond

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/24/2022	TAC Submission

PROJECT NO:	K0076-038
DATE:	5/24/2022
FILE:	K0076-038_DSGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

PHOTOMETRICS PLAN

SCALE: AS SHOWN

C-701

Last Save Date: May 24, 2022 10:25 AM By: CML
Plot Date: May 24, 2022 10:26 AM By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company\General Proposals\0076-038 Portsmouth Blvd\Drawings, Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Photometrics

1 A-200 East Elevation
3/16" = 1'-0"

1 A-200 West Elevation
3/16" = 1'-0"

NELSON
Nelson Architecture & Interiors, Inc.

198 Tremont Street, Suite 439
Boston, MA. 02116
Phone: (617) 778-7229
WWW.NELSONWORLDWIDE.COM

25 PORTSMOUTH BOULEVARD
PORTSMOUTH, NH 03801

Issue: No: Date:

ELEVATIONS

Proj #: 20.0003391 Reviewed By: Checker

A-200

5/23/2022 1:47:31 PM C:\Users\jjnowak\Desktop\Port_Locals\20211215 Commerce Way_jjnowakVYH67.rvt

1 A-201 South Elevation
3/16" = 1'-0"

2 A-201 North Elevation
3/16" = 1'-0"

5/23/2022 1:55:59 PM C:\Users\jjnowak\Desktop\Revit_Local\A20\1215 Commerce Way_jjnowakVWH2.rvt

NELSON
Nelson Architecture & Interiors, Inc.

198 Tremont Street, Suite 439
Boston, MA. 02116
Phone: (617) 778-7229
WWW.NELSONWORLDWIDE.COM

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25 PORTSMOUTH BOULEVARD
PORTSMOUTH, NH 03801

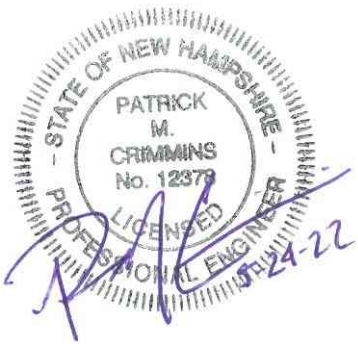
Issue: No: Date:

ELEVATIONS

Proj #: 20.0003391 Reviewed By: Checker

A-201

Drainage Analysis



TO: City of Portsmouth Technical Advisory Committee (TAC)

FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE
Craig Langton, PE

COPY: 230 Commerce Way, LLC

DATE: May 24, 222

1.0 Project Description

The proposed project is located at 230 Commerce Way. The existing parcels includes a three (3) story office building with a footprint of approximately 16,650 SF with associated surface parking. The site is bound to the southeast by Portsmouth Boulevard, and two (2) commercial properties to the southwest and northwest. The topography of the site has high points along Commerce Way and slopes to the rear, southwest, portion of the site.

Runoff generated by the existing site flows to one (1) discharge point identified as Point of Analysis 1 (PA-1) on the enclosed Pre-Development Watershed Plan. PA-1 is an existing wetland complex in the rear of the site that collects the drainage from the existing commercial uses adjacent to the site.

The proposed project consists of the constructing of an additional 2-story building that has an overall footprint of approximately 12,500 SF with associated site improvements within the area of the rear parking lot of the existing site. The proposed site improvements include a stormwater management system providing treatment not only to the newly redeveloped areas but also to portions of the existing impervious areas on site.

Portions of the proposed project are location within the local wetland buffer setback, and as part of the redevelopment there will be a decrease of impervious area of approximately 5,070 SF within the buffer as well as an overall decrease of impervious area to the overall site.

2.0 Drainage Analysis

2.1 Calculation Methods

The parcels on-site watersheds were analyzed under this section. The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour duration storm as per NHDES AoT Regulations (Env-Wq 1500). 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 were obtained from the data published by the Northeast Regional Climate Center at Cornell University for the extreme precipitation estimates.

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.

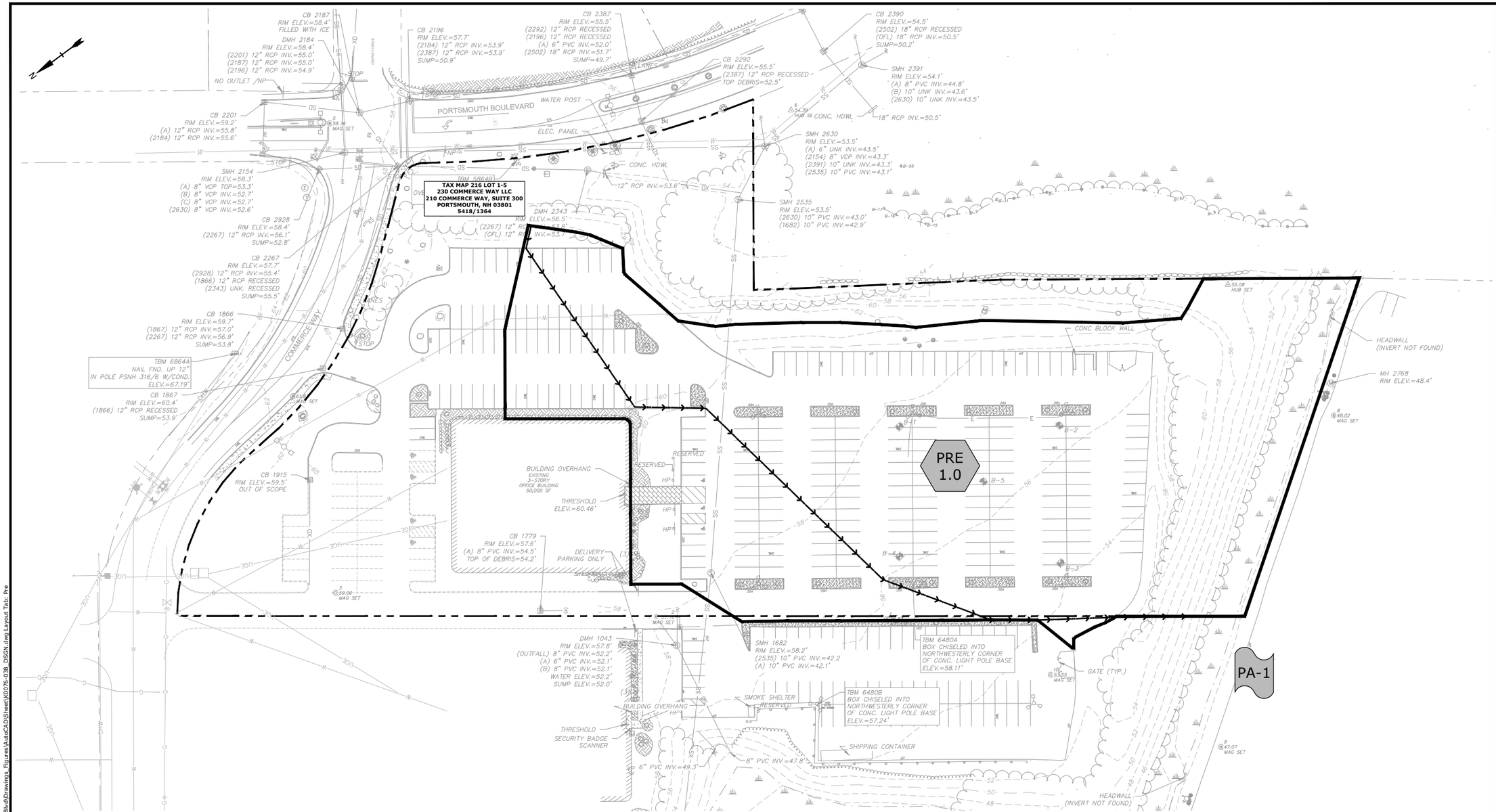
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

2.2 Pre-Development Calculations

As stated above the stromwater runoff characteristics of the site were analyzed at one distinct point of analysis. This point of analysis being the existing wetland complex in the rear of the site identified as PA-1. The limits of the contributing watershed area (Pre-1.0) of the pre-development condition studied in this analysis are depicted the enclosed plan entitled "Pre-Development Watershed Plan", Sheet C-801.

2.2.1 Pre-Development Calculations

2.2.2 Pre-Development Watershed Plan



LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- NRCS WEB SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/24/2022	TAC Submission

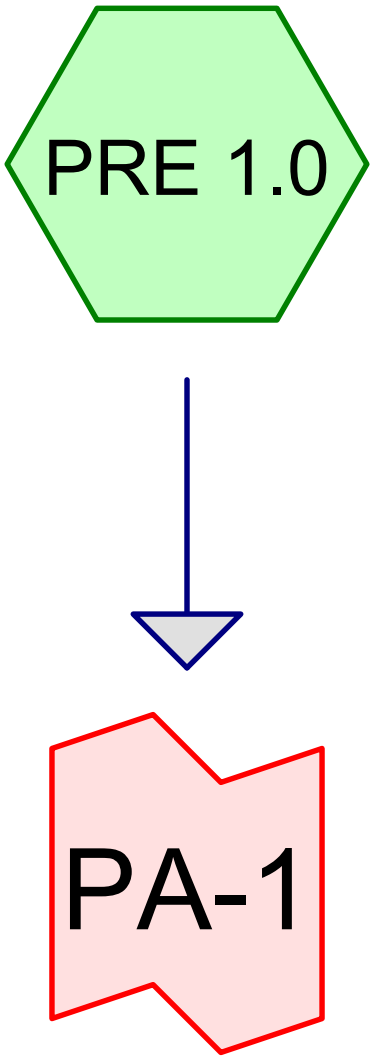
PROJECT NO:	K0076-038
DATE:	5/24/2022
FILE:	K0076-038_DSGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Save Date: May 23, 2022 5:03 PM By: CML
Plot Date: May 23, 2022 5:03 PM By: Chris M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings, Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Pre



Subcat Reach Pond Link

Routing Diagram for K0076-038_PRE
Prepared by Tighe & Bond, Printed 5/17/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
25,735	61	>75% Grass cover, Good, HSG B (PRE 1.0)
6,305	80	>75% Grass cover, Good, HSG D (PRE 1.0)
86,704	98	Paved parking, HSG B (PRE 1.0)
17,987	55	Woods, Good, HSG B (PRE 1.0)
136,731	**85**	**TOTAL AREA**

Summary for Subcatchment PRE 1.0:

Runoff = 6.67 cfs @ 12.07 hrs, Volume= 20,027 cf, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.20"

Area (sf)	CN	Description
86,704	98	Paved parking, HSG B
6,305	80	>75% Grass cover, Good, HSG D
17,987	55	Woods, Good, HSG B
25,735	61	>75% Grass cover, Good, HSG B
136,731	85	Weighted Average
50,027		36.59% Pervious Area
86,704		63.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	500	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	56	0.1439	5.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	656	Total			

Summary for Link PA-1:

Inflow Area = 136,731 sf, 63.41% Impervious, Inflow Depth = 1.76" for 2yr event
Inflow = 6.67 cfs @ 12.07 hrs, Volume= 20,027 cf
Primary = 6.67 cfs @ 12.07 hrs, Volume= 20,027 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PRE 1.0:

Runoff = 12.16 cfs @ 12.07 hrs, Volume= 36,800 cf, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.85"

Area (sf)	CN	Description
86,704	98	Paved parking, HSG B
6,305	80	>75% Grass cover, Good, HSG D
17,987	55	Woods, Good, HSG B
25,735	61	>75% Grass cover, Good, HSG B
136,731	85	Weighted Average
50,027		36.59% Pervious Area
86,704		63.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	500	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	56	0.1439	5.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	656	Total			

Summary for Link PA-1:

Inflow Area = 136,731 sf, 63.41% Impervious, Inflow Depth = 3.23" for 10yr event
Inflow = 12.16 cfs @ 12.07 hrs, Volume= 36,800 cf
Primary = 12.16 cfs @ 12.07 hrs, Volume= 36,800 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PRE 1.0:

Runoff = 16.54 cfs @ 12.06 hrs, Volume= 50,638 cf, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=6.15"

Area (sf)	CN	Description
86,704	98	Paved parking, HSG B
6,305	80	>75% Grass cover, Good, HSG D
17,987	55	Woods, Good, HSG B
25,735	61	>75% Grass cover, Good, HSG B
136,731	85	Weighted Average
50,027		36.59% Pervious Area
86,704		63.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	500	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	56	0.1439	5.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	656	Total			

Summary for Link PA-1:

Inflow Area = 136,731 sf, 63.41% Impervious, Inflow Depth = 4.44" for 25yr event
Inflow = 16.54 cfs @ 12.06 hrs, Volume= 50,638 cf
Primary = 16.54 cfs @ 12.06 hrs, Volume= 50,638 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PRE 1.0:

Runoff = 20.61 cfs @ 12.06 hrs, Volume= 63,778 cf, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.36"

Area (sf)	CN	Description
86,704	98	Paved parking, HSG B
6,305	80	>75% Grass cover, Good, HSG D
17,987	55	Woods, Good, HSG B
25,735	61	>75% Grass cover, Good, HSG B
136,731	85	Weighted Average
50,027		36.59% Pervious Area
86,704		63.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.5	500	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	56	0.1439	5.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	656	Total			

Summary for Link PA-1:

Inflow Area = 136,731 sf, 63.41% Impervious, Inflow Depth = 5.60" for 50yr event
Inflow = 20.61 cfs @ 12.06 hrs, Volume= 63,778 cf
Primary = 20.61 cfs @ 12.06 hrs, Volume= 63,778 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

2.3 Post-Development Calculations

The stromwater runoff characteristics of the pre-development conditions were analyzed at same distinct point of analysis (PA-1). However, in the post-development condition the overall contributing watershed was split into two (2) sub watershed areas (Post-1.0 & Post-1.1). Though the two (2) post-development watershed areas ultimately drain to the same point of analysis (PA-1), the proposed drainage system was designed to capture runoff from the contributing impervious areas (Post-1.1) and direct the flow through a proprietary stormwater treatment unit prior to discharging the runoff to PA-1. Post-development watershed areas (Post-1.0 & Post-1.1) of the post-development condition are depicted the enclosed plan entitled "Post-Development Watershed Plan", Sheet C-802.

2.3.1 Post-Development Calculations

2.3.2 Post-Development Watershed Plan

PORTSMOUTH BOULEVARD

COMMERCE WAY

OSPREY DRIVE

TAX MAP 216 LOT 1-5
230 COMMERCE WAY LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801
5418/1364

TBM 6864A
NAIL FND. UP 12"
IN POLE PSNH 316/6 W/COND.
ELEV.=67.19'

EXISTING
3-STORY
OFFICE BUILDING
50,000 SF

THRESHOLD
ELEV.=60.46'

THRESHOLD
ELEV.=58.81'

PROPOSED
2-STORY BUILDING
FOOTPRINT: ±12,500 SF

LINAC
VAULT

LINAC
CONTROL
ROOM

TBM 6480B
BOX CHISELED INTO
NORTHWESTERLY CORNER
OF CONC. LIGHT POLE BASE
ELEV.=57.24'

POST
1.0

POST
1.1

PA-1

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- NRCS WEB SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/24/2022	TAC Submission

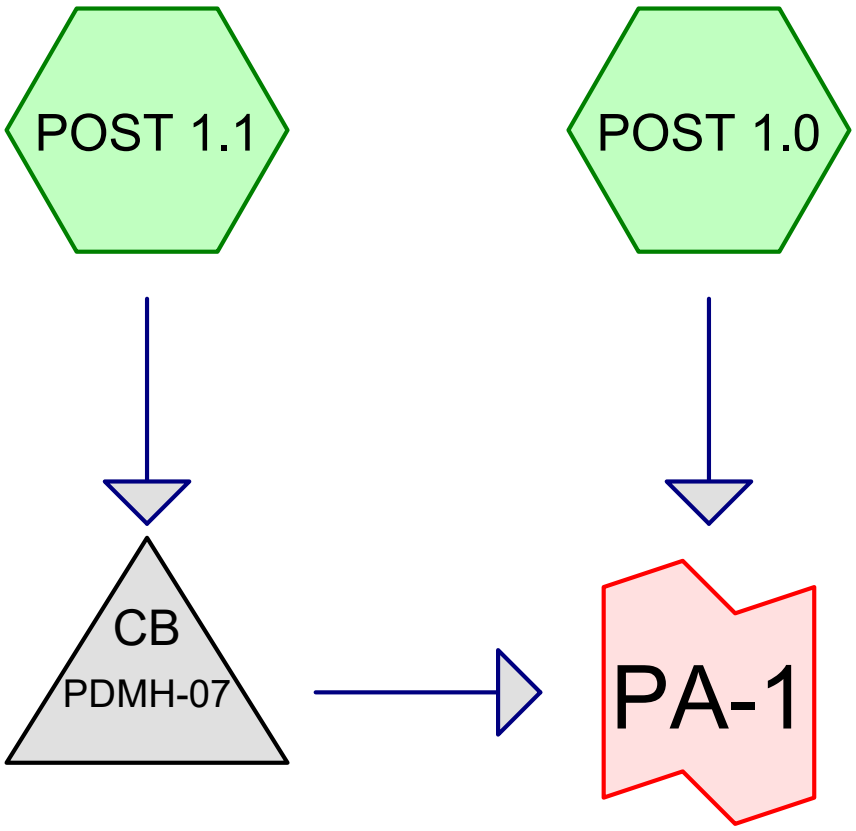
PROJECT NO:	K0076-038
DATE:	5/24/2022
FILE:	K0076-038_DSGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Save Date: May 23, 2022, 5:03 PM By: CML
Plot Date: Monday, May 23, 2022 Plotted For: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Post



JELLYFISH JF8

Subcat Reach Pond Link

Routing Diagram for K0076-038_POST
Prepared by Tighe & Bond, Printed 5/17/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
33,121	61	>75% Grass cover, Good, HSG B (POST 1.0, POST 1.1)
6,305	80	>75% Grass cover, Good, HSG D (POST 1.0)
66,420	98	Paved parking, HSG B (POST 1.1)
14,617	98	Roofs, HSG B (POST 1.1)
16,268	55	Woods, Good, HSG B (POST 1.0, POST 1.1)
136,731	**83**	**TOTAL AREA**

Summary for Subcatchment POST 1.0:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 924 cf, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.20"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
0	98	Roofs, HSG B
6,305	80	>75% Grass cover, Good, HSG D
13,316	55	Woods, Good, HSG B
1,719	61	>75% Grass cover, Good, HSG B
21,340	63	Weighted Average
21,340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.3333	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment POST 1.1:

Runoff = 6.16 cfs @ 12.07 hrs, Volume= 18,413 cf, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.20"

Area (sf)	CN	Description
66,420	98	Paved parking, HSG B
14,617	98	Roofs, HSG B
0	80	>75% Grass cover, Good, HSG D
2,952	55	Woods, Good, HSG B
31,402	61	>75% Grass cover, Good, HSG B
115,391	87	Weighted Average
34,354		29.77% Pervious Area
81,037		70.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	19	0.0815	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	151	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	194	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.2	34	0.0060	3.51	2.76	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.7	166	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	13	0.0080	5.32	9.40	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.3	75	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
4.3	652	Total			

Summary for Pond PDMH-07: JELLYFISH JF8

Inflow Area = 115,391 sf, 70.23% Impervious, Inflow Depth = 1.91" for 2yr event
Inflow = 6.16 cfs @ 12.07 hrs, Volume= 18,413 cf
Outflow = 6.16 cfs @ 12.07 hrs, Volume= 18,413 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.16 cfs @ 12.07 hrs, Volume= 18,413 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 50.61' @ 12.07 hrs
Flood Elev= 55.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**18.0" Round Culvert** L= 74.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.75' S= 0.0047 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.93 cfs @ 12.07 hrs HW=50.57' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 5.93 cfs @ 4.25 fps)

Summary for Link PA-1:

Inflow Area = 136,731 sf, 59.27% Impervious, Inflow Depth = 1.70" for 2yr event
Inflow = 6.37 cfs @ 12.07 hrs, Volume= 19,337 cf
Primary = 6.37 cfs @ 12.07 hrs, Volume= 19,337 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment POST 1.0:

Runoff = 0.79 cfs @ 12.07 hrs, Volume= 2,516 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.85"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
0	98	Roofs, HSG B
6,305	80	>75% Grass cover, Good, HSG D
13,316	55	Woods, Good, HSG B
1,719	61	>75% Grass cover, Good, HSG B
21,340	63	Weighted Average
21,340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.3333	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment POST 1.1:

Runoff = 10.85 cfs @ 12.06 hrs, Volume= 32,946 cf, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.85"

Area (sf)	CN	Description
66,420	98	Paved parking, HSG B
14,617	98	Roofs, HSG B
0	80	>75% Grass cover, Good, HSG D
2,952	55	Woods, Good, HSG B
31,402	61	>75% Grass cover, Good, HSG B
115,391	87	Weighted Average
34,354		29.77% Pervious Area
81,037		70.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	19	0.0815	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	151	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	194	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.2	34	0.0060	3.51	2.76	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.7	166	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	13	0.0080	5.32	9.40	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.3	75	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
4.3	652	Total			

Summary for Pond PDMH-07: JELLYFISH JF8

Inflow Area = 115,391 sf, 70.23% Impervious, Inflow Depth = 3.43" for 10yr event
Inflow = 10.85 cfs @ 12.06 hrs, Volume= 32,946 cf
Outflow = 10.85 cfs @ 12.06 hrs, Volume= 32,946 cf, Atten= 0%, Lag= 0.0 min
Primary = 10.85 cfs @ 12.06 hrs, Volume= 32,946 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 51.92' @ 12.06 hrs
Flood Elev= 55.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**18.0" Round Culvert** L= 74.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.75' S= 0.0047 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=10.48 cfs @ 12.06 hrs HW=51.81' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 10.48 cfs @ 5.93 fps)

Summary for Link PA-1:

Inflow Area = 136,731 sf, 59.27% Impervious, Inflow Depth = 3.11" for 10yr event
Inflow = 11.63 cfs @ 12.06 hrs, Volume= 35,462 cf
Primary = 11.63 cfs @ 12.06 hrs, Volume= 35,462 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment POST 1.0:

Runoff = 1.33 cfs @ 12.07 hrs, Volume= 4,058 cf, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=6.15"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
0	98	Roofs, HSG B
6,305	80	>75% Grass cover, Good, HSG D
13,316	55	Woods, Good, HSG B
1,719	61	>75% Grass cover, Good, HSG B
21,340	63	Weighted Average
21,340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.3333	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment POST 1.1:

Runoff = 14.56 cfs @ 12.06 hrs, Volume= 44,819 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=6.15"

Area (sf)	CN	Description
66,420	98	Paved parking, HSG B
14,617	98	Roofs, HSG B
0	80	>75% Grass cover, Good, HSG D
2,952	55	Woods, Good, HSG B
31,402	61	>75% Grass cover, Good, HSG B
115,391	87	Weighted Average
34,354		29.77% Pervious Area
81,037		70.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	19	0.0815	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	151	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	194	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.2	34	0.0060	3.51	2.76	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.7	166	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	13	0.0080	5.32	9.40	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.3	75	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
4.3	652	Total			

Summary for Pond PDMH-07: JELLYFISH JF8

Inflow Area = 115,391 sf, 70.23% Impervious, Inflow Depth = 4.66" for 25yr event
Inflow = 14.56 cfs @ 12.06 hrs, Volume= 44,819 cf
Outflow = 14.56 cfs @ 12.06 hrs, Volume= 44,819 cf, Atten= 0%, Lag= 0.0 min
Primary = 14.56 cfs @ 12.06 hrs, Volume= 44,819 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 53.24' @ 12.06 hrs
Flood Elev= 55.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**18.0" Round Culvert** L= 74.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.75' S= 0.0047 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=14.08 cfs @ 12.06 hrs HW=53.06' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 14.08 cfs @ 7.97 fps)

Summary for Link PA-1:

Inflow Area = 136,731 sf, 59.27% Impervious, Inflow Depth = 4.29" for 25yr event
Inflow = 15.89 cfs @ 12.06 hrs, Volume= 48,876 cf
Primary = 15.89 cfs @ 12.06 hrs, Volume= 48,876 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment POST 1.0:

Runoff = 1.89 cfs @ 12.07 hrs, Volume= 5,642 cf, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.36"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
0	98	Roofs, HSG B
6,305	80	>75% Grass cover, Good, HSG D
13,316	55	Woods, Good, HSG B
1,719	61	>75% Grass cover, Good, HSG B
21,340	63	Weighted Average
21,340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.3333	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment POST 1.1:

Runoff = 18.00 cfs @ 12.06 hrs, Volume= 56,040 cf, Depth= 5.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.36"

Area (sf)	CN	Description
66,420	98	Paved parking, HSG B
14,617	98	Roofs, HSG B
0	80	>75% Grass cover, Good, HSG D
2,952	55	Woods, Good, HSG B
31,402	61	>75% Grass cover, Good, HSG B
115,391	87	Weighted Average
34,354		29.77% Pervious Area
81,037		70.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	19	0.0815	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	151	0.0120	2.22		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	194	0.0200	6.42	5.04	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.2	34	0.0060	3.51	2.76	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
0.7	166	0.0050	3.72	4.57	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
0.0	13	0.0080	5.32	9.40	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
0.3	75	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
4.3	652	Total			

Summary for Pond PDMH-07: JELLYFISH JF8

Inflow Area = 115,391 sf, 70.23% Impervious, Inflow Depth = 5.83" for 50yr event
Inflow = 18.00 cfs @ 12.06 hrs, Volume= 56,040 cf
Outflow = 18.00 cfs @ 12.06 hrs, Volume= 56,040 cf, Atten= 0%, Lag= 0.0 min
Primary = 18.00 cfs @ 12.06 hrs, Volume= 56,040 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 54.82' @ 12.06 hrs
Flood Elev= 55.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.10'	**18.0" Round Culvert** L= 74.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.10' / 48.75' S= 0.0047 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=17.42 cfs @ 12.06 hrs HW=54.55' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 17.42 cfs @ 9.86 fps)

Summary for Link PA-1:

Inflow Area = 136,731 sf, 59.27% Impervious, Inflow Depth = 5.41" for 50yr event
Inflow = 19.89 cfs @ 12.06 hrs, Volume= 61,683 cf
Primary = 19.89 cfs @ 12.06 hrs, Volume= 61,683 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

2.4 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at each point of analysis.

Table 2.4.1 - Comparison of Pre- and Post-Development flows (cfs)

	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed				
PA-1	6.67	12.16	16.54	20.61
Post-Development Watershed				
PA-1	6.37	11.63	15.89	19.89

2.5 Stormwater Treatment

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and the NHDES AoT Regulations (Env-Wq 1500).

Runoff generated from impervious areas will be treated by a Contech Jellyfish (JF8) stormwater treatment system. The surface parking area will receive pre-treatment via deep sump catch basins prior to discharging to the Jellyfish unit. Roof runoff is to be discharged directly in the proposed closed drainage system prior to being directed to the Contech stromwater treatment unit.

The Contech stormwater treatment unit was sized to treat the one (1) inch storm per the NHDES AoT Regulations for water quality flow (WQF), as shown on the enclosed NHDES WQF worksheet.

3.0 Conclusion

The proposed project will result in a reduction in post-development peak runoff rates from the pre-development condition. The impervious area resulting from the proposed project will be treated by the proposed stormwater treatment system.

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)

2.65	ac	A = Area draining to the practice
1.86	ac	A_I = Impervious area draining to the practice
0.70	decimal	I = Percent impervious area draining to the practice, in decimal form
0.68	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.81	ac-in	WQV= 1" x Rv x A
6,559	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".
0.68	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
0.068	inches	Ia = Initial abstraction. Ia = 0.2S
4.3	minutes	T_c = Time of Concentration
615.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
1.736	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:

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	70.786 degrees West
Latitude	43.089 degrees North
Elevation	0 feet
Date/Time	Wed, 11 May 2022 10:39:24 -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	2.02	2.65	2.91	**1yr**	2.35	2.80	3.20	3.93	4.53	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.56	**2yr**	2.83	3.42	3.92	4.66	5.31	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.05	4.56	**5yr**	3.59	4.38	5.02	5.91	6.68	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.24	1.72	2.22	2.88	3.73	4.85	5.51	**10yr**	4.29	5.30	6.05	7.08	7.95	**10yr**
25yr	0.47	0.75	0.96	1.32	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.71	6.15	7.07	**25yr**	5.44	6.80	7.75	8.98	10.01	**25yr**
50yr	0.53	0.85	1.09	1.52	2.05	2.73	**50yr**	1.77	2.51	3.26	4.29	5.63	7.36	8.55	**50yr**	6.51	8.22	9.36	10.76	11.93	**50yr**
100yr	0.59	0.95	1.23	1.75	2.39	3.22	**100yr**	2.06	2.95	3.87	5.12	6.73	8.82	10.33	**100yr**	7.80	9.94	11.30	12.89	14.22	**100yr**
200yr	0.67	1.09	1.41	2.02	2.79	3.79	**200yr**	2.41	3.49	4.57	6.08	8.03	10.57	12.50	**200yr**	9.35	12.02	13.64	15.45	16.96	**200yr**
500yr	0.79	1.29	1.69	2.45	3.43	4.70	**500yr**	2.96	4.34	5.70	7.63	10.15	13.43	16.08	**500yr**	11.88	15.46	17.52	19.65	21.42	**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	2.49	**1yr**	1.96	2.39	2.84	3.16	3.87	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.36	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53	5.05	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.78	4.18	**5yr**	3.34	4.02	4.69	5.51	6.22	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.36	4.85	**10yr**	3.86	4.66	5.42	6.38	7.17	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.77	3.56	4.67	5.88	**25yr**	4.14	5.65	6.61	7.76	8.65	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.10	3.96	5.28	6.79	**50yr**	4.67	6.53	7.69	9.00	9.98	**50yr**
100yr	0.53	0.81	1.01	1.46	2.00	2.47	**100yr**	1.73	2.41	2.62	3.45	4.39	5.92	7.84	**100yr**	5.24	7.54	8.93	10.45	11.51	**100yr**
200yr	0.59	0.89	1.12	1.63	2.27	2.82	**200yr**	1.96	2.75	2.93	3.83	4.85	6.63	9.05	**200yr**	5.86	8.70	10.37	12.15	13.30	**200yr**
500yr	0.68	1.02	1.31	1.90	2.70	3.37	**500yr**	2.33	3.29	3.40	4.38	5.54	7.69	10.93	**500yr**	6.81	10.51	12.63	14.85	16.08	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.14	**1yr**	2.64	3.02	3.57	4.37	5.03	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.26	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.68	**2yr**	3.02	3.54	4.07	4.82	5.62	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.32	4.94	**5yr**	3.83	4.75	5.35	6.34	7.12	**5yr**
10yr	0.46	0.71	0.89	1.24	1.60	1.96	**10yr**	1.38	1.92	2.27	3.10	3.94	5.32	6.17	**10yr**	4.71	5.93	6.77	7.80	8.71	**10yr**
25yr	0.57	0.87	1.08	1.54	2.03	2.55	**25yr**	1.75	2.49	2.94	4.05	5.12	7.77	8.29	**25yr**	6.87	7.97	9.07	10.28	11.35	**25yr**
50yr	0.66	1.01	1.26	1.81	2.44	3.10	**50yr**	2.10	3.03	3.58	4.97	6.26	9.73	10.39	**50yr**	8.61	9.99	11.33	12.65	13.89	**50yr**
100yr	0.78	1.18	1.48	2.13	2.92	3.77	**100yr**	2.52	3.68	4.35	6.12	7.68	12.17	13.01	**100yr**	10.77	12.51	14.16	15.60	17.01	**100yr**
200yr	0.91	1.37	1.74	2.51	3.50	4.59	**200yr**	3.02	4.49	5.30	7.53	9.41	15.28	16.32	**200yr**	13.52	15.70	17.71	19.22	20.82	**200yr**
500yr	1.13	1.68	2.16	3.13	4.45	5.95	**500yr**	3.84	5.82	6.87	9.93	12.35	20.64	22.03	**500yr**	18.27	21.19	23.82	25.34	27.23	**500yr**

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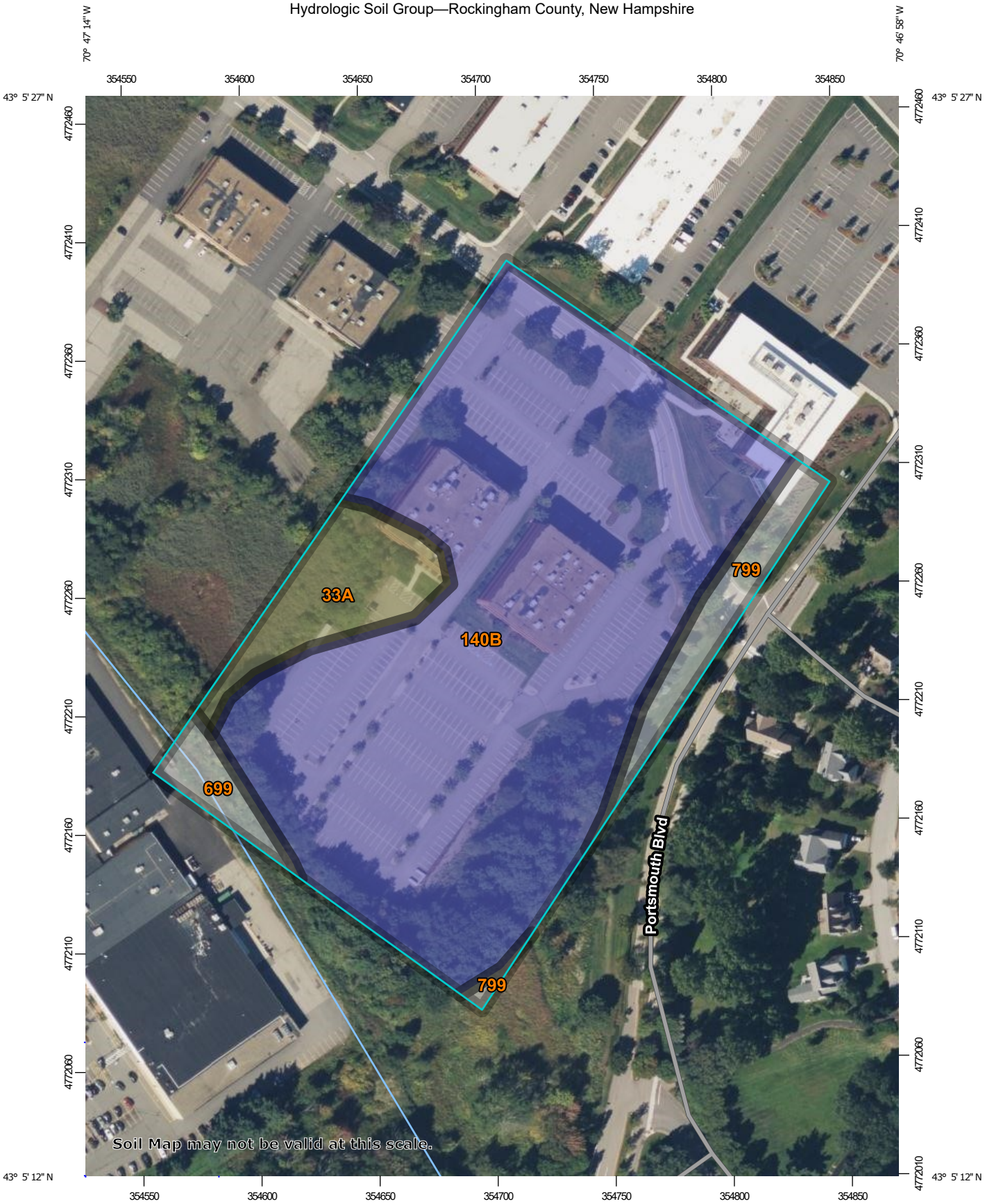
Northeast Regional Climate Center



Map Scale: 1:2,220 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
33A	Scitico silt loam, 0 to 5 percent slopes	C/D	0.9	8.3%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	9.2	82.8%
699	Urban land		0.3	2.8%
799	Urban land-Canton complex, 3 to 15 percent slopes		0.7	6.0%
Totals for Area of Interest			**11.1**	**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.

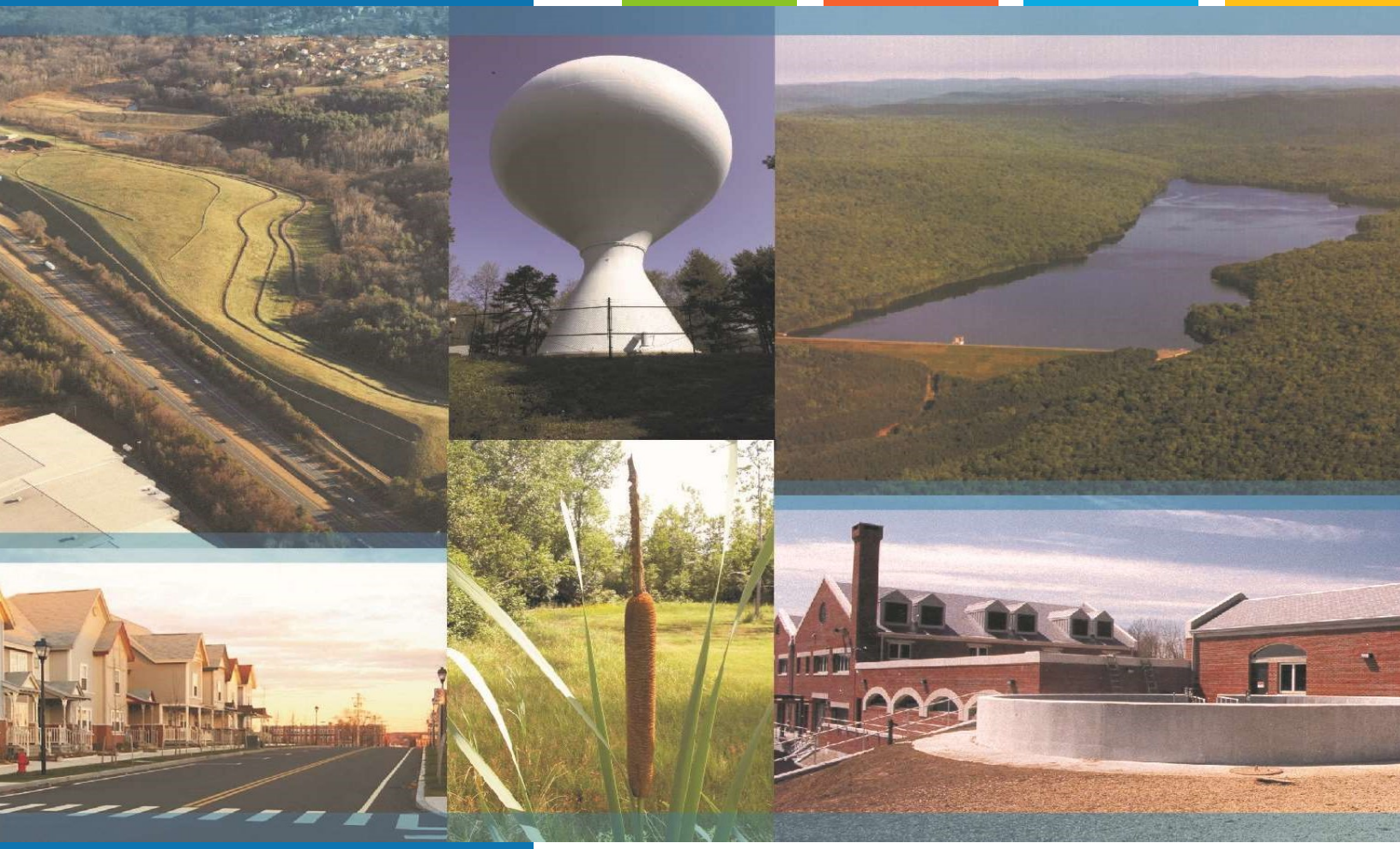
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Proposed 2-Story Building

Portsmouth, NH

Long Term Operation & Maintenance Plan

Prepared For:

230 Commerce Way LLC
210 Commerce Way, Suite 300
Portsmouth, NH 03801

May 24, 2022

100% Recyclable

Section 1 Long-Term Operation & Maintenance Plan

1.1 Contact/Responsible Party 1-1
1.2 Maintenance Items 1-1
1.3 Overall Site Operation & Maintenance Schedule 1-2
1.3.1 Disposal Requirements 1-2
1.4 Jellyfish Treatment Unit Maintenance Requirements 1-3
1.5 Snow & Ice Management for Standard Asphalt and Walkways 1-4

Section 2 Annual Updates and Log Requirements

Section 1
Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

Kelsey Kraus, Director of Property Management
The Kane Company, Inc.
210 Commerce Way, Suite 300
Portsmouth, NH 03801
603-559-9666

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catch Basin
- Pavement Sweeping
- ADS Water Quality Unit

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CBs to be cleaned of solids and oils.	Bi-Annually
Jellyfish Treatment Unit - Visual observation of sediment levels within system - Cleaned (pumped and pressure washed) - Per manufacture recommendations	 - Quarterly and after major storm events. - Annually - See manufactures Jellyfish Treatment Unit Inspection and Maintenance Guide, enclosed

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.4 Jellyfish Treatment Unit Maintenance Requirements

1.5 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan).

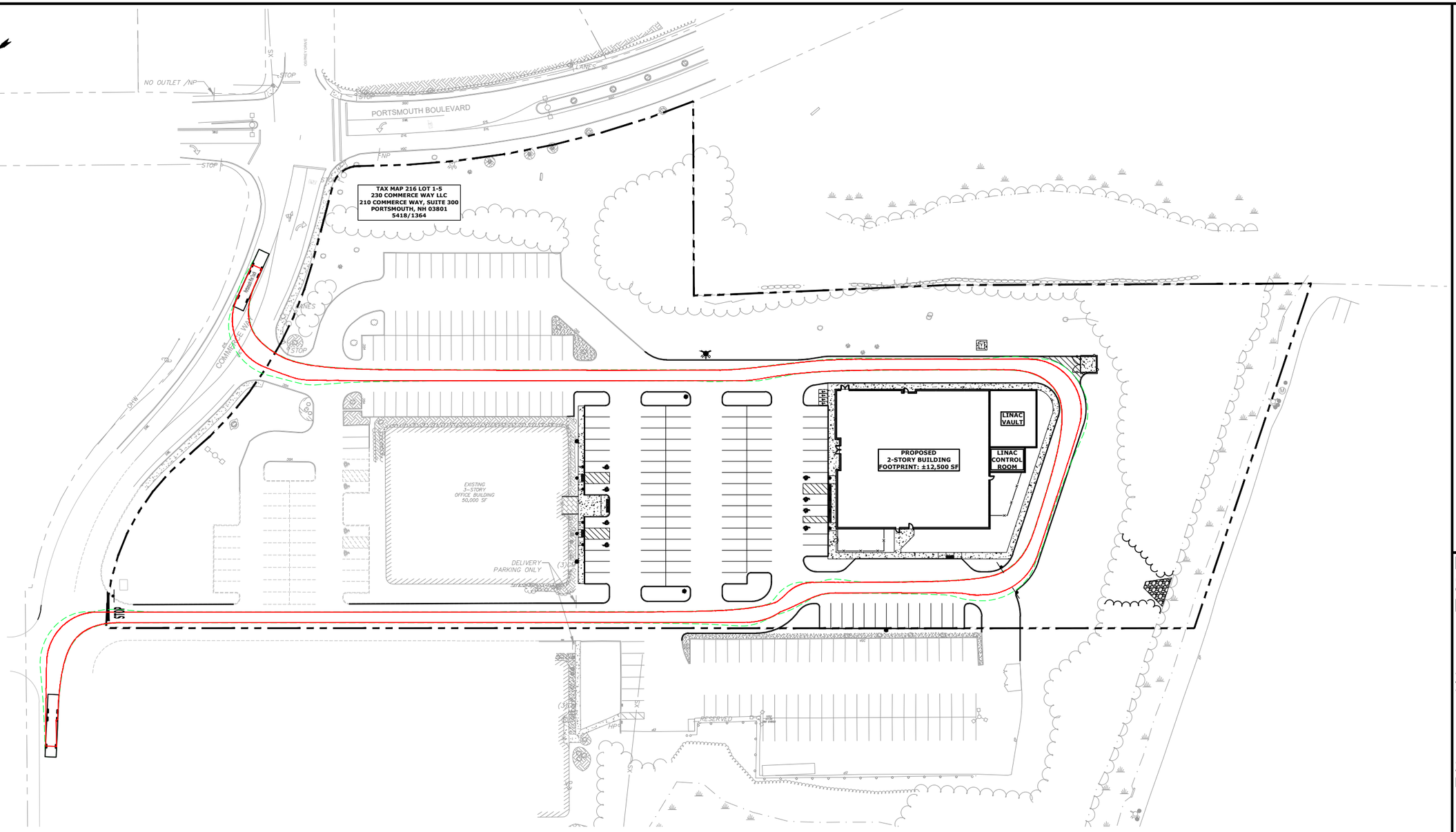
Section 2
Annual Updates and Log Requirements

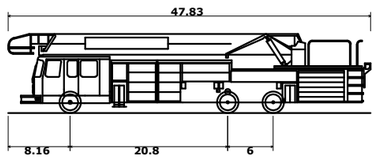
The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth DPW on an annual basis.

Stormwater Management Report						
Proposed Hampton Street Hangars		**Proposed 2-Story Building – Portsmouth NH 03801**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Jellyfish Treatment Unit			❑Yes ❑No			





Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

LEGEND

- VEHICLE OVERHANG
- VEHICLE WHEEL BASE

Tighe&Bond

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/24/2022	TAC Submission

PROJECT NO:	K0076-038
DATE:	5/24/2022
FILE:	K0076-038_DSGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

FIRE TRUCK TURNING EXHIBIT

SCALE: AS SHOWN

1 OF 1

Last Save Date: May 23, 2022 4:17 PM By: CML
Last Plot Date: May 23, 2022 4:17 PM By: Craig M. Langton
T&B File Location : J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\Autocad\CAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Fire Truck

K0076-038
May 24, 2022

Mr. Eric Eby, City Traffic Engineer
City of Portsmouth
Department of Public Works
680 Peverly Hill Road
Portsmouth New Hampshire

Re: **Trip Generation Analysis**
Proposed 2-Story Building, 230 Commerce Way, Portsmouth, NH

Dear Eric:

Tighe & Bond has performed a trip generation analysis related to the construction of a proposed two-story 25,000 SF (GFA) building that will consist of a Veterinary Care use located at 230 Commerce Way in Portsmouth, NH. Port City Veterinary Referral Hospital ("Port City") will be relocating from its current 15,000 SF facility located at 215 Commerce Way.

This analysis was performed utilizing Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. For the purposes of analysis, we have calculated the trip generation for the the veterinary use utilizing the average peak AM and PM hour rates for ITE Land Use Code 640 – Animal Hospital/Veterinary Clinic, which are 3.64 and 3.53 per 1,000 SF, respectively.

	Veterinary Care (ITE LUC 640)
Weekday AM Peak Hour	
Trips Entering (67%)	61
Trips Exiting (33%)	30
Total Vehicle Trips	**91**
Weekday PM Peak Hour	
Trips Entering (40%)	35
Trips Exiting (60%)	53
Total Vehicle Trips	**88**

As depicted above, the proposed Veterinary Care use will result in approximately 1.5 additional vehicle trips every minute during the Weekday AM and PM peak hours which is anticipated to have minimal impact to the surrounding roadway network during these peak times.

In addition to the above trip generation calculations, the subject site has previously been reviewed through the City of Portsmouth Site Review process with respect to traffic-related impacts.

- In the September 1999, CLD Consulting Engineers, Inc. (CLD) prepared a *Traffic Impact Evaluation* for full build out of the Portsmouth Office Park with 244,000 square feet of Office use.

- In October 2005, AMES MSC prepared a *Traffic Impact Evaluation* as part of the Homewood Suites project located on Portsmouth Boulevard. This evaluation replaced 19,000 square feet of the Office use that was evaluated in the 1999 CLD *Traffic Impact Evaluation* with a 108-room hotel. With this evaluation, there was 225,000 SF of Office use remaining from the prior CLD study that was not yet constructed.

- In June 2015, Tighe & Bond prepared a *Traffic Evaluation* as part of an Office Building project located 75 Portsmouth Boulevard. This evaluation reviewed impacts associated with the construction of 112,000 SF of Office use at 75 Portsmouth Boulevard. This memorandum evaluated the proposed 112,000 SF of office to be built plus the 113,000 SF of remaining office use from the CLD study for the full build out of Portsmouth Office Park. **It should be noted that only 67,000 SF of the proposed 112,000 SF was ultimately built.**

- The proposed 25,000 SF Veterinary Care use has a peak hour generator that is approximately the equivalent of a 60,000 SF Office use. Thus, the peak hour trip generation associated with the Veterinary Care use is already accounted in the 2015 Tighe & Bond *Traffic Evaluation* described above.
    - With only 67,000 SF of the approved 112,000 SF of Office use being constructed at 75 Portsmouth Boulevard, a 45,000 SF balance of Office use previously anticipated to be constructed remains from the 2015 Tighe & Bond evaluation.
    - Applying this 45,000 SF balance to the Veterinary use equivalent of 60,000 SF leaves a surplus of 15,000 SF of Office use. This 15,000 SF surplus would then be subtracted from the 113,000 SF of Office use remaining for the full build out of Portsmouth Office Park as described above. In summary, a balance of 98,000 SF of Office use accounted for in the June 2015 Traffic Evaluation still remains not yet constructed for the full buildout of Portsmouth Office Park.

Please feel free to contact us if you have any questions or need any additional information.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

EVERSOURCE ENERGY

May 24, 2022

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

Craig Langton, PE
Tighe & Bond
177 Corporate Drive
Portsmouth NH, 03801

Dear Craig:

I am responding to your request to confirm the availability of electric service for the proposed 230 Commerce Way project being constructed for/by 230 Commerce Way, LLC.

The proposed project consists of a 2-story building with 0 residential units approximately 25,000 s/f of Veterinary Care space. The proposed development will be constructed along Commerce Way and Portsmouth Boulevard.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan C-104. The proposed building service will be fed from Commerce Way, to be determined by Eversource Engineering as depicted on utility plan C-104. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed 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 "Utility Plan" dated May 24, 2022, shows transformer locations to service your proposed project.

Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our 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

Unitil
Northern Utilities, Inc.

May 12th, 2022

Craig Langton, PE
Project Engineer
Tighe & Bond
177 Corporate Drive, Portsmouth, NH, 03801

Natural Gas to 230 Commerce Way Portsmouth, NH

Hi Craig,

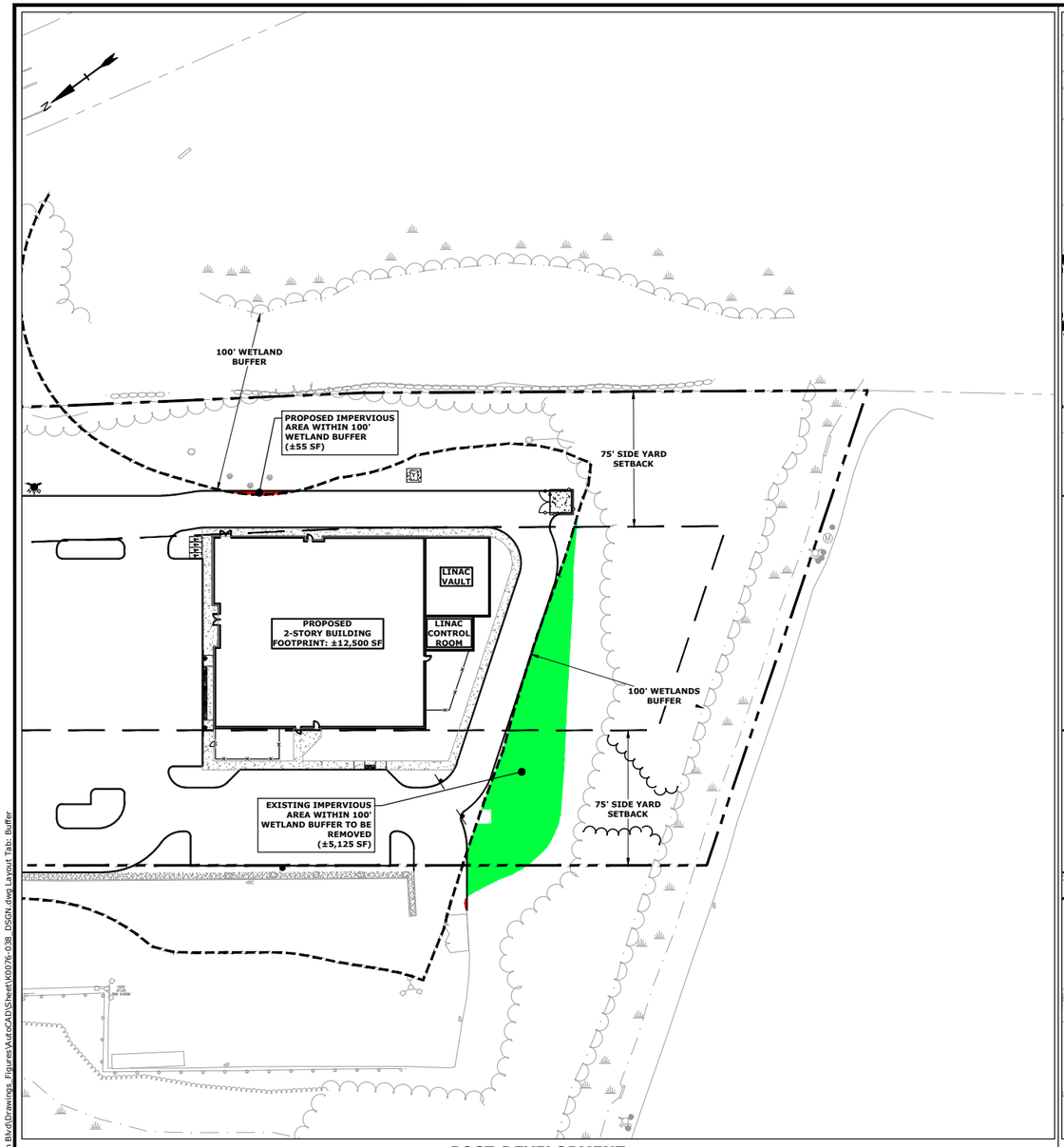
Unitil/Northern Utilities Natural Gas Division has reviewed the requested site for natural gas service:

Unitil hereby confirms that natural gas is available for the proposed two-story commercial building at 230 Commerce Way, Portsmouth, NH.

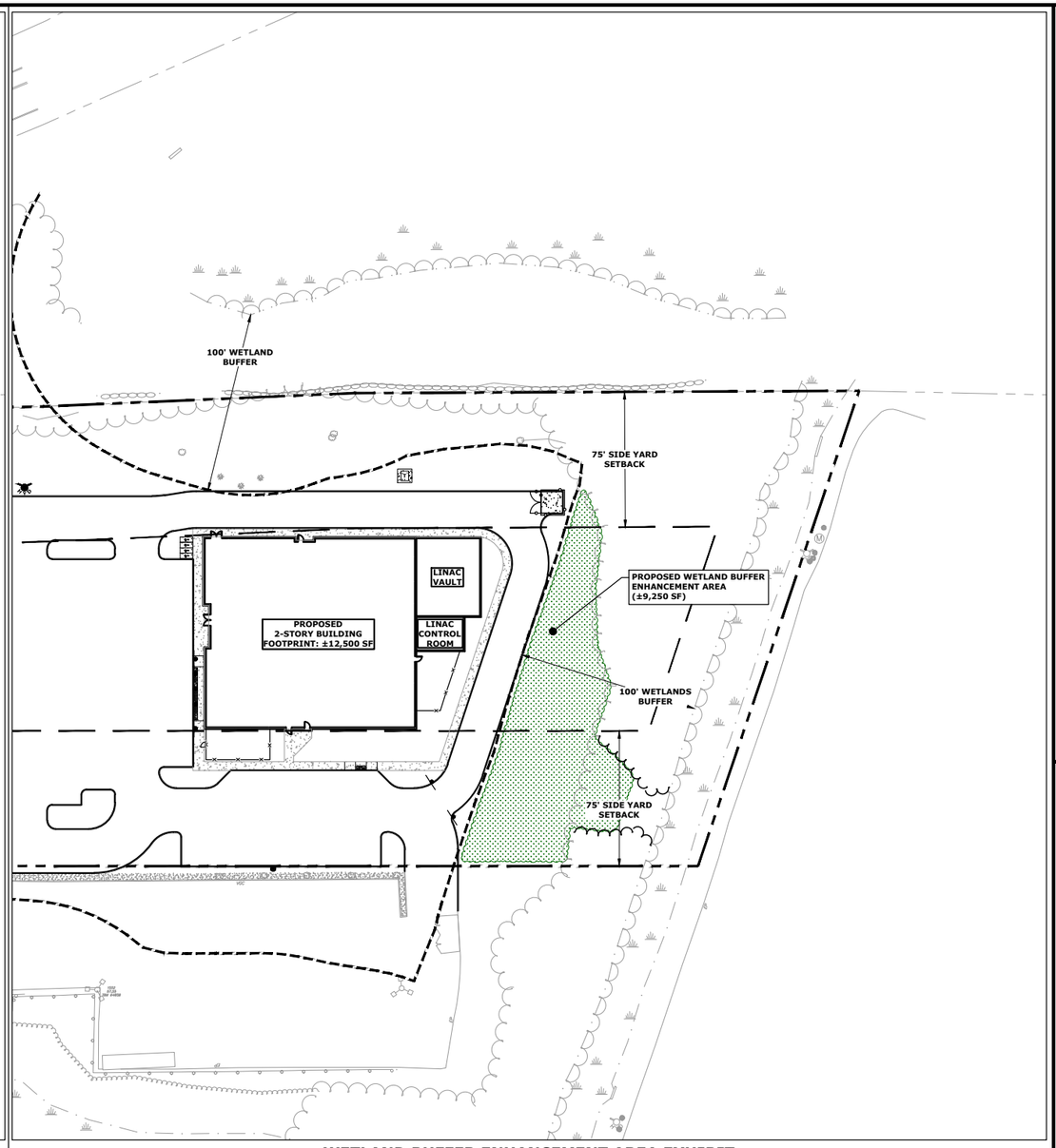
If you have any questions, please contact me at 603-534-2379.

Sincerely,

Dave MacLean
Senior Business Development Rep
Unitil
T 603.294.5261 **M** 603.534.2379 **F** 603.294.5264
Email macleand@unitil.com



POST-DEVELOPMENT
IMPERVIOUS AREA REDUCTION EXHIBIT



WETLAND BUFFER ENHANCEMENT AREA EXHIBIT

Tighe&Bond

SCALE IN FEET
0 40' 80'
GRAPHIC SCALE

Proposed 2-Story Building

230 Commerce Way, LLC

230 Commerce Way
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	5/24/2022	TAC Submission

PROJECT NO:	K0076-038
DATE:	5/24/2022
FILE:	K0076-038_DSGN.DWG
DRAWN BY:	CML
CHECKED:	NAH
APPROVED:	PMC

100' WETLAND BUFFER IMPACT EXHIBIT

SCALE: AS SHOWN

1 OF 1

Last Save Date: May 23, 2022 4:17 PM By: CML
Plot Date: Monday, May 23, 2022 Plotted By: Craig M. Langton
T&B File Location: J:\K\K0076 The Kane Company - General Proposals\0076-038 Portsmouth Blvd\Drawings_Figures\AutoCAD\Sheet\K0076-038_DSGN.dwg Layout Tab: Buffer

May 24, 2022

Sustainability Narrative for Planning Board

Proposed Office/Animal Clinic Building

25 Portsmouth Boulevard, Portsmouth NH

Introduction

25 Portsmouth Boulevard is a core and shell construction project located in Portsmouth that will accommodate office and animal clinic program components. It will follow the U.S. Green Building Council under the LEED v4 Building Design + Construction for Core & Shell. The project team expects the project shows sufficient potential to reach a minimum of Certified level LEED certification. This shall be accomplished through various qualities attributed to both the project context, as well as its design merits, and client (and tenant) initiatives described in the following sections.

Integrative Design

Integrative Process

During the preliminary design phases, the team studied site conditions, basic envelope attributes, energy-related systems, and water-related systems to identify potential synergies across disciplines and building systems.

Location and Transportation

Sensitive Land Protection

The project site is not located on prime farmland, not parkland, not on previously undeveloped land, not designated as habitat for endangered species, and not in proximity to wetlands or water bodies. The project site is in a previously developed parking lot area surrounded by other similar scale office properties

Access to Quality Transit

The planned project is 100 feet from Portsmouth Avenue and Shearwater COAST #2 bus stop. The site is also a 6 minute drive to Portsmouth International Airport.

Bicycle Facilities

The project will provide numerous bicycle racks for short-term storage outside of the project building for occupants' and visitors' use. Additionally, if the tenant choses to provide, the building will contain shower and locker/changing facilities for its regular occupants.

Green Vehicles

Hybrid vehicle preferred parking spaces and charging stations designated for use by plug-in electric vehicles are being explored.

Sustainable Sites

Construction Activity Pollution Prevention

A project-specific erosion and sedimentation control plan will be created with the objective of preventing loss of soil during construction, sedimentation of storm sewers, and pollution of the air with dust and particulate matter. The contractor shall be required to document compliance with the ESC throughout the construction process.

Site Assessment

A site assessment including topography, hydrology, climate, vegetation, soils, human uses, and human health effects will be performed and will inform the design of the project as appropriate.

Site Development –Protect or Restore Habitat

The project is built on a site with no greenfield area. Greenspace with a variety of native or adaptive vegetation, trees, and soil restoration will be provided.

Open Space

The project will provide some open space within the site area. The outdoor space will be physically accessible and includes pet and pedestrian-oriented paving with physical site elements that accommodate outdoor social activities.

Rainwater Management

The proposed stormwater management system will be designed to comply with the City of Portsmouth standards.

Heat Island Reduction

The solar reflectance index on the light-colored and reflective low sloped roofing, which will cover more than 75% of the overall building roof surface

Light Pollution Reduction

All exterior lighting shall automatically turn off when sufficient daylight is available. All building façade/landscape lighting shall be automatically shut off between midnight/business closing, and 6am/business opening.

Tenant Design and Construction Guidelines

Tenant design and construction guidelines will be issued to the building tenant to educate about implementing sustainable design and construction features in their tenant improvement fit-out. These guidelines will encourage building tenants to earn LEED ID+C v4 Certification for their interior fit-out.

Water Efficiency

Outdoor Water Use Reduction

Plant selection and an efficient irrigation system will reduce the potable water used for irrigation by at least 75% from a calculated midsummer baseline case as delineated under Option 2 for Reduced Irrigation.

Indoor Water Use Reduction

Water-efficient plumbing fixtures will reduce domestic water below the LEED water use baseline, shown through the usage-based calculations
· All toilets will utilize 1.1 gpf low flush valves
· All urinals will utilize 0.125 gpf ultra low flow flush valves
· All lavatories will utilize 0.35 gpm with metering tempering faucets
· All showers will utilize 1.5 gpm low flow shower heads
· All kitchen sinks will utilize 1.5 gpm faucets

Building – Level Water Metering & Water Metering

Permanent water meters will be installed which will measure the total potable water use for the building and its associated grounds.

Energy and Atmosphere

Fundamental Commissioning And Verification & Enhanced Commissioning

A third-party Commissioning Agent may be engaged before the end of the design development phase, and will review and comment on the project Owner's Project Requirements (OPR), Basis of Design, draft Design Development & Construction Documents. Additionally, he/she will develop and implement a Commissioning Plan for the building HVAC, plumbing, lighting systems and envelope, review construction submittals, and then issue a summary Commissioning Report. Finally, the CxA will participate in training for the building operational staff.

In addition to the Fundamental scope listed above, the CxA verifies the following for mechanical, electrical, plumbing, energy systems, and building envelope; these tasks shall be included in the OPR and BOD:

- Review contractor submittals.
- Verify Inclusion of systems manuals and operator training requirements in the construction documents
- Verify systems manual updates and delivery
- Verify operator and occupant training delivery and effectiveness
- Verify seasonal testing
- Review building operations 10 months after substantial completion.
- Develop an on-going commissioning plan

Minimum Energy Performance & Optimize Energy Performance

An energy model will be developed to describe how an energy-efficient building envelope and base building mechanical systems will reduce the building design performance rating to below the baseline building performance rating. This will continue to evolve through the design phase and align with the project design and any additional energy savings we are able to confirm as the design further develops.

Building-Level Energy Metering

Permanently installed meters will measure total building energy consumption

Fundamental Refrigerant Management & Enhanced Refrigerant Management

Building refrigerants will be selected to minimize the emission of compounds that contribute to ozone depletion and global climate change. Building refrigerants will not exceed maximum threshold allowances for contributions to ozone depletion and global warming potential. Our core and shell project will likely not include all HVAC associated with anticipated work by the tenant.

Green Power and Carbon Offsets

The Kane Company *is investigating options* to engage in a contract to purchase building's energy from green power, carbon offsets, or renewable energy certificates for a minimum of five years.

Materials and Resources

Storage and Collection of Recyclables

A Recycling Staging Room at the building loading area will support a building-wide recycling program for paper, corrugated cardboard, glass, plastic, and metal.

Construction and Demolition Waste Management Planning

A construction and demolition waste management plan will be developed prior to the start of construction which will identify at least five materials targeted for diversion, whether these materials will be separated or comingled, and will approximate a percentage of the overall project waste that these will represent, at least 50% of the construction and demolition debris and a minimum of four material streams will be diverted from landfill and incineration facilities and redirected instead for recycling to the manufacturing process and reusable materials to appropriate sites.

Building Product Disclosure and Optimization Environmental Product Declarations, Sourcing of Raw Materials, and Material Ingredients

The design team shall proactively seek and track materials and products that comprehensively address these material and resource concerns during the design phase. Priority will be given to those items that comprise a high percentage of the project's overall material cost, and Low-Emitting Materials.

Minimum Indoor Air Quality Performance

Building HVAC systems will meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2010 - Ventilation for Acceptable Indoor Air Quality, based on anticipated future tenant requirements.

Environmental Tobacco Smoke (ETS) Control

Smoking will be prohibited inside the building and within 25 feet of the entire building perimeter.

Enhanced Indoor Air Quality Strategies

To promote a healthy indoor air quality, permanent entryway systems or appropriate roll-up mats will be installed at all regularly used building entrances; any room with hazardous gases or chemicals will be negatively pressured to contain such elements. MERV 13 or higher filters will be provided in all ventilation systems providing outdoor air to occupied spaces.

Low-Emitting Materials

The design team shall proactively seek and track products that comply with the low-emitting requirements during the design phase

Construction IAQ Management Plan

An indoor air quality plan during construction will require the builder to follow industry best-practices such as SMACNA IAQ Guidelines for Occupied Buildings Under Construction, protecting absorptive materials stored on site from moisture

Daylight

The project will provide window shading devices, and prioritize daylighting strategies for regularly occupied spaces.

Quality Views

The design of the building envelope and floor plan is exploring prioritizing quality view strategies that would allow tenants to design their fit-out with a direct line of sight to the outdoors in at least 75% of all regularly occupied areas.

Innovation

Innovation

The project will target this category by pursuing and combination of Innovation and Pilot Credits recognized by USGBC. The strategies listed below are currently being considered:

· Innovation: Purchasing – Lamps – The based building lighting shall be selected to focus on low- or no mercury-containing lamps. A purchasing plan will be implemented for both indoor and outdoor fixtures.

· Innovation: Green Education. The project will consider utilizing the building's sustainable feature as an opportunity to educate tenants and visitors on the value of green building.

LEED Accredited Professional

The project team includes several LEED Accredited Professionals

Regional Priority Credits

Regional Priority Credits

The project currently anticipates potentially earning points for the Regional Priority category

Sincerely,

Sr. VP/Managing Director, Boston

NELSON

Site Plan Review & Wetlands Conditional Use Application Fees

Project: 230 Commerce Way **Map/Lot:** 216/1-5

Applicant: 230 Commerce Way, LLC c/o The Kane Company

Site Plan Review Fee

All development

Base fee $500			$500.00
Plus $5.00 per $1,000 of site costs			
Site costs	$750,000	+	$3,750.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	99,000 S.F.	+	$990.00
		Subtotal Fee	**$5,240.00**

Maximum fee: $15,000.00

Wetlands Conditional Use Application Fee

Area of disturbance in wetland or wetland buffer:

Up to 250 sq. ft. ($100.00)		$0.00
Up to 1,000 sq. ft. ($500.00)		$0.00
Greater than 1,000 sq. ft. ($1,000.00)		$1,000.00
	Subtotal Fee	**$1,000.00**
	Total Fee	**$6,240.00**

T5037-002
May 24, 2022

Mr. Peter Stith, Principal Planner, Chair
Site Plan Review Technical Advisory Committee
City of Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Site Review, Lot Line Revision & Conditional Use Permit Applications
Proposed Mixed Use Development, Russell & Deer Street, Portsmouth, NH

Dear Peter,

On behalf of Port Harbor Land, LLC (owner/applicant), we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of the following information to support a request for a Site Review Permit, Lot Line Revision Permit, Conditional Use Permit for Shared Parking on Separate Lots, and a Conditional Use Permit for Increased Building Footprint the above referenced project:

- One (1) full size & one (1) half size copy of the Site Plan Set, dated May 24, 2022;
- Owner/Applicant Authorization, dated January 4, 2022;
- Site Review Checklist, dated May 24, 2022;
- Drainage Analysis, dated May 24, 2022;
- Operations and Maintenance Manual, dated May 24, 2022;
- Grade Plane Exhibit, dated May 24, 2022;
- Community Space Exhibit, dated May 24, 2022;
- Landscape Presentation Plan Set, dated May 24, 2022;
- Lighting Graphical Design Package, dated May 24, 2022;
- Fire Truck Turning Exhibit, dated May 24, 2022;
- Traffic Impact Study, dated May 24, 2022;
- Eversource Will Service Letter, dated May 23, 2022;
- Unitil Will Service Letter, dated February 22, 2021;
- Green Building Statement, dated May 23, 2022;
- Application fee calculation form

PROJECT SUMMARY

Existing Conditions

The project is located at 2 Russell Street, Deer Street & 250 Market Street consisting of properties identified as Map 118 Lot 28, Map 119 Lot 1-1C & Lot 4, Map 124 Lot 12, and Map 125 Lot 21 on the City of Portsmouth Tax Maps which are located in the Character District 5 (CD5). The properties identified as Map 118 Lot 28, Map 124 Lot 12, and Map 125 Lot 21 (proposed redevelopment parcels) are the existing parcels proposed to be redeveloped are bound by Deer Street to the south, Maplewood Avenue to the west, the railroad to the north

and Russell Street to the east. Map 119 Lot 4 will be developed into a park area as part of the community space for the proposed project, and Map 119 Lot 1-1C will be part of the lot line revision application.

The proposed redevelopment parcels lots currently consist of a large surface parking lot which is mainly used by the Sheraton Hotel. There are some small patches of gravel and grass where the site abuts the railroad property and a ledge outcropping to the north.

Proposed Redevelopment

The proposed project will include the construction of three buildings consisting of office, retail/commercial, and residential uses. Building 1 is a proposed 4-story office building at the corner of Deer Street and Maplewood Avenue, Building 2 is a proposed 5-story mixed-use residential building at the corner of Deer Street and Russell Street with below ground parking, first floor residential lobby, commercial space and parking and 60 upper floor residential units, and Building 3 is a proposed 5-story mixed-use residential building along Russell Street with first floor residential lobby and commercial space and 24 upper floor residential units.

The existing condition of the proposed redevelopment parcels does not provide any stormwater treatment. The proposed development will provide stormwater treatment to runoff from the new buildings and surface pedestrian and vehicle access ways via stormwater treatment units. In addition, an underground detention system has been incorporated into the design to address peak runoff rates from the site. The stormwater management system is described in further detail in the enclosed Drainage Analysis.

The project also consists of significant on-site and off-site improvements including wide sidewalks, roadway improvements, community space, lighting, landscaping, and utilities. The proposed development will provide landscape improvements including an enhanced streetscape and plantings, plaza area at the redesigned intersection of Deer Street and Russell Street, and community space areas. The streetscape design includes a variety of vibrant site elements such as shade trees, public benches, and retail spill out zones. Combined, these site features will create a friendly, safe pedestrian experience and connect users with first floor programs and access to proposed on-site and off-site community space areas. In total the proposed project is providing 22,169 SF of off-site, pedestrian orientated and park space public improvements.

Community Space & Off-Site Improvements

The project is located in the North End Incentive Overlay District. The applicant will be providing 38,721 SF of community spaces. This Community Space is 38.8% of the total lot area which exceeds the 20% of total lot area required to receive the incentive bonus for one additional story (10 ft) above the maximum height requirement. The community space calculation is depicted in the enclosed Community Space Exhibit. Additionally, the project is required to provide 30% community space as part of a conditional use permit application discussed below for Map 118 Lot 28 to allow proposed Building 2 to have a maximum 40,000 SF building footprint. Overall, the project will be providing 31.2% open space on the development lot where only 5% is required by zoning.

LAND-USE PERMIT APPLICATIONS

Local Permitting Timeline

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

- Site Plan Review Permit
- Lot Line Revision Permit

- Conditional Use Permit for Shared Parking on a Separate Lot
- Conditional Use Permit for Increased Building Footprint

Along with attending six (6) work sessions with the Historic District Commission (HDC), to date the applicant has attended the following meetings with the local land-use boards related to the Site Plan:

- December 16, 2021 – Planning Board Conceptual Consultation
- January 11, 2022 – Technical Advisory Committee Work Session
- February 17,2022 – Planning Board Design Review

In addition to the local land-use permits, the project will also require the following approvals from the New Hampshire Department of Environmental Services (NHDES):

- Alteration of Terrain Permit
- Sewer Connection Permit

Site Plan Review Permit

The project will require a Site Plan Review Permit for the site improvements described above in the project summary. The project has previously been before the Planning Board for Conceptual Consultation and Preliminary Design Review. In addition, the project has previously been before the Technical Advisory Committee (TAC) for a work session.

Lot Line Revision Permit

The proposed redevelopment parcels located at the corner of Russell Street and Deer Street consist of properties identified as Map 118 Lot 28, Map 124 Lot 12, and Map 125 Lot 21. The existing internal lot lines separating these three lots, are proposed to be relocated to better align the parcels for the proposed building footprints.

Additionally, three land transfers are proposed to allow for the realignment of the Russell Street & Deer Street intersection and for the City's future construction of a roundabout at Russell Street and Market Street. Land transfer area 1 is proposed from Map 119, Lot 4 to the City of Portsmouth. Land transfer areas 2 and 3 are from Map 119, Lot 1-1C to the City of Portsmouth.

Conditional Use Permits

Shared Parking on Separate Lots

A Conditional Use Permit for parking on a separate lot as permitted under Section 10.1112.62 of the City of Portsmouth Zoning Ordinance is requested for the project. The project meets the parking requirements by sharing parking between the three (3) proposed redevelopment parcels and the existing Sheraton Hotel and Deer Street condos as shown on the enclosed Site Plans. A total of 341 parking spaces are required to meet the Zoning requirements.

The existing surface parking lot is used by the Sheraton Hotel for their valet and self-park operations. There are also an existing 82 deeded parking spaces for the Deer Street and Sheraton Condos that can be assigned to any space on either the Sheraton Lot or the redevelopment parcels. The table below identifies the required parking for the existing and proposed uses per the City of Portsmouth Ordinance. The project is providing 189 spaces within Building 2 and there are 154 existing spaces on the Sheraton lot, for a total of 343 proposed parking spaces where 341 spaces are required.

City of Portsmouth Downtown Overlay Parking Requirement	
North End Development, Portsmouth, NH	
Proposed Commercial Use Parking Requirements	No requirements 75,000 SF **0 Spaces**
Proposed Residential Use Parking Requirements	1.3 Spaces / Dwelling Unit 84 Dwelling Units **110 Spaces**
Proposed Residential Visitor Parking Requirements	1 Spaces / 5 Dwelling Unit 84 Dwelling Units **17 Spaces**
Sheraton Hotel Parking Requirements	0.75 Spaces / Hotel Room 181 Rooms **136 Spaces**
Sheraton Condo Parking Requirements	Deeded Easement for 24 Spaces 12 Dwelling Units **24 Spaces**
Deer Street Condo Parking Requirements	Deeded Easement for 58 Spaces 3-story mixed use Condos on Deer Street **58 Spaces**
Subtotal Required	**345 Spaces**
DOD Parking	**-4 Spaces**
Total Spaces Required	**341 Spaces**

Per Section 10.1112.62 (2) the shared parking arrangement shall be secured by a covenant acceptable to the City and recorded at the Rockingham County Registry of Deeds. The applicant understands that should the Planning Board grant the shared parking CUP, as a condition of approval the applicant will be required to record the agreement. The applicant will manage the parking for hotel use with a valet parking operator that will operate and manage the parking 24/7/365 to optimize the use of the available parking.

Increased Building Footprint

A Conditional Use Permit to allow a building footprint of up to 40,000 SF as permitted under Section 10.5A43.43 of the City of Portsmouth Zoning Ordinance is being requested for the project. The Planning Board may grant a conditional use permit to allow a building footprint of up to 40,000 SF in the CD5 district, if all of the following criteria are met:

(a) No story above the ground floor parking shall be greater than 30,000 SF in the CD5 district.

The footprint of the building stories above the ground floor are 29,810 SF.

(b) All ground floor parking areas shall be separated from any public or private street by a liner building.

The ground floor parking areas are separated from the public street by a liner building.

(c) At least 50% of the gross floor area of the ground floor shall be dedicated to parking.

The total gross floor area of the ground floor dedicated to parking is 64.2%.

(d) At least 30% of the property shall be assigned and improved as community space.

The proposed lot area for Map 118, Lot 28 and Map 119 Lot 4 is 62,417 SF which requires 18,725 SF of community space to meet the 30% requirement. Map 124, Lot 12 and Map 125, Lot 21 also require 20% community space to be eligible for the North End Overlay Incentives. Proposed community space areas on Map 118, Lot 28 and Map 119 Lot 4 totals 25,352 SF or 40.6%. The total required community space for the project is 26,201 SF with the total proposed community space equaling 38,721 SF or 38.8%. This is shown on the enclosed Community Space Exhibit.

(e) The development shall comply with all applicable standards of the ordinance and the City's land use regulations.

The development complies with all applicable standards of the ordinance and the City's land use regulations.

Under separate cover, a Site Plan Review application fee in the amount of $6,497.94, a Conditional Use Permit for Shared Parking application fee in the amount of $200, and a Conditional Use Permit for Increased Building Footprint fee in the amount of $200 have been mailed to the Planning Department by the applicant. A copy of the application fee calculation form is enclosed.

We respectfully request to be placed on the TAC meeting agenda for June 7, 2022. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Neil A. Hansen, PE
Project Manager

Patrick M. Crimmins, PE
Vice President

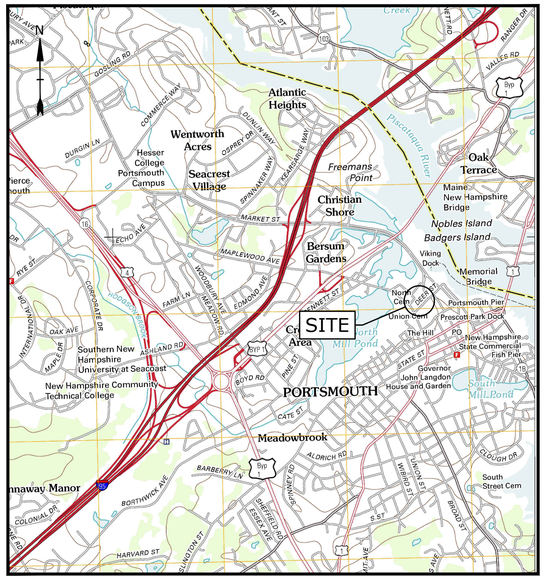
Cc: Port Harbor Land, LLC (via e-mail)

NORTH END
MIXED USE DEVELOPMENT

RUSSELL STREET & DEER STREET
PORTSMOUTH, NEW HAMPSHIRE
MAY 24, 2022

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	5/24/2022
G-100	GENERAL NOTES AND LEGEND	5/24/2022
C-101	EXISTING CONDITIONS & DEMOLITION PLAN	5/24/2022
C-102	OVERALL SITE PLAN	5/24/2022
C-102.1	SITE PLAN	5/24/2022
C-103	GRADING & DRAINAGE PLAN	5/24/2022
C-104	UTILITIES PLAN	5/24/2022
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	5/24/2022
C-502	DETAILS SHEET	5/24/2022
C-503	DETAILS SHEET	5/24/2022
C-504	DETAILS SHEET	5/24/2022
C-505	DETAILS SHEET	5/24/2022
C-506	DETAILS SHEET	5/24/2022
C-507	DETAILS SHEET	5/24/2022
C-508	DETAILS SHEET	5/24/2022
L-100	LANDSCAPE MATERIAL PLAN, LEGEND AND NOTES	5/24/2022
L-101	LANDSCAPE SITE PLAN	5/24/2022
L-102	LANDSCAPE DETAILS	5/24/2022
A-101	BUILDING 1 AREA PLANS	5/24/2022
A-102	BUILDING 2 AREA PLANS	5/24/2022
A-103	BUILDING 3 AREA PLANS	5/24/2022
A-201	BUILDING 1 ELEVATION	5/24/2022
A-202	BUILDING 1 ELEVATION	5/24/2022
A-203	BUILDING 2 ELEVATION	5/24/2022
A-204	BUILDING 2 ELEVATION	5/24/2022
A-205	BUILDING 2 ELEVATION	5/24/2022
A-206	BUILDING 3 ELEVATION	5/24/2022
A-207	BUILDING 3 ELEVATION	5/24/2022
A-208	GLAZING STUDY	5/24/2022

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
LOT LINE REVISION PERMIT	PENDING	
CONDITIONAL USE PERMIT	PENDING	
STATE		
NHDES - SEWER CONNECTION PERMIT	NOT SUBMITTED	
NHDES - ALTERATION OF TERRAIN PERMIT	NOT SUBMITTED	



LOCATION MAP
SCALE: 1" = 2,000'

PREPARED BY:
Tighe&Bond
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801
603-433-8818

ARCHITECT:
SGA ARCHITECTURE
200 HIGH STREET, FLOOR 2
BOSTON MA, 02110
857-300-2610

OWNER/APPLICANT:
TAX MAP 118, LOT 28,
TAX MAP 119, LOT 1-1C
TAX MAP 119, LOT 4
TAX MAP 124, LOT 12 &
TAX MAP 125, LOT 21

PORT HARBOR LAND, LLC
1000 MARKET STREET, BUILDING ONE
PORTSMOUTH, NEW HAMPSHIRE 03801

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 12979 LICENSED PROFESSIONAL ENGINEER — 5/24/22

STATE OF NEW HAMPSHIRE — NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER — 5/24/22

TAC SUBMISSION

COMPLETE SET 29 SHEETS

T & B PROJECT NO: T-5037-002

Last Saved: 5/24/2022
Plotted On: May 24, 2022 - 1:56pm By: ckrouik
Tighe & Bond J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002_C-COVER.dwg

GENERAL NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
6. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
7. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
13. APPLICANT SHALL SUBMIT, AS PART OF THE FINAL POST APPROVAL PROCEDURES, RELEVANT PTAP INFORMATION USING THE MOST RECENT ONLINE DATA PORTAL CURRENTLY MANAGED BY THE UNH STORMWATER CENTER. THE PLANNING DEPARTMENT SHALL BE NOTIFIED AND COPIED OF THE PTAP DATA SUBMITTAL.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
3. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
4. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
5. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
7. ALL UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND/OR SERVICES ARE ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
9. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
11. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
12. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
14. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
15. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
16. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.

SITE NOTES:

1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
7. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
8. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
9. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
10. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
11. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
12. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
13. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
14. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
15. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
16. ALL TREES PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
17. A TEMPORARY SUPPORT OF EXCAVATION (SOE) PLAN SHALL BE PREPARED BY THE APPLICANT'S CONTRACTOR TO CONFIRM ANY TEMPORARY ENCUMBRANCES OF THE CITY'S RIGHT-OF-WAY. IF LICENSES ARE REQUIRED FOR THE SOE, THE APPLICANT WILL BE REQUIRED TO OBTAIN THESE FROM THE CITY PRIOR TO CONSTRUCTION.
18. APPLICANT SHALL COMPLETE FINAL PAVING AND PAVEMENT STRIPING PER DPW REQUIREMENTS FOR THE ENTIRE WIDTH OF RAYNES AVENUE FROM VAUGHAN STREET TO MAPLEWOOD AVENUE.
19. THE PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PRIVATE SIDEWALKS, DRIVEWAYS, AND PARKING AREAS. ALL SNOW REMOVAL WILL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF.
20. THE STREET LIGHTING TYPE TO BE HISTORIC STYLE FIXTURES AND POLE TO MATCH EXISTING LIGHTING ON SOUTH SIDE OF DEER STREET.
21. CONSTRUCTION SEQUENCING OF NORTH COMMUNITY PARK SHALL BE COORDINATED WITH MARKET STREET AND RUSSELL STREET INTERSECTION CONSTRUCTION.

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.

2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) UNLESS OTHERWISE SPECIFIED.
3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
4. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
8. 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.

EROSION CONTROL NOTES:

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER/SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - COMCAST/CONSOLIDATED COMMUNICATIONS/FIRST LIGHT
2. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
3. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
6. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
7. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
8. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
9. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
10. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
11. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
12. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
13. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
14. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
15. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
16. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
17. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
18. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
19. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
20. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
21. FINAL LOCATIONS OF ALL UTILITY LINES SHALL BE APPROVED BY THE CITY OF PORTSMOUTH DPW PRIOR TO CONSTRUCTION.
22. CONTRACTOR SHALL PERFORM TEST PITS TO VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IF LOCATIONS DIFFER FROM PLAN.

LANDSCAPE NOTES:

1. SEE SHEET L-100 FOR LANDSCAPE NOTES.

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY PERFORMED BY MSC CIVIL ENGINEERS & LAND SURVEYORS, INC., SEE REFERENCE PLAN #1.

REFERENCE PLANS:

1. "EXISTING FEATURES PLAN MAP 118 LOT 28, MAP 119 LOT 4, MAP 124 LOT 12 AND MAP 125 LOT 21" PREPARED BY MSC CIVIL ENGINEERS AND LAND SURVYORS, INC., DATED JANUARY 16, 2015.

ABBREVIATIONS

TBR	TO BE REMOVED
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	CURB RADIUS
SSWL	SINGLE SOLID WHITE LINE
DSYL	DOUBLE SOLID YELLOW LINE
VGC	VERTICAL GRANITE CURB
SGC	SLOPED GRANITE CURB
FGC	FLUSH GRANITE CURB
TC	TOP OF CURB
BC	BOTTOM OF CURB
TW	TOP OF WALL
BW	BOTTOM OF WALL
TS	TOP OF STEP
BS	BOTTOM OF STEP
HDPE	HIGH-DENSITY POLYETHYLENE
FF	FINISH FLOOR
VIF	VERIFY IN FIELD

LEGEND

- PROPOSED SAWCUT
- LIMIT OF WORK
- PROPOSED SILT SOCK
- APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
- PROPOSED CONSTRUCTION EXIT
- PROPERTY LINE
- PROPOSED PROPERTY LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED CURB
- PROPOSED BUILDING
- PROPOSED PAVEMENT SECTION
- PROPOSED MILL AND OVERLAY SECTION
- PROPOSED CONCRETE SIDEWALK
- PROPOSED BRICK SIDEWALK
- PROPOSED BOLLARD
- PROPOSED MAJOR CONTOUR LINE (20)
- PROPOSED MINOR CONTOUR LINE (22)
- PROPOSED DRAIN LINE (TYP)
- INLET PROTECTION SILT SACK
- PROPOSED CATCHBASIN
- PROPOSED DRAIN MANHOLE
- PROPOSED YARD DRAIN
- EXISTING STORM DRAIN (D)
- EXISTING SANITARY SEWER (S)
- EXISTING SANITARY SEWER TO BE REMOVED (S)
- EXISTING UNDERGROUND TELECOMMUNICATION (T T T)
- EXISTING WATER (W)
- EXISTING GAS (G)
- EXISTING UNDERGROUND ELECTRIC (E)
- EXISTING OVERHEAD UTILITY (OHW)
- PROPOSED SANITARY SEWER (PS)
- PROPOSED WATER (PW)
- PROPOSED GAS (G)
- PROPOSED UNDERGROUND ELECTRIC
- PROPOSED UNDERGROUND TELECOMMUNICATION (COM)
- EXISTING CATCHBASIN
- EXISTING DRAIN MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING WATER VALVE
- EXISTING HYDRANT
- EXISTING ELECTRIC MANHOLE
- EXISTING TELEPHONE MANHOLE
- PROPOSED SEWER MANHOLE
- PROPOSED WATER VALVE
- PROPOSED HYDRANT
- PROPOSED GAS VALVE
- PROPOSED ELECTRIC MANHOLE
- PROPOSED LIGHT POLE BASE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK M. CUMMINGS No. 13579 LICENSED PROFESSIONAL ENGINEER – 5/24/22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 5/24/22

0 30' 60'
GRAPHIC SCALE

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DSGN.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

GENERAL NOTES AND LEGEND

SCALE: AS SHOWN

G-100

Last Saved: 5/24/2022
Plotted: Tuesday, May 24, 2022 - 1:22pm By: ckrzcuik
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg

EXISTING DRAINAGE SCHEDULE

ECB1
RIM=15.36
INV. OUT=11.88 (ED1)

ECB2
RIM=15.31
INV. OUT= 12.11 (ED2)

ECB3
RIM=13.39
INV. OUT=8.69 (ED4)

ECB4
RIM=13.91
INV. OUT=9.59 (ED5)

ECB5
RIM=13.73
INV. OUT=10.42 (ED7)

ECB6
RIM=14.06
INV. OUT=9.42 (ED10)

ECB7
RIM=14.48
INV. OUT=10.26 (ED9)

ECB8
RIM=16.49
INV. OUT=12.74 (ED12)

ECB9
RIM=15.78
INV. OUT=13.15 (ED13)

ECB10
RIM=22.49
INV. OUT=19.39 (ED15)

ECB11
RIM=22.51
INV. OUT=19.46 (ED16)

ECB12
RIM=15.69
INV. OUT=12.39 (ED21)

ECB13
RIM=15.76
INV. OUT=12.52 (ED20)

ECB14
RIM=10.43
INV. OUT=6.97 (ED26)

ECB15
RIM=10.00
INV. OUT=6.74 (ED24)

ECB16
RIM=9.82
INV. OUT=6.80 (ED23)

ECB17
RIM=23.85
INV. OUT=20.21 (ED27)

EDMH1
RIM=15.59
INV. IN=11.17 (ED1)
INV. IN=11.33 (ED2)
INV. OUT=8.65 (ED3)

EDMH2
RIM=14.00
INV. IN=6.67 (ED3)
INV. IN=8.79 (ED5)
INV. IN=8.80 (ED4)
INV. OUT=6.64 (ED6)

EDMH3
RIM=13.91
INV. IN=6.41 (ED6)
INV. IN=10.43 (ED7)
INV. OUT=6.35 (ED8)

EDMH4
RIM=14.12
INV. IN=6.26 (ED8)
INV. IN=9.25 (ED10)
INV. IN=10.12 (ED9)
INV. OUT=6.24 (ED11)

EDMH5
RIM=16.60
INV. IN=12.98 (ED12)
INV. IN=12.50 (ED13)
INV. IN=5.74 (ED11)
INV. 12" OUT (SW)=5.64

EDMH6
RIM=25.21
INV. IN(SE)=19.93
INV. OUT=19.97 (ED14)

EDMH7
RIM=22.94
INV. IN=19.49 (ED16)
INV. IN=19.19 (ED15)
INV. IN=18.78 (ED17)
INV. IN=18.13 (ED14)
INV. OUT=18.18 (ED18)

EDMH8
RIM=15.58
INV. IN=12.26 (ED20)
INV. IN=12.28 (ED21)
INV. IN=9.80 (ED19)
INV. OUT=9.97 (ED22)

EDMH9
RIM=11.06
INV. IN=6.50 (ED26)
INV. IN=5.14 (ED25)
INV. IN=5.54
INV. OUT=3.70

EDMH10
RIM=16.89
INV. IN=10.43 (ED18)
INV. OUT=10.51 (ED19)

EDMH11
RIM=10.14
INV. IN=6.96 (ED23)
INV. IN(N)=6.74 (ED24)
INV. IN=5.94 (ED22)
INV. OUT=5.94(ED25)

EDMH12
RIM=11.55
INV. IN=3.81 (ED27)
INV. OUT=3.71(ED28)

EDMH13
RIM=11.45
INV. IN=2.37 (ED29)
INV. OUT=2.27 (ED30)

EXISTING DRAINAGE PIPE SCHEDULE			
LINES	LENGTH	TYPE	SLOPE
ED1	9'	12" CONC	S=0.078
ED2	38'	12" CONC	S=0.0205
ED3	62'	12" CONC	S=0.0319
ED4	10'	12" CONC	S=-0.011
ED5	39'	12" CONC	S=0.0205
ED6	45'	12" CONC	S=0.004
ED7	9'	12" CONC	S=-0.001
ED8	32'	12" CONC	S=0.0028
ED9	18'	12" PVC	S=0.0077
ED10	27'	12" CONC	S=0.0062
ED11	116'	12" CONC	S=0.0043
ED12	44'	12" CONC	S=-0.005
ED13	30'	12" CMP	S=0.0216
ED14	202'	12" CONC	S=0.0091
ED15	33'	12" CONC	S=0.006
ED16	32'	12" CONC	S=0.0009
ED17	186'	6" PVC	UNKNOWN
ED18	210'	12" CONC	S=0.0369
ED19	38'	12" CONC	S=0.0186
ED20	47'	12" CONC	S=0.0055
ED21	7'	12" CONC	S=0.0071
ED22	223'	12" CONC	S=0.0180
ED23	59'	12" CONC	S=0.0145
ED24	6'	12" CONC	S=0.0000
ED25	52'	12" CONC	S=0.0153
ED26	34'	12" CONC	S=0.0138
ED27	241'	12" CONC	S=0.0076
ED28	161'	48" CONC	S=0.0047
ED29	104'	48" CONC	S=0.0047
ED30	252'	48" CONC	S=0.0047

EXISTING SEWER SCHEDULE

ESMH1
RIM=16.09
INV. IN(NW)=1.18
INV. OUT=1.10 (ES1)

ESMH2
RIM=15.13
FROZEN

ESMH3
RIM=14.18
INV. IN=0.56 (ES1)
INV. OUT=0.34 (ES2)

ESMH4
RIM=14.16
INV. IN=0.19 (ES2)
INV. OUT=0.09 (ES3)

ESMH5
RIM=16.43
INV.(SW)=-1.00
INV. IN=-0.22 (ES3)
INV. OUT=-1.17 (ES4)

ESMH6
RIM=22.60
INV. IN(SE)=15.24
INV. IN(SW)=15.20
INV. OUT=15.20 (ES10)

ESMH7
RIM=14.05
INV. IN(E)=8.00
INV. IN=7.87 (ES10)
INV. OUT=7.92 (ES11)

ESMH8
RIM=10.96
INV. IN=3.82 (ES11)
INV. OUT=3.89 (ES12)

ESMH9
RIM=20.88
CHANNEL=-1.07
INV. IN 8"=13.60

ESMH10
RIM=24.86
INV.(E)=17.22
INV.(SE)=17.16
INV. OUT=17.03 (ES9)

ESMH11
RIM=24.39
INV. IN=16.27 (ES9)
INV. OUT=16.08 (ES8)

ESMH12
RIM=23.25
INV. IN=-0.89 (ES6)
INV. OUT(NE)=-0.97

ESMH13
RIM=19.42
INV.4"C(NW)=13.69
INV.6"(N)=7.87
INV.6"VC(NE)=12.25
INV.6"VC(E)=12.40
INV.IN=-1.20 (ES5)
INV.OUT=-1.44 (ES6)

ESMH14
RIM=18.09
INV. IN=-0.80 (ES7)
INV. IN=-1.33 (ES4)
INV. OUT=UNKNOWN (ES5)

ESMH15
RIM=18.23
INV.8"VC=9.83 (ES8)
INV.6"VC(SE)=10.06
INV.6"VC(NW)=10.02
INV. OUT 8"VC=9.84 (ES7)

EXISTING SEWER PIPE SCHEDULE			
LINES	LENGTH	TYPE	SLOPE
ES1	153'	24" RCP	S=0.0035
ES2	66'	24" RCP	S=0.0022
ES3	116'	24" RC	S=0.0026
ES4	82'	48" BOX	S=0.0019
ES5	47'	48" BOX	UNKNOWN
ES6	109'	48" BOX	S=-0.005
ES7	7'	8" VC	S=0.0228
ES8	276'	8" VC	S=0.0226
ES9	33'	8" VC	S=0.0230
ES10	294'	8" AC	S=0.0249
ES11	170'	8" AC	S=0.0241
ES12	47'	8" AC	UNKNOWN

INSET PLAN

0 30' 60'
GRAPHIC SCALE

EXISTING TREE LINE TBR
SEE INSET PLAN
EXISTING "STOP & GREEN STREET" SIGN TBR
EXISTING CONCRETE RETAINING WALL TBR
EXISTING CATCHBASIN TO BE RELOCATED
LIMIT OF EXISTING DRAINLINE TO BE REMOVED
MARKET STREET IMPROVEMENTS (BY OTHERS)
RUSSELL STREET IMPROVEMENTS
EXISTING UTILITY POLE AND UGU TBR
EXISTING ELECTRIC SERVICE PANEL TBR
MAP 124 LOT 12
AREA = 19,055 S.F.
(0.4374 ACRES)
EXISTING PAYMENT TO BE REMOVED (TYP)
MAP 119 LOT 1-1C
AREA = 86,031 S.F.
(1.975 ACRES)
EXISTING PLANTER BEDS TBR (TYP)
LOCATION OF PROPOSED STRUCTURE (TYP)
EXISTING ENTRANCE GATES TBR
EXISTING PROPERTY LINE TO BE RELOCATED
APPROXIMATE LIMIT OF WORK (TYP)
EXISTING "SHERATON PORTSMOUTH" SIGN TBR
EXISTING FENCE TBR
EXISTING JERSEY BARRIERS TBR
EXISTING 10' ELECTRIC EASEMENT TBR
UNDERGROUND ELECTRIC–EXACT LOCATION UNKNOWN
EXISTING UNDERGROUND ELECTRIC TBR
LIMIT OF EXISTING DRAINLINE TO BE REMOVED
EXISTING CATCHBASIN TO BE RELOCATED
EXISTING "LIMO PARKING ONLY" SIGN TBR
EXISTING "DRIECTORY" SIGN TBR
MAP 118 LOT 28
AREA = 48,417 S.F.
(1.1115 ACRES)
EXISTING SEWER EASEMENT TO REMAIN
EXISTING SEWER EASEMENT TBR
EXISTING GAS LINE TBR
EXISTING PAVEMENT TO BE REMOVED (TYP)
SIDEWALK AND TIP DOWN RAMP TBR (TYP)
EXISTING CATCHBASIN TBR
MAP 125 LOT 21
AREA =22,559 S.F.
(0.5179 ACRES)
EXISTING PROPERTY LINE TO BE RELOCATED
EXISTING "STOP" SIGN TBR
EXISTING CATCHBASIN TO BE REMOVED
LIMIT OF EXISTING DRAINLINE TO BE REMOVED
EXISTING ABANDONED 24" SEWER LINE TBR
EXISTING STUMP TBR (TYP)
EXISTING 10' GAS EASEMENT TBR
EXISTING "FOUNDRY PLACE GARAGE" SIGN TBR
EXISTING DIRECTORY SIGN TO BE RELOCATED
EXISTING UTILITY POLE TBR
EXISTING CATCHBASIN TO BE RELOCATED
EXISTING PROPERTY LINE TO BE ABANDONED
EXISTING TREE TBR (TYP)
EXISTING SIGNAL POST TO REMAIN
EXISTING "LANE DIRECTORY" SIGN TBR
EXISTING "SPEED LIMIT & KEEP RIGHT" SIGN TBR
EXISTING PAVEMENT TO BE REMOVED (TYP)
EXISTING PARKING METER TBR
APPROXIMATE LIMIT OF SAWCUT (TYP)
APPROXIMATE LIMIT OF SAWCUT
EXISTING "ONE WAY" SIGN TO BE RELOCATED
EXISTING BRICK SIDEWALK & GRANITE CURB TBR (BRICK TO BE SAVED FOR RECONSTRUCTION)
EXISTING "ONE WAY" & "PORTWALK PLACE" SIGNS TO BE RELOCATED
EXISTING BRICK SIDEWALK & GRANITE CURB TBR (BRICK TO BE SAVED FOR RECONSTRUCTION)
EXISTING BRICK SIDEWALK & GRANITE CURB TBR (BRICK TO BE SAVED FOR RECONSTRUCTION)
EXISTING CONCRETE TIP DOWN TBR

MAPLEWOOD AVENUE
DEER STREET
RINKLER STREET
CBA ZONE

124/1 N/F PORTSMOUTH BOX 628 UTH, NH 03802
1/4 /F MAINE CORP. SE PARK STREET MA 01862
125/17 N/F EET ASSOCIATES BOX 100 RBOR, ME 03911 3395–2669
125/1
125/22 N/F HILL CONDO UNIT OWNERS
118/26
118/27 N/F GREGORY E. & JENNIFER L. SANCOFF 120 MILL ROAD NORTH HAMPTON, NH
119/1–1A N/F HARBORSIDE INN INC. PO BOX 660 LEWISTON, ME 04243 RCRD 3133–2873

SEE SHEET G-100 FOR EXISTING CONDITIONS & DEMOLITION NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 12579 LICENSED PROFESSIONAL ENGINEER – 5-24-22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL SURVEYOR – 5/24/22

0 30' 60'
GRAPHIC SCALE

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DSGN.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: AS SHOWN

C-101

Last Saved: 5/24/2022 1:23pm By: ckrzcuik
Plotted: 5/24/2022 1:23pm
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg

SITE DATA:

LOCATION: TAX MAP 118 LOT 28, TAX MAP 119 LOT 1-1C, TAX MAP 119 LOT 4, TAX MAP 124 LOT 12, TAX MAP 125 LOT 21

OWNER: PORT HARBOR LAND LLC, 1000 MARKET ST, BUILDING ONE, PORTSMOUTH, NH 03801

ZONING DISTRICT: CHARACTER DISTRICT 5 (CD5), DOWNTOWN OVERLAY DISTRICT, NORTH END INCENTIVE OVERLAY DISTRICT, HISTORIC DISTRICT

PROPOSED USE: MIXED USE, RESIDENTIAL, RETAIL

DEVELOPMENT STANDARDS

BUILDING PLACEMENT (PRINCIPAL BUILDING):	REQUIRED	PROPOSED MAP 125 LOT 21	MAP 118 LOT 28	MAP 124 LOT 12
MAXIMUM PRINCIPAL FRONT YARD:	5 FT	6 FT(1)	9 FT(1)	10 FT(1)
SIDE YARD:	NR			
MINIMUM REAR YARD:	5 FT	20 FT	22 FT	20 FT
FRONT LOT LINE LENGTH:	NR			
MINIMUM FRONT LOT LINE BUILDOUT:	80%	81%	100%	84%

BUILDING AND LOT OCCUPATION:	REQUIRED	PROPOSED MAP 125 LOT 21	MAP 118 LOT 28	MAP 124 LOT 12
MAXIMUM BUILDING BLOCK LENGTH:	225 FT	107 FT	104 FT	225 FT
MAXIMUM FACADE MODULATION LENGTH:	100 FT	<100 FT	<100 FT	<100 FT
MAXIMUM ENTRANCE SPACING:	50 FT	<50 FT	<50 FT	<50 FT
MAXIMUM BUILDING COVERAGE:	95%	65%	74%	58%
MAXIMUM BUILDING FOOTPRINT:	40,000 SF(2)	11,935 SF	39,255 SF	11,210 SF
MINIMUM LOT AREA:	NR			
MINIMUM OPEN SPACE:	5%	35%	26%	42%
MAXIMUM GROUND FLOOR GFA PER USE:	15,000 SF	7,975 SF	10,419 SF	8,067 SF

BUILDING FORM (PRINCIPAL BUILDING):	REQUIRED	PROPOSED MAP 125 LOT 21	MAP 118 LOT 28	MAP 124 LOT 12
BUILDING HEIGHT:	2-4 STORIES	4 STORIES	5 STORIES(3)	5 STORIES(3)
	60 FT	57 FT	60 FT	60 FT
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	0 IN	0 IN	0 IN
MINIMUM GROUND STORY HEIGHT:	12 FT	16.5 FT	14.0 FT	13.0 FT
MINIMUM SECOND STORY HEIGHT:	10 FT	13 FT	10.5 FT	10.5 FT
FACADE GLAZING:				
SHOP FRONT	70% MIN.	75%	73%	71%
ALLOWED ROOF TYPES				
FLAT, GABLE, HIP, GAMBREL, MANSARD		FLAT	FLAT	FLAT

OFF-STREET PARKING REQUIREMENTS

PARKING SPACES REQUIRED:		
COMMERCIAL:		
NO REQUIREMENT IN DOD		0 SPACES
DWELLING UNITS:		
OVER 750 SF, 1.3 SPACES PER UNIT	84 UNITS	110 SPACES
VISITOR SPACES:		
1 SPACE PER 5 DWELLING UNITS	84 UNITS	17 SPACES
EXISTING HOTEL:		
0.75 SPACES PER GUEST ROOM	181 ROOMS	136 SPACES
EXISTING DEEDED CONDO SPACES:		
SHERATON CONDOS		24 SPACES
DEER STREET CONDOS		58 SPACES
DOWNTOWN OVERLAY DISTRICT		-4 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		341 SPACES

TOTAL PARKING SPACES PROVIDED	
EXISTING SHERATON HOTEL PARKING	154 SPACES
ON SITE SURFACE PARKING	189 SPACES
TOTAL SPACES PROVIDED	343 SPACES

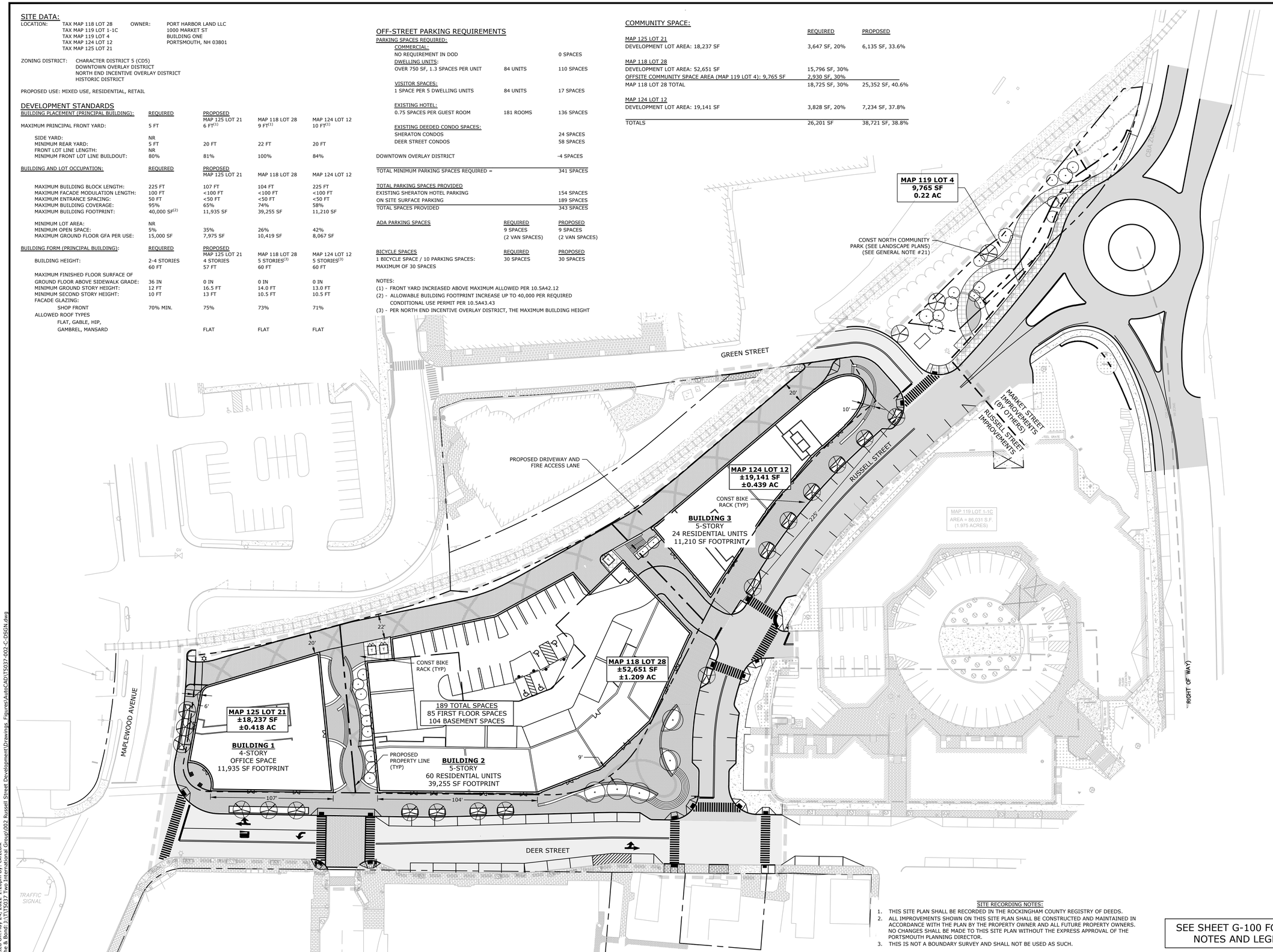
ADA PARKING SPACES	REQUIRED	PROPOSED
	9 SPACES (2 VAN SPACES)	9 SPACES (2 VAN SPACES)

BICYCLE SPACES	REQUIRED	PROPOSED
1 BICYCLE SPACE / 10 PARKING SPACES: MAXIMUM OF 30 SPACES	30 SPACES	30 SPACES

NOTES:
(1) - FRONT YARD INCREASED ABOVE MAXIMUM ALLOWED PER 10.5A42.12
(2) - ALLOWABLE BUILDING FOOTPRINT INCREASE UP TO 40,000 PER REQUIRED CONDITIONAL USE PERMIT PER 10.5443.43
(3) - PER NORTH END INCENTIVE OVERLAY DISTRICT, THE MAXIMUM BUILDING HEIGHT

COMMUNITY SPACE:

	REQUIRED	PROPOSED
MAP 125 LOT 21		
DEVELOPMENT LOT AREA: 18,237 SF	3,647 SF, 20%	6,135 SF, 33.6%
MAP 118 LOT 28		
DEVELOPMENT LOT AREA: 52,651 SF	15,796 SF, 30%	
OFFSITE COMMUNITY SPACE AREA (MAP 119 LOT 4): 9,765 SF	2,930 SF, 30%	
MAP 118 LOT 28 TOTAL	18,725 SF, 30%	25,352 SF, 40.6%
MAP 124 LOT 12		
DEVELOPMENT LOT AREA: 19,141 SF	3,828 SF, 20%	7,234 SF, 37.8%
TOTALS	26,201 SF	38,721 SF, 38.8%



SITE RECORDING NOTES:
1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK M. CUMMINGS No. 15379 LICENSED PROFESSIONAL ENGINEER – 5-24-22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 5/24/22

N

0 40' 80'
GRAPHIC SCALE

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Two International Group

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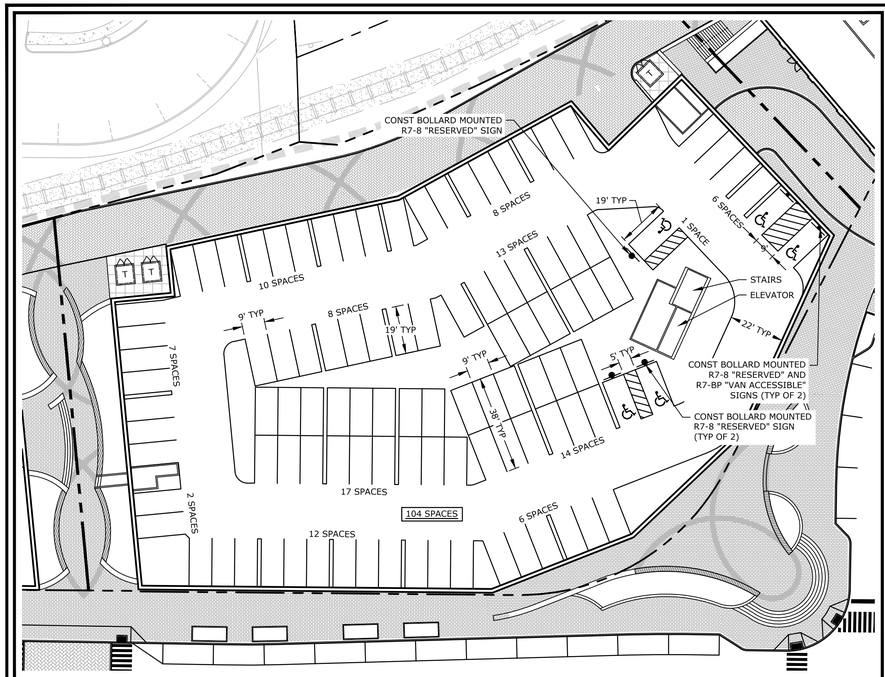
CHECKED:	NAH
APPROVED:	PMC

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

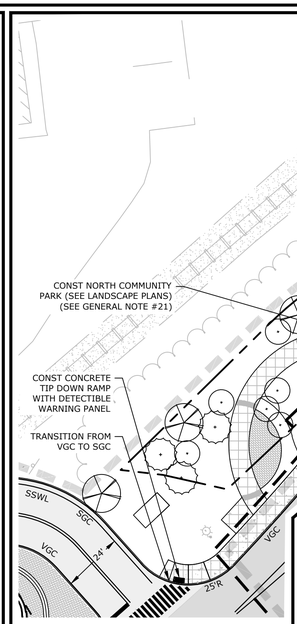
Last Saved: 5/24/2022
Printed: May 24, 2022 - 1:26pm By: ckrzcuik
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg



NOTE:
1. TANDEM SPACES TO BE ASSIGNED TO THE SAME UNIT AND SHALL NOT BE USED FOR GUEST PARKING PER 10.1114.33.

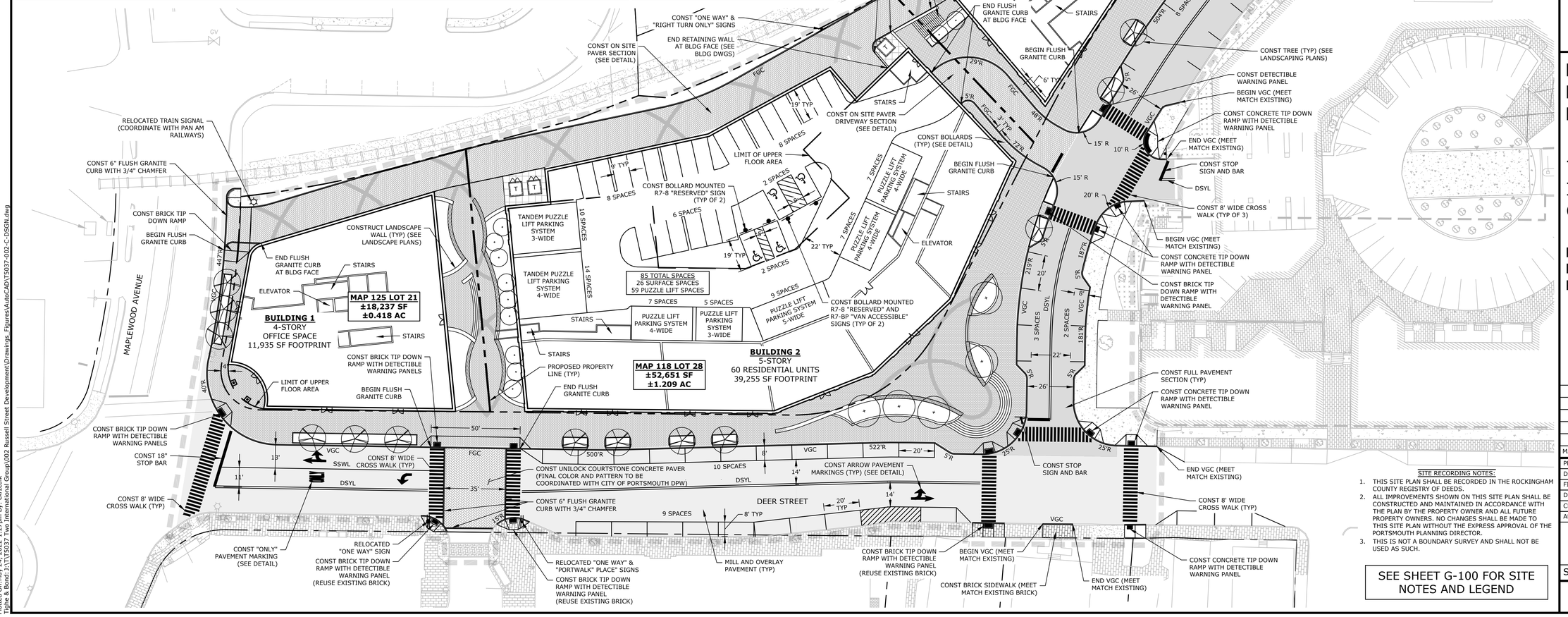
BUILDING 2 LOWER LEVEL PARKING LAYOUT

0 30' 60'
GRAPHIC SCALE



SITE INSET PLAN

0 30' 60'
GRAPHIC SCALE



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SEE SHEET G-100 FOR SITE NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 12579 LICENSED PROFESSIONAL ENGINEER – 5-24-22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 5/24/22

N

0 30' 60'
GRAPHIC SCALE

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Two International Group

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Portsmouth, NH

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APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-102.1

Last Saved: 5/24/2022
Plotted: May 24, 2022 - 1:27pm By: dkrzcuk
Tighe & Bond J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg

EXISTING DRAINAGE SCHEDULE

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ECB3
RIM=13.39
INV. OUT=8.69 (ED4)

ECB4
RIM=13.91
INV. OUT=9.59 (ED5)

ECB5
RIM=13.73
INV. OUT=10.42 (ED7)

ECB6
RIM=14.06
INV. OUT=9.42 (ED10)

ECB7
RIM=14.48
INV. OUT=10.26 (ED9)

ECB8
RIM=16.49
INV. OUT=12.74 (ED12)

ECB9
RIM=15.78
INV. OUT=13.15 (ED13)

ECB10
RIM=22.49
INV. OUT=19.39 (ED15)

ECB11
RIM=22.51
INV. OUT=19.46 (ED16)

ECB12
RIM=15.69
INV. OUT=12.39 (ED21)

ECB13
RIM=15.76
INV. OUT=12.52 (ED20)

ECB14
RIM=10.43
INV. OUT=6.97 (ED26)

ECB15
RIM=10.00
INV. OUT=6.74 (ED24)

ECB16
RIM=9.82
INV. OUT=6.80 (ED23)

ECB17
RIM=23.85
INV. OUT=20.21 (ED27)

EDMH1
RIM=15.59
INV. IN=11.17 (ED1)
INV. IN=11.33 (ED2)
INV. OUT=8.65 (ED3)

EDMH2
RIM=14.00
INV. IN=6.67 (ED3)
INV. IN=8.79 (ED5)
INV. IN=8.80 (ED4)
INV. OUT=6.64 (ED6)

EDMH3
RIM=13.91
INV. IN=6.41 (ED6)
INV. IN=10.43 (ED7)
INV. OUT=6.35 (ED8)

EDMH4
RIM=14.12
INV. IN=6.26 (ED8)
INV. IN=9.25 (ED10)
INV. IN=10.12 (ED9)
INV. OUT=6.24 (ED11)

EDMH5
RIM=16.60
INV. IN=12.98 (ED12)
INV. IN=12.50 (ED13)
INV. IN=5.74 (ED11)
INV. 12" OUT (SW)=5.64

EDMH6
RIM=25.21
INV. IN(SE)=19.93
INV. OUT=19.97 (ED14)

EDMH7
RIM=22.94
INV. IN=19.49 (ED16)
INV. IN=19.19 (ED15)
INV. IN=18.78 (ED17)
INV. IN=18.13 (ED14)
INV. OUT=18.18 (ED18)

EDMH8
RIM=15.58
INV. IN=12.26 (ED20)
INV. IN=12.28 (ED21)
INV. IN=9.80 (ED19)
INV. OUT=9.97 (ED22)

EDMH9
RIM=11.06
INV. IN=6.50 (ED26)
INV. IN=5.14 (ED25)
INV. IN=5.54
INV. OUT=3.70

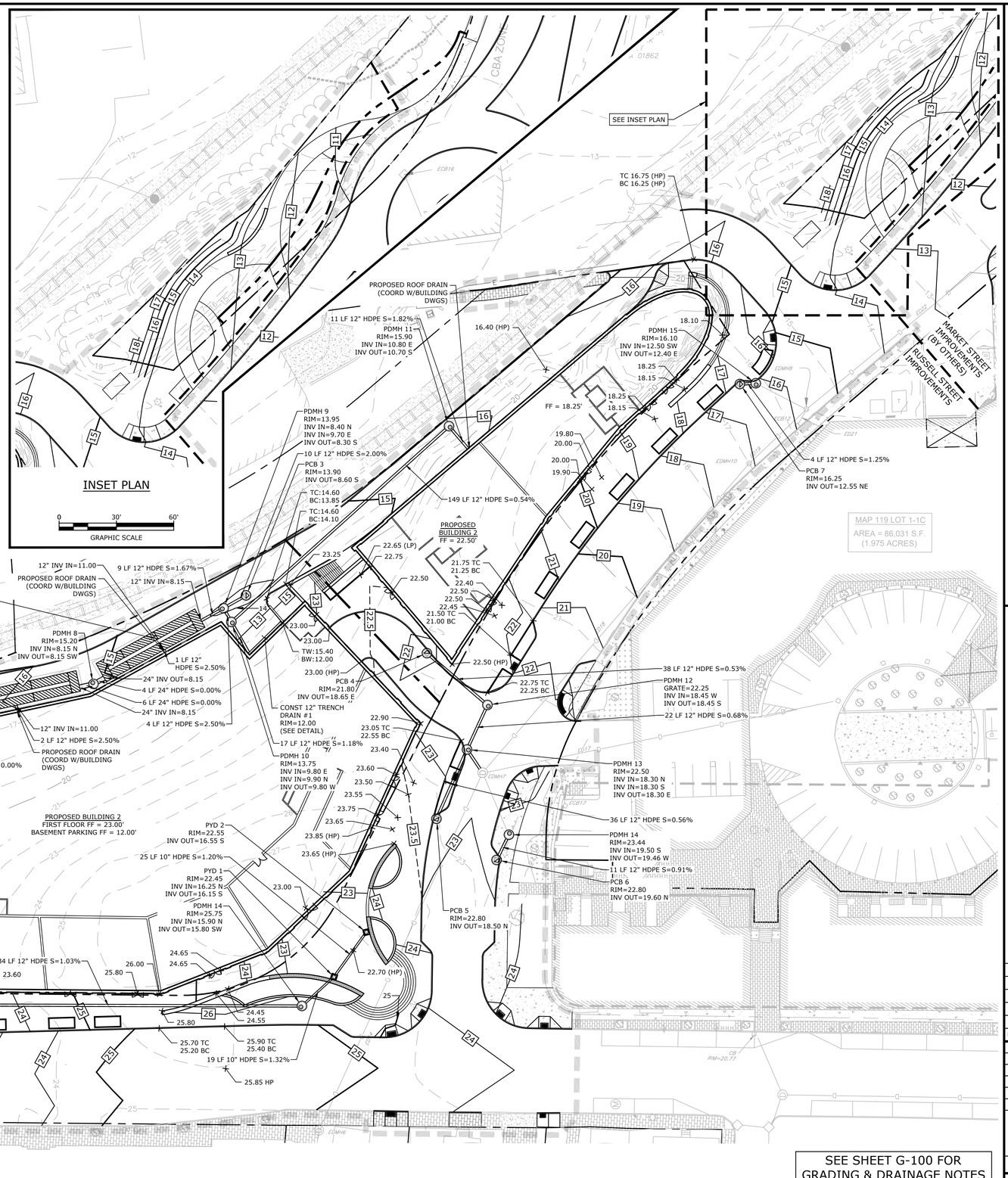
EDMH10
RIM=16.89
INV. IN=10.43 (ED18)
INV. OUT=10.51 (ED19)

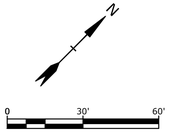
EDMH11
RIM=10.14
INV. IN=6.96 (ED23)
INV. IN(N)=6.74 (ED24)
INV. IN=5.94 (ED22)
INV. OUT=5.94(ED25)

EDMH12
RIM=11.55
INV. IN=3.81 (ED27)
INV. OUT=3.71(ED28)

EDMH13
RIM=11.45
INV. IN=2.37 (ED29)
INV. OUT=2.27 (ED30)

EXISTING DRAINAGE PIPE SCHEDULE			
LINES	LENGTH	TYPE	SLOPE
ED1	9'	12" CONC	S=0.078
ED2	38'	12" CONC	S=0.0205
ED3	62'	12" CONC	S=0.0319
ED4	10'	12" CONC	S=-0.011
ED5	39'	12" CONC	S=0.0205
ED6	45'	12" CONC	S=0.004
ED7	9'	12" CONC	S=-0.001
ED8	32'	12" CONC	S=0.0028
ED9	18'	12" PVC	S=0.0077
ED10	27'	12" CONC	S=0.0062
ED11	116'	12" CONC	S=0.0043
ED12	44'	12" CONC	S=-0.005
ED13	30'	12" CMP	S=0.0216
ED14	202'	12" CONC	S=0.0091
ED15	33'	12" CONC	S=0.006
ED16	32'	12" CONC	S=0.0009
ED17	186'	6" PVC	UNKNOWN
ED18	210'	12" CONC	S=0.0369
ED19	38'	12" CONC	S=0.0186
ED20	47'	12" CONC	S=0.0055
ED21	7'	12" CONC	S=0.0157
ED22	223'	12" CONC	S=0.0180
ED23	59'	12" CONC	S=0.0145
ED24	6'	12" CONC	S=0.0000
ED25	52'	12" CONC	S=0.0153
ED26	34'	12" CONC	S=0.0138
ED27	241'	12" CONC	S=0.0076
ED28	161'	48" CONC	S=0.0047
ED29	104'	48" CONC	S=0.0047
ED30	252'	48" CONC	S=0.0047





Tighe&Bond

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DSGN.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

GRADING & DRAINAGE PLAN

SCALE: AS SHOWN

C-103

SEE SHEET G-100 FOR GRADING & DRAINAGE NOTES AND LEGEND

Last Saved: 5/24/2022
By: ckrzciuk
Plotted: 5/24/2022 1:33pm By: ckrzciuk
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg

EXISTING SEWER SCHEDULE

ESMH1
RIM=16.09
INV. IN(NW)=1.18
INV. OUT=1.10 (ES1)

ESMH2
RIM=15.13
FROZEN

ESMH3
RIM=14.18
INV. IN=0.56 (ES1)
INV. OUT=0.34 (ES2)

ESMH4
RIM=14.16
INV. IN=0.19 (ES2)
INV. OUT=0.09 (ES3)

ESMH5
RIM=16.43
INV.(SW)=-1.00
INV. IN=-0.22 (ES3)
INV. OUT=-1.17 (ES4)

ESMH6
RIM=22.60
INV. IN(SE)=15.24
INV. IN(SW)=15.20
INV. OUT=15.20 (ES10)

ESMH7
RIM=14.05
INV. IN(E)=8.00
INV. IN=7.87 (ES10)
INV. OUT=7.92 (ES11)

ESMH8
RIM=10.96
INV. IN=3.82 (ES11)
INV. OUT=3.89 (ES12)

ESMH9
RIM=20.88
CHANNEL=-1.07
INV. IN 8"=13.60

ESMH10
RIM=24.86
INV.(E)=17.22
INV.(SE)=17.16
INV. OUT=17.03 (ES9)

ESMH11
RIM=24.39
INV. IN=16.27 (ES9)
INV. OUT=16.08 (ES8)

ESMH12
RIM=23.25
INV. IN=-0.89 (ES6)
INV. OUT(NE)=-0.97

ESMH13
RIM=19.42
INV.4"CI(NW)=13.69
INV.6"(N)=7.87
INV.6"VC(NE)=12.25
INV.6"VC(E)=12.40
INV.IN=-1.20 (ES5)
INV.OUT=-1.44 (ES6)

ESMH14
RIM=18.09
INV. IN=-0.80 (ES7)
INV. IN=-1.33 (ES4)
INV. OUT=UNKNOWN (ES5)

ESMH15
RIM=18.23
INV.8"VC=9.83 (ES8)
INV.6"VC(SE)=10.06
INV.6"VC(NW)=10.02
INV. OUT 8"VC=9.84 (ES7)

EXISTING SEWER PIPE SCHEDULE			
LINES	LENGTH	TYPE	SLOPE
ES1	153'	24" RCP	S=0.0035
ES2	66'	24" RCP	S=0.0022
ES3	116'	24" RC	S=0.0026
ES4	82'	48" BOX	S=0.0019
ES5	47'	48" BOX	UNKNOWN
ES6	109'	48" BOX	S=-0.005
ES7	7'	8" VC	S=0.0228
ES8	276'	8" VC	S=0.0226
ES9	33'	8" VC	S=0.0230
ES10	294'	8" AC	S=0.0249
ES11	170'	8" AC	S=0.0241
ES12	47'	8" AC	UNKNOWN

124/14
N/F
233 VAUGHAN STREET LLC
C/O AMERICAN ECOTHERMAL INC
& MERRIL INDUSTRIAL DRIVE,
SUITE 7
HAMPTON, NH 03842
RCRD 5144-1916

STRATHAM, NH 03885
RCRD 5249-1921

CONST GREASE TRAP 1
RIM=14.25
INV IN=6.55 SE
INV OUT=6.05 SW

CONST 2 LF
6" PVC SDR 35
S = 0.025

PSMH 1
RIM=14.15
INV IN=6.00 NE
INV IN=6.00 SE
INV OUT=5.90 SW

CONST 10 LF
8" PVC SDR 35
S = 0.005

CORE INTO EXISTING
STRUCTURE TO ACCEPT
NEW 8" PVC @ ELEV=5.85
REBUILD BRICK NIVERT

CONNECT TO EXISTING
ELECTRIC MANHOLE
(COORD W/ EVERSOURCE)

CONST ELECTRIC SERVICE
CONNECTION (COORD W/
BUILDING DWGS & EVERSOURCE)

CONST COMMUNICATION
SERVICE CONNECTION
(COORD W/ BUILDING DWGS
& COMCAST)

CONST TRANSFORMERS
(COORD W/ BUILDING
DWGS & EVERSOURCE)

CONST GREASE WASTE LINE
11 LF 6" PVC @ S = 0.023
INV @ BLDG = 6.80 (COORD
W/ BUILDING DWGS)

CONST SANITARY
SERVICE CONNECTION
11 LF 6" PVC @ S = 0.023
INV @ BLDG = 6.25 (COORD
W/ BUILDING DWGS)

CONST GAS SERVICE
CONNECTION (COORD W/
BUILDING DWGS & UNITIL)

CONST FIRE & DOMESTIC
WATER SERVICE CONNECTIONS
(COORD W/ BUILDING DWGS,
FIRE DEPT & DPW)

CONNECT TO
EXISTING GAS MAIN
(COORD W/ UNITIL)

CONNECT TO EXISTING
WATER MAIN (COORD
W/PORTSMOUTH DPW)

CONST ELECTRICAL DUCT BANK
(COORD W/ EVERSOURCE)

CONST GREASE TRAP 3
RIM=22.20
INV IN=16.50 N
INV OUT=16.00 E

CONST COMMUNICATION SERVICE
CONNECTION(COORD W/
BUILDING DWGS & COMCAST)

CONST GREASE TRAP 2
RIM=22.35
INV IN=16.40 S
INV OUT=15.90 E

CONST GREASE WASTE LINE
8 LF 6" PVC @ S = 0.021
INV @ BLDG = 16.65 (COORD
W/ BUILDING DWGS)

CONST TRANSFORMERS
(COORD W/ BUILDING
DWGS & EVERSOURCE)

CONST ELECTRIC MANHOLE
(COORD W/ EVERSOURCE)

CONST ELECTRIC SERVICE
CONNECTION (COORD W/
BUILDING DWGS & EVERSOURCE)

CONST 2 LF
6" PVC SDR 35
S = 0.025

PSMH 3
RIM=22.20
INV IN=15.80 N
INV IN=15.80 W
INV IN=15.80 S
INV OUT=15.70 E

CONST SANITARY
SERVICE CONNECTION
8 LF 6" PVC @ S = 0.022
INV @ BLDG = 16.05 (COORD
W/ BUILDING DWGS)

CONST 8 LF
8" PVC SDR 35
S = 0.004

CONST SANITARY
SERVICE CONNECTION
8 LF 6" PVC @ S = 0.020
INV @ BLDG = 15.80 (COORD
W/ BUILDING DWGS)

CONST GAS SERVICE CONNECTION
(COORD W/ BUILDING DWGS & UNITIL)

CONST FIRE & DOMESTIC WATER
SERVICE CONNECTIONS (COORD
W/ BUILDING DWGS, FIRE DEPT &
DPW)

CONST 2 LF
6" PVC SDR 35
S = 0.025

CONST GREASE WASTE LINE
7 LF 6" PVC @ S = 0.022
INV @ BLDG = 16.75 (COORD
W/ BUILDING DWGS)

PSMH 4
RIM=22.00
INV IN=15.95 W
INV IN=15.95 N
INV OUT=15.85 S

CONST SANITARY
SERVICE CONNECTION
7 LF 6" PVC @ S = 0.022
INV @ BLDG = 16.20 (COORD
W/ BUILDING DWGS)

CONST SANITARY
SERVICE CONNECTION
21 LF 6" PVC @ S = 0.020
INV @ BLDG = 16.05 (COORD
W/ BUILDING DWGS)

CONST 16 LF
8" PVC SDR 35
S = 0.005

PSMH 2
RIM=22.25
INV IN=15.60 W
INV IN=15.60 S
INV IN=15.60 N
INV OUT=15.50 E

CONST 45 LF
8" PVC SDR 35
S = 0.004

CORE INTO EXISTING
STRUCTURE TO ACCEPT
NEW 8" PVC @ ELEV=15.30

CONST 3-WAY ELECTRIC
MANHOLE (COORD W/
EVERSOURCE)

CONNECT TO
EXISTING GAS MAIN
(COORD W/ UNITIL)

CONNECT TO EXISTING
WATER MAIN (COORD
W/PORTSMOUTH DPW)

CONST 3-WAY ELECTRIC
MANHOLE AND CONNECT
TO EXISTING DEER STREET
DUCT BACK (COORD W/
EVERSOURCE)

CONST SWITCH GEAR
(COORD W/ EVERSOURCE)

CONNECT TO
EXISTING GAS MAIN
(COORD W/ UNITIL)

CONST GAS SERVICE
CONNECTION (COORD W/
BUILDING DWGS & UNITIL)

CONST 3-WAY ELECTRIC
MANHOLE (COORD W/
EVERSOURCE)

CONST FIRE & DOMESTIC
WATER SERVICE CONNECTIONS
(COORD W/ BUILDING DWGS,
FIRE DEPT & DPW)

CONNECT TO EXISTING
WATER MAIN (COORD
W/PORTSMOUTH DPW)

CONST OFF SITE ELECTRICAL
IMPROVEMENTS (COORD W/
EVERSOURCE)

MARKET STREET
IMPROVEMENTS
(BY OTHERS)

RUSSELL STREET
IMPROVEMENTS

AUTO SPRINKLER

MAP 119 LOT 1-1C
AREA = 86,031 S.F.
(1.975 ACRES)

0 30' 60'
GRAPHIC SCALE

SEE SHEET G-100 FOR
UTILITIES NOTES AND LEGEND

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK M. CUMMINGS No. 12579 LICENSED PROFESSIONAL ENGINEER
5-24-22

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER
5/24/22

North End Mixed Use Development

Two International Group

Russell Street &
Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DSGN.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-104

Last Saved: 5/24/2022
Plotted: May 24, 2022 - 1:35pm By: ckrzcuk
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg

GENERAL PROJECT INFORMATION

PROJECT APPLICANT: PORT HARBOR LAND, LLC
1000 MARKET STREET, BUILDING ONE
PORTSMOUTH, NH 03801
PROJECT NAME: PROPOSED MIXED USE DEVELOPMENT
PROJECT ADDRESS: RUSSELL STREET & DEER STREET
PORTSMOUTH, NH 03801
PROJECT MAP / LOT: MAP 118 / LOT 28
MAP 119 / LOT 1-1C
MAP 119 / LOT 4
MAP 124 / LOT 12
MAP 125 / LOT 21
PROJECT LATITUDE: 43°-04'-43" N
PROJECT LONGITUDE: 70°-45'-41" W

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OF AN OFFICE BUILDING AND TWO MIXED USE RESIDENTIAL BUILDINGS WITH ASSOCIATED SITE IMPROVEMENTS.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 2.1 ACRES.

SOIL CHARACTERISTICS

BASED ON THE USCS WEB SOIL SURVEY THE SOILS ON SITE CONSIST OF URBAN LAND WHICH IS EXCESSIVELY DRAINED SOILS WITH A HYDROLOGIC SOIL GROUP RATING OF A.

NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA A CLOSED DRAINAGE SYSTEM TO THE CITY OF PORTSMOUTH'S CLOSED DRAINAGE SYSTEM WHICH ULTIMATELY FLOWS TO NORTH MILL POND THEN TO THE PISCATAQUA RIVER.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

1. CUT AND CLEAR TREES.
2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - CONTROL OF DUST
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR AND DISPOSE OF DEBRIS.
5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:

1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:

1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:

1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
CREEPING RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE

      IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.
3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

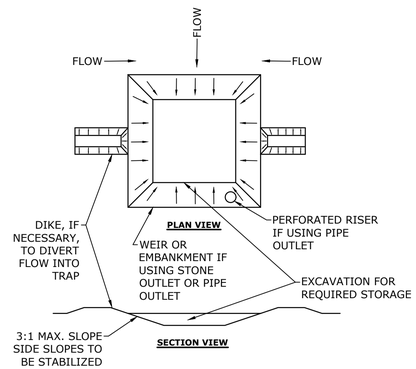
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:

1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
      i. ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
      ii. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      iii. SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
      iv. INSPECT FUEL STORAGE AREAS WEEKLY;
      v. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
      vi. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
      vii. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
      viii. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
         (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
         (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
         (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
         (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
         (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
      ix. FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
      HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF
      b. FERTILIZERS:
      i. FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
      ii. ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
      iii. STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
      i. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
      ii. EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
      iii. EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

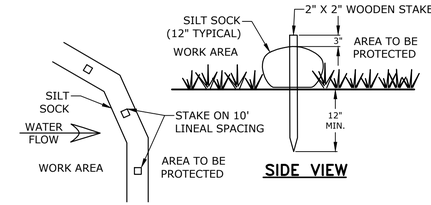
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
   A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
   B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
   C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
   D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.



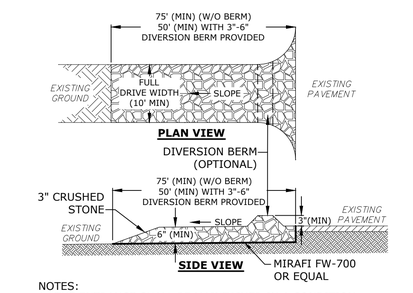
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
5. TRAP SHALL DISCHARGE TO A STABILIZED AREA.
6. TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
8. SEDIMENT TRAPS MUST BE USED AS NEEDED TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.

SEDIMENT TRAP
NO SCALE



NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL
2. INSTALL SILT SOCK IN ACCORDANCE WITH...

SILT SOCK
NO SCALE



NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 12579 LICENSED PROFESSIONAL ENGINEER – 5/24/22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 5/24/22

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

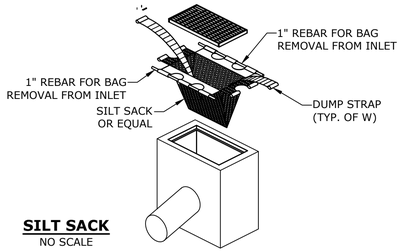
PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES AND DETAILS SHEET

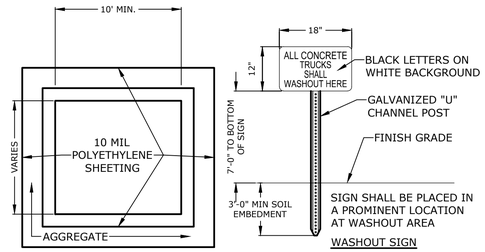
SCALE: AS SHOWN

C-501

Last Saved: 5/24/2022
Plotted: May 24, 2022 - 1:47pm By: ckrzcuk
Tighe & Bond J:\T

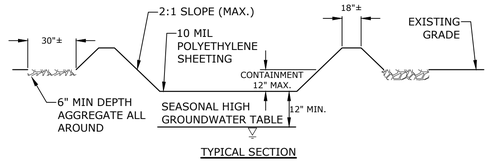


SILT SACK
NO SCALE



PLAN

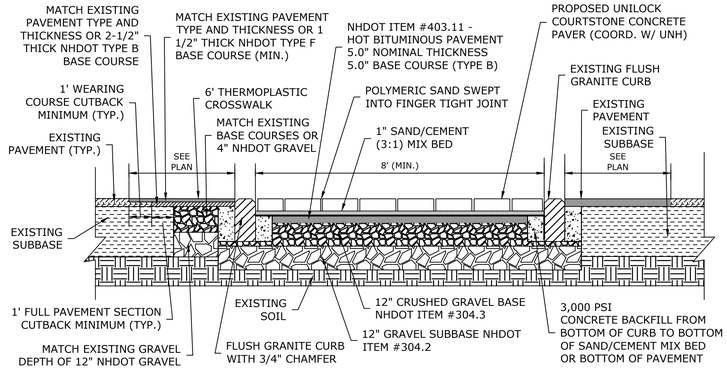
WASHOUT SIGN



TYPICAL SECTION

NOTES:
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

CONCRETE WASHOUT AREA
NO SCALE



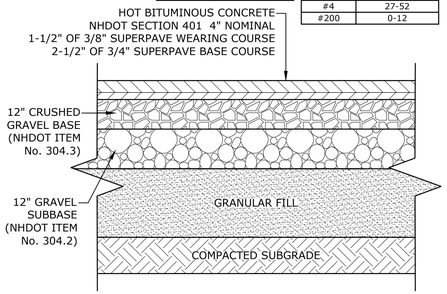
SECTION VIEW

NOTES:
1. FINAL COLOR AND PATTERN OF **UNILOCK COURTSTONE** CONCRETE PAVERS TO BE COORDINATED WITH DPW. CONTRACTOR SHALL PROVIDE SAMPLES TO THE GROUP PRIOR TO ORDERING MATERIALS.
2. BEDDING MATERIAL SHALL BE A SAND/CEMENT MIX THAT IS 3 PARTS SAND AND 1 PART CEMENT. SAND SHALL CONFORM WITH ASTM C33 AND CEMENT SHALL BE PORTLAND CEMENT TYPE I/TYPE II.

DEER STREET PAVER CROSSWALK
NO SCALE

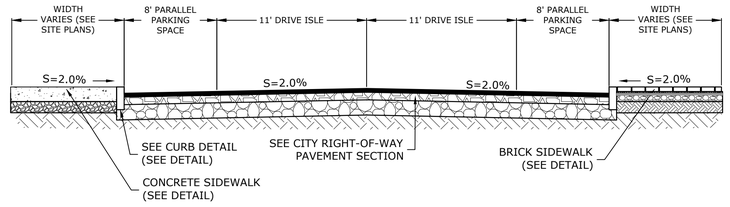
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.

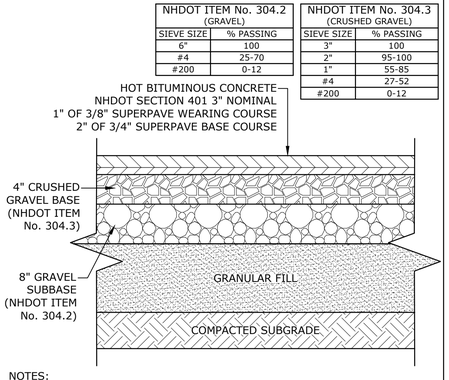
CITY RIGHT-OF-WAY PAVEMENT SECTION
NO SCALE



TYPICAL RUSSELL STREET ROADWAY CROSS SECTION
NO SCALE

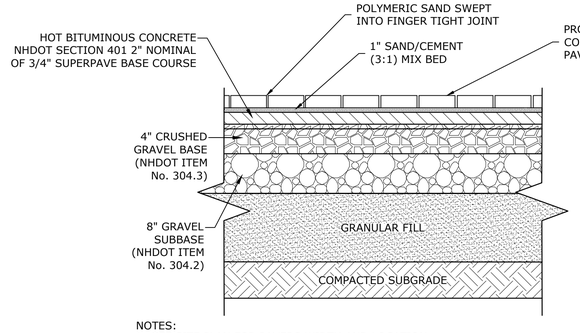
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
4. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.

ON-SITE PAVEMENT SECTION
NO SCALE



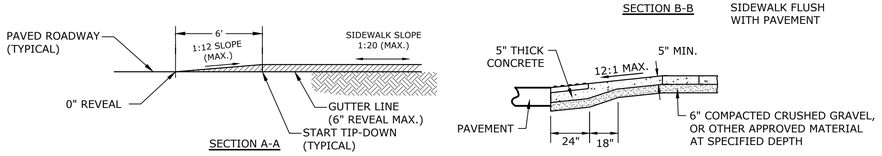
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12

NOTES:
1. SEE SITE PLAN FOR PAVERS WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.

ON-SITE PAVERS SECTION
NO SCALE

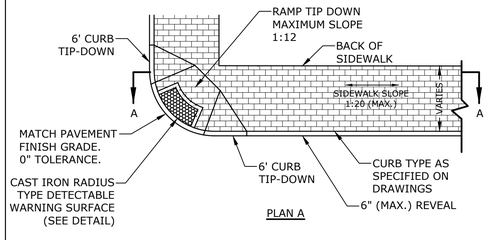
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



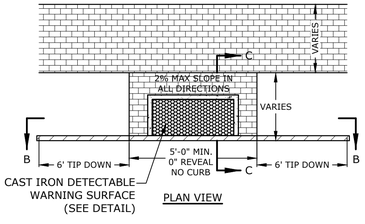
SECTION B-B

SECTION A-A

SECTION C-C



PLAN A



PLAN VIEW

NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
4. PROVIDE DETECTABLE WARNING SURFACES ANYTIME THAT A CURB RAMP, BLENDED TRANSITION, OR LANDING CONNECTS TO A STREET.
5. LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.
6. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
7. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURBLINE.
8. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
9. DETECTABLE WARNING PANELS SHALL BE A MINIMUM OF 2 FEET IN DEPTH. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP, BLENDED TRANSITION, OR LANDING AND THE STREET.
10. THE TEXTURE OF THE DETECTABLE WARNING FEATURE MUST CONTRAST VISUALLY WITH THE SURROUNDING SURFACES (EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT).

CONCRETE WHEELCHAIR ACCESSIBLE RAMP
NO SCALE

Tighe&Bond

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

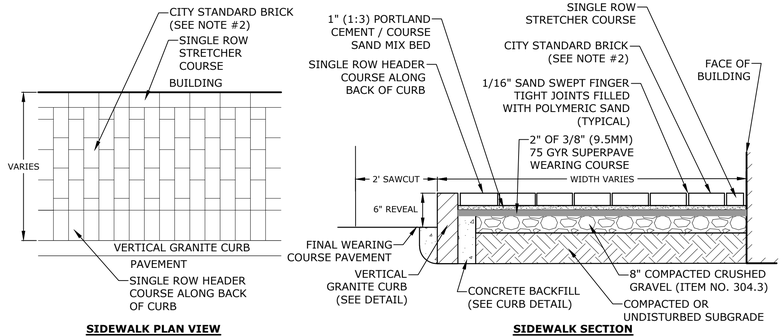
PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-502

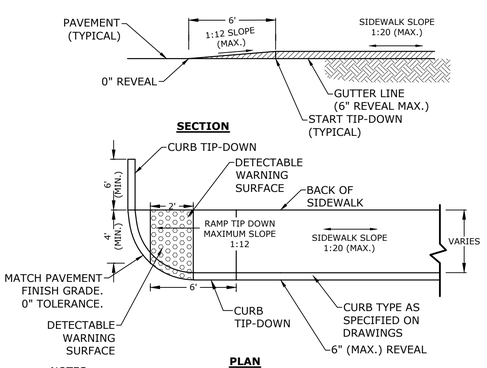
Last Saved: 5/24/2022
Plotted: May 24, 2022 - 1:47pm By: ckrzcuik
Tighe & Bond: J:\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DTLS.dwg



SIDEWALK PLAN VIEW **SIDEWALK SECTION**

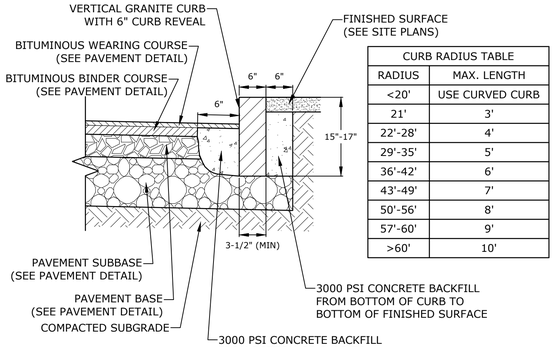
NOTES:
1. BRICK SIDEWALK SHALL BE INSTALLED AS DETAILED AND PER CITY OF PORTSMOUTH REQUIREMENTS/SPECIFICATIONS AND SHALL INCLUDE A CONTINUOUS APPROVED PAVER EDGE RESTRAINT SYSTEM AT ALL LOCATIONS NOT ADJACENT TO CURB OR BUILDINGS.
2. CITY STANDARD BRICK SHALL BE TRADITIONAL EDGE, PATHWAY, FULL RANGE 2.25"X4"X8" PAVER, BY PINE HALL BRICK, INC. BRICK MATERIAL SAMPLES SHALL BE PROVIDED TO DPW PRIOR TO INSTALLATION FOR REVIEW AND APPROVAL.
3. BEDDING MATERIAL SHALL BE A PORTLAND CEMENT / COURSE SAND MIX THAT IS 1 PART PORTLAND CEMENT AND 3 PARTS COURSE SAND. SAND SHALL CONFORM WITH ASTM C-33 AND CEMENT SHALL BE PORTLAND CEMENT TYPE I/TYPE II.

BRICK SIDEWALK
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.

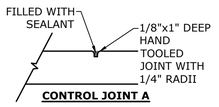
CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL
NO SCALE



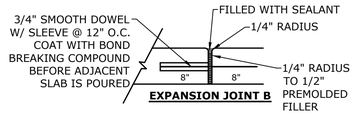
CURB RADIUS TABLE	
RADIUS	MAX. LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

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.

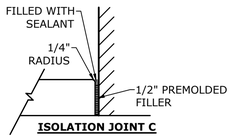
VERTICAL GRANITE CURB
NO SCALE



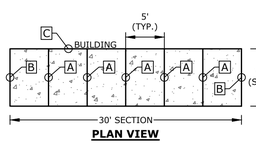
CONTROL JOINT A



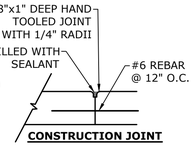
EXPANSION JOINT B



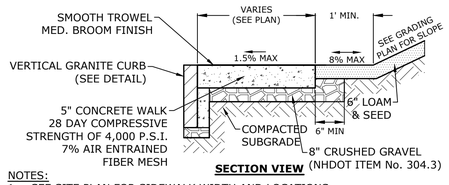
ISOLATION JOINT C



PLAN VIEW



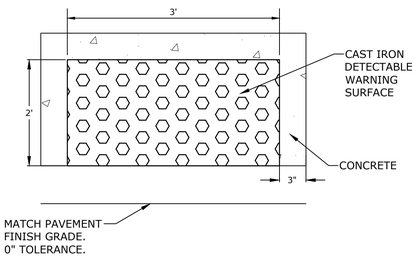
CONSTRUCTION JOINT



SECTION VIEW

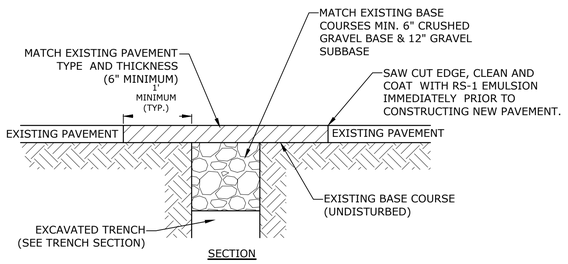
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
3. ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.

CONCRETE SIDEWALK WITH GRANITE CURB
NO SCALE

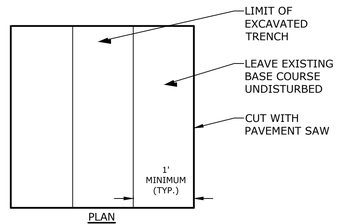


NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
2. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



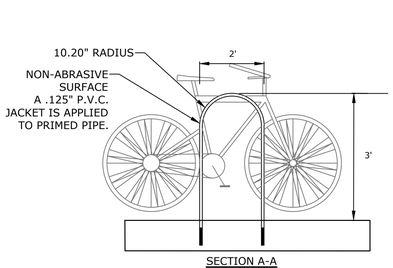
SECTION



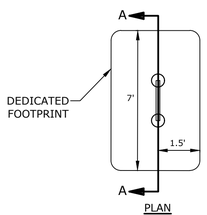
PLAN

NOTE:
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

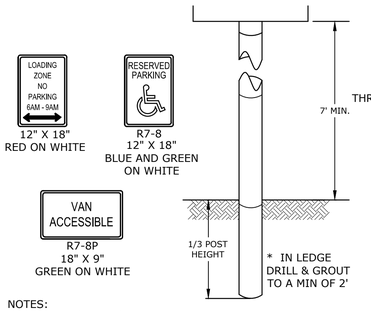


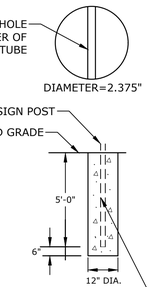
SECTION A-A



PLAN

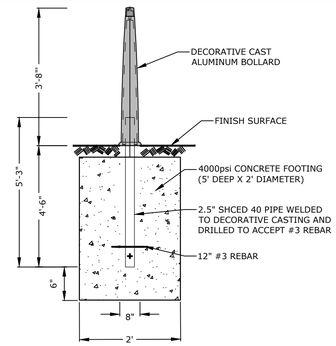
BIKE RACK
NO SCALE





NOTES:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
FINISH: POST TO BE POWDER COATED GLOSS BLACK
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER (AS REQUIRED)
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070-1080)

SIGN LEGEND & SIGN POST
NO SCALE



NOTES:
1. DECORATIVE CAST BOLLARD TO BE DG4 BY URBAN ACCESSORIES OR APPROVED EQUAL

BOLLARD DETAIL
NO SCALE

Tighe&Bond

PATRICK M. CUMMINGS No. 12378 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

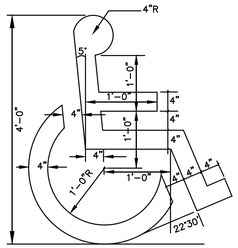
PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-503

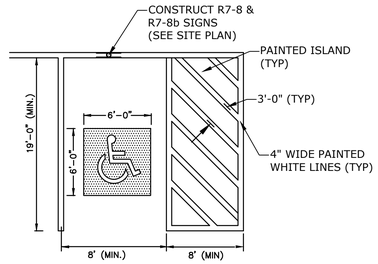
Last Saved: 5/24/2022
Plotted: May 24, 2022 - 1:47pm By: ckrzcuik
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DTLS.dwg



NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING WHITE THERMOPLASTIC, REFLECTORIZED PAVEMENT PARKING MATERAL MEETING THE REQUIREMENTS OF ASTM D 4505.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL

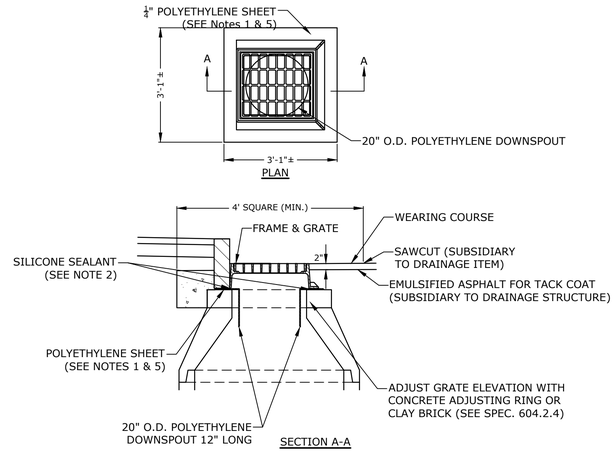
NO SCALE



NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN W/DISABILITIES ACT.

ACCESSIBLE PARKING STALL

NO SCALE



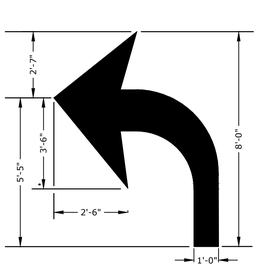
NOTES:
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE 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

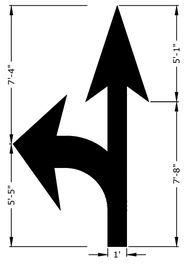
NO SCALE

Tighe&Bond

ONLY LEGEND



TURN ARROW

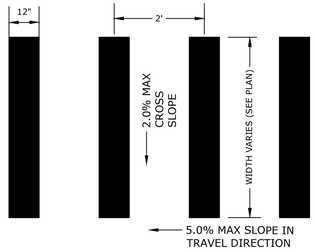


COMBINATION ARROW

NOTES:
1. ALL WORDS AND SYMBOLS SHALL BE RETROREFLECTIVE WHITE AND SHALL CONFORM TO THE LATEST VERSION OF THE MUTCD.
2. MULTI-WORD MESSAGES SHALL READ "UP"; THAT IS, THE FIRST WORD SHALL BE NEAREST THE APPROACHING DRIVER.
3. THE WORD "ONLY" SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS, AND SHALL NOT BE USED ADJACENT TO A BROKEN LANE LINE. A WORD/SYMBOL SHALL PRECEED THE WORD "ONLY".
4. COMBINATION ARROWS MAY BE COMPRISED OF 2 SINGLE ARROWS (e.g. TURN AND THROUGH ARROWS). HOWEVER, THE SHAFTS OF THE ARROWS SHALL COINCIDE AS SHOWN.
5. PREFORMED WORDS AND SYMBOLS SHALL BE PRE-CUT BY THE MANUFACTURER.
6. WRONG-WAY ARROWS SHALL NOT BE SUBSTITUTED FOR THROUGH ARROWS.
7. ALL STOP BARS, WORDS, SYMBOLS AND ARROW SHALL BE THERMOPLASTIC.

PAVEMENT MARKINGS

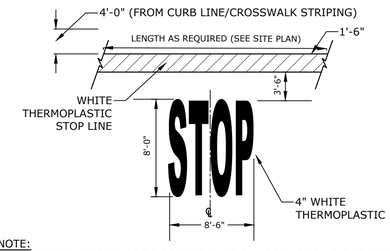
NO SCALE



NOTE:
STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

CROSSWALK STRIPING

NO SCALE

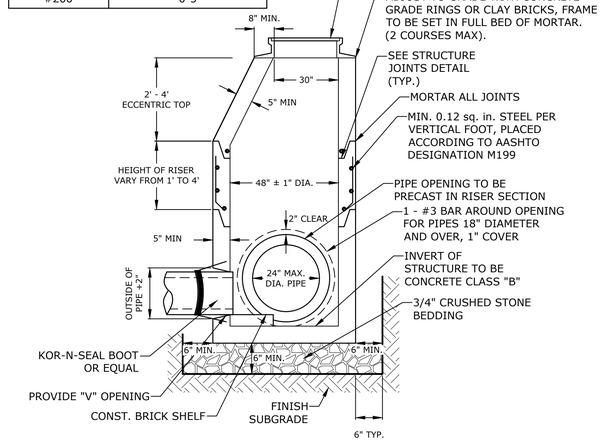


NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR AND LEGEND

NO SCALE

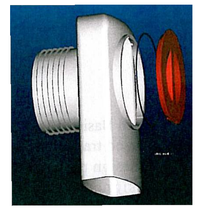
NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
9. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

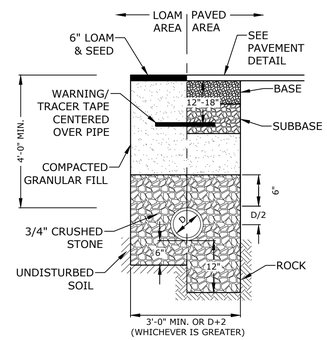
4' DIAMETER DRAIN MANHOLE

NO SCALE



NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP



NOTE:
1. 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

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
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A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-504

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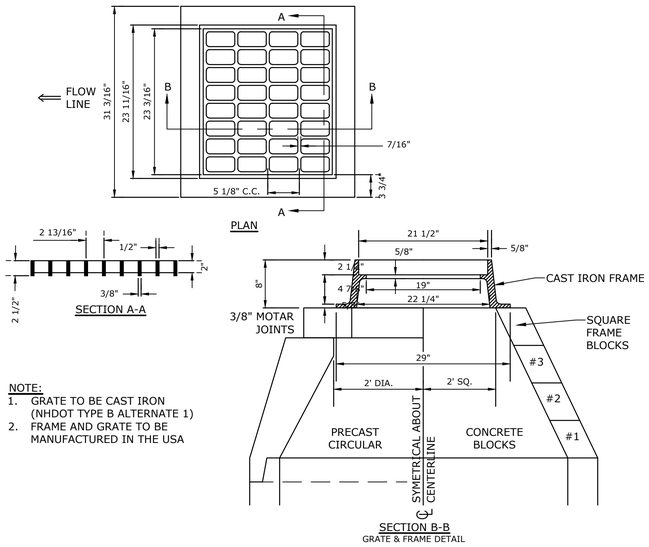
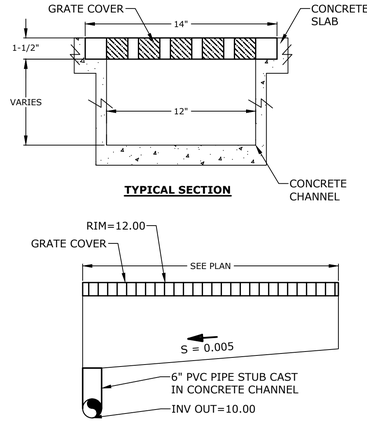
Tighe & Bond J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\AutoCAD\T5037-002-C-DTLS.dwg



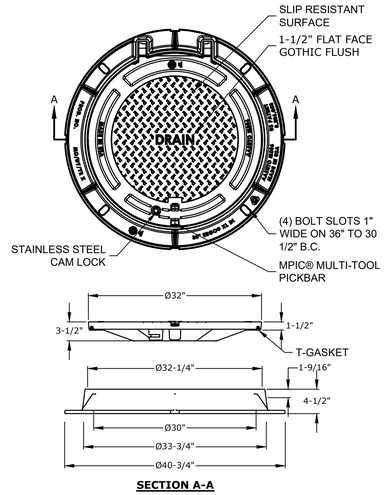
NOTE:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE
NO SCALE



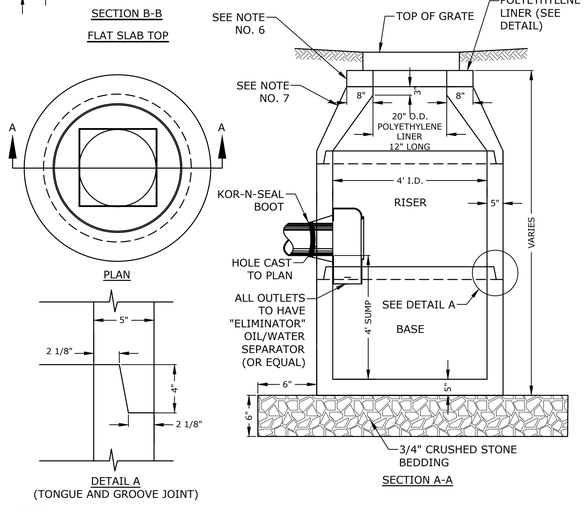
NOTES:
1. TRENCH DRAIN FRAME AND GRATE SHALL BE MULTIDRAIN ECONODRAIN SERIES #12 OR EQUAL.

TRENCH DRAIN
NO SCALE



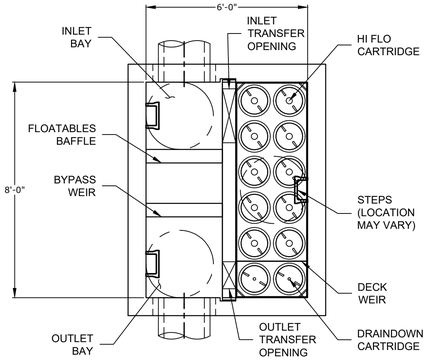
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN 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



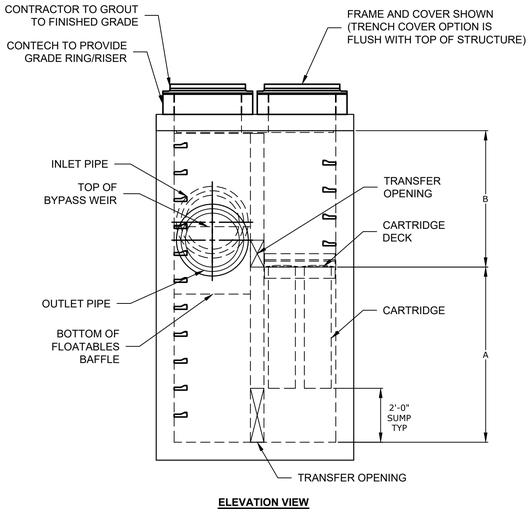
NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE



JELLYFISH JFPD0808 - 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)	2.94	2.21	1.47	0.81
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

JELLYFISH JFPD0806 - 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)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00



SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	JF-1
MODEL SIZE	JFPD0808
WATER QUALITY FLOW RATE (cfs)	1.76
PEAK FLOW RATE (cfs)	11.24
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	9/2
CARTRIDGE SIZE	54"

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

Jellyfish Filter

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935. OTHER INTERNATIONAL PATENTS PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH JELLYFISH STORMWATER FILTER
NO SCALE

Tighe&Bond

PATRICK M. CRIMMINS No. 12579 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE - 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE - 5/24/22

North End Mixed Use Development

Two International Group

Russell Street & Deer Street Portsmouth, NH

MARK	DATE	DESCRIPTION
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D		
C		
B		
A		

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DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-505

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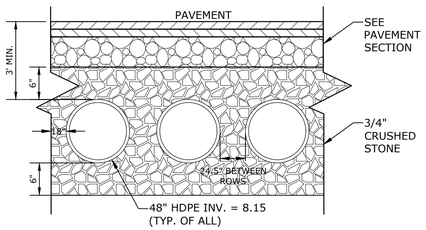
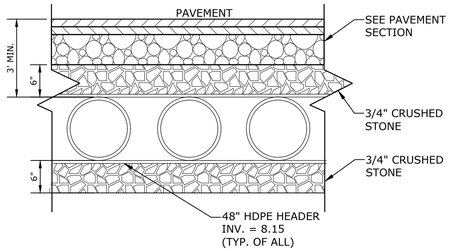
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DTLS.dwg



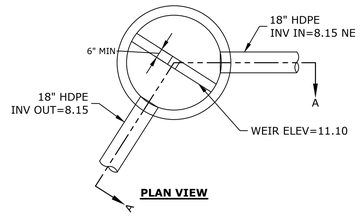
UNDERGROUND DETENTION AREA



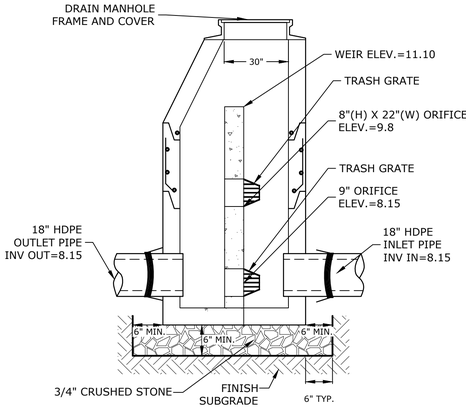
HEADER ROW

NOTES:
1. UNDERGROUND DETENTION SYSTEM TO BE 48" 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.
4. REFER TO STANDARD DUTY PAVEMENT SECTION DETAIL FOR PAVEMENT SECTION.

UNDERGROUND DETENTION SYSYTEM DETAIL
NO SCALE

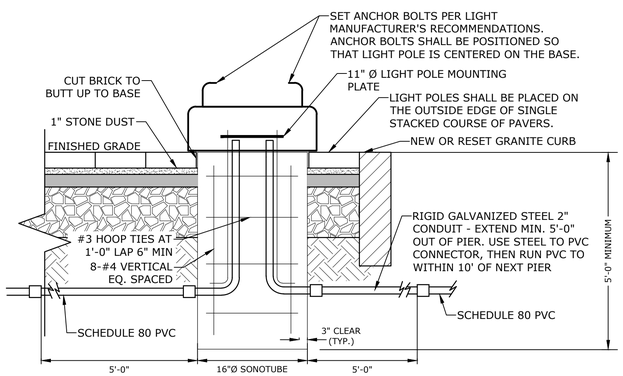


PLAN VIEW



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRD WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

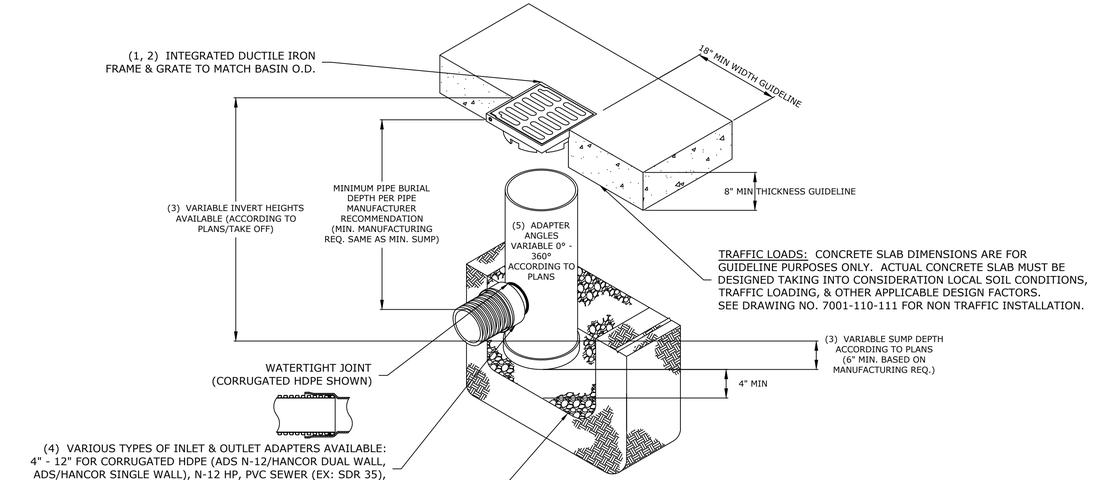
POS-01
NO SCALE



STANDARD BASE

NOTES:
1. REFER TO ELECTRICAL PLANS FOR WIRING DETAILS.
2. CONCRETE: 4000 PSI, AIR ENTRAINED STEEL: 60 KSI
3. LIGHT POLE FOUNDATIONS SHALL BE PLACED PRIOR TO INSTALLATION OF BRICK PAVERS.
4. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL, TO INCLUDE PERFORMANCE SPECIFICATIONS, CALCULATIONS AND NH LICENSED STRUCTURAL ENGINEER'S STAMP FOR LIGHT POLE FOUNDATION.
5. STANDARD BASE SHALL BE CONSTRUCTED UNLESS THERE IS CONFLICT WITH THE EXISTING DUCT BANK. SPREAD FOOTING BASE SHALL BE USED IN LIEU OF STANDARD BASE IN LOCATIONS WHERE TOP OF DUCT BANK ELEVATION WILL CONFLICT WITH STANDARD POLE BASE DEPTH. CONTRACTOR SHALL VERIFY LOCATIONS WHERE SPREAD FOOTINGS ARE REQUIRED PRIOR TO CONSTRUCTION. SEE NOTE#4 FOR SUBMITTAL REQUIREMENTS.

HISTORIC LIGHT FIXTURE BASE
NO SCALE

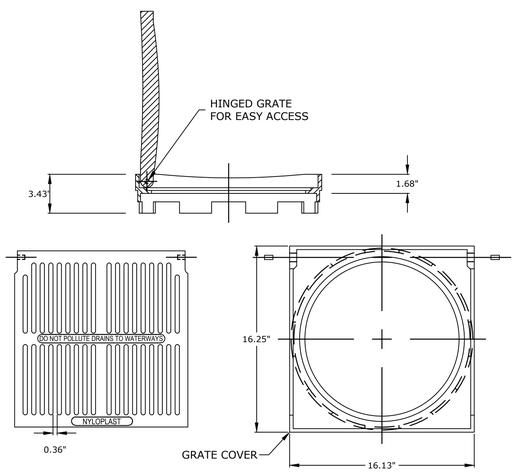


GRATE OPTIONS	LOAD RATING	PART #	DRAWING #
PEDESTRIAN	MEETS H-10	1299CGP	7001-110-202
STANDARD	MEETS H-20	1299CGS	7001-110-203
SOLID COVER	MEETS H-20	1299CGC	7001-110-204
PEDESTRIAN BRONZE	N/A	1299CGPB	7001-110-205
DOME	N/A	1299CGD	7001-110-206
DROP IN GRATE	LIGHT DUTY	1201DI	7001-110-021

TYPICAL SECTION

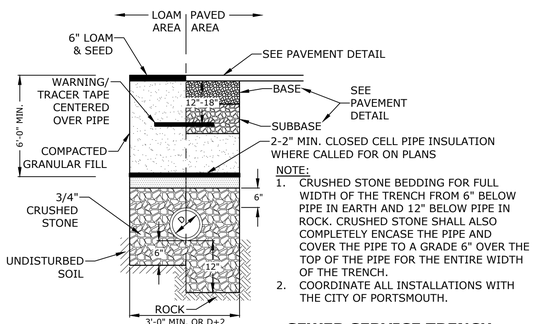
NOTES:
1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05, WITH THE EXCEPTION OF THE BRONZE GRATE.
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING 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.
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

YARD DRAIN
NO SCALE



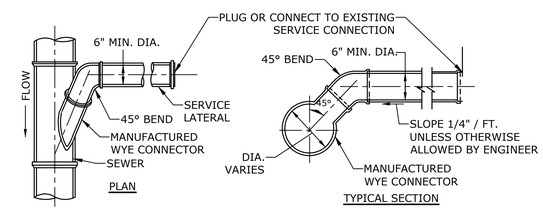
NOTES:
1. NYLOPLAST MODEL 1299CGPBL OR EQUAL.

YARD DRAIN FRAME AND GRATE
NO SCALE



NOTE:
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

SEWER SERVICE TRENCH
NO SCALE



STANDARD SERVICE LATERAL CONNECTION
NO SCALE

Tighe&Bond

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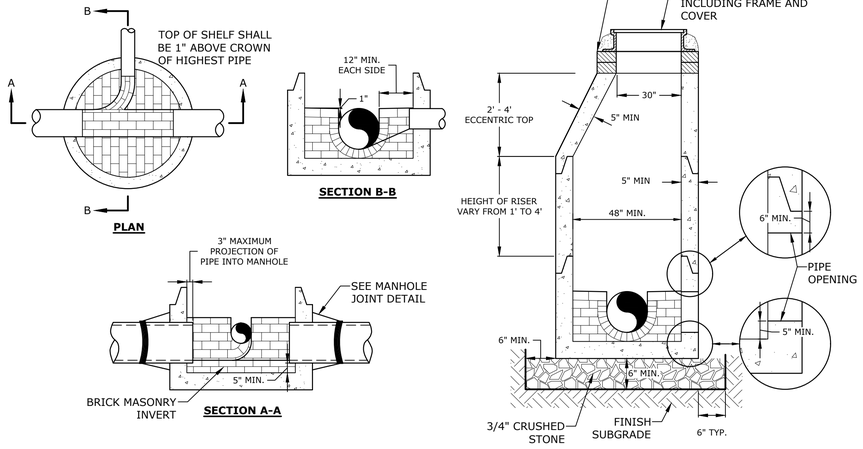
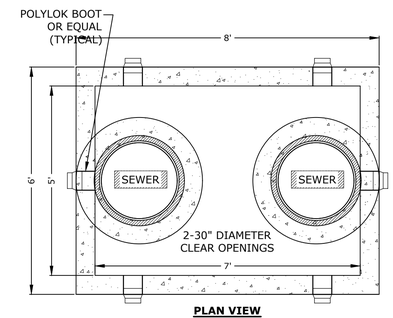


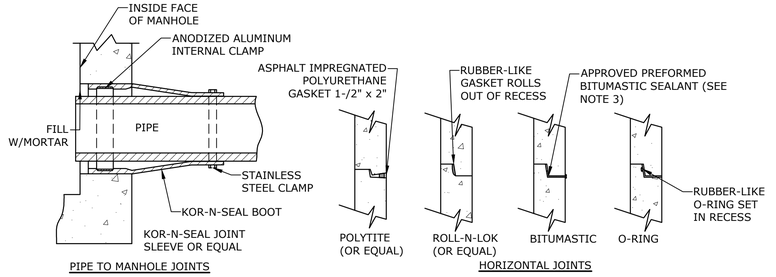
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

SEWER MANHOLE
NO SCALE



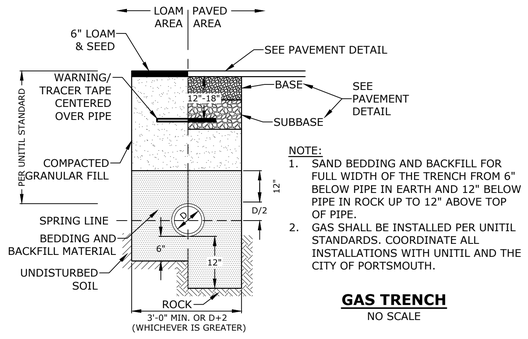
NOTES:
1. STEEL REINFORCEMENT SHALL CONFORM TO LATEST ASTM SPECIFICATIONS: ASTM-A615 GRADE 60 REBAR.
2. CONCRETE SHALL BE F_c=5,000 PSI @ 28 DAYS MINIMUM.
3. FLEXIBLE SLEEVES SHALL BE PROVIDED ON ALL PIPE CONNECTIONS.
4. JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
5. INLET SHALL PENETRATE AT LEAST 9" BELOW THE LIQUID LEVEL, BUT NOT DEEPER THAN THE OUTLET BAFFLE.
6. OUTLET SHALL EXTEND BELOW THE SURFACE OF THE LIQUID EQUAL TO 40% OF THE LIQUID DEPTH (19").
7. DESIGN LOADING SHALL BE: AASHTO-HS20-44, ASTM C-890-06.
8. DESIGN SPECIFIED AS: ASTM C-1227-08, ASTM C-913-08.
9. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
10. GREASE TRAP SHALL BE PHOENIX PRECAST CONCRETE P/N: C-6420 OR EQUAL.
11. TANK SHALL BE PUMPED AS NEEDED.

1,000 GALLON GREASE TRAP
NO SCALE



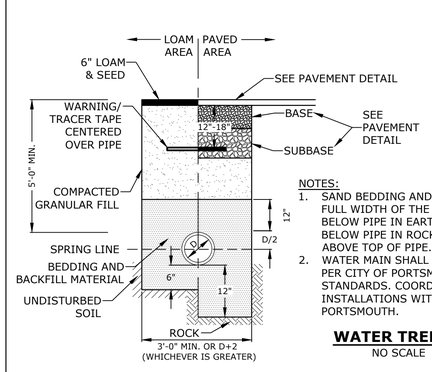
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

MANHOLE JOINTS
NO SCALE



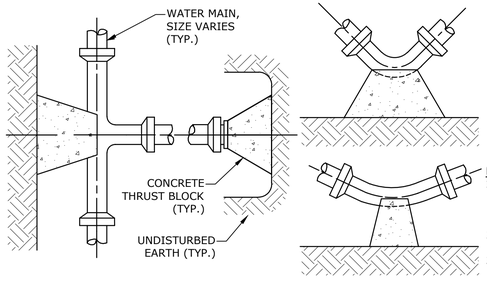
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE



NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE



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 DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK W. CUMMINGS No. 12379 LICENSED PROFESSIONAL ENGINEER – 5-24-22

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER – 5/24/22

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-507

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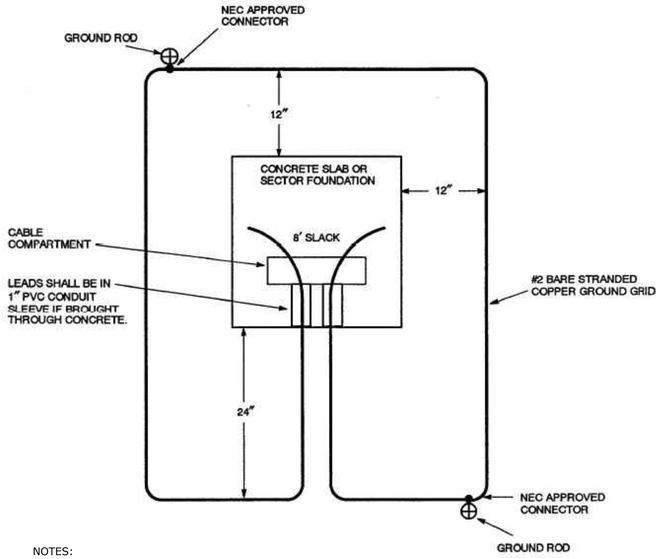
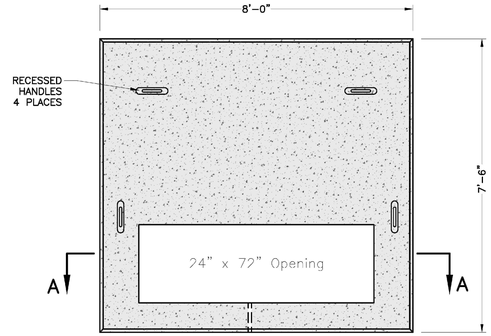
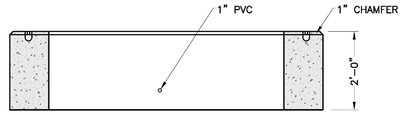


NOTES:
THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.

PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL
NO SCALE



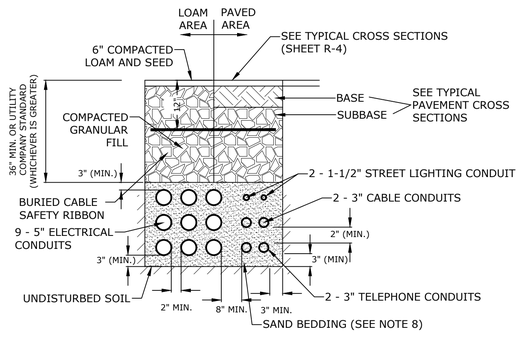
PLAN



SECTION A–A

NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

3-PHASE TRANSFORMER PAD
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.

ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE

Tighe&Bond

PATRICK M. CRIMMINS No. 12979 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5-24-22

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 5/24/22

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
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DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-508

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PLANT SCHEDULE

Symbol	Quantity	*Botanical Name*	Common Name	Size	Spacing	Notes
TREES						
AB CO	1	*Abies concolor*	White Fir	8-10' Ht, B&B		B&B; matched
AC BO	7	*Acer rubrum 'Bowhall'*	Bowhall Maple	4-5" Cal.		Single-stem, matched
AC KA	1	*Acer rubrum 'Karpick'*	Karpick Maple	4-5" Cal.		Single-stem, matched
BE AL	5	*Betula nigra 'Little King'*	Little King River Brch	4-5" Cal.		Single-stem, matched
CA CA	6	*Carpinus caroliniana*	American Hornbean	4-5" Cal.		Single-stem, matched
CR WK	6	*Crataegus viridis 'Winter King'*	Winter King Hawthorn	3-4" Cal.		Single-stem, matched
CO SP	2	*Cornus 'Rutgan' Stellar Pink*	Stellat Pink Dogwood	3-4" Cal.		B&B; matched
GI BI	5	*Ginkgo biloba 'Magyar'*	Magyar Ginkgo	5-6" Cal.		B&B; matched
JU VI	4	*Juniperus virginiana*	Eastern Red Cedar	8-10' Ht, B&B		B&B; matched
LI WO	5	*Liquidambar styraciflua 'Worplesdon'*	Worplesdon Sweetgum	4-5" Cal.		B&B; matched
MA SO	3	*Magnoila x soulangiana*	Saucer Magnolia	3-4" Cal.		B&B; matched
QU PA	2	*Quercus palustris*	Pin Oak	4-5" Cal.		B&B; matched
QU RP	6	*Quercus x warei 'Long' Regal Prince*	Regal Prince Oak	4-5" Cal.		B&B; matched
SHRUBS						
Co Pe		*Comptonia peregrina*	Sweet Fern	#3 Container	36" O.C.	
Co Ra		*Cornus sericea 'Cardinal'*	Cardinal Red Twig Dogwood	#5 Container	36" O.C.	
De Gr		*Deutzia gracilis 'Nikko'*	Nikko Deutzia	#3 Container	30" O.C.	
Fo Ga		*Fothergilla gardenii 'Mount Airy'*	Mount Airy Fothergilla	#5 Container	36" O.C.	
Hy Qu		*Hydrangea quercifolia 'Pee Wee'*	Oakleaf Hydrangea	#5 Container	48" O.C	
Li Be		*Lindera Benzoin*	Spice Bush	#5 Container	36" O.C.	
Ix GI		*Ilex glabra 'Shamrock'*	Shamrock Inkberry	#5 Container	36" O.C.	
Il Ji		*Ilex verticillata 'Jim Dandy'*	Jim Dandy Winterberry	#5 Container	48" O.C	
Il Ve		*Ilex verticillata 'Red Sprite'*	Red Sprite Winterberry	#5 Container	48" O.C	
My Pe		*Myrica pensylvanica*	Northern Bayberry	#5 Container	48" O.C.	
Rh GI		*Rhus aromatica 'Gro-Low'*	Fro-Low Fragrant Sumac	#3 Container	30" O.C.	
Rh Mh		*Rhododendron x 'Marie Hoffman'*	Mare Hoffman Azalea	#5 Container	48" O.C.	
Sp To		*Spiraea tomentosa*	Steeplebush	#3 Container	30" O.C.	
PERENNIALS						
am hu		*Amsonia x 'Blue Ice'*	Blue Star Flower	#2 Container	18" O.C.	
as ob		*Aster oblongifolius 'Raydon's Favorite'*	Raydon's Favorite Aster	#2 Container	24" O.C.	
ba bi		*Baptisia australis*	Blue False Indigo	#3 Container	30" O.C.	
ga od		*Galium odoratum*	Sweet Woodruff	#2 Container	12" O.C.	
ge ro		*Geranium x 'Rozanne'*	Rozanna Cranesbill	#2 Container	18" O.C.	
he vi		*Heuchera villosa 'Autumn Bride'*	Autumn Bride Coral Bells	#2 Container	18" O.C.	
he hr		*Hemerocallis 'Happy Returns'*	Happy Returns Daylily	#2 Container	24" O.C.	
li sp		*Liriope spicata*	Lilyturf	4" Container	10" O.C.	
os ci		*Osmundastrum cinnamomeum*	Cinnamon Fern	#2 Container	30" O.C.	
po od		*Polygonatum odoratum var. pluriflorum 'Variegatum'*	Variegated Solomon's Seal	#2 Container	15" O.C.	
ti co		*Tiarella cordifolia*	Foamflower	#2 Container	15" O.C.	
va an		*Vaccinium angustifolium*	Lowbush Blueberry	#2 Container	15" O.C.	
ORNAMENTAL GRASSES						
bo cu		*Bouteloua curtipendula*	Side Oats Grama	#2 Container	30" O.C.	
ca pe		*Carex pennsylvania*	Pennsylvania Sedge	#2 Container	30" O.C.	
ca ac		*Calamagrostis acutiflora 'Karl Foerster'*	Feather Reed Grass	#3 Container	30" O.C.	
de ce		*Deschampsia cespitosa 'Pixie Fountain'*	Tufted Hair Grass	#2 Container	30" O.C.	
mi si		*Miscanthus sinensis 'Adagio'*	Dwarf Silver Grass	#2 Container	30" O.C.	
pe al		*Pennisetum alopecuroides 'Hamelin'*	Hameln Dwarf Fountain Grass	#2 Container	24" O.C.	
SEED MIXES						
Buffer Seed Mix		*Ernst Seed Fescue Mix composed of 45% Creeping Red Fescue/ 27.5% Hard Fescue 'Minimus' / 27.5% Hard Fescue 'Beacon'*				

PLANTING NOTES

1. LANDSCAPE ARCHITECT TO APPROVE PLANT MATERIAL PRIOR TO DELIVERY TO SITE.

2. PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.

3. NO SUBSTITUTIONS OF PLANT SPECIES WITHOUT LANDSCAPE ARCHITECT'S WRITTEN APPROVAL.

4. SUBSTITUTIONS OF PLANT SPECIES SHALL BE A PLANT OF EQUIVALENT OVERALL FORM, HEIGHT AND BRANCHING HABIT, FLOWER, LEAF AND FRUIT, COLOR AND TIME OF BLOOM, AS APPROVED BY LANDSCAPE ARCHITECT.

5. LOCATE AND VERIFY UTILITY LINE LOCATIONS PRIOR TO STAKING AND REPORT CONFLICTS TO LANDSCAPE ARCHITECT.

6. PLANTING DEMOLITION DEBRIS, GARBAGE, LUMPS OF CONCRETE, STEEL AND OTHER MATERIALS DELETERIOUS TO PLANT'S HEALTH AS DETERMINED BY LANDSCAPE ARCHITECT SHALL BE REMOVED FROM ALL PLANTING AREAS.

7. NO PLANTING TO BE INSTALLED BEFORE ACCEPTANCE OF ROUGH GRADING.

8. ALL PROPOSED TREE LOCATIONS SHALL BE STAKED OR LAID OUT IN THEIR APPROXIMATE LOCATION BY THE CONTRACTOR. REFER TO LAYOUT AND PLANTING SHEETS FOR LAYOUT INFORMATION. THE CONTRACTOR SHALL ADJUST THE LOCATIONS AS REQUESTED BY THE LANDSCAPE ARCHITECT TO ACCOUNT FOR SUBSURFACE UTILITIES AND OTHER FIELD CONDITIONS. FINAL LOCATIONS OF ALL PLANTS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.

9. INSTALL PLANTS WITH ROOT FLARES FLUSH WITH FINISHED GRADE. IMMEDIATELY REPLANT PLANTS THAT SETTLE OUT OF PLUMB OR BELOW FINISHED GRADE.

10. PLANT UNDER FULL TIME SUPERVISION OF CERTIFIED ARBORIST, NURSERYMAN, OR LICENSED LANDSCAPE ARCHITECT. PROVIDE WRITTEN VERIFICATION OF CERTIFICATION AND/OR LICENSE FOR LANDSCAPE ARCHITECT'S APPROVAL.

11. WATER PLANTS THOROUGHLY AFTER INSTALLATION, A MINIMUM OF TWICE WITHIN THE FIRST 24 HOURS.

12. REPAIR DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF LIMIT OF WORK

13. SOAK ALL PERENNIALS FOR 24 HOURS PRIOR TO INSTALLATION

14. BUFFER SEED MIX AREA TO BE WATERED AND MONITORED DURING ESTABLISHMENT TO ENSURE SEED COVERAGE AND ESTABLISHMENT IS UNIFORM AND HEALTHY AND UNTIL ACCEPTANCE.

15. MOWING OF THE BUFFER SEED MIX AREA FOLLOWING ESTABLISHED AND ACCEPTANCE SHALL OCCUR TWICE A YEAR - IN SPRING PRIOR TO NEW GROWTH AND THE AUTUMN AFTER DORMANCY. MOWING IS NOT TO OCCUR IN THE HEAT OF SUMMER. MOWING ENCOURAGES ESTABLISHMENT VIA ROOT SYSTEM GROWTH AND MITIGATES GROWTH OF WEEDS, UNDESIRABLE AND INVASIVE SPECIES.

16. MOWING HEIGHT TO BE NOT LESS THAN 3".

Tighe&Bond

North End Mixed Use Development

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FILE:	T5037-002-L-DSGN-WORKING.DWG
DRAWN BY:	OS
CHECKED:	RU
APPROVED:	RU

LANDSCAPE MATERIAL PLAN, LEGEND AND NOTES

SCALE: AS SHOWN

L-100

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LEGEND

- SEEDED LAWN
- BUFFER SEED MIX
- PLANTING BED
- DECIDUOUS TREE
- CONIFEROUS TREE

MAP 119 LOT 4
AREA = 9,765 S.F.
(0.22 ACRES)

100' BUFFER FROM NORTH MILL POND

GREEN STREET

VAUGHAN STREET
(PUBLIC RIGHT OF WAY)

RUSSELL STREET

MARKET STREET
(76' WIDE PUBLIC RIGHT OF WAY)

MAPLEWOOD AVENUE

DEER STREET

TRAFFIC SIGNAL

BUILDING 1

BUILDING 2

BUILDING 3

1 JU VI
2 BE AL
PROPERTY LINE
CONNECT TO EXISTING SIDEWALK
PERENNIALS & ORNAMENTAL GRASS
1 AB CO
SEAT WALL
1 QU PA
1 BE AL
3 CR WK
SEEDED LAWN
CAST-IN-PLACE CONCRETE SIDEWALK
3 CR WK
2 BE AL
1 QU PA
3 JU VI
BRICK PAVING
SHRUBS, PERENNIALS & ORNAMENTAL GRASS
1 AC KA
SEATING NICHE
DECORATIVE PAVING BANDING
BIKE PARKING
WELCOME STEPS & HANDRAILS
5 LI WO
CITY STANDARD HISTORIC LIGHT FIXTURE & POLE
BIKE PARKING
RAISED STREETSCAPE TREE PLANTER
CITY STANDARD BRICK PAVING
2 CO SP
SEATING AREA
2 AC BO
BOLLARDS
RAISED PEDESTRIAN CROSSING WITH VEHICULAR UNIT PAVING
CITY STANDARD HISTORIC LIGHT FIXTURE & POLE
1 AC BO
CITY STANDARD BRICK PAVING
2 GI BI
PLANTER CURB
DECORATIVE PAVING BANDING
WOOD MOUNTED BENCH
ART FEATURE
STEPS & HANDRAILS
PROPERTY LINE
SHARED PATH WITH DECORATIVE PAVING BANDING & VEHICULAR UNIT PAVING
CITY STANDARD BRICK PAVING
BIKE PARKING
RAISED STREETSCAPE TREE PLANTER
3 QU RP
CITY STANDARD HISTORIC LIGHT FIXTURE & POLE
BIKE PARKING
SEAT WALL
WOOD MOUNTED BENCH
SHRUBS, PERENNIALS & ORNAMENTAL GRASS
CATENARY LIGHTING
3 CA CA
SPILL OUT SEATING ZONE
SLOPED WALK & STEPS
3 MA SO
EGRESS PATH
CITY STANDARD BRICK PAVING
SHRUBS, PERENNIALS & ORNAMENTAL GRASS
WOOD MOUNTED BENCH
3 CA CA
SEAT WALL
3 QU RP
DECORATIVE PAVING BANDING
INTERSECTION IMPROVEMENTS AT PORTWALK & DEET INTERSECTION
4 AC BO
RAISED STREETSCAPE TREE PLANTER
BIKE PARKING
SEAT WALL
PLANTER CURB
3 GI BI
SEATING ZONE
SHRUBS, PERENNIALS & ORNAMENTAL GRASS
WOOD MOUNTED BENCH

N

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

North End Mixed Use Development

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LANDSCAPE SITE PLAN

SCALE: AS SHOWN

L-101

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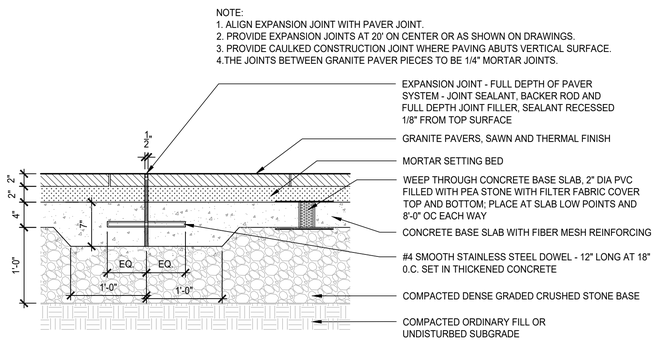
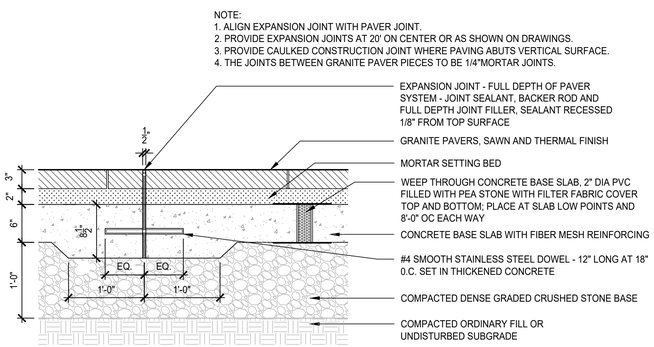
CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS

THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE 'END ALL' FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

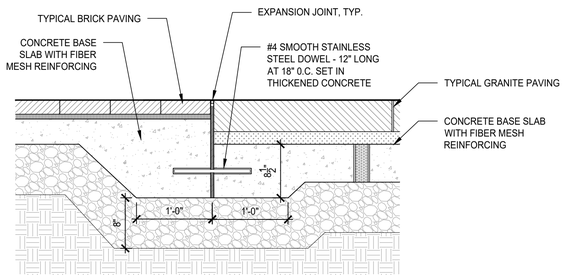
1. ALL PLANTING HOLES SHALL BE DUG BY HAND- NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINES USED TO DIG ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.
2. ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.
3. THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.
4. THE ROOT COLLAR OF THE TREE SHALL BE 2"-3" ABOVE GRADE OF PLANTING HOLE FOR FINISHED DEPTH.
5. ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.
6. ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS- NO EXCEPTIONS.
7. AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.
8. 2"-3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.
9. AT THE TIME THE PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.



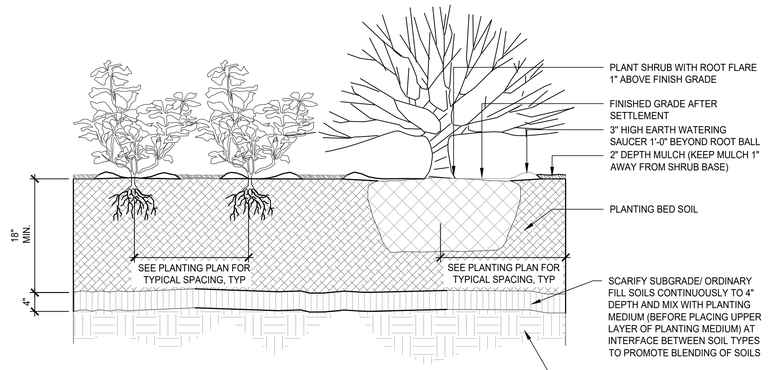
1 GRANITE PAVERS ON CONCRETE BASE - PEDESTRIAN
SCALE: 1'=1'-0"



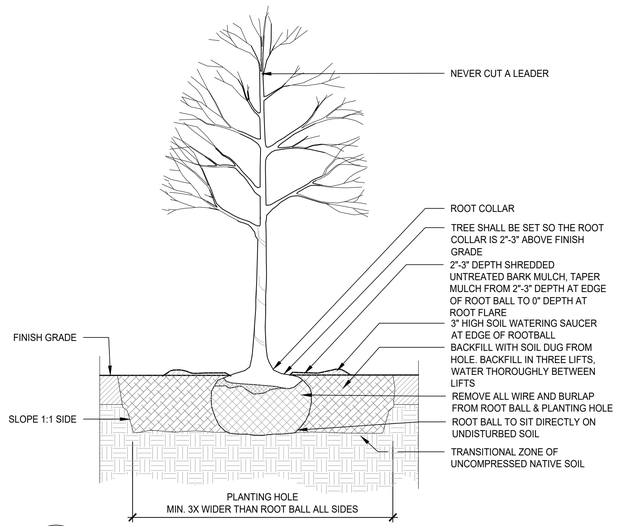
2 GRANITE PAVERS ON CONCRETE BASE - VEHICULAR
SCALE: 1'=1'-0"



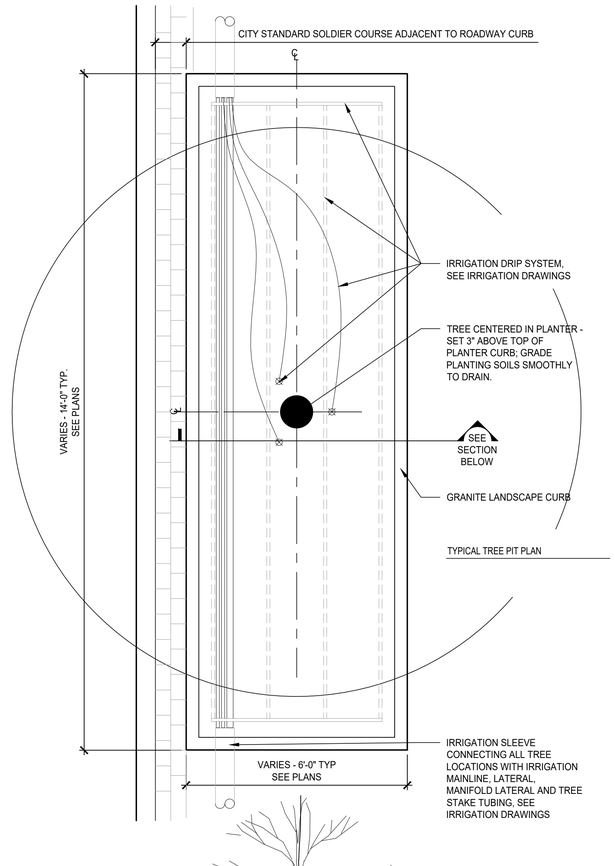
3 GRANITE TO BRICK PAVING TRANSITION
SCALE: 1"=1'-0"

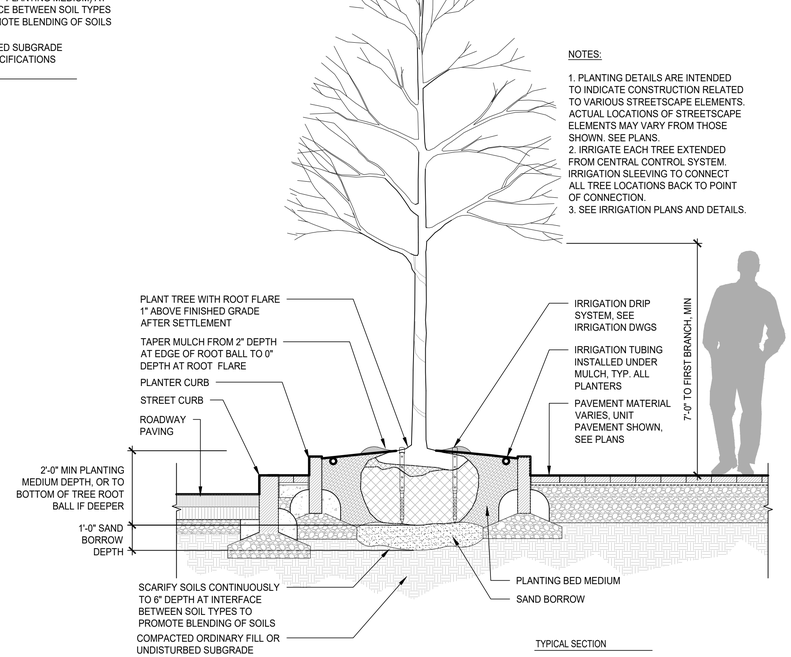


4 SHRUB, PERENNIAL AND ANNUAL PLANTING
SCALE: 3/4"=1'-0"



5 TREE PLANTING DETIAL
SCALE: 3/8"=1'-0"





6 TREE PLANTING IN RAISED LANDSCAPE CURB PLANTER
SCALE: 1/2" = 1'-0"

Tighe&Bond

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

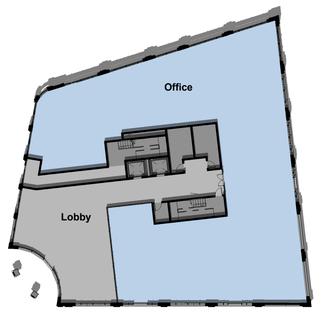
PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-L-DSGN-WORKING.DWG
DRAWN BY:	OS
CHECKED:	RU
APPROVED:	RU

LANDSCAPE DETAILS

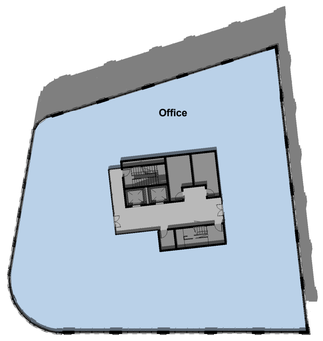
SCALE: AS SHOWN

L-102

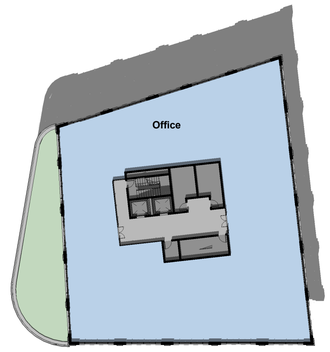
Last Saved: 5/24/2022
Printed: May 24, 2022 - 12:19pm By: OStasin
Tighe & Bond: \\tighebond.com\data\Data\Projects\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-L-DSGN-Working.dwg



1 B1 - LEVEL 1
1/32" = 1'-0"



2 B1 - LEVEL 3
1/32" = 1'-0"



3 B1 - LEVEL 4
1/32" = 1'-0"

GROSS AREA CALCULATIONS

B1 - LEVEL 1	
Back of House	1,061 SF
Lobby	2,574 SF
Office	7,974 SF
	11,609 SF
B1 - LEVEL 2	
Back of House	956 SF
Lobby	663 SF
Office	10,312 SF
	11,932 SF
B1 - LEVEL 3	
Back of House	956 SF
Lobby	663 SF
Office	10,313 SF
	11,932 SF
B1 - LEVEL 4	
Back of House	956 SF
Lobby	663 SF
Office	8,851 SF
	10,471 SF
GRAND TOTAL	45,944 SF

AREA LEGEND

- OFFICE
- CONDO
- RETAIL
- PARKING
- LOBBY
- OUTDOOR SPACE
- BACK OF HOUSE

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PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

No.	Date	Description

SUBMISSIONS:

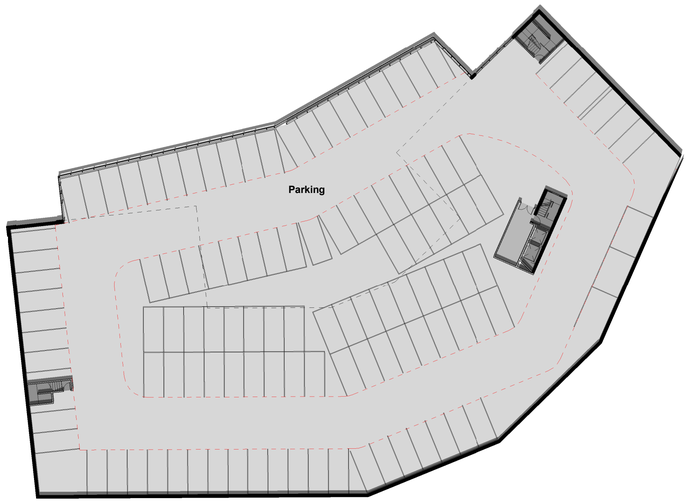
Date	Issued For:
05/23/22	TAC Work Session

SCALE	**As indicated**
DATE ISSUED	**05/23/22**
PROJECT NO	**4979.00**
DRAWN BY	**Author**
CHECKED BY	**Checker**

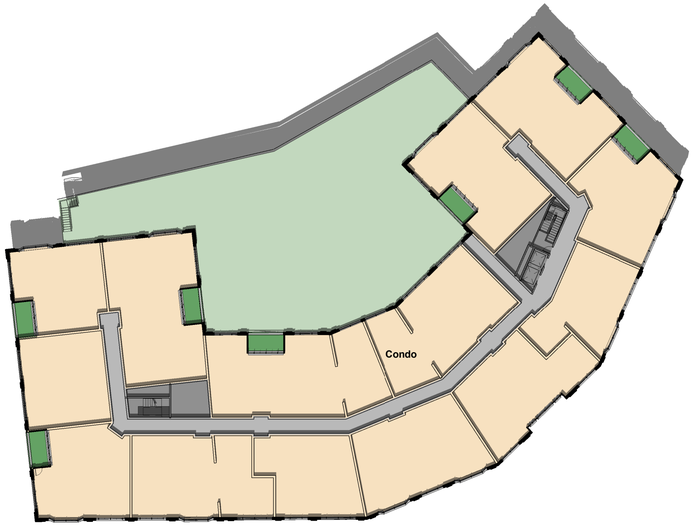
SHEET TITLE:

BUILDING 1 AREA PLANS

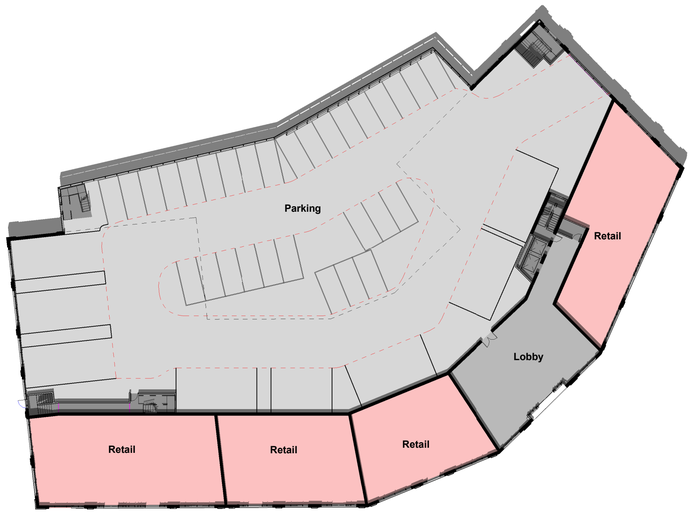
A - 101



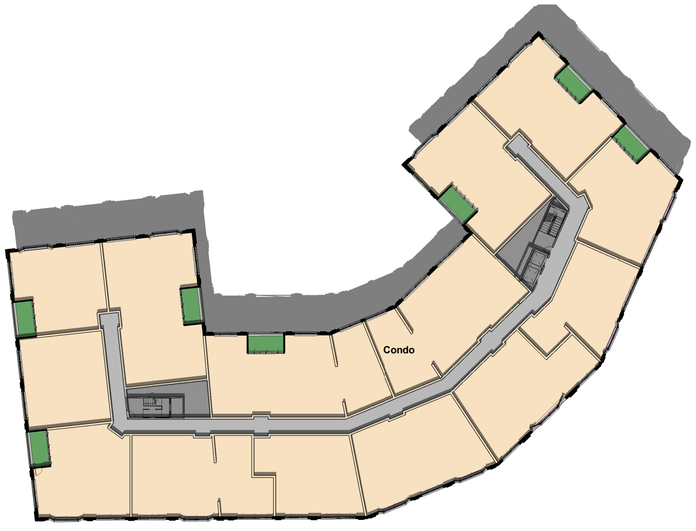
1 B2 - LEVEL 0
1/32" = 1'-0"



3 B2 - LEVEL 2
1/32" = 1'-0"



2 B2 - LEVEL 1
1/32" = 1'-0"



4 B2 - LEVEL 3-5
1/32" = 1'-0"

GROSS AREA CALCULATIONS

B2 - LEVEL 0	
Back of House	625 SF
Lobby	253 SF
Parking	38,270 SF
	39,148 SF
B2 - LEVEL 1	
Back of House	1,263 SF
Lobby	2,441 SF
Parking	25,590 SF
Retail	10,440 SF
	39,735 SF
B2 - LEVEL 2	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,109 SF
Lobby	2,619 SF
	29,754 SF
B2 - LEVEL 3	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,395 SF
Lobby	2,391 SF
	29,810 SF
B2 - LEVEL 4	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,395 SF
Lobby	2,391 SF
	29,810 SF
B2 - LEVEL 5	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,395 SF
Lobby	2,391 SF
	29,810 SF
GRAND TOTAL	198,068 SF

AREA LEGEND

- OFFICE
- CONDO
- RETAIL
- PARKING
- LOBBY
- OUTDOOR SPACE
- BACK OF HOUSE

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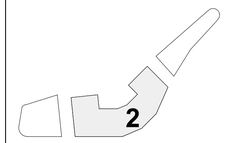

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PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

No.	Date	Description

SUBMISSIONS:

Date	Issued For:
05/23/22	TAC Work Session

SCALE	**As indicated**
DATE ISSUED	**05/23/22**
PROJECT NO	**4979.00**
DRAWN BY	**Author**
CHECKED BY	**Checker**

SHEET TITLE:

BUILDING 2 AREA PLANS

A - 102

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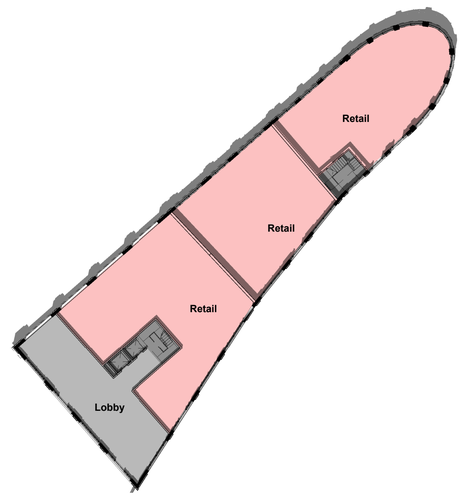
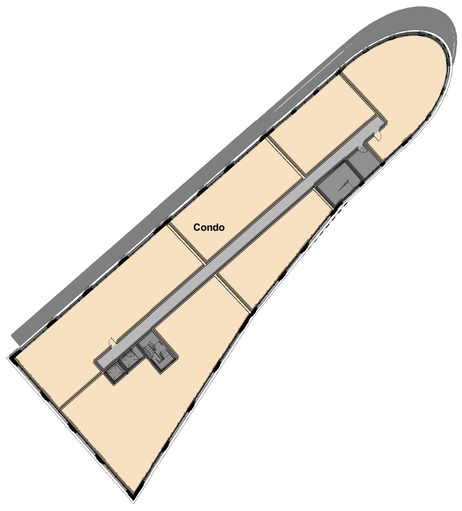


1 B3 - LEVEL 1
1/32" = 1'-0"



2 B3 - LEVEL 2-5
1/32" = 1'-0"

GROSS AREA CALCULATIONS

B3 - LEVEL 1	
Back of House	514 SF
Lobby	1,861 SF
Retail	8,829 SF
	11,203 SF
B3 - LEVEL 2	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
B3 - LEVEL 3	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
B3 - LEVEL 4	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
B3 - LEVEL 5	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
GRAND TOTAL	56,017 SF

AREA LEGEND

- OFFICE
- CONDO
- RETAIL
- PARKING
- LOBBY
- OUTDOOR SPACE
- BACK OF HOUSE

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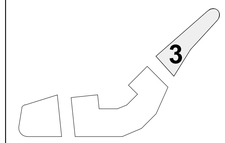

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PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

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SUBMISSIONS:

Date	Issued For:
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PROJECT NO	**4979.00**
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SHEET TITLE:

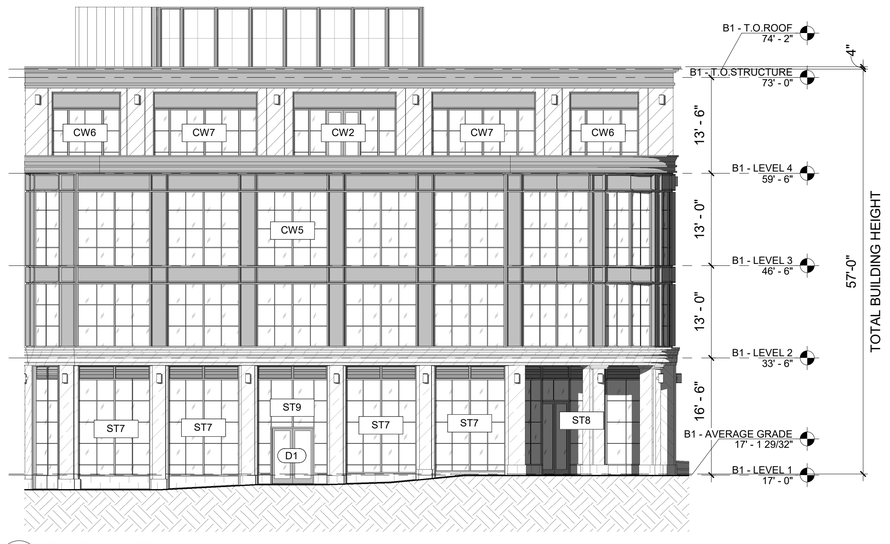
BUILDING 3 AREA PLANS

A - 103

5/23/2022 9:26:16 PM

MATERIAL LEGEND	
	BRICK
	LIMESTONE
	GRANITE
	METAL

1 B1 - East Elevation
3/32" = 1'-0"



2 B1- South Elevation
3/32" = 1'-0"

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SHEET TITLE:

BUILDING 1 ELEVATION

A - 201

MATERIAL LEGEND	
	BRICK
	LIMESTONE
	GRANITE
	METAL

1 B1-West Elevation
3/32" = 1'-0"

2 B1- North Elevation
3/32" = 1'-0"

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PROJECT:

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Russell Street, Portsmouth NH

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SHEET TITLE:

BUILDING 1 ELEVATION

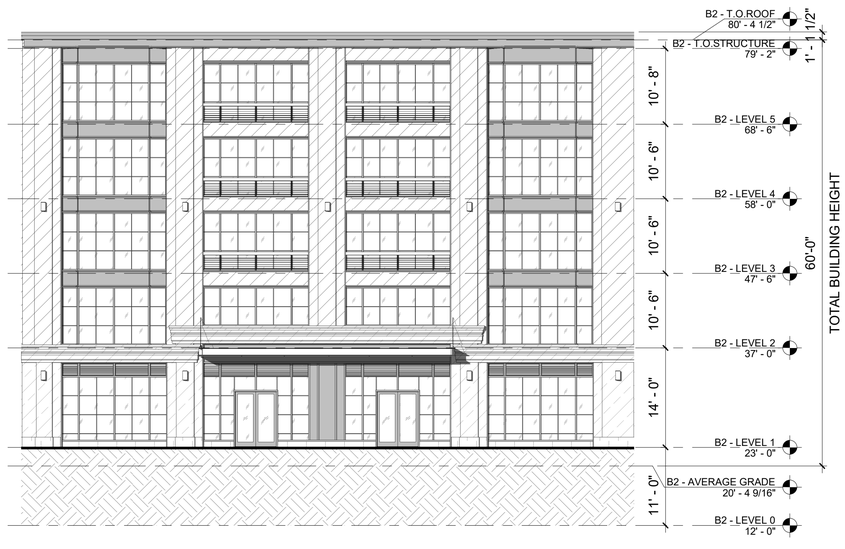
A - 202

5/23/2022 9:26:56 PM

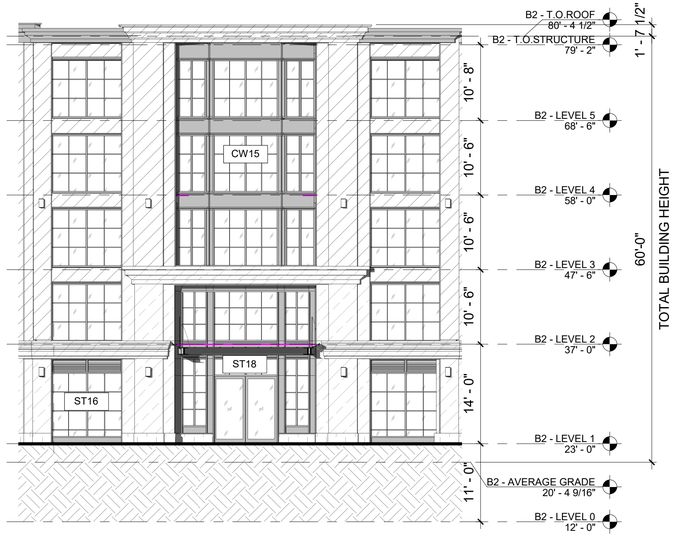
MATERIAL LEGEND

- BRICK
- LIMESTONE
- GRANITE
- METAL

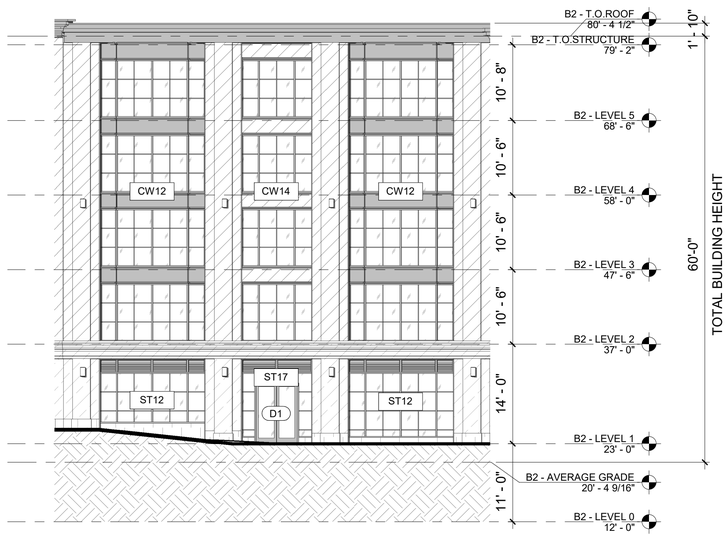
1 B2 - North Elevation
3/32" = 1'-0"



2 B2 - East Elevation 1
3/32" = 1'-0"



3 B2 - East Elevation 2
3/32" = 1'-0"



4 B2 - South-East Elevation 1
3/32" = 1'-0"

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PROJECT:

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Russell Street, Portsmouth NH

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SHEET TITLE:

BUILDING 2 ELEVATION

A - 203

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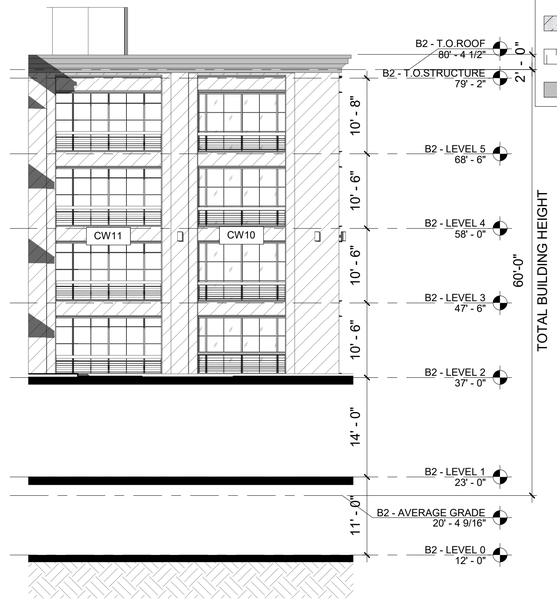
1 B2 - South-East Elevation 2
3/32" = 1'-0"

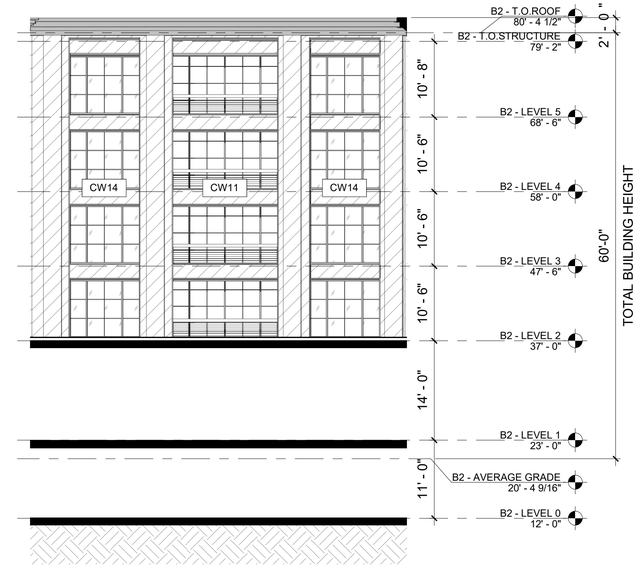


3 B2 - North Elevation 2
3/32" = 1'-0"

MATERIAL LEGEND

- BRICK
- LIMESTONE
- GRANITE
- METAL

2 B2- South Elevation
3/32" = 1'-0"



4 B2 - South-West Elevation 2
3/32" = 1'-0"

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PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

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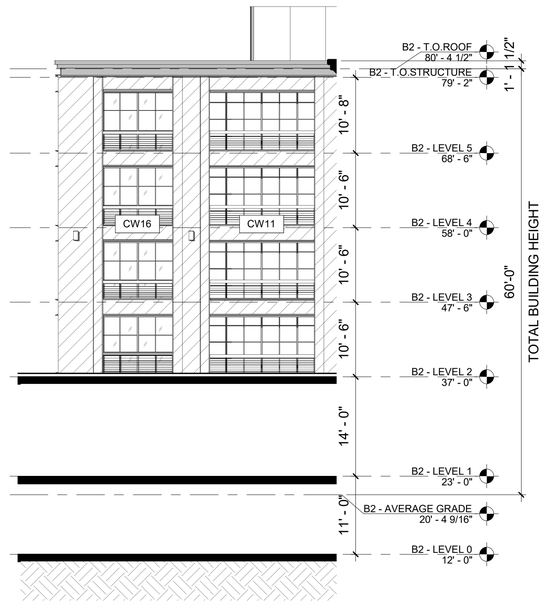
PROJECT NO	**4979.00**
DRAWN BY	**Author**
CHECKED BY	**Checker**

SHEET TITLE:

BUILDING 2 ELEVATION

A - 204

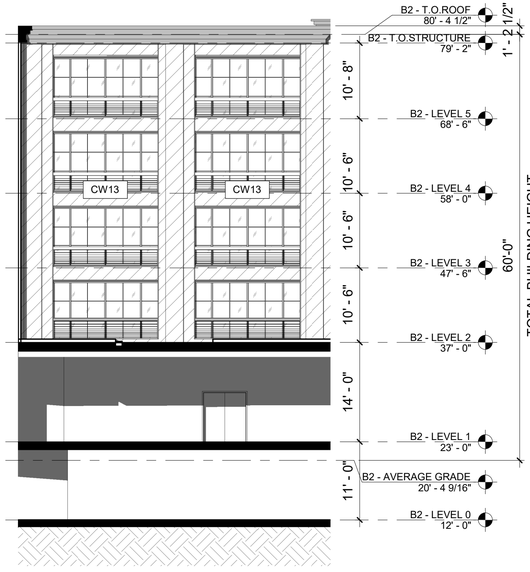
1 B2 - West Elevation 1
3/32" = 1'-0"



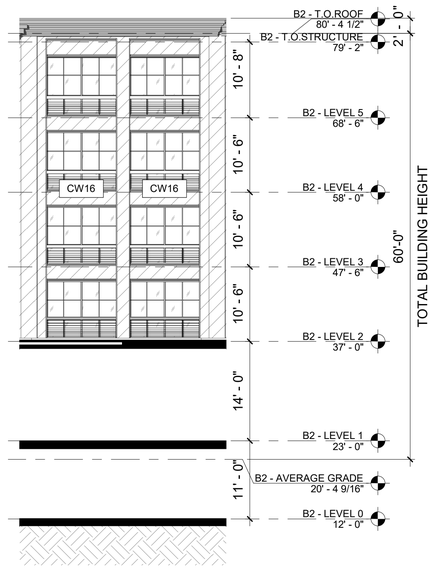
2 B2 - South Elevation 2
3/32" = 1'-0"

MATERIAL LEGEND

- BRICK
- LIMESTONE
- GRANITE
- METAL



3 B2 - West Elevation 2
3/32" = 1'-0"



4 B2 - South West Elevation 1
3/32" = 1'-0"

5 B2 - North-West Elevation
3/32" = 1'-0"

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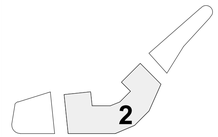
PROJECT TEAM:



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PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

No.	Date	Description

SUBMISSIONS:

Date	Issued For:
05/23/22	TAC Work Session

SCALE	**As indicated**
DATE ISSUED	**05/23/22**
PROJECT NO	**4979.00**
DRAWN BY	**Author**
CHECKED BY	**Checker**

SHEET TITLE:

BUILDING 2 ELEVATION

A - 205

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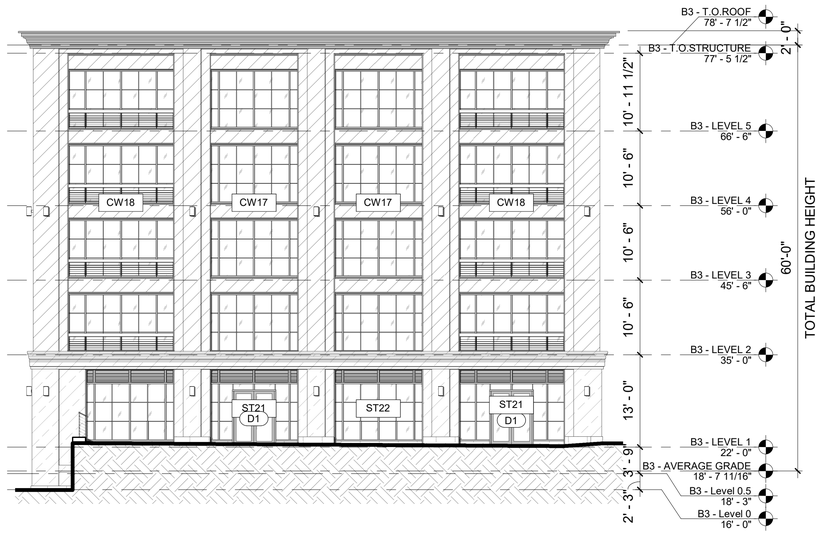
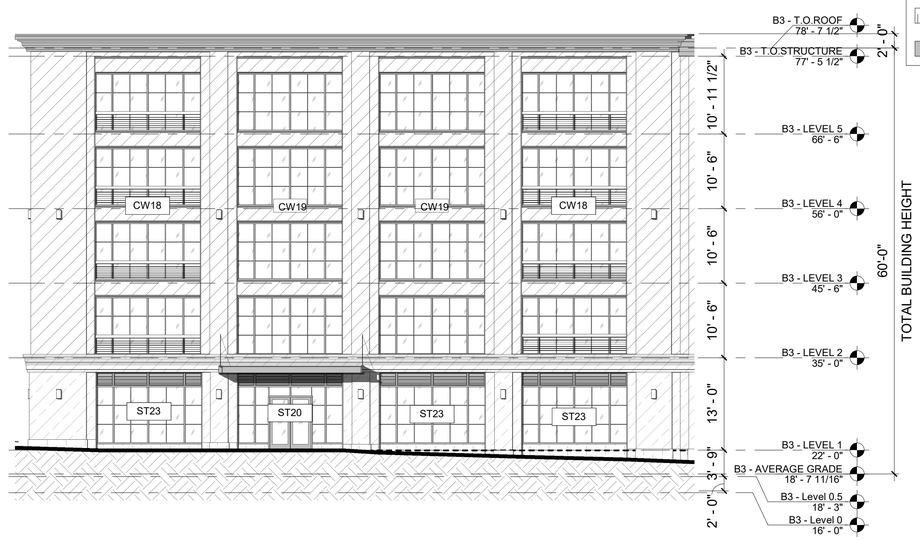


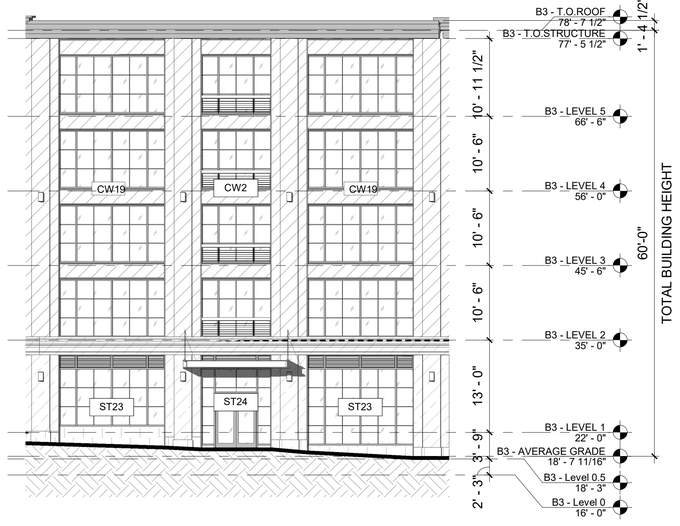
1 B3 - South Elevation
3/32" = 1'-0"



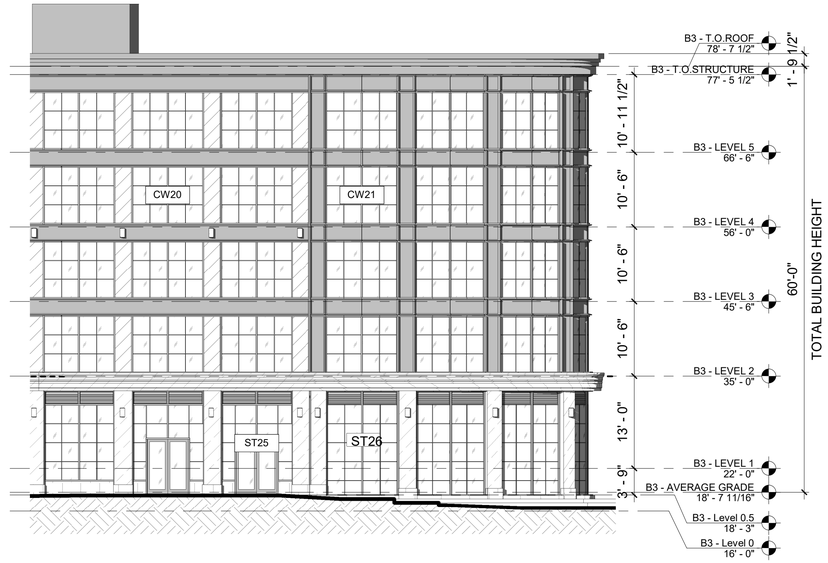
2 B3 -East Elevation 1
3/32" = 1'-0"

MATERIAL LEGEND

- BRICK
- LIMESTONE
- GRANITE
- METAL



3 B3- East Elevation 2
3/32" = 1'-0"



4 B3- East Elevation 3
3/32" = 1'-0"

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05/23/22

PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

No.	Date	Description

SUBMISSIONS:

Date	Issued For:
05/23/22	TAC Work Session

SCALE	**As indicated**
DATE ISSUED	**05/23/22**
PROJECT NO	**4979.00**
DRAWN BY	**Author**
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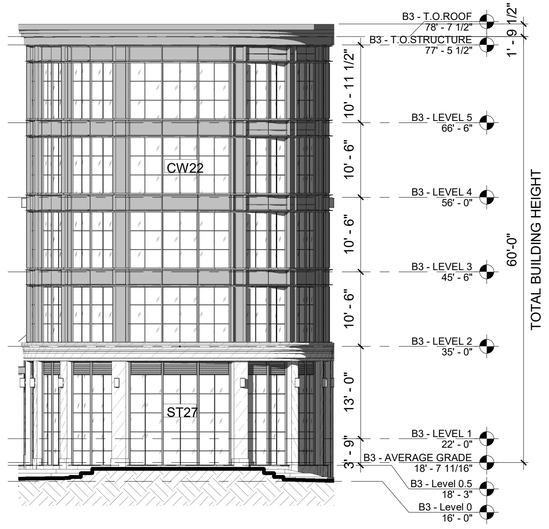
SHEET TITLE:

BUILDING 3 ELEVATION

A - 206



1 B3 - North Elevation
3/32" = 1'-0"

2 B3 -West Elevation
3/32" = 1'-0"

MATERIAL LEGEND

	BRICK
	LIMESTONE
	GRANITE
	METAL

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PROJECT TEAM:

3

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PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

No.	Date	Description

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Date	Issued For:
05/23/22	TAC Work Session

SCALE	**As indicated**
DATE ISSUED	**05/23/22**
PROJECT NO	**4979.00**
DRAWN BY	**Author**
CHECKED BY	**Checker**

SHEET TITLE:

BUILDING 3 ELEVATION

A - 207

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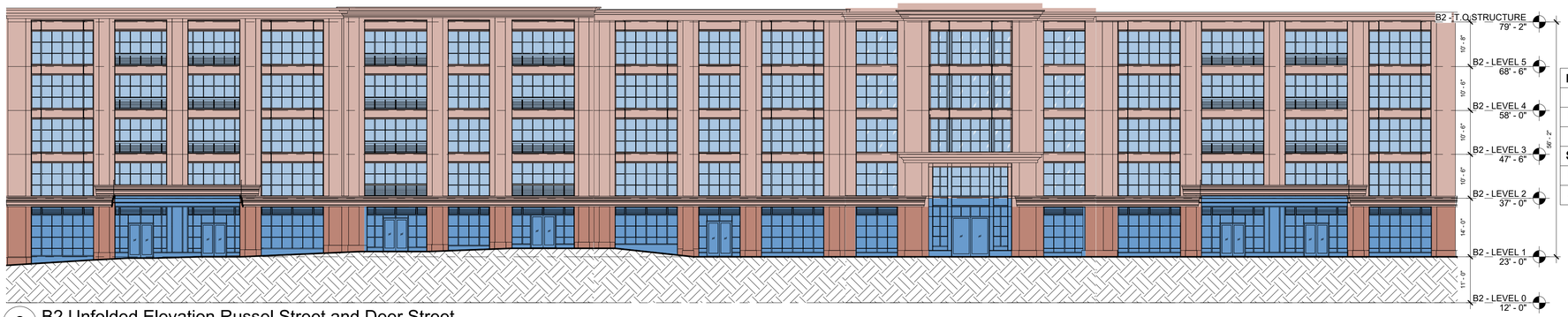
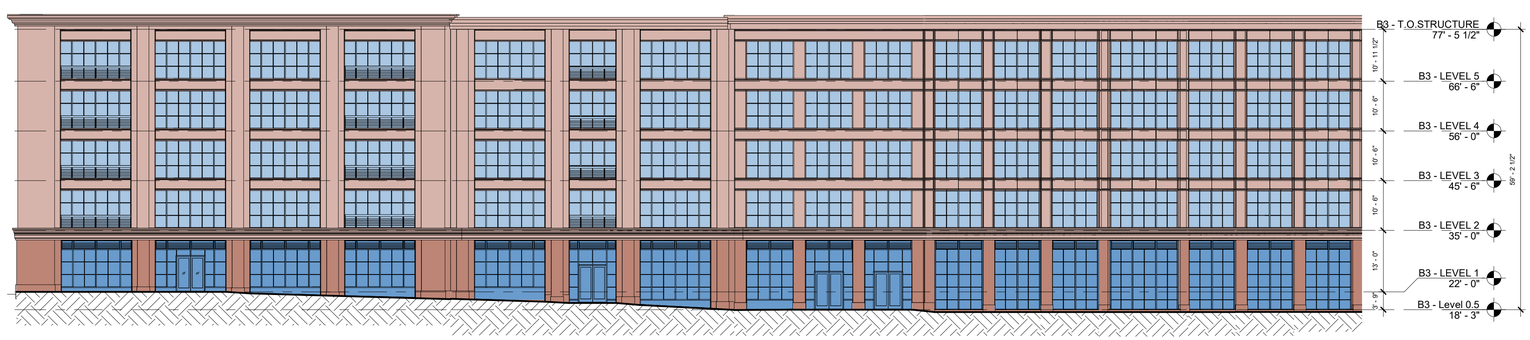
1 B1 Unfolded Elevation Deer Street And Maplewood Avenue
1/16" = 1'-0"

Facade Glazing		
Facade	Glazing	Percentage
8884.76 SF	4059.69 SF	45.69%
Shopfront Facade		
Facade	Glazing	Percentage
3228.43 SF	2411.33 SF	74.69%



2 B2 Unfolded Elevation Russel Street and Deer Street
1/16" = 1'-0"

Facade Glazing		
Facade	Glazing	Percentage
16269.4 SF	7016.41 SF	43.13%
Shopfront Facade		
Facade	Glazing	Percentage
4171.77 SF	3041.62 SF	72.91%



3 B3 Unfolded Elevation Russel Street And Green Street
1/16" = 1'-0"

Facade Glazing		
Facade	Glazing	Percentage
13590.1 SF	6313.03 SF	46.45%
Shopfront Facade		
Facade	Glazing	Percentage
3892.94 SF	2769.66 SF	71.15%

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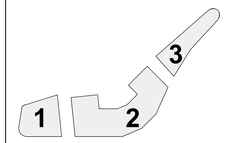
PROJECT TEAM:



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05/23/22

PROJECT:

Russell Street Mixed Use Scheme

Russell Street, Portsmouth NH

REVISIONS:

No.	Date	Description

SUBMISSIONS:

Date	Issued For:
05/23/22	TAC Work Session

SCALE	**As indicated**
DATE ISSUED	**05/23/22**
PROJECT NO	**4979.00**
DRAWN BY	**Author**
CHECKED BY	**Checker**

SHEET TITLE:

GLAZING STUDY

A - 208

Owner/Agent Letter of Authorization

This letter is to authorize Tighe & Bond, Inc. (Civil Engineer), to represent and submit on behalf of Port Harbor Land, LLC (Owner/Applicant), applications and materials in all site design and permitting matters for the proposed development project located along Deer Street and Russell Street in Portsmouth, New Hampshire on parcels of land identified as Map 118 Lot 28, Map 119 Lot 4, Map 124 Lot 12, and Map 125 Lot 21. This project includes the construction of an office building, two mixed-use residential buildings, and associated on-site and off-site improvements. This authorization shall relate to those activities that are required for local, state and federal permitting for the above project and include any required signatures for those applications.

Signature	Ryan Plummer Print Name	1-4-22 Date
Witness	J. Russell Dyke Print Name	1/4/2022 Date

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: Port Harbor Land, LLC Date Submitted: May 24, 2022

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

Site Address: 2 Russell Street & Deer Street Map: 118 119 119 124 125 Lot: 28 1-1C 4 12 21

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Enclosed	
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Building Area Plans Sheet A-101, A-102 & A-103	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Site Plan Sheet C-102	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed Cover Sheet	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Sheet C-101	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 Sheet C-101	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	Utilities Plan Sheet C-104	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☑	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☑	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Existing Conditions Plan Sheet C-101	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	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Required on all plan sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Required on all plan sheets	N/A
☑	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☑	Source and date of data displayed on the plan. **(2.5.4.2D)**	Required on all plan sheets	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Site Plan Sheets C-102, C-102.1	
☑	**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 Sheets C-102, C-102.1	
☑	**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 Sheets C-102, C-102.1	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utilities Plan Sheet C-104	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utilities Plan Sheet C-104	

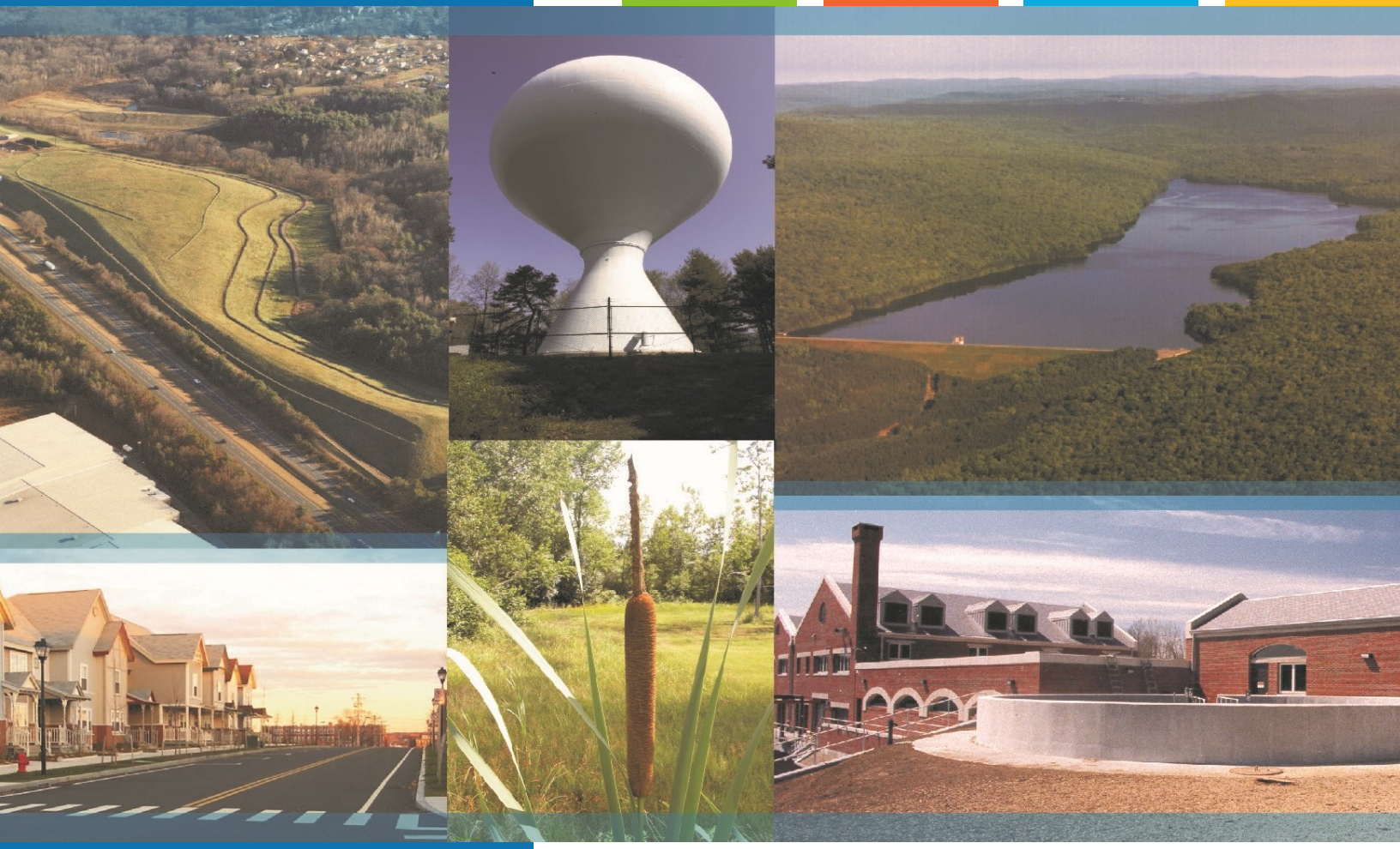
☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utilities Plan Sheet C-104	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**	Site Plan Sheet C-102.1	
	• The size, type and location of solid waste facilities.	Site Plan Sheet C-102.1	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading and Drainage Plan Sheet C-103	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plan	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Photometrics Plan	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscaping Plan Sheets L-101	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading and Drainage Plan Sheet C-103	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan Sheet C-102	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	Site Plan Sheet C-102	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plan Sheet C-103	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

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

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheets C-102 & C-102.1	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)**	Site Plan Sheets C-102 & C-102.1	N/A

Applicant's Signature: _____ **Date:** 5/24/22

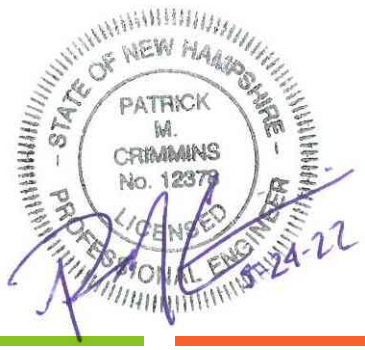


North End Mixed Use Development
Russell & Deer Street
Portsmouth, NH

Drainage Analysis

Port Harbor Land, LLC

May 24, 2022



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Appendices

A Web Soil Survey Report
B Extreme Precipitation Tables

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SECTION 1

Section 1
Project Description

The project is located at 2 Russell Street, Deer Street & 250 Market Street consisting of properties identified as Map 118 Lot 28, Map 119 Lot 1-1C & Lot 4, Map 124 Lot 12, and Map 125 Lot 21 on the City of Portsmouth Tax Maps. The properties identified as Map 118 Lot 28, Map 124 Lot 12, and Map 125 Lot 21 (proposed redevelopment parcels) are the existing parcels proposed to be redeveloped are bound by Deer Street to the south, Maplewood Avenue to the west, the railroad to the north and Russell Street to the east.

The proposed project will include the construction of three buildings consisting of office, retail/commercial, and residential uses. Building 1 is a proposed 4-story office building at the corner of Deer Street and Maplewood Avenue, Building 2 is a proposed 5-story mixed-use residential building at the corner of Deer Street and Russell Street with below ground parking, first floor residential lobby, commercial space and parking and 60 upper floor residential units, and Building 3 is a proposed 5-story mixed-use residential building along Russell Street with first floor residential lobby and commercial space and 24 upper floor residential units.

1.1 On-Site Soil Description

The proposed redevelopment parcels lots currently consist of a large surface parking lot which is mainly used by the Sheraton Hotel. There are some small patches of gravel and grass where the site abuts the railroad property and a ledge outcropping to the north.

A web soil survey was completed for the project and can be found in Appendix A of this report. Based on the soil survey, the runoff analyzed within these studies has been modeled using Hydrologic Soil Group D and Hydrologic Soil Group A soils.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed at two (2) point of analysis. While the points of analysis have remained unchanged, the contributing sub-catchment areas varied between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant. PA-1 assesses flows that discharge to a closed drainage system on Maplewood Avenue, which flows to the North Mill Pond and ultimately to the Piscataqua River. PA-2 assesses flows that discharge to a separate closed drainage system along Russell Street that ultimately discharges to the Piscataqua River.

The peak discharge rates at these points of analysis were determined by analyzing Type III, 24-hour storm events. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center at Cornell University which can be found in Appendix B.

Additionally, the site is located within a Coastal and Great Bay Community, therefore an added factor of safety of 15% was included as required by Env-Wq 1503.08(l).

1.3 Calculation Methods

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

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SECTION 2

Section 2
Pre-Development Conditions

To analyze the pre-development condition, the site has been divided into two (2) distinct points of analysis (PA-1 & PA-2). This point of analysis and watershed is depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

The point of analysis and its contributing watershed areas are described below:

Point of Analysis (PA-2)

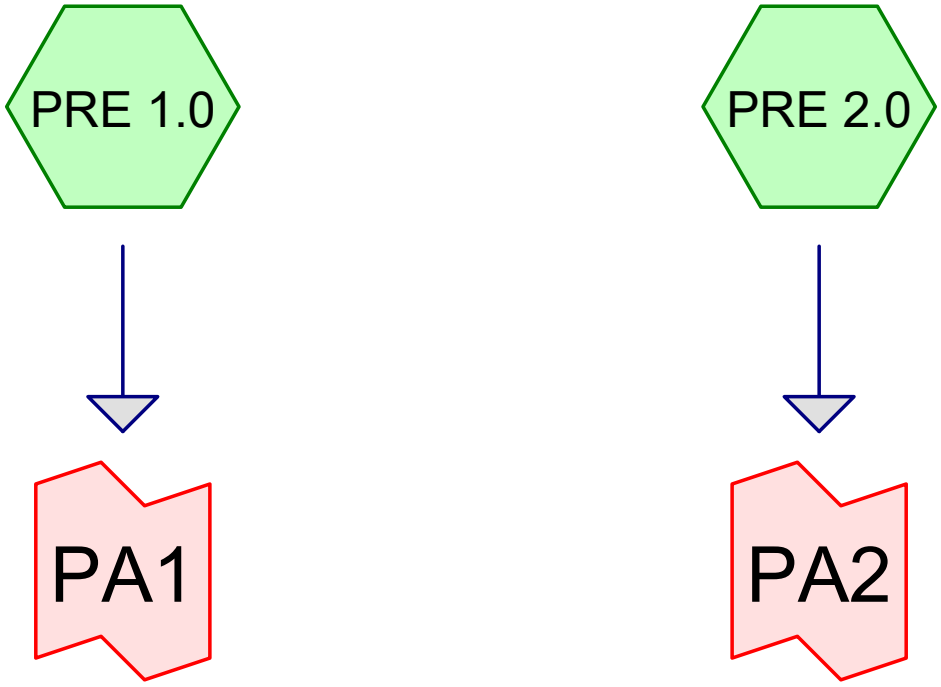
Pre-development Watershed 1.0 (PRE 1.0) is comprised of mostly impervious surfaces from the existing paved parking area, Deer Street and concrete sidewalks, with pockets of grass and gravel. Runoff from this watershed area sheets via overland flow to a gravel swale along the railroad tracks connecting to a closed drainage system along Maplewood Avenue discharge to North Mill Pond and ultimately the Piscataqua River.

Point of Analysis (PA-2)

Pre-development Watershed 2.0 (PRE 2.0) is comprised of mostly impervious surfaces including the existing Russell Street, paved parking and concrete sidewalks. Additionally, there are some small portions of Ledge and grassed landscaped areas. Runoff from this watershed area travels via overland flow to a closed drainage system along Russell Street discharge to the Piscataqua River.

2.1 Pre-Development Calculations

2.2 Pre-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for T-5037-002 PRE
Prepared by Tighe & Bond, Printed 5/24/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
9,627	39	>75% Grass cover, Good, HSG A (PRE 1.0, PRE 2.0)
10,377	80	>75% Grass cover, Good, HSG D (PRE 1.0, PRE 2.0)
2,104	96	Gravel surface, HSG A (PRE 1.0)
5,270	96	Gravel surface, HSG D (PRE 1.0)
3,120	98	Ledge, HSG A (PRE 1.0, PRE 2.0)
57,819	98	Unconnected pavement, HSG A (PRE 1.0, PRE 2.0)
62,647	98	Unconnected pavement, HSG D (PRE 1.0, PRE 2.0)
150,964	**93**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
72,670	HSG A	PRE 1.0, PRE 2.0
0	HSG B	
0	HSG C	
78,294	HSG D	PRE 1.0, PRE 2.0
0	Other	
150,964		**TOTAL AREA**

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

Subcatchment PRE 1.0: Runoff Area=92,563 sf 76.49% Impervious Runoff Depth>2.91"
Flow Length=587' Tc=5.0 min CN=93 Runoff=7.00 cfs 22,427 cf

Subcatchment PRE 2.0: Runoff Area=58,401 sf 90.39% Impervious Runoff Depth>2.91"
Flow Length=470' Tc=5.0 min CN=93 Runoff=4.41 cfs 14,150 cf

Link PA1: Inflow=7.00 cfs 22,427 cf
Primary=7.00 cfs 22,427 cf

Link PA2: Inflow=4.41 cfs 14,150 cf
Primary=4.41 cfs 14,150 cf

Total Runoff Area = 150,964 sf Runoff Volume = 36,577 cf Average Runoff Depth = 2.91"
18.14% Pervious = 27,378 sf 81.86% Impervious = 123,586 sf

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

Subcatchment PRE 1.0: Runoff Area=92,563 sf 76.49% Impervious Runoff Depth>4.78"
Flow Length=587' Tc=5.0 min CN=93 Runoff=11.18 cfs 36,839 cf

Subcatchment PRE 2.0: Runoff Area=58,401 sf 90.39% Impervious Runoff Depth>4.78"
Flow Length=470' Tc=5.0 min CN=93 Runoff=7.05 cfs 23,243 cf

Link PA1: Inflow=11.18 cfs 36,839 cf
Primary=11.18 cfs 36,839 cf

Link PA2: Inflow=7.05 cfs 23,243 cf
Primary=7.05 cfs 23,243 cf

Total Runoff Area = 150,964 sf Runoff Volume = 60,081 cf Average Runoff Depth = 4.78"
18.14% Pervious = 27,378 sf 81.86% Impervious = 123,586 sf

Summary for Subcatchment PRE 1.0:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 11.18 cfs @ 12.07 hrs, Volume= 36,839 cf, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

	Area (sf)	CN	Description
*	1,504	98	Ledge, HSG A
	4,951	39	>75% Grass cover, Good, HSG A
	2,104	96	Gravel surface, HSG A
	12,416	98	Unconnected pavement, HSG A
	9,441	80	>75% Grass cover, Good, HSG D
	5,270	96	Gravel surface, HSG D
	56,877	98	Unconnected pavement, HSG D
	92,563	93	Weighted Average
	21,766		23.51% Pervious Area
	70,797		76.49% Impervious Area
	69,293		97.88% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.50		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
2.5	344	0.0129	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	143	0.0053	3.30	2.59	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
3.9	587	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment PRE 2.0:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 7.05 cfs @ 12.07 hrs, Volume= 23,243 cf, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

	Area (sf)	CN	Description
*	1,616	98	Ledge, HSG A
	4,676	39	>75% Grass cover, Good, HSG A
	45,403	98	Unconnected pavement, HSG A
	936	80	>75% Grass cover, Good, HSG D
	5,770	98	Unconnected pavement, HSG D
	58,401	93	Weighted Average
	5,612		9.61% Pervious Area
	52,789		90.39% Impervious Area
	51,173		96.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0140	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.1	15	0.1670	2.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	140	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	290	0.0300	7.86	6.17	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.2	470	Total, Increased to minimum Tc = 5.0 min			

Summary for Link PA1:

Inflow Area = 92,563 sf, 76.49% Impervious, Inflow Depth > 4.78" for 10-Yr event
Inflow = 11.18 cfs @ 12.07 hrs, Volume= 36,839 cf
Primary = 11.18 cfs @ 12.07 hrs, Volume= 36,839 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA2:

Inflow Area = 58,401 sf, 90.39% Impervious, Inflow Depth > 4.78" for 10-Yr event
Inflow = 7.05 cfs @ 12.07 hrs, Volume= 23,243 cf
Primary = 7.05 cfs @ 12.07 hrs, Volume= 23,243 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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

Subcatchment PRE 1.0: Runoff Area=92,563 sf 76.49% Impervious Runoff Depth>6.25"
Flow Length=587' Tc=5.0 min CN=93 Runoff=14.40 cfs 48,190 cf

Subcatchment PRE 2.0: Runoff Area=58,401 sf 90.39% Impervious Runoff Depth>6.25"
Flow Length=470' Tc=5.0 min CN=93 Runoff=9.08 cfs 30,404 cf

Link PA1: Inflow=14.40 cfs 48,190 cf
Primary=14.40 cfs 48,190 cf

Link PA2: Inflow=9.08 cfs 30,404 cf
Primary=9.08 cfs 30,404 cf

Total Runoff Area = 150,964 sf Runoff Volume = 78,594 cf Average Runoff Depth = 6.25"
18.14% Pervious = 27,378 sf 81.86% Impervious = 123,586 sf

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

Subcatchment PRE 1.0: Runoff Area=92,563 sf 76.49% Impervious Runoff Depth>7.64"
Flow Length=587' Tc=5.0 min CN=93 Runoff=17.41 cfs 58,896 cf

Subcatchment PRE 2.0: Runoff Area=58,401 sf 90.39% Impervious Runoff Depth>7.64"
Flow Length=470' Tc=5.0 min CN=93 Runoff=10.98 cfs 37,160 cf

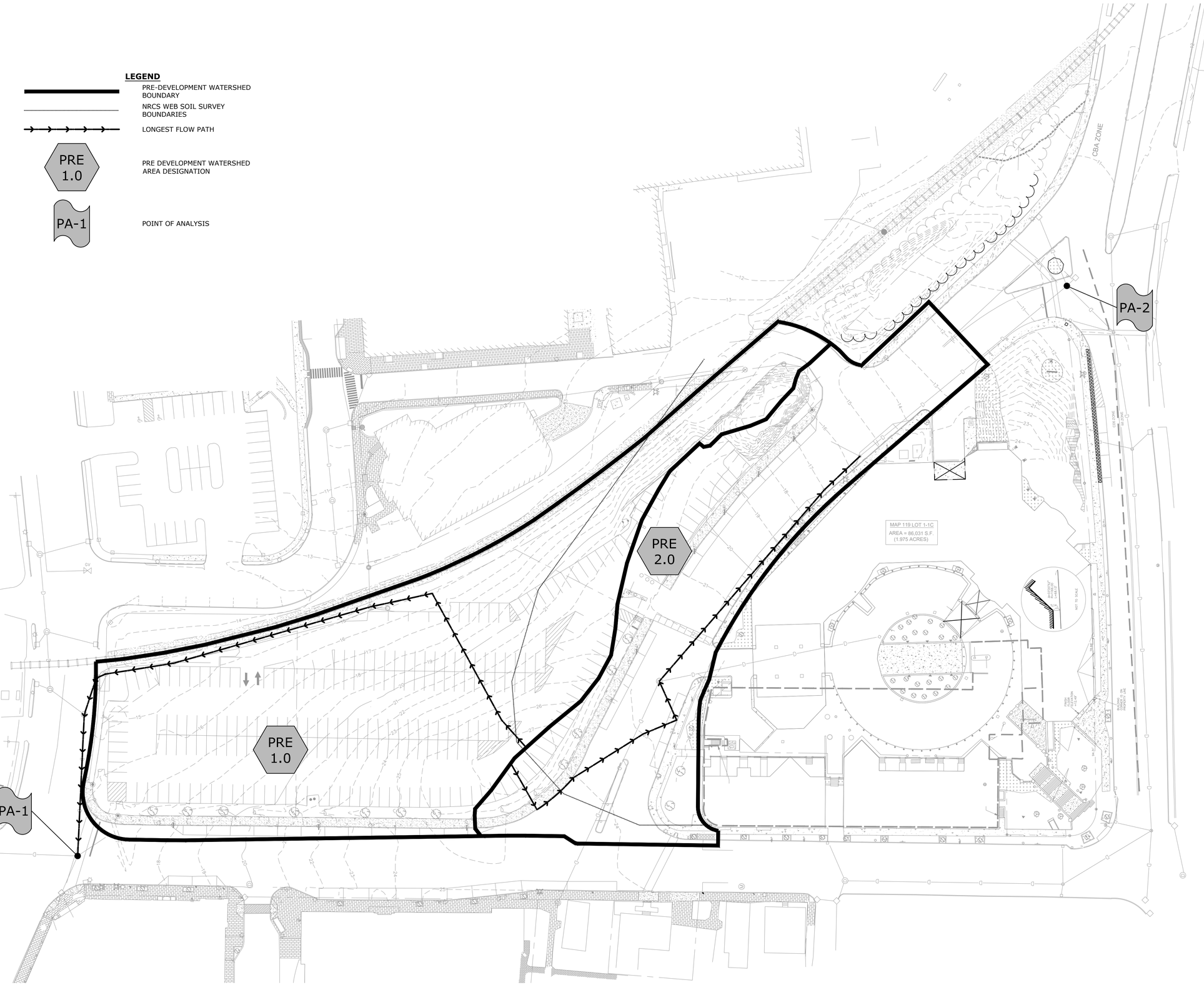
Link PA1: Inflow=17.41 cfs 58,896 cf
Primary=17.41 cfs 58,896 cf

Link PA2: Inflow=10.98 cfs 37,160 cf
Primary=10.98 cfs 37,160 cf

Total Runoff Area = 150,964 sf Runoff Volume = 96,056 cf Average Runoff Depth = 7.64"
18.14% Pervious = 27,378 sf 81.86% Impervious = 123,586 sf

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- NRCS WEB SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS



0 40' 80'

GRAPHIC SCALE

Tighe&Bond

North End Mixed Use Development

Two International Group

Russell Street & Deer Street Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-HYDRO.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Saved: 5/24/2022
Plotted: 5/24/2022 - 11:29am By: ckrzoulk
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-HYDRO.dwg

Tighe&Bond

SECTION 3

Section 3
Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into four (4) watershed areas. Stormwater runoff from these sub-catchment areas flow via subsurface drainage systems prior to discharging to the city's closed drainage system. Like the pre-development condition, flows from these sub-catchment areas are modeled at two point of analysis (PA-1 & PA-2).

An underground detention system is included on the development site for the purpose of mitigating peak flowrates. Flows greater than the 2-year storm event are designed to bypass the treatment unit.

These points of analysis and their sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802. The point of analysis and it's contributing watershed areas are described below:

Point of Analysis (PA-1)

Post-development Watershed 1.0 (POST 1.0) is comprised mostly of concrete sidewalks and seating areas along Deer Street as well as portions of gravel adjacent to the railroad tracks. Runoff from this sub-catchment travels via overland flow to the existing closed drainage system on Maplewood Avenue.

Post-development Watershed 1.1 (Post 1.1) is comprised of the majority of the development lot. This watershed contains the proposed buildings as well as the rear fire access and driveway lane. Runoff from this watershed is captured by various catch basins, yard drains and roof leaders connecting to a proposed underground detention system (Pond 1.1). The detention system discharges to the treatment unit, a Contech Jellyfish Stormwater Filter (Pond 1.2). Flows exiting the Jellyfish Filter discharge to the closed drainage system along Maplewood Avenue (PA-1).

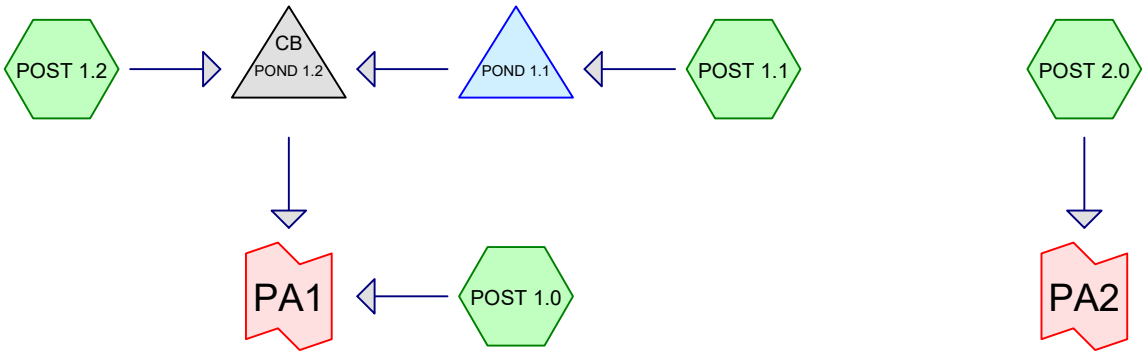
Post-development Watershed 1.2 (POST 1.2) is compromised of the mews community space area in between Buildings 1 and 2. This area is modeled as mostly impervious surface with portions of grassed landscaped areas. Runoff from this watershed is captured by various yard drains connecting to the proposed closed drainage system. This drainage system is connected to the same proposed Jelly Fish Filter (Pond 1.2), prior to discharging to the city's closed drainage system.

Point of Analysis (PA-1)

Post-development Watershed 2.0 (POST 2.0) is comprised of mostly impervious surfaces including the proposed realigned Russell Street and sidewalks adjacent to the proposed building. Additionally, there are some small portions of grassed landscaped areas along the street. Runoff from this watershed area travels via overland flow to a closed drainage system along Russell Street discharge to the Piscataqua River.

3.1 Post-Development Calculations

3.2 Post-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for T-5037-002 POST
Prepared by Tighe & Bond, Printed 5/24/2022
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
4,281	39	>75% Grass cover, Good, HSG A (POST 2.0)
3,072	80	>75% Grass cover, Good, HSG D (POST 1.0, POST 1.1, POST 1.2)
1,124	96	Gravel surface, HSG A (POST 1.0, POST 2.0)
2,825	96	Gravel surface, HSG D (POST 1.0)
46,279	98	Paved parking, HSG A (POST 1.0, POST 1.1, POST 2.0)
29,051	98	Paved parking, HSG D (POST 1.0, POST 1.1, POST 1.2, POST 2.0)
20,986	98	Roofs, HSG A (POST 1.1)
43,346	98	Unconnected roofs, HSG D (POST 1.1)
150,964	**96**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
72,670	HSG A	POST 1.0, POST 1.1, POST 2.0
0	HSG B	
0	HSG C	
78,294	HSG D	POST 1.0, POST 1.1, POST 1.2, POST 2.0
0	Other	
150,964		**TOTAL AREA**

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

Subcatchment POST 1.0: Runoff Area=20,516 sf 76.08% Impervious Runoff Depth>3.22"
Flow Length=510' Tc=5.0 min CN=96 Runoff=1.65 cfs 5,508 cf

Subcatchment POST 1.1: Runoff Area=78,514 sf 99.34% Impervious Runoff Depth>3.44"
Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=6.50 cfs 22,535 cf

Subcatchment POST 1.2: Runoff Area=3,449 sf 68.89% Impervious Runoff Depth>2.81"
Flow Length=276' Tc=5.0 min CN=92 Runoff=0.25 cfs 807 cf

Subcatchment POST 2.0: Runoff Area=48,485 sf 90.09% Impervious Runoff Depth>2.91"
Flow Length=370' Tc=5.0 min CN=93 Runoff=3.66 cfs 11,747 cf

Pond POND 1.1: Peak Elev=10.34' Storage=2,404 cf Inflow=6.50 cfs 22,535 cf
Outflow=5.22 cfs 22,324 cf

Pond POND 1.2: Peak Elev=8.34' Inflow=5.42 cfs 23,131 cf
18.0" Round Culvert n=0.013 L=13.0' S=0.0077 '/' Outflow=5.42 cfs 23,131 cf

Link PA1: Inflow=6.89 cfs 28,639 cf
Primary=6.89 cfs 28,639 cf

Link PA2: Inflow=3.66 cfs 11,747 cf
Primary=3.66 cfs 11,747 cf

Total Runoff Area = 150,964 sf Runoff Volume = 40,598 cf Average Runoff Depth = 3.23"
7.49% Pervious = 11,302 sf 92.51% Impervious = 139,662 sf

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

Subcatchment POST 1.0: Runoff Area=20,516 sf 76.08% Impervious Runoff Depth>5.12"
Flow Length=510' Tc=5.0 min CN=96 Runoff=2.56 cfs 8,748 cf

Subcatchment POST 1.1: Runoff Area=78,514 sf 99.34% Impervious Runoff Depth>5.35"
Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=9.93 cfs 35,003 cf

Subcatchment POST 1.2: Runoff Area=3,449 sf 68.89% Impervious Runoff Depth>4.66"
Flow Length=276' Tc=5.0 min CN=92 Runoff=0.41 cfs 1,341 cf

Subcatchment POST 2.0: Runoff Area=48,485 sf 90.09% Impervious Runoff Depth>4.78"
Flow Length=370' Tc=5.0 min CN=93 Runoff=5.85 cfs 19,296 cf

Pond POND 1.1: Peak Elev=10.90' Storage=3,149 cf Inflow=9.93 cfs 35,003 cf
Outflow=8.22 cfs 34,783 cf

Pond POND 1.2: Peak Elev=8.99' Inflow=8.59 cfs 36,124 cf
18.0" Round Culvert n=0.013 L=13.0' S=0.0077 '/' Outflow=8.59 cfs 36,124 cf

Link PA1: Inflow=10.95 cfs 44,872 cf
Primary=10.95 cfs 44,872 cf

Link PA2: Inflow=5.85 cfs 19,296 cf
Primary=5.85 cfs 19,296 cf

Total Runoff Area = 150,964 sf Runoff Volume = 64,388 cf Average Runoff Depth = 5.12"
7.49% Pervious = 11,302 sf 92.51% Impervious = 139,662 sf

Summary for Subcatchment POST 1.0:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.56 cfs @ 12.07 hrs, Volume= 8,748 cf, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

	Area (sf)	CN	Description
	0	98	Roofs, HSG A
	0	39	>75% Grass cover, Good, HSG A
*	600	96	Gravel surface, HSG A
	1,734	98	Paved parking, HSG A
	0	98	Unconnected roofs, HSG D
	1,482	80	>75% Grass cover, Good, HSG D
*	2,825	96	Gravel surface, HSG D
	13,875	98	Paved parking, HSG D
	20,516	96	Weighted Average
	4,907		23.92% Pervious Area
	15,609		76.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	92	0.0385	1.89		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.9	418	0.0240	8.15	10.01	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	510	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 1.1:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 9.93 cfs @ 12.07 hrs, Volume= 35,003 cf, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

	Area (sf)	CN	Description
	20,986	98	Roofs, HSG A
	0	39	>75% Grass cover, Good, HSG A
*	0	96	Gravel surface, HSG A
	2,482	98	Paved parking, HSG A
	43,346	98	Unconnected roofs, HSG D
	517	80	>75% Grass cover, Good, HSG D
*	0	96	Gravel surface, HSG D
	11,183	98	Paved parking, HSG D
	78,514	98	Weighted Average
	517		0.66% Pervious Area
	77,997		99.34% Impervious Area
	43,346		55.57% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.7	58	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.7	158	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 1.2:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.41 cfs @ 12.07 hrs, Volume= 1,341 cf, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

	Area (sf)	CN	Description
	0	98	Roofs, HSG A
	0	39	>75% Grass cover, Good, HSG A
*	0	96	Gravel surface, HSG A
	0	98	Paved parking, HSG A
	0	98	Unconnected roofs, HSG D
	1,073	80	>75% Grass cover, Good, HSG D
*	0	96	Gravel surface, HSG D
	2,376	98	Paved parking, HSG D
	3,449	92	Weighted Average
	1,073		31.11% Pervious Area
	2,376		68.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	25	0.0500	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.1	15	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	236	0.0200	7.44	9.14	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	276	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment POST 2.0:

[49] Hint: Tc<2dt may require smaller dt

Runoff = 5.85 cfs @ 12.07 hrs, Volume= 19,296 cf, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.59"

	Area (sf)	CN	Description
	0	98	Roofs, HSG A
	4,281	39	>75% Grass cover, Good, HSG A
*	524	96	Gravel surface, HSG A
	42,063	98	Paved parking, HSG A
	0	98	Unconnected roofs, HSG D
	0	80	>75% Grass cover, Good, HSG D
*	0	96	Gravel surface, HSG D
	1,617	98	Paved parking, HSG D
	48,485	93	Weighted Average
	4,805		9.91% Pervious Area
	43,680		90.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0200	1.14		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.3	40	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	302	0.0300	7.86	6.17	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.3	370	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond POND 1.1:

Inflow Area = 78,514 sf, 99.34% Impervious, Inflow Depth > 5.35" for 10-Yr event
Inflow = 9.93 cfs @ 12.07 hrs, Volume= 35,003 cf
Outflow = 8.22 cfs @ 12.12 hrs, Volume= 34,783 cf, Atten= 17%, Lag= 2.9 min
Primary = 8.22 cfs @ 12.12 hrs, Volume= 34,783 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 10.90' @ 12.13 hrs Surf.Area= 2,120 sf Storage= 3,149 cf
Flood Elev= 12.15' Surf.Area= 2,120 sf Storage= 4,566 cf

Plug-Flow detention time= 12.9 min calculated for 34,783 cf (99% of inflow)
Center-of-Mass det. time= 8.7 min (753.7 - 745.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	7.65'	0 cf	**14.04'W x 89.00'L x 5.50'H Field A** 6,874 cf Overall - 2,705 cf Embedded = 4,169 cf x 0.0% Voids
#2A	8.15'	2,258 cf	**ADS N-12 48"** x 8 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf 2 Rows of 4 Chambers 11.04' Header x 12.40 sf x 2 = 273.8 cf Inside
#3B	7.65'	1,190 cf	**14.04'W x 62.00'L x 5.50'H Field B** 4,788 cf Overall - 1,814 cf Embedded = 2,975 cf x 40.0% Voids
#4B	8.15'	1,514 cf	**ADS N-12 48"** x 4 Inside #3 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.86 sf x 20.00'L = 297.1 cf Row Length Adjustment= +10.00' x 12.40 sf x 2 rows 11.04' Header x 12.40 sf x 2 = 273.8 cf Inside
		4,962 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.15'	**18.0" Round Culvert** L= 27.0' Ke= 0.500 Inlet / Outlet Invert= 8.15' / 8.00' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	8.15'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	9.80'	**22.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	11.10'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 Width (feet) 4.00 4.00

Primary OutFlow Max=7.95 cfs @ 12.12 hrs HW=10.87' TW=8.95' (Dynamic Tailwater)
└─**1=Culvert** (Passes 7.95 cfs of 11.75 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.95 cfs @ 6.68 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 5.00 cfs @ 4.09 fps)
  └─**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond POND 1.2:

Inflow Area = 81,963 sf, 98.06% Impervious, Inflow Depth > 5.29" for 10-Yr event
Inflow = 8.59 cfs @ 12.12 hrs, Volume= 36,124 cf
Outflow = 8.59 cfs @ 12.12 hrs, Volume= 36,124 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.59 cfs @ 12.12 hrs, Volume= 36,124 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.99' @ 12.11 hrs
Flood Elev= 20.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	6.95'	**18.0" Round Culvert** L= 13.0' Ke= 0.500 Inlet / Outlet Invert= 6.95' / 6.85' S= 0.0077 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=8.34 cfs @ 12.12 hrs HW=8.95' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 8.34 cfs @ 4.72 fps)

Summary for Link PA1:

Inflow Area = 102,479 sf, 93.66% Impervious, Inflow Depth > 5.25" for 10-Yr event
Inflow = 10.95 cfs @ 12.10 hrs, Volume= 44,872 cf
Primary = 10.95 cfs @ 12.10 hrs, Volume= 44,872 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA2:

Inflow Area = 48,485 sf, 90.09% Impervious, Inflow Depth > 4.78" for 10-Yr event
Inflow = 5.85 cfs @ 12.07 hrs, Volume= 19,296 cf
Primary = 5.85 cfs @ 12.07 hrs, Volume= 19,296 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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

Subcatchment POST 1.0: Runoff Area=20,516 sf 76.08% Impervious Runoff Depth>6.60"
Flow Length=510' Tc=5.0 min CN=96 Runoff=3.26 cfs 11,284 cf

Subcatchment POST 1.1: Runoff Area=78,514 sf 99.34% Impervious Runoff Depth>6.84"
Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=12.60 cfs 44,738 cf

Subcatchment POST 1.2: Runoff Area=3,449 sf 68.89% Impervious Runoff Depth>6.13"
Flow Length=276' Tc=5.0 min CN=92 Runoff=0.53 cfs 1,762 cf

Subcatchment POST 2.0: Runoff Area=48,485 sf 90.09% Impervious Runoff Depth>6.25"
Flow Length=370' Tc=5.0 min CN=93 Runoff=7.54 cfs 25,242 cf

Pond POND 1.1: Peak Elev=11.33' Storage=3,705 cf Inflow=12.60 cfs 44,738 cf
Outflow=10.77 cfs 44,512 cf

Pond POND 1.2: Peak Elev=9.44' Inflow=11.24 cfs 46,274 cf
18.0" Round Culvert n=0.013 L=13.0' S=0.0077 '/' Outflow=11.24 cfs 46,274 cf

Link PA1: Inflow=14.24 cfs 57,559 cf
Primary=14.24 cfs 57,559 cf

Link PA2: Inflow=7.54 cfs 25,242 cf
Primary=7.54 cfs 25,242 cf

Total Runoff Area = 150,964 sf Runoff Volume = 83,026 cf Average Runoff Depth = 6.60"
7.49% Pervious = 11,302 sf 92.51% Impervious = 139,662 sf

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

Subcatchment POST 1.0: Runoff Area=20,516 sf 76.08% Impervious Runoff Depth>8.00"
Flow Length=510' Tc=5.0 min CN=96 Runoff=3.92 cfs 13,670 cf

Subcatchment POST 1.1: Runoff Area=78,514 sf 99.34% Impervious Runoff Depth>8.24"
Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=15.11 cfs 53,888 cf

Subcatchment POST 1.2: Runoff Area=3,449 sf 68.89% Impervious Runoff Depth>7.52"
Flow Length=276' Tc=5.0 min CN=92 Runoff=0.64 cfs 2,160 cf

Subcatchment POST 2.0: Runoff Area=48,485 sf 90.09% Impervious Runoff Depth>7.64"
Flow Length=370' Tc=5.0 min CN=93 Runoff=9.12 cfs 30,850 cf

Pond POND 1.1: Peak Elev=11.81' Storage=4,249 cf Inflow=15.11 cfs 53,888 cf
Outflow=12.96 cfs 53,657 cf

Pond POND 1.2: Peak Elev=10.24' Inflow=13.57 cfs 55,817 cf
18.0" Round Culvert n=0.013 L=13.0' S=0.0077 '/' Outflow=13.57 cfs 55,817 cf

Link PA1: Inflow=17.31 cfs 69,488 cf
Primary=17.31 cfs 69,488 cf

Link PA2: Inflow=9.12 cfs 30,850 cf
Primary=9.12 cfs 30,850 cf

Total Runoff Area = 150,964 sf Runoff Volume = 100,568 cf Average Runoff Depth = 7.99"
7.49% Pervious = 11,302 sf 92.51% Impervious = 139,662 sf

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- NRCS WEB SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

POST 1.0
POST 2.0
POST 1.1
POST 1.2
POST POND 1.1
POST POND 1.2
PA-1
PA-2

MARKET STREET (IMPROVEMENTS BY OTHERS)
RUSSEL STREET (IMPROVEMENTS BY OTHERS)

MAP 119 LOT 1-1C
AREA = 86,031 S.F. (1.975 ACRES)

CBA ZONE

TRAFFIC SIGNAL

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

North End Mixed Use Development

Two International Group

Russell Street & Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A		

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-HYDRO.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Saved: 5/24/2022
Plotted On: May 24, 2022 - 11:30am By: dkrzcuk
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-HYDRO.dwg

Tighe&Bond

SECTION 4

Section 4
Peak Rate Comparison

The following table summarizes and compares the pre- and post-development peak runoff rates from the 2-year, 10-year, 25-year and 50-year storm events at the point of analysis.

Table 4.1
Comparison of Pre- and Post-Development Flows (CFS)

	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed				
PA-1	7.00	11.18	14.40	17.41
PA-2	4.41	7.05	9.08	10.98
Post-Development Watershed				
PA-1	6.89	10.95	14.24	17.31
PA-2	3.66	5.85	7.54	9.12

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SECTION 5

Section 5
Mitigation Description

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and NHDES AoT Regulations (Env-Wq 1500).

5.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consist of deep sump catch basins.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated by a Contech Jellyfish stormwater filtration system. This Jellyfish system is sized to treat the Water Quality Flows of its subcatchment areas. The system is outfitted with an internal bypass that diverts peak flows away from treatment. The BMP worksheet for this treatment practice has been included in Section 6 of this report.

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment[1]	91%	53%	61%

1. Pollutant removal calculations for Jellyfish Filter with deep sump catchbasin pretreatment shown in Table 4.2.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

Table 5.2 – Pollutant Removal Calculations				
Contech Jellyfish Filter				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood[1]	0.15	1.00	0.15	0.85
Jellyfish Filter[2]	0.89	0.85	0.76	0.09
	Total Suspended Solids Removed:			**91%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.51	0.95	0.48	0.47
	Total Nitrogen Removed:			**53%**
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.59	0.95	0.56	0.39
	Total Phosphorus Removed:			**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E.
2. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment performance testing results.

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SECTION 6

Section 6
BMP Worksheet

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)

1.88	ac	A = Area draining to the practice
1.85	ac	A_I = Impervious area draining to the practice
0.98	decimal	I = percent impervious area draining to the practice, in decimal form
0.94	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.76	ac-in	WQV= 1" x Rv x A
6,385	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".
0.94	inches	Q = water quality depth. Q = WQV/A
99	unitless	CN = unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.1	inches	S = potential maximum retention. S = (1000/CN) - 10
0.011	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
640.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
1.759	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: JELLYFISH FILTER

Pretreatment: Offline Deep Sump Catch Basins

Treatment: (1) Contech Jellyfish Model JF0806-9-2- design cpacity of 1.78 cfs

Treatment structures located post-detention

APPENDIX A

Soil Map—Rockingham County, New Hampshire
(Russel Street Development)

Map Scale: 1:1,560 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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
699	Urban land	3.2	62.5%
799	Urban land-Canton complex, 3 to 15 percent slopes	1.9	37.5%
Totals for Area of Interest		**5.2**	**100.0%**

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	70.761 degrees West
Latitude	43.079 degrees North
Elevation	0 feet
Date/Time	Thu, 10 Mar 2022 09:15:04 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.65	2.92	**1yr**	2.35	2.81	3.22	3.94	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.48	3.20	3.57	**2yr**	2.84	3.43	3.93	4.67	5.32	**2yr**
5yr	0.37	0.58	0.73	0.97	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.06	4.57	**5yr**	3.59	4.40	5.03	5.93	6.69	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.72	2.23	2.89	3.74	4.86	5.52	**10yr**	4.30	5.31	6.07	7.09	7.96	**10yr**
25yr	0.48	0.76	0.97	1.33	1.77	2.33	**25yr**	1.53	2.14	2.77	3.62	4.73	6.16	7.09	**25yr**	5.45	6.81	7.78	9.00	10.03	**25yr**
50yr	0.53	0.86	1.10	1.53	2.07	2.75	**50yr**	1.78	2.52	3.28	4.31	5.65	7.37	8.57	**50yr**	6.53	8.24	9.40	10.79	11.95	**50yr**
100yr	0.59	0.96	1.24	1.76	2.41	3.25	**100yr**	2.08	2.97	3.90	5.15	6.75	8.83	10.36	**100yr**	7.82	9.96	11.35	12.93	14.24	**100yr**
200yr	0.67	1.10	1.42	2.04	2.82	3.82	**200yr**	2.43	3.51	4.60	6.11	8.06	10.58	12.52	**200yr**	9.37	12.04	13.71	15.50	16.98	**200yr**
500yr	0.80	1.31	1.71	2.48	3.47	4.75	**500yr**	2.99	4.37	5.75	7.68	10.19	13.45	16.11	**500yr**	11.90	15.49	17.61	19.72	21.44	**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	0.88	**1yr**	0.63	0.86	0.92	1.33	1.68	2.23	2.48	**1yr**	1.97	2.39	2.86	3.18	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.45	**2yr**	2.70	3.31	3.82	4.54	5.07	**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	3.78	4.18	**5yr**	3.34	4.02	4.71	5.52	6.23	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.80	2.39	3.06	4.36	4.85	**10yr**	3.86	4.66	5.42	6.39	7.17	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.76	3.54	4.70	5.87	**25yr**	4.16	5.64	6.62	7.76	8.65	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.34	3.07	3.93	5.31	6.77	**50yr**	4.70	6.51	7.68	9.00	9.98	**50yr**
100yr	0.53	0.81	1.01	1.46	2.00	2.47	**100yr**	1.73	2.41	2.62	3.42	4.35	5.96	7.81	**100yr**	5.28	7.51	8.92	10.45	11.52	**100yr**
200yr	0.59	0.89	1.12	1.63	2.27	2.81	**200yr**	1.96	2.75	2.93	3.79	4.79	6.68	9.01	**200yr**	5.91	8.66	10.34	12.15	13.31	**200yr**
500yr	0.68	1.02	1.31	1.90	2.70	3.36	**500yr**	2.33	3.28	3.41	4.32	5.46	7.76	10.87	**500yr**	6.87	10.45	12.58	14.86	16.11	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.98	3.16	**1yr**	2.64	3.04	3.58	4.37	5.04	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.52	3.42	3.70	**2yr**	3.03	3.56	4.08	4.83	5.62	**2yr**
5yr	0.40	0.62	0.76	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.33	4.96	**5yr**	3.84	4.77	5.37	6.37	7.15	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.11	3.95	5.33	6.20	**10yr**	4.72	5.96	6.82	7.83	8.74	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.57	**25yr**	1.76	2.51	2.95	4.07	5.15	7.77	8.34	**25yr**	6.88	8.02	9.15	10.33	11.40	**25yr**
50yr	0.67	1.02	1.27	1.82	2.46	3.12	**50yr**	2.12	3.05	3.59	5.00	6.32	9.73	10.46	**50yr**	8.62	10.06	11.45	12.71	13.95	**50yr**
100yr	0.79	1.19	1.49	2.15	2.95	3.80	**100yr**	2.55	3.72	4.37	6.15	7.76	12.18	13.11	**100yr**	10.78	12.61	14.32	15.68	17.08	**100yr**
200yr	0.92	1.39	1.76	2.54	3.55	4.64	**200yr**	3.06	4.54	5.33	7.58	9.53	15.29	16.45	**200yr**	13.53	15.82	17.94	19.34	20.91	**200yr**
500yr	1.14	1.70	2.19	3.18	4.52	6.02	**500yr**	3.90	5.89	6.92	10.01	12.54	20.67	22.22	**500yr**	18.29	21.37	24.18	25.50	27.33	**500yr**

Powered by ACIS Northeast Regional Climate Center

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
1 Year	2.65	3.05
2 Year	3.20	3.68
10 Year	4.86	5.59
25 Year	6.16	7.08
50 Year	7.37	8.48

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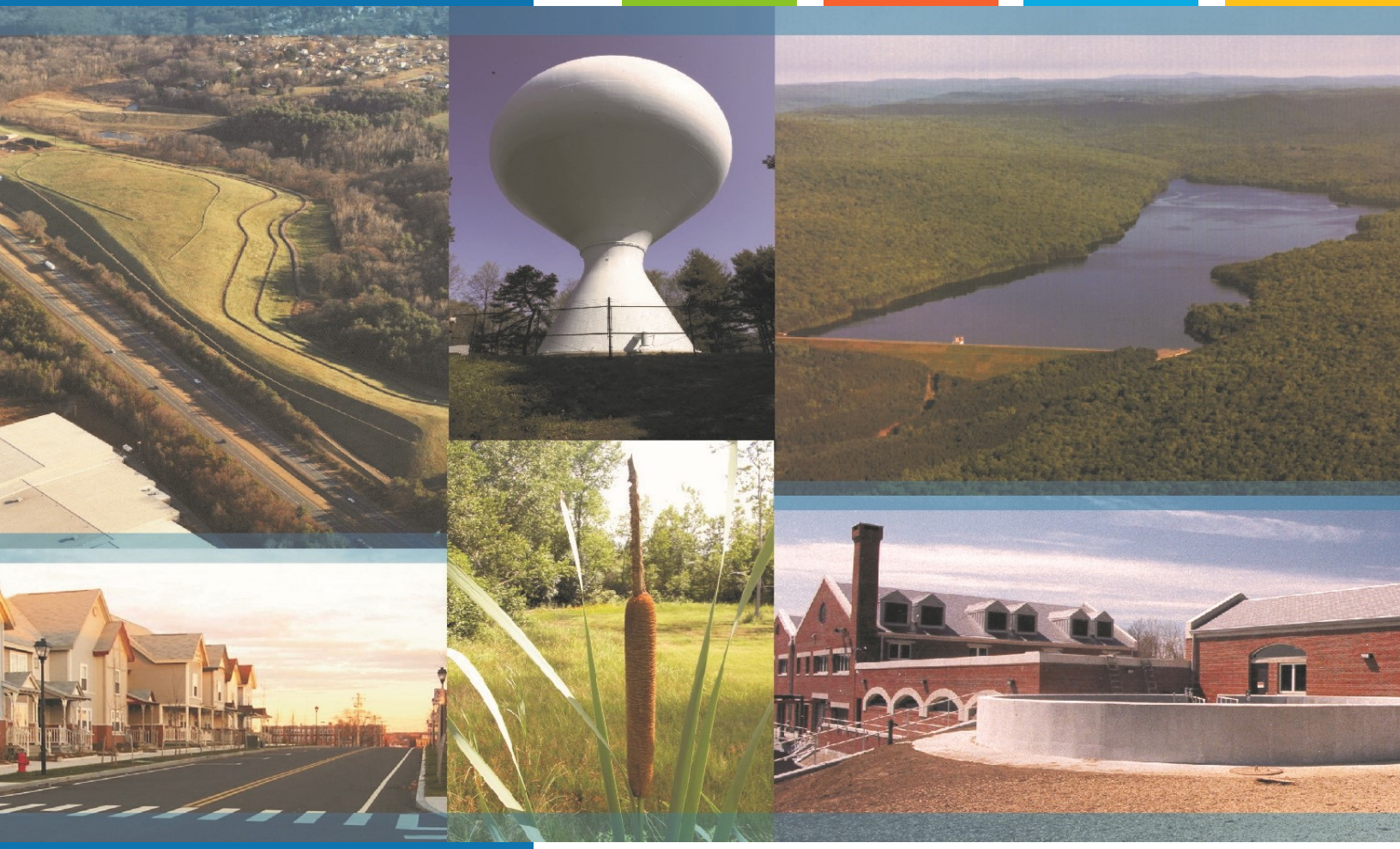

North End Mixed Use Development
Russell Street & Deer Street
Portsmouth, NH

Long-Term Operation & Maintenance Plan

Two International Group

May 24, 2022

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Section 1 Long-Term Operation & Maintenance Plan

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Section 1
Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

Port Harbor Land, LLC
1000 Market Street, 3rd Floor
Portsmouth, NH 03801

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Underground Detention System
- Contech Jellyfish Filtration System

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Contech Jelly Fish Units	In accordance with Manufacturer's Recommendations (See section 1.5)
Underground Detention Basin - Visual observation of sediment levels within system	Bi-Annually (See Section 1.4)

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.4 Underground Detention System Maintenance Requirements

Underground Detention System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catchbasins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed

1.5 Contech Jellyfish Filter System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Inspect vault for sediment build up, static water, plugged media and bypass condition	Quarterly during the first year of operation, Minimum of annually in subsequent years	- See section 4 & 5 of Jellyfish Filter Owner's Manual
Replace Cartridges	As required by inspection, 1–5 years.	- See section 6 & 7 of Jellyfish Filter Owner's Manual

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter
Owner's Manual

Jellyfish® Filter

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THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project's stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

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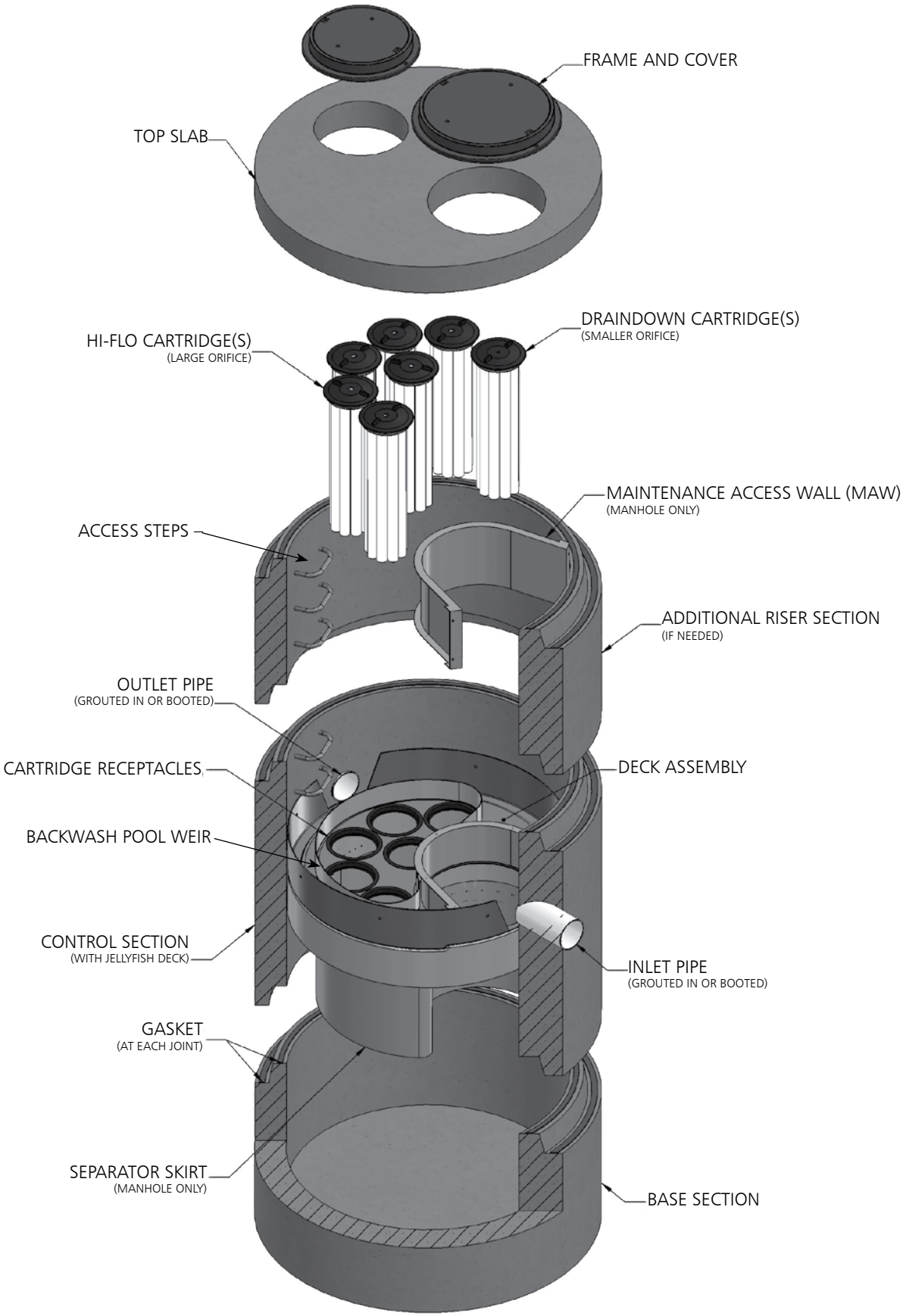
www.ContechES.com
info@conteches.com


FRAME AND COVER
TOP SLAB
DRAINDOWN CARTRIDGE(S)
(SMALLER ORIFICE)
HI-FLO CARTRIDGE(S)
(LARGE ORIFICE)
MAINTENANCE ACCESS WALL (MAW)
(MANHOLE ONLY)
ACCESS STEPS
ADDITIONAL RISER SECTION
(IF NEEDED)
OUTLET PIPE
(GROUTED IN OR BOOTED)
CARTRIDGE RECEPTACLES
DECK ASSEMBLY
BACKWASH POOL WEIR
CONTROL SECTION
(WITH JELLYFISH DECK)
INLET PIPE
(GROUTED IN OR BOOTED)
GASKET
(AT EACH JOINT)
SEPARATOR SKIRT
(MANHOLE ONLY)
BASE SECTION

WARNINGS / CAUTION

1. FALL PROTECTION may be required.
2. WATCH YOUR STEP if standing on the Jellyfish Filter Deck at any time; Great care and safety must be taken while walking or maneuvering on the Jellyfish Filter Deck. Attentive care must be taken while standing on the Jellyfish Filter Deck at all times to prevent stepping onto a lid, into or through a cartridge hole or slipping on the deck.
3. The Jellyfish Filter Deck can be SLIPPERY WHEN WET.
4. If the Top Slab, Covers or Hatches have not yet been installed, or are removed for any reason, great care must be taken to NOT DROP ANYTHING ONTO THE JELLYFISH FILTER DECK. The Jellyfish Filter Deck and Cartridge Receptacle Rings can be damaged under high impact loads. This type of activity voids all warranties. All damaged items to be replaced at owner's expense.
5. Maximum deck load 2 persons, total weight 450 lbs.

Safety Notice

Jobsite safety is a topic and practice addressed comprehensively by others. The inclusions here are intended to be reminders to whole areas of Safety Practice that are the responsibility of the Owner(s), Manager(s) and Contractor(s). OSHA and Canadian OSH, and Federal, State/Provincial, and Local Jurisdiction Safety Standards apply on any given site or project. The knowledge and applicability of those responsibilities is the Contractor's responsibility and outside the scope of Contech Engineered Solutions.

Confined Space Entry

Secure all equipment and perform all training to meet applicable local and OSHA regulations regarding confined space entry. It is the Contractor's or entry personnel's responsibility to proceed safely at all times.

Personal Safety Equipment

Contractor is responsible to provide and wear appropriate personal protection equipment as needed including, but not limited to safety boots, hard hat, reflective vest, protective eyewear, gloves and fall protection equipment as necessary. Make sure all equipment is staffed with trained and/or certified personnel, and all equipment is checked for proper operation and safety features prior to use.

- Fall protection equipment
- Eye protection
- Safety boots
- Ear protection
- Gloves
- Ventilation and respiratory protection
- Hard hat
- Maintenance and protection of traffic plan

Chapter 1

1.0 – Owner Specific Jellyfish Filter Product Information

Below you will find a reference page that can be filled out according to your Jellyfish Filter specification to help you easily inspect, maintain and order parts for your system.

Owner Name:	
Phone Number:	
Site Address:	
Site GPS Coordinates/unit location:	
Unit Location Description:	
Jellyfish Filter Model No.:	
Contech Project & Sequence Number	
No. of Hi-Flo Cartridges	
No. of Cartridges:	
Length of Draindown Cartridges:	
No. of Blank Cartridge Lids:	
Bypass Configuration (Online/Offline):	

Notes:

_____

_____

_____

_____

Chapter 2

2.0 – Jellyfish Filter System Operations and Functions

The Jellyfish Filter is an engineered stormwater quality treatment technology that removes a high level and wide variety of stormwater pollutants. Each Jellyfish Filter cartridge consists of eleven membrane - encased filter elements ("filtration tentacles") attached to a cartridge head plate. The filtration tentacles provide a large filtration surface area, resulting in high flow and high pollutant removal capacity.

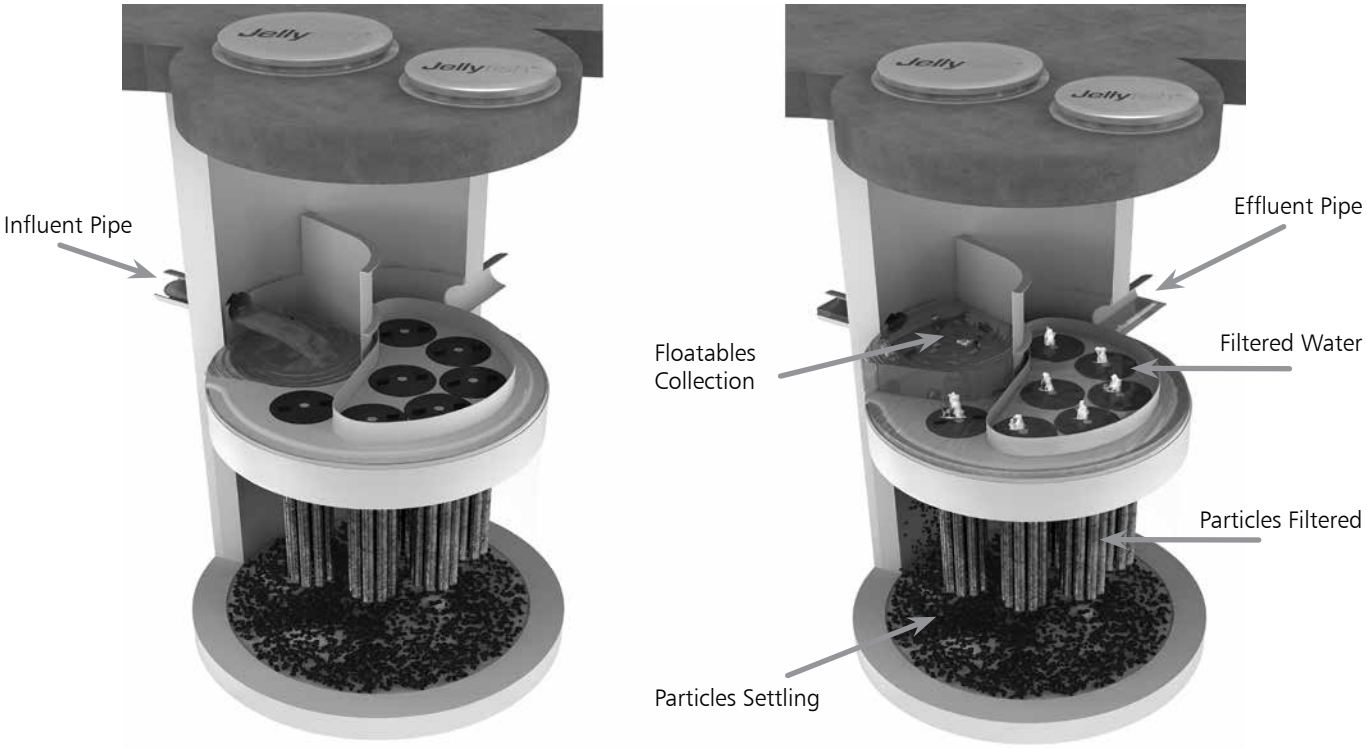
The Jellyfish Filter functions are depicted in Figure 1 below.

FIGURE 1

Jellyfish Filter Treatment Functions

Membrane Filtration

Section View with Maintenance Access Wall (MAW) Cutaway



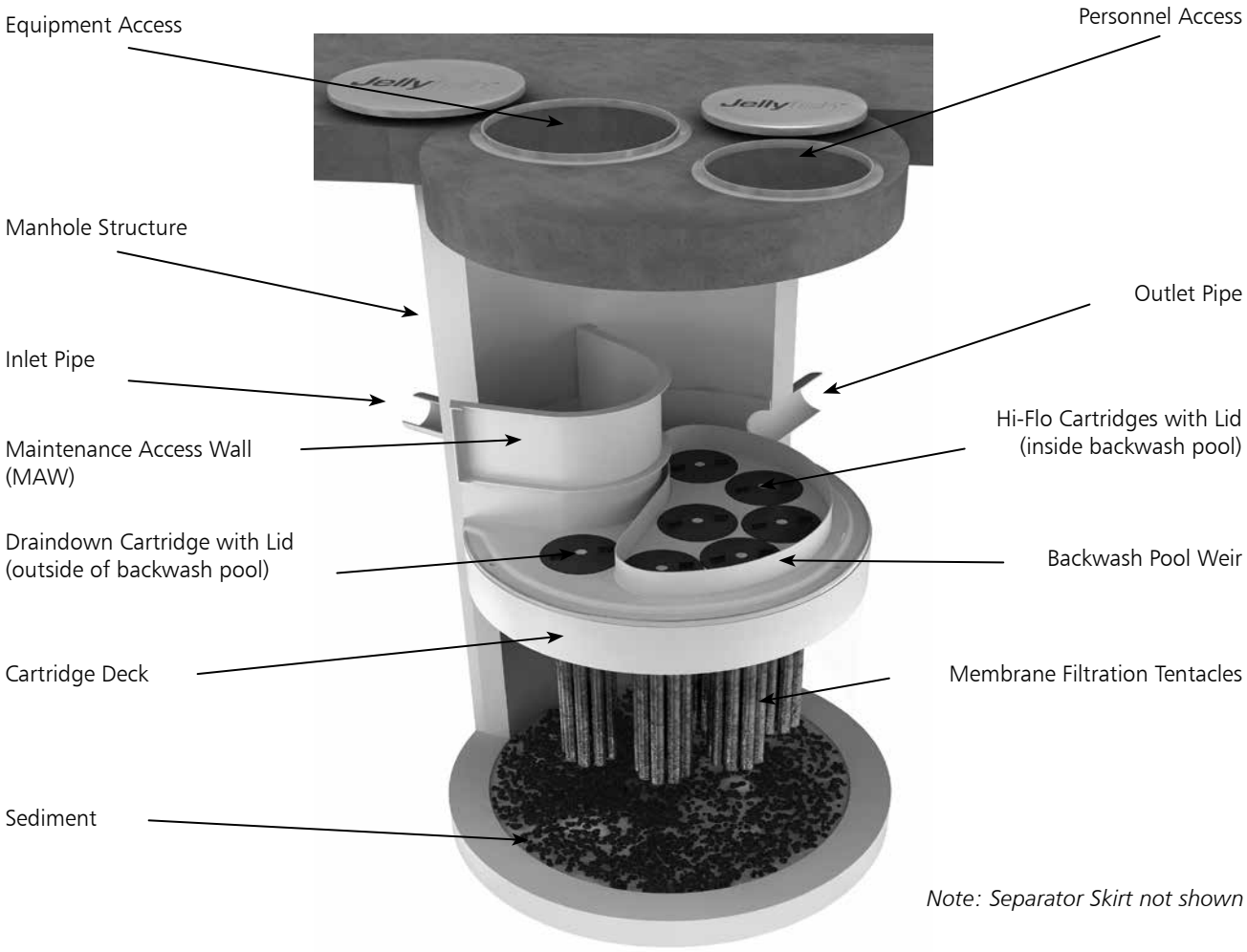
Jellyfish Filter cartridges are backwashed after each peak storm event, which removes accumulated sediment from the membranes. This backwash process extends the service life of the cartridges and increases the time between maintenance events.

For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at www.ContechES.com.

2.1 – Components and Cartridges

The Jellyfish Filter and components are depicted in Figure 2 below.

FIGURE 2 **Jellyfish Filter Components**



Tentacles are available in various lengths as depicted in Table 1 below.

Table 1 – Cartridge Lengths / Weights and Cartridge Lid Orifice Diameters

Cartridge Lengths	Dry Weight	Hi-Flo Orifice Diameter	Draindown Orifice Diameter
15 inches (381 mm)	10 lbs (4.5 kg)	35 mm	20 mm
27 inches (686 mm)	14.5 lbs (6.6 kg)	45 mm	25 mm
40 inches (1,016 mm)	19.5 lbs (8.9 kg)	55 mm	30 mm
54 inches (1,372 mm)	25 lbs (11.4 kg)	70 mm	35 mm

2.2 – Jellyfish Membrane Filtration Cartridge Assembly

The Jellyfish Filter utilizes multiple membrane filtration cartridges. Each cartridge consists of removable cylindrical filtration "tentacles" attached to a cartridge head plate. Each filtration tentacle has a threaded pipe nipple and o-ring. To attach, insert the top pipe nipples with the o-ring through the head plate holes and secure with locking nuts. Hex nuts to be hand tightened and checked with a wrench as shown below.

2.3 – Jellyfish Membrane Filtration Cartridge Installation

- Cartridge installation will be performed by trained individuals and coordinated with the installing site Contractor. Flow diversion devices are required to be in place until the site is stabilized (final paving and landscaping in place). Failure to address this step completely will reduce the time between required maintenance.
- Descend to the cartridge deck (see Safety Notice and page 3).
- Refer to Contech's submittal drawings to determine proper quantity and placement of Hi-Flo, Draindown and Blank cartridges with appropriate lids. Lower the Jellyfish membrane filtration cartridges into the cartridge receptacles within the cartridge deck. It is possible that not all cartridge receptacles will be filled with a filter cartridge. In that case, a blank headplate and blank cartridge lid (no orifice) would be installed.

Cartridge Assembly

Do not force the tentacles down into the cartridge receptacle, as this may damage the membranes. Apply downward pressure on the cartridge head plate to seat the lubricated rim gasket (thick circular gasket surrounding the circumference of the head plate) into the cartridge receptacle. (See Figure 3 for details on approved lubricants for use with rim gasket.)

- Examine the cartridge lids to differentiate lids with a small orifice, a large orifice, and no orifice.
  - Lids with a small orifice are to be inserted into the Draindown cartridge receptacles, outside of the backwash pool weir.
  - Lids with a large orifice are to be inserted into the Hi-Flo cartridge receptacles within the backwash pool weir.
  - Lids with no orifice (blank cartridge lids) and a blank headplate are to be inserted into unoccupied cartridge receptacles.
- To install a cartridge lid, align both cartridge lid male threads with the cartridge receptacle female threads before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation.

3.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.
Inspection activities are typically conducted from surface observations and include:

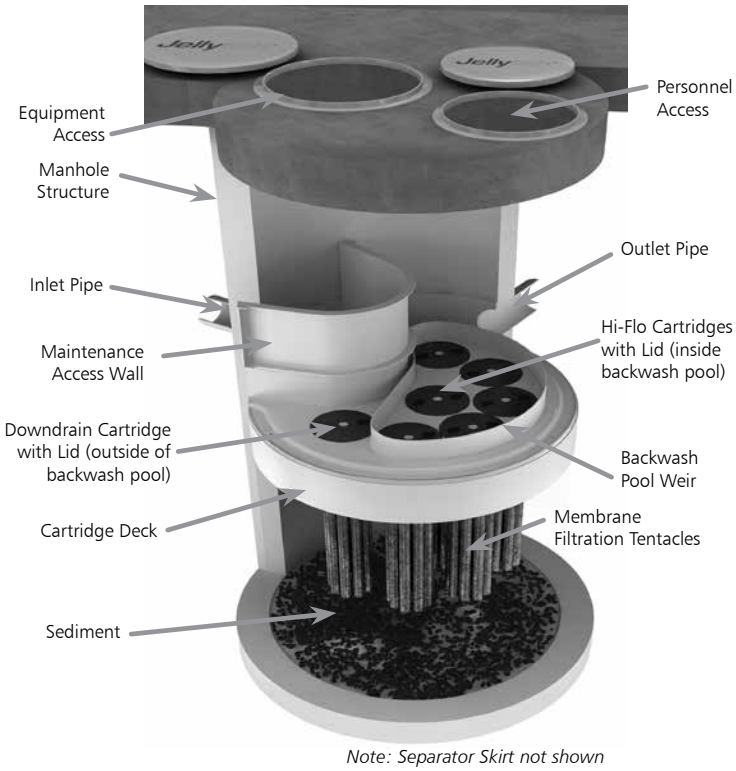
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed

4.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.



Note: Separator Skirt not shown

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

5.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

5.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.

Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

5.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

6.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

7.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

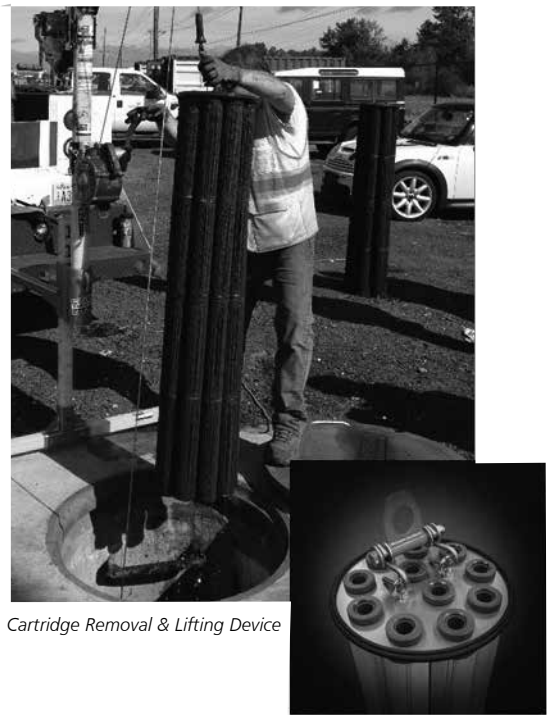
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

7.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs*.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

7.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.
2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.



Cartridge Removal & Lifting Device

3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane*.
4. Collected rinse water is typically removed by vacuum hose.

5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

7.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.
3. Pressure wash cartridge deck and receptacles to remove all

Rinsing Cartridge with Contech Rinse Tool

sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.

4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.
6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some

Vacuuming Sump Through MAW

vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

7.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. *Caution: Do not force the cartridge downward; damage may occur.*
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

7.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

7.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

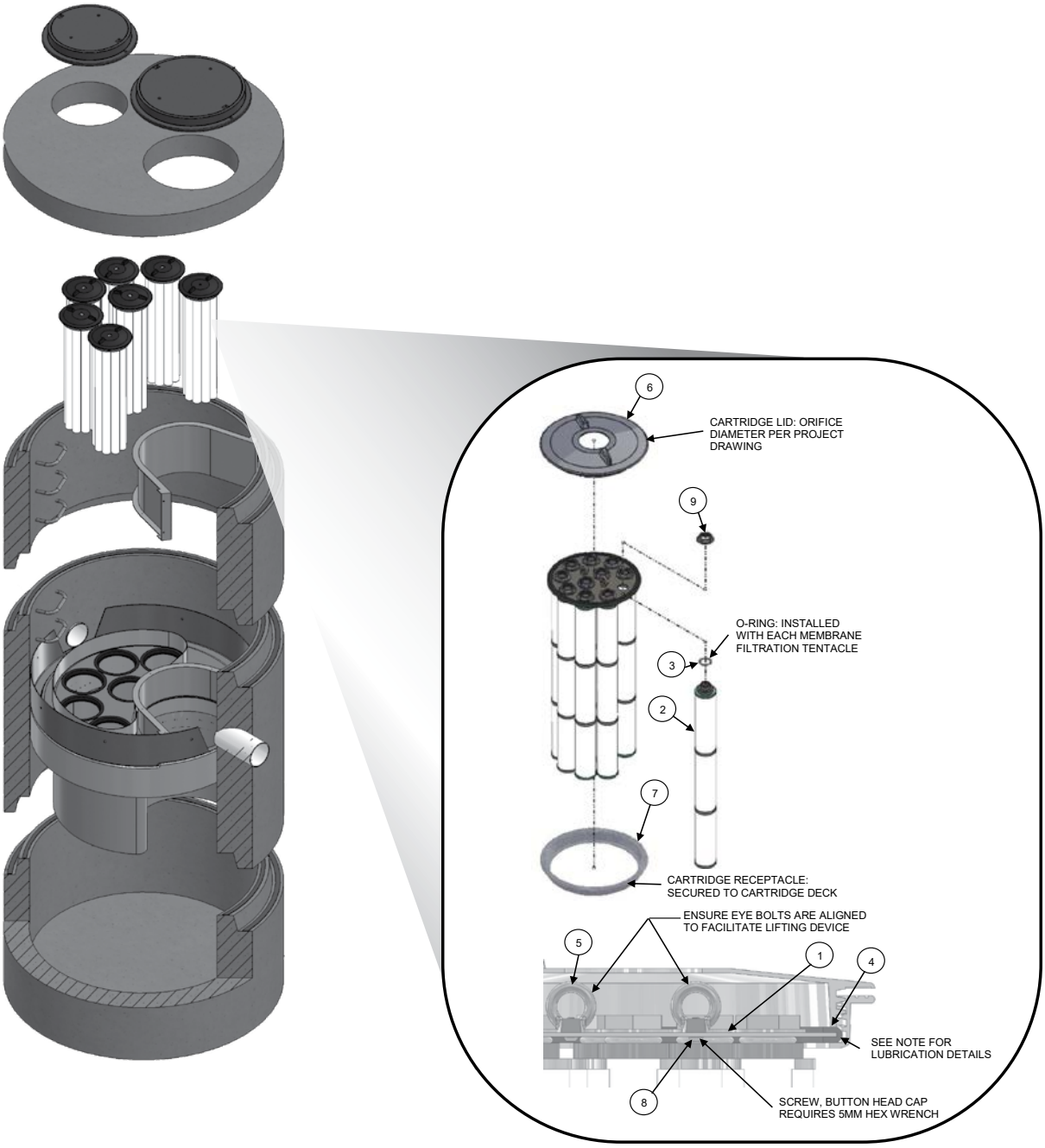


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lid (Item 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner: _____ Jellyfish Model No.:_____

Location: _____ GPS Coordinates: _____

Land Use: Commercial:_____ Industrial: _____ Service Station:_____

Road/Highway:____ Airport: _____ Residential: _____ Parking Lot:_____

Date/Time:					
Inspector:					
Maintenance Contractor:					
Visible Oil Present: (Y/N)					
Oil Quantity Removed					
Floatable Debris Present: (Y/N)					
Floatable Debris removed: (Y/N)					
Water Depth in Backwash Pool					
Cartridges externally rinsed/re-commissioned: (Y/N)					
New tentacles put on Cartridges: (Y/N)					
Sediment Depth Measured: (Y/N)					
Sediment Depth (inches or mm):					
Sediment Removed: (Y/N)					
Cartridge Lids intact: (Y/N)					
Observed Damage:					
Comments:					

1.6 Snow & Ice Management for Standard Asphalt and Walkways

There are no snow storage areas on site. The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. All snow removal will be hauled off-site and legally disposed of. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

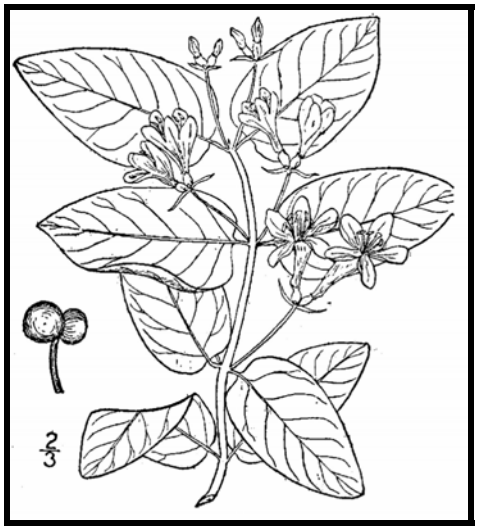
Section 2
Invasive Species

With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem is classified as an invasive species. Refer to the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

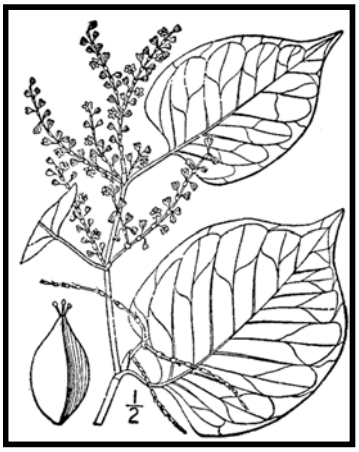
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
 </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
 </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time … but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.

Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

4. **Dry it/cook it**—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. ***Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.*** Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

   ME: Department of Environmental Protection
   www.state.me.us/dep/blwq/docstand/nrpapage.htm

   NH: Department of Environmental Services
   www.des.state.nh.us/wetlands/

   VT: Department of Environmental Conservation
   www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

   MA: Consult your local town conservation commission

   RI: Department of Environmental Management
   www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

   CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

Section 3
Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth on an annual basis.

Stormwater Management Report						
North End Mixed Use Development		**Russell Street – Map 118 Lot 28, Map 119 Lot 4, Map 124 Lot 12, Map 125 Lot 21**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Underground Detention			❑Yes ❑No			
Jellyfish Filter 1			❑Yes ❑No			

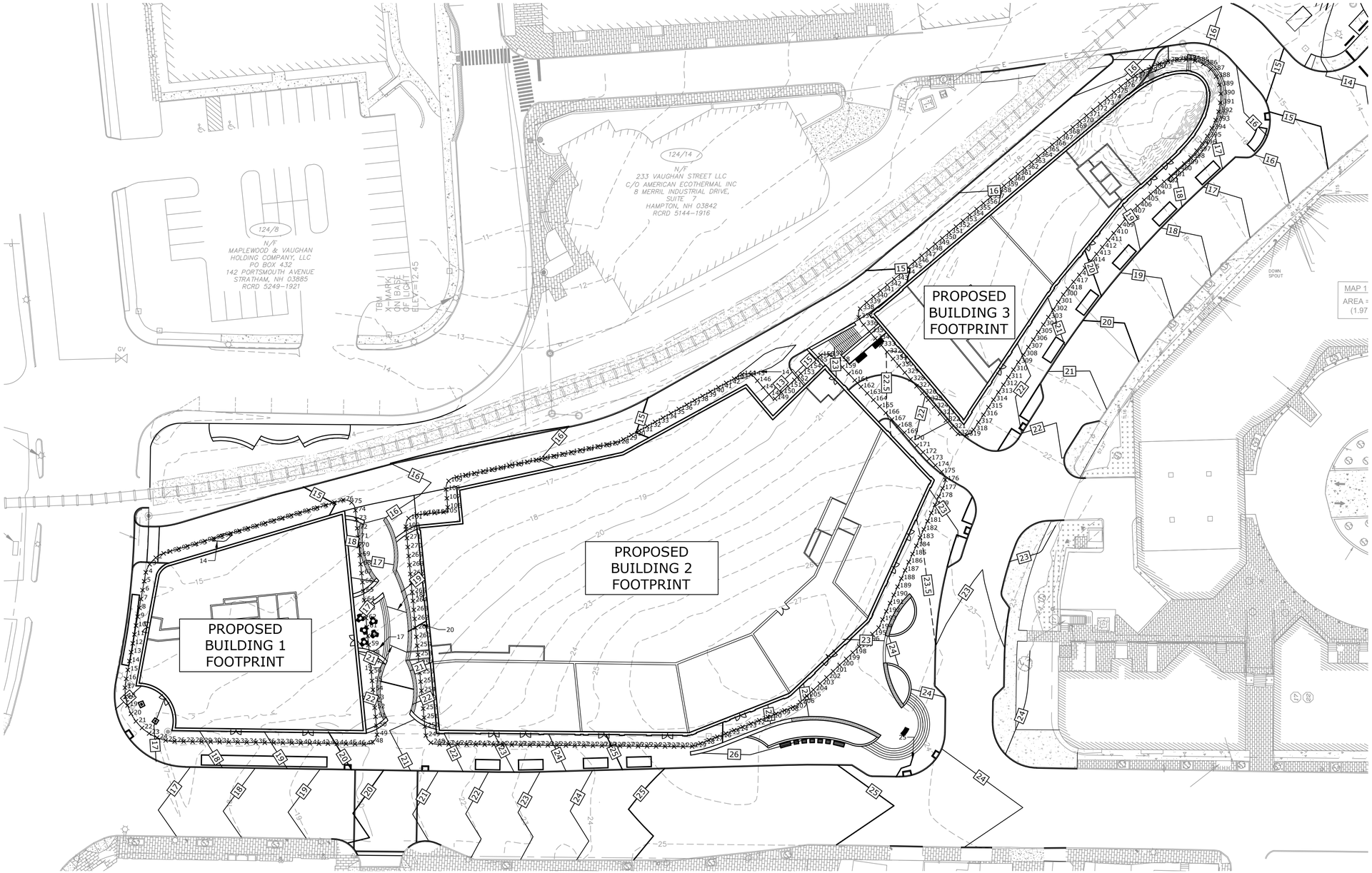
BUILDING 1 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
17.16'	77.16'	74.16'	60.00'	57.00'

BUILDING 2 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
20.38'	80.38'	80.38'	60.00'	60.00'

BUILDING 3 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
18.64'	78.64'	78.64'	60.00'	60.00'

NORTH END MIXED USE DEVELOPMENT
RUSSELL STREET & DEER STREET
PORTSMOUTH, NEW HAMPSHIRE

GRADE PLANE EXHIBIT



Tighe&Bond

May 24, 2022
T5037-002-C-DSGN.dwg

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Plot Date: Tuesday, May 24, 2022 Plotted By: Colter Krzcuik
TBS File Location: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg Layout Tab: Grade Plane

NORTH END MIXED USE DEVELOPMENT
RUSSELL STREET & DEER STREET
PORTSMOUTH, NEW HAMPSHIRE

COMMUNITY SPACE EXHIBIT

PROPOSED COMMUNITY SPACE:

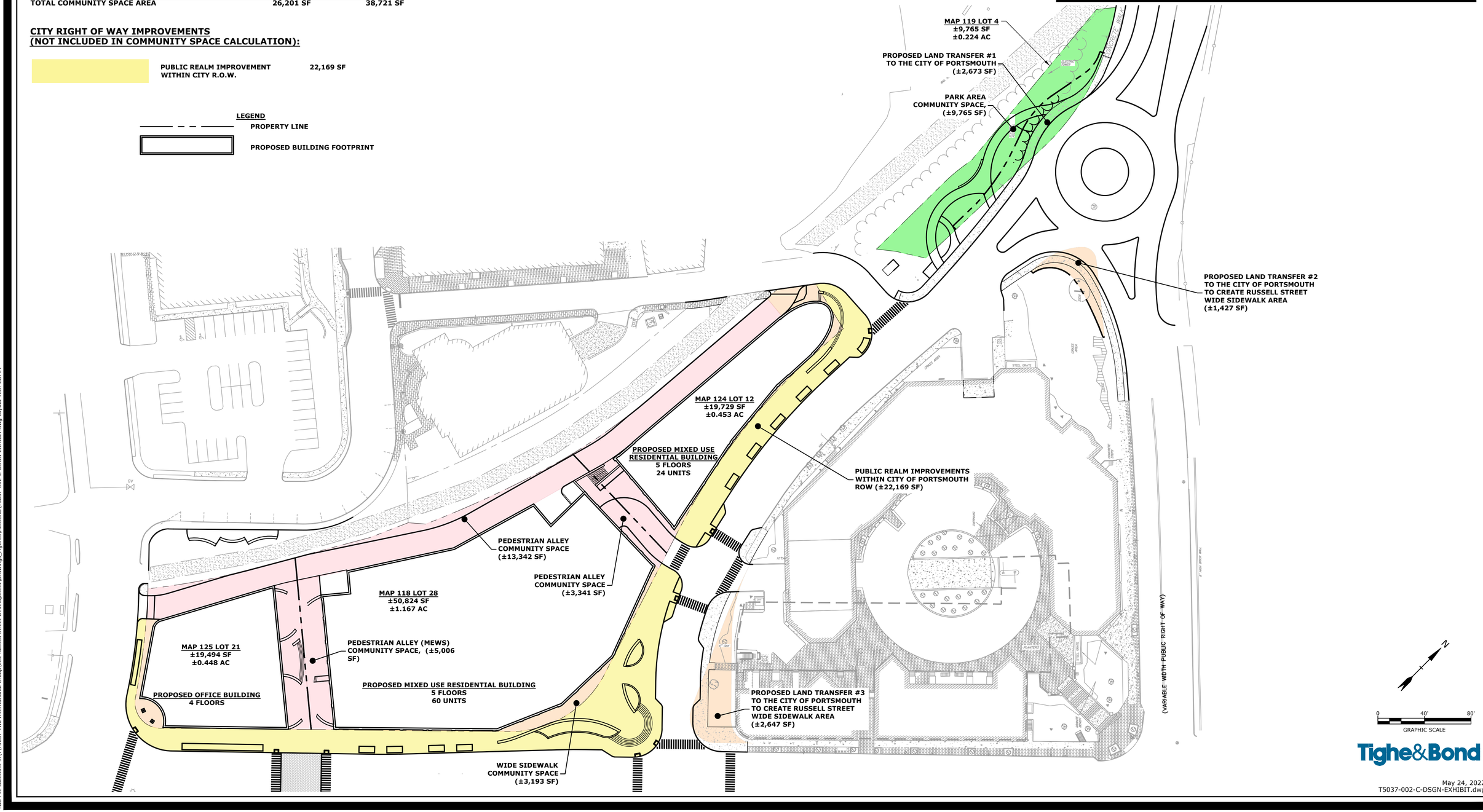
	REQUIRED	PROVIDED
WIDE SIDEWALK COMMUNITY SPACE		7,267 SF
PEDESTRIAN ALLEY COMMUNITY SPACE		21,689 SF
PARK AREA COMMUNITY SPACE		9,765 SF
TOTAL COMMUNITY SPACE AREA	26,201 SF	38,721 SF

CITY RIGHT OF WAY IMPROVEMENTS (NOT INCLUDED IN COMMUNITY SPACE CALCULATION):

PUBLIC REALM IMPROVEMENT WITHIN CITY R.O.W.	22,169 SF

LEGEND

- PROPERTY LINE
- PROPOSED BUILDING FOOTPRINT

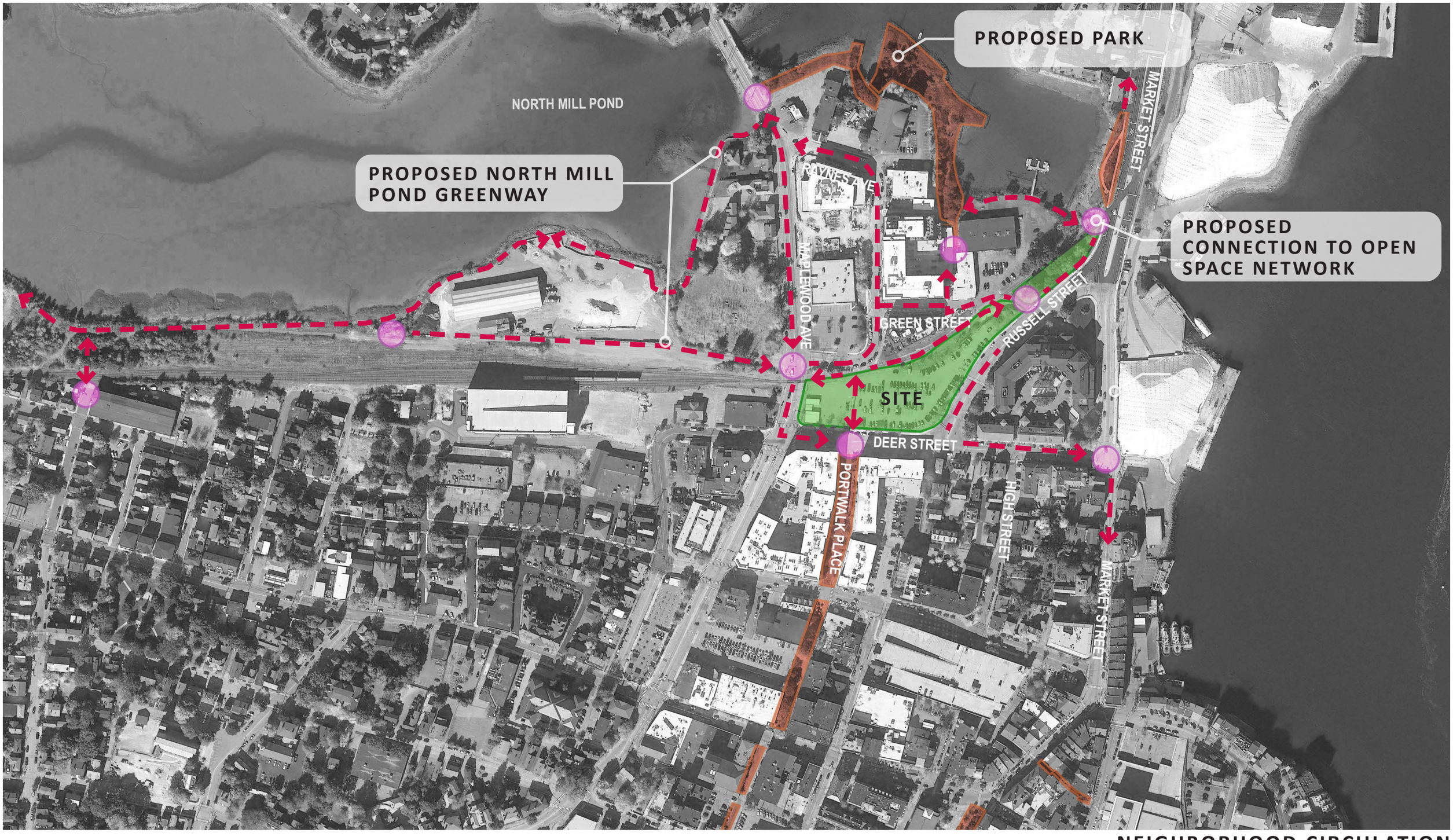


Tighe&Bond

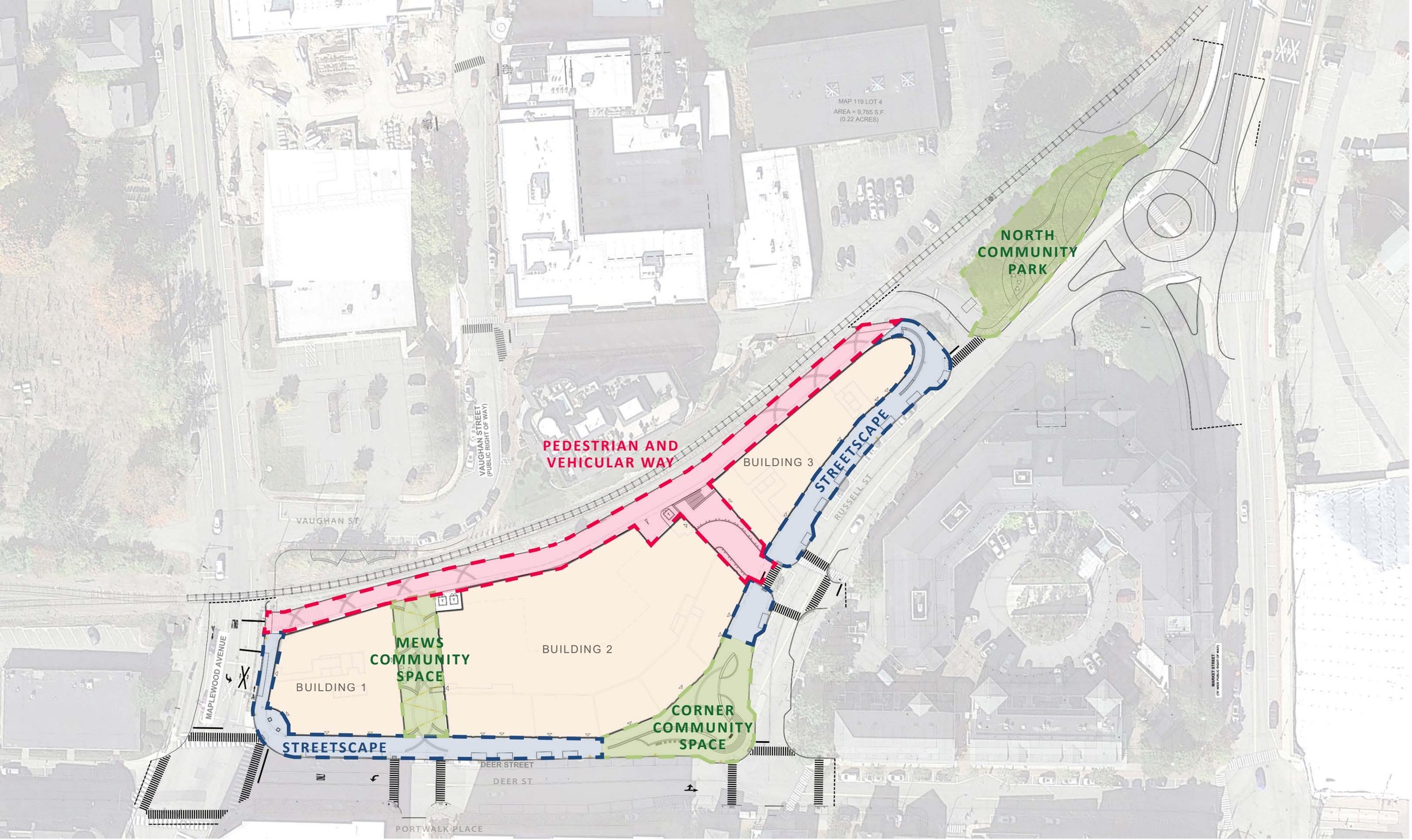
May 24, 2022
T5037-002-C-DSGN-EXHIBIT.dwg

Last Save Date: May 23, 2022 5:35 PM By: NAHANSEN
Plot Date: Tuesday, May 24, 2022 Plotted By: Neil A. Hansen
T&B File Location: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DSGN-EXHIBIT.dwg Layout Tab: COMM

SITE CONTEXT



NEIGHBORHOOD CIRCULATION



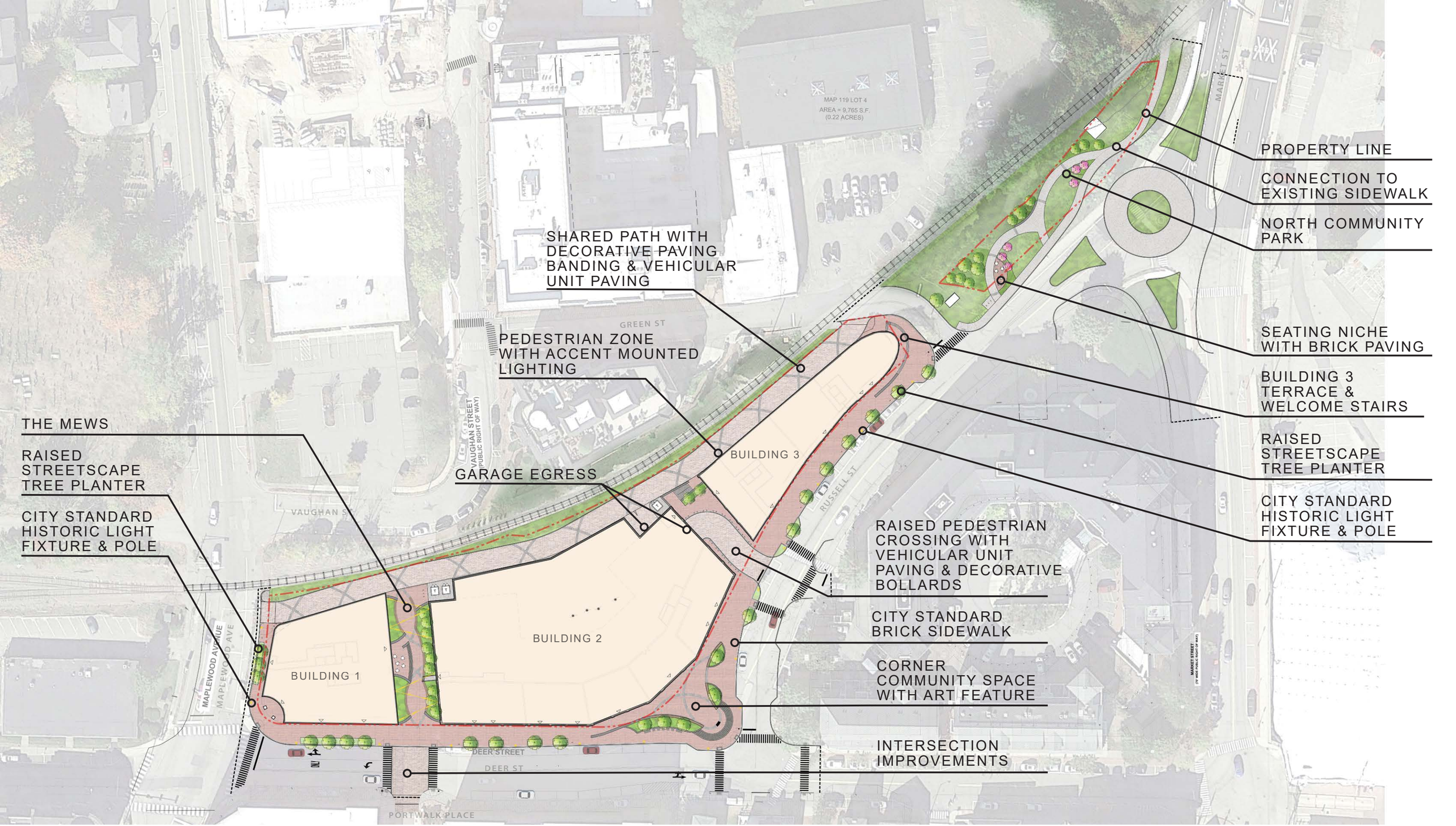
0 40 80 160 SCALE: 1" = 80'-0"

OPEN SPACE - KEY PLAN

RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

5/24/2022

LIGHTBOX STUDIOS DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

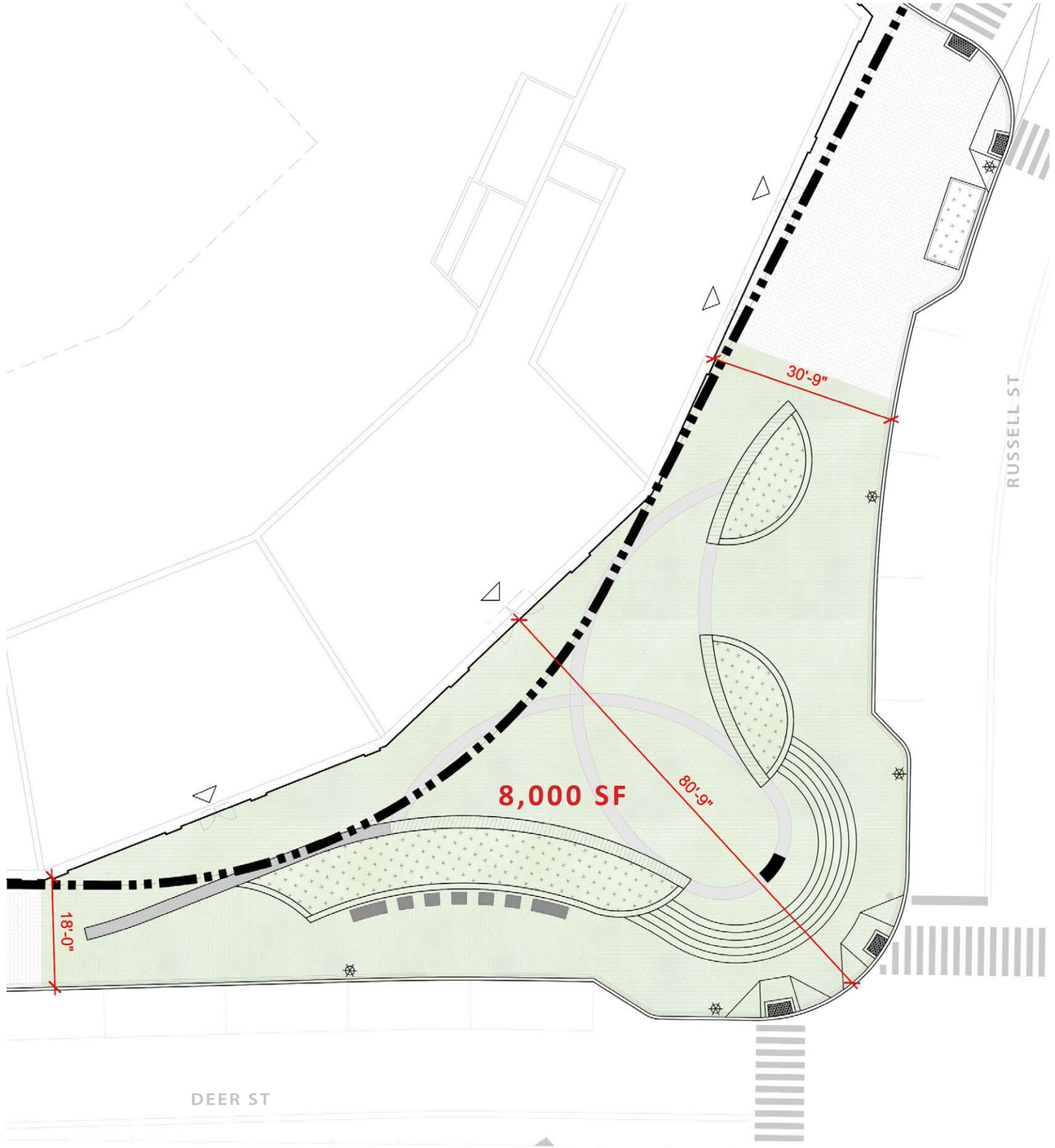


SITE PLAN

RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

5/24/2022

LIGHTBOX STUDIOS™ · DESIMONE · JBB · MARKET SQUARE ARCHITECTS · SGA · TWO INTERNATIONAL GROUP · Tighe&Bond · HALVORSON Tighe&Bond STUDIO



0 10 20 40 SCALE: 1" = 20'-0"

CORNER COMMUNITY SPACE- SCALE COMPARISON

LIGHTBOX STUDIOS DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

CORNER COMMUNITY SPACE - SCALE COMPARISON - QUINCY PARK CAMBRIDGE

CORNER COMMUNITY SPACE - SCALE COMPARISON - MARKET SQUARE

0 10 20 40 SCALE: 1" = 20'-0"

STANDARD BRICK SIDEWALK PAVING

PLACE-MAKING SEATING NICHE

LANDSCAPE FEATURE

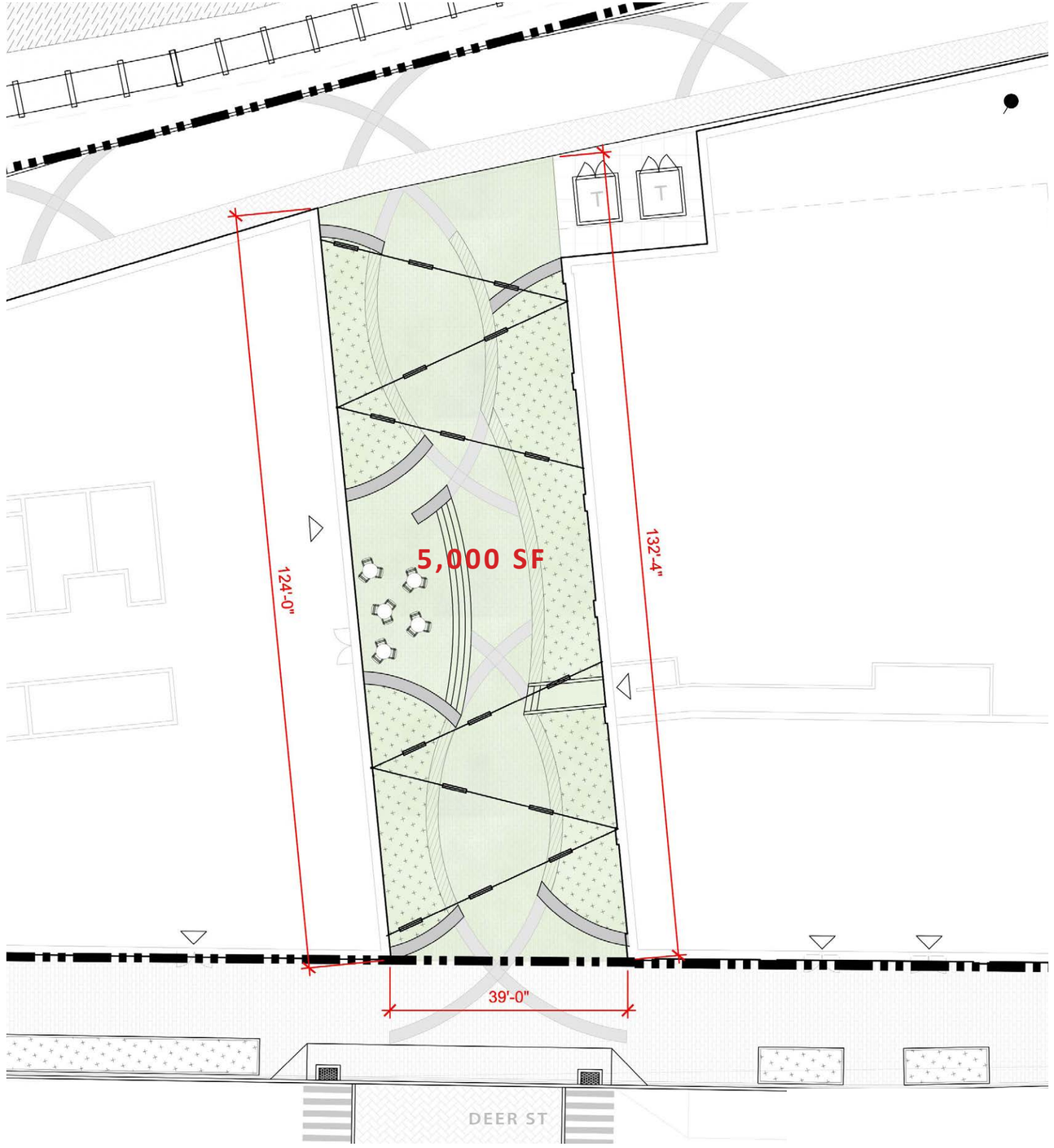
CORNER COMMUNITY SPACE - ENLARGEMENT

LIGHTBOX STUDIOS DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

CORNER COMMUNITY SPACE - PERSPECTIVE VIEW A.1

CORNER COMMUNITY SPACE - PERSPECTIVE VIEW A.2

CORNER COMMUNITY SPACE - PERSPECTIVE VIEW A.3



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THE MEWS COMMUNITY SPACE - SCALE COMPARISON

LIGHTBOX STUDIOS DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

THE MEWS COMMUNITY SPACE - SCALE COMPARISON - THOMSON PLACE

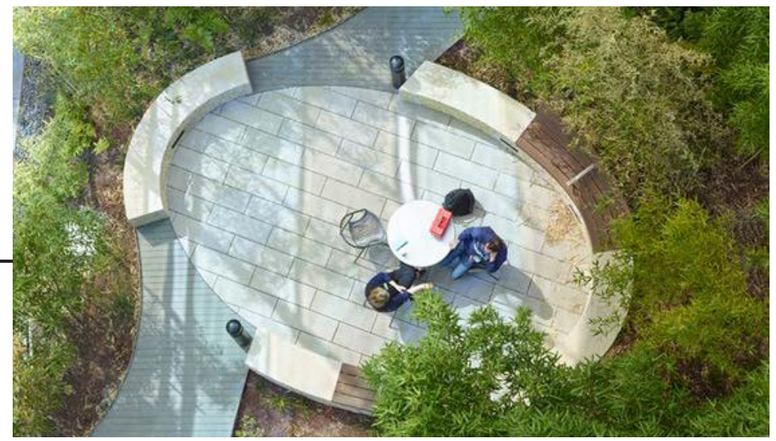
THE MEWS COMMUNITY SPACE - SCALE COMPARISON - VAUGHAN MALL

CATENARY LIGHTING

SEAT WALL WOOD MOUNTED BENCHES

PLAYFUL PLANTING BACKDROP

PLACE-MAKING SEATING NODES



0 10 20 40 SCALE: 1" = 20'-0"

THE MEWS COMMUNITY SPACE - ENLARGEMENT

THE MEWS COMMUNITY SPACE - PERSPECTIVE VIEW A.1

LIGHTBOX STUDIOS™ DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

MEWS COMMUNITY SPACE - PERSPECTIVE VIEW A.2

MEWS COMMUNITY SPACE - PERSPECTIVE VIEW A.3

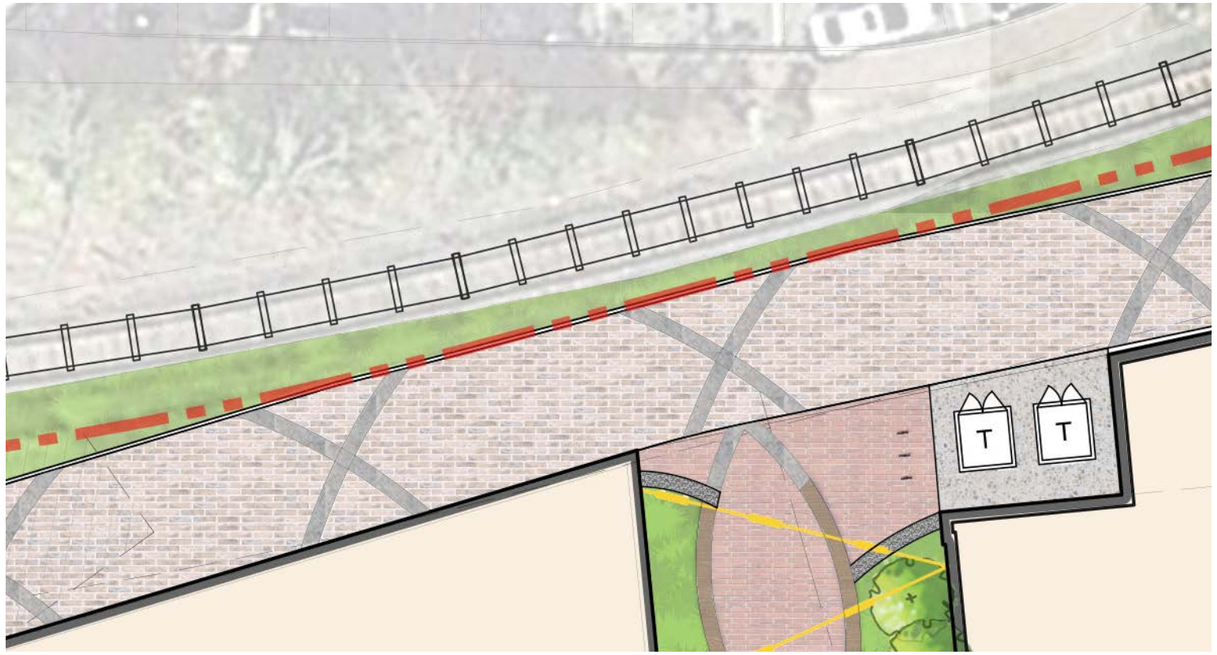
RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

5/24/2022

LIGHTBOX STUDIOS™ DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

STANDARD BRICK PAVING & LIGHTING

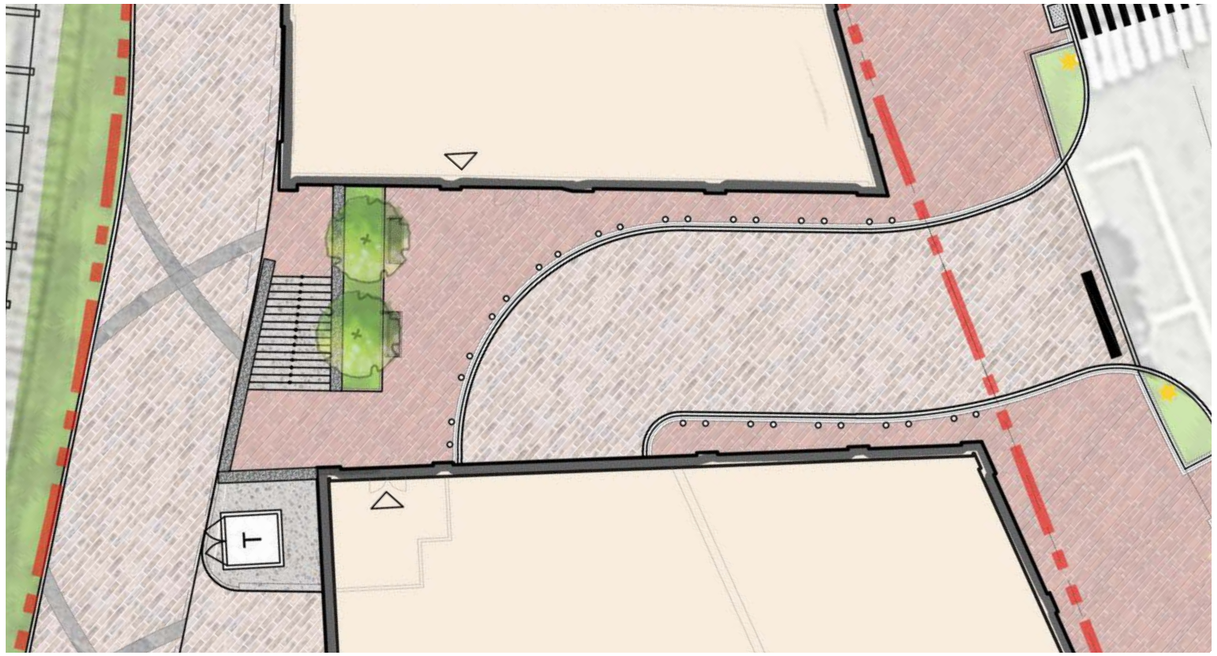
RAISED CURB STREETSCAPE TREE PLANTERS

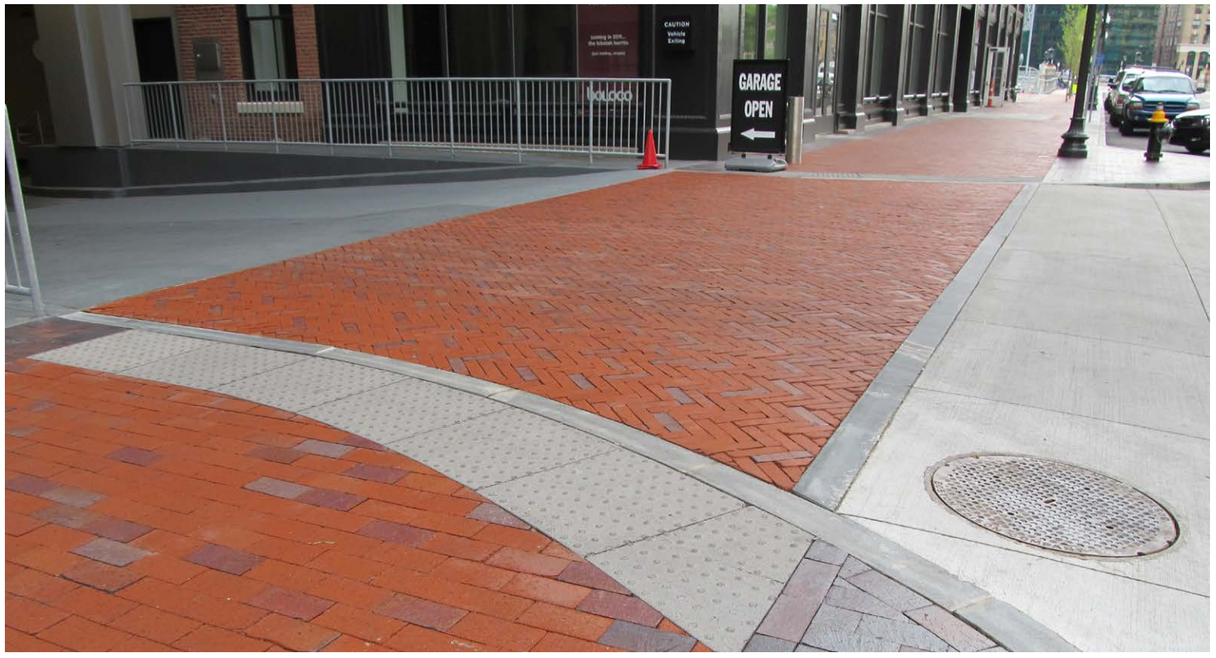


SHARED PEDESTRIAN AND VEHICULAR WAY

DECORATIVE PAVING BANDING & VEHICULAR UNIT PAVING

PEDESTRIAN AND VEHICULAR WAY - ALONG TRACK

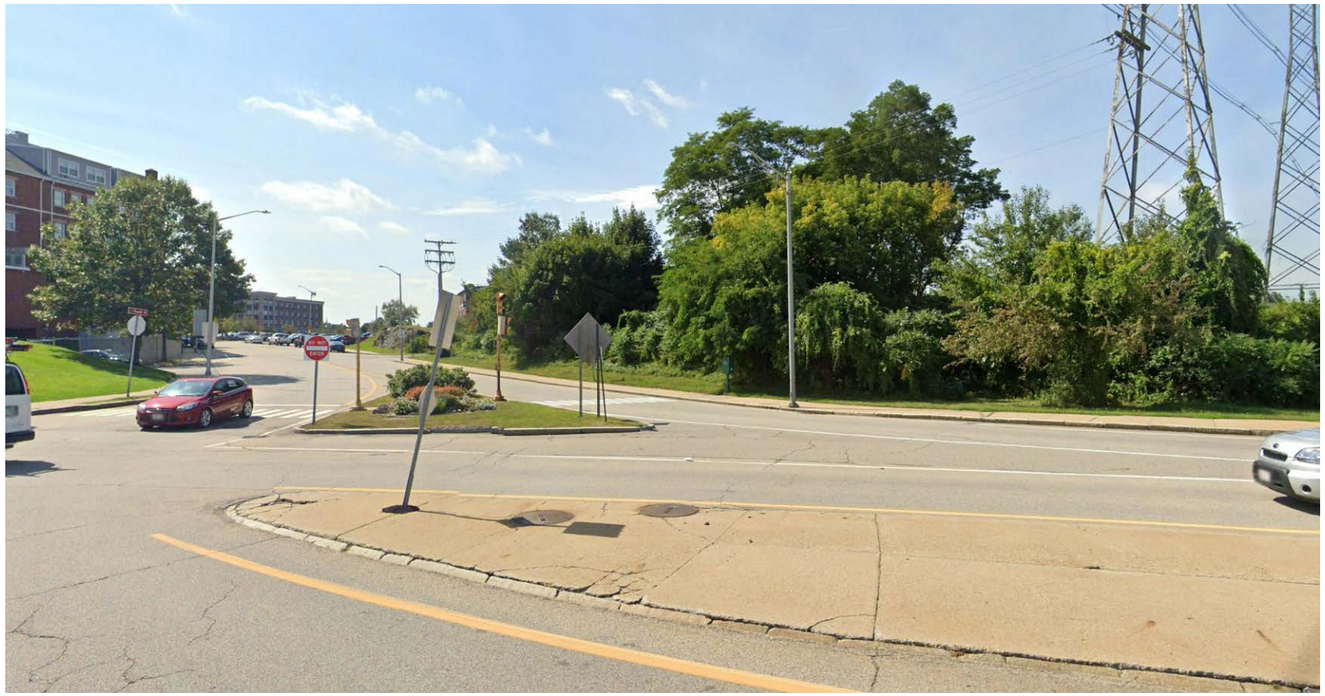




RAISED PEDESTRIAN CROSSING

PEDESTRIAN & VEHICULAR WAY DEFINED WITH BOLLARDS

PEDESTRIAN AND VEHICULAR WAY - BETWEEN BUILDING 2 & 3



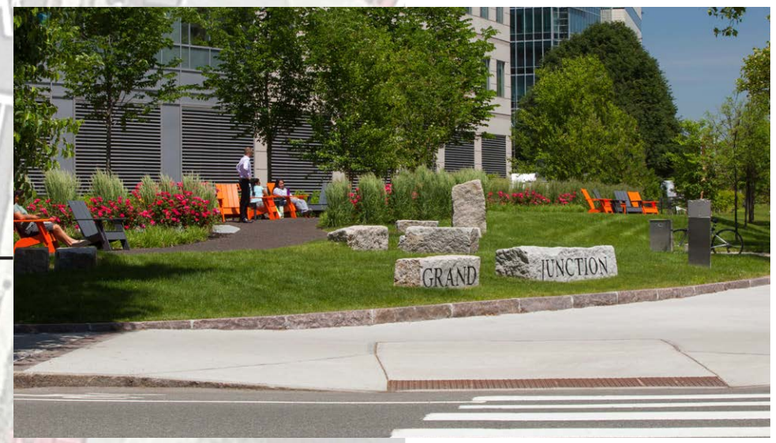
NORTH COMMUNITY PARK - EXISTING CONDITIONS

MAP 119 LOT 4

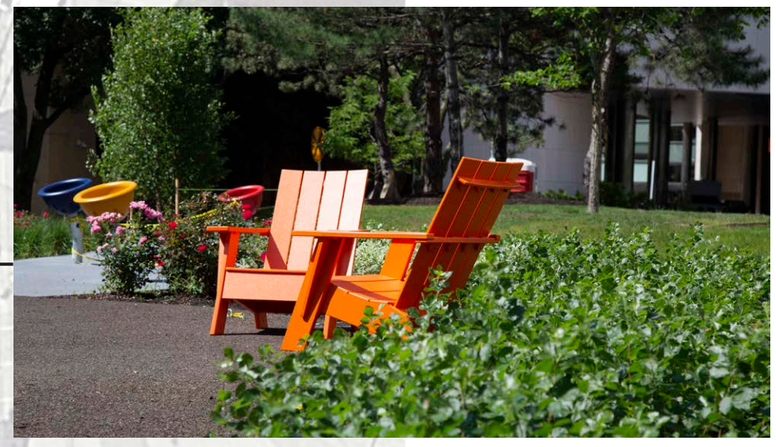
AREA = 9,765 S.F.
(0.22 ACRES)

0 40 80 160 SCALE: 1" = 80'-0"

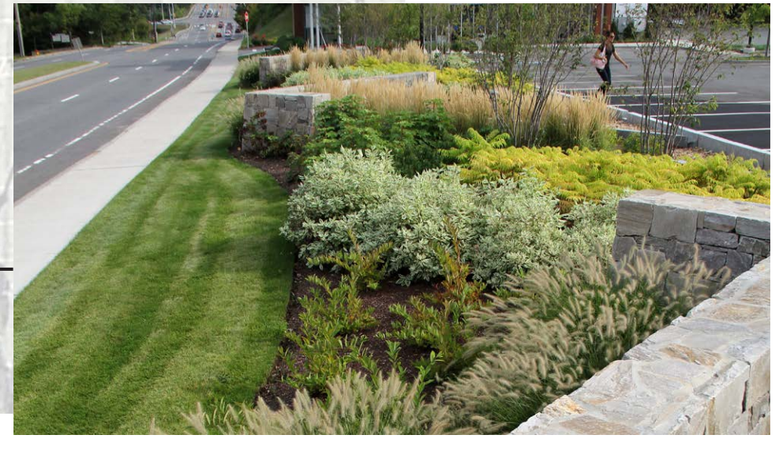
WELCOME LANDSCAPE



PLACE-MAKING SEATING NICHE



SEASONAL PLANTINGS



NORTH COMMUNITY PARK - ENLARGEMENT

RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

5/24/2022

LIGHTBOX STUDIOS™ DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO

THANK YOU

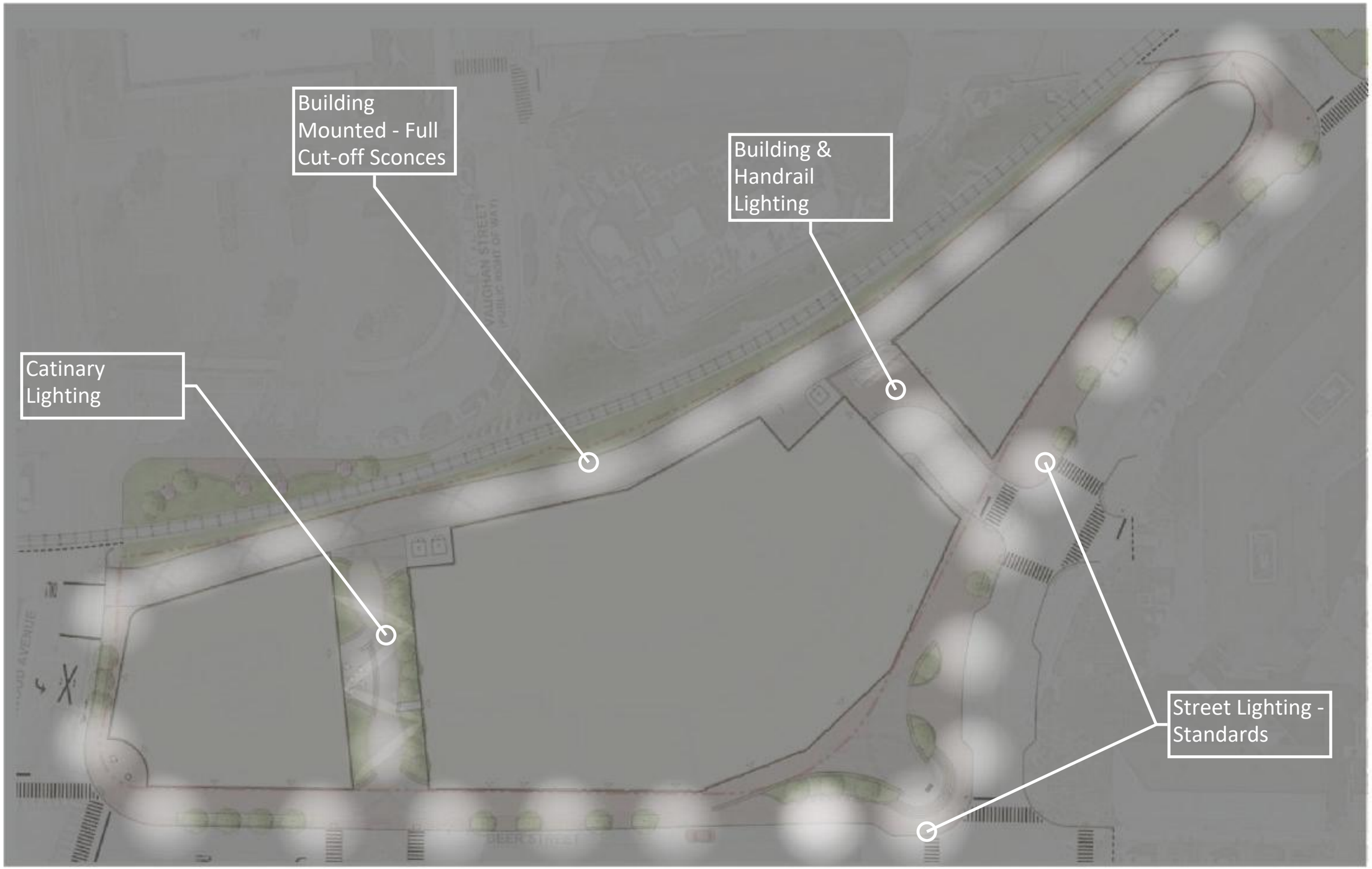
0 40 80 160 SCALE: 1" = 80'-0"

SITE PLAN

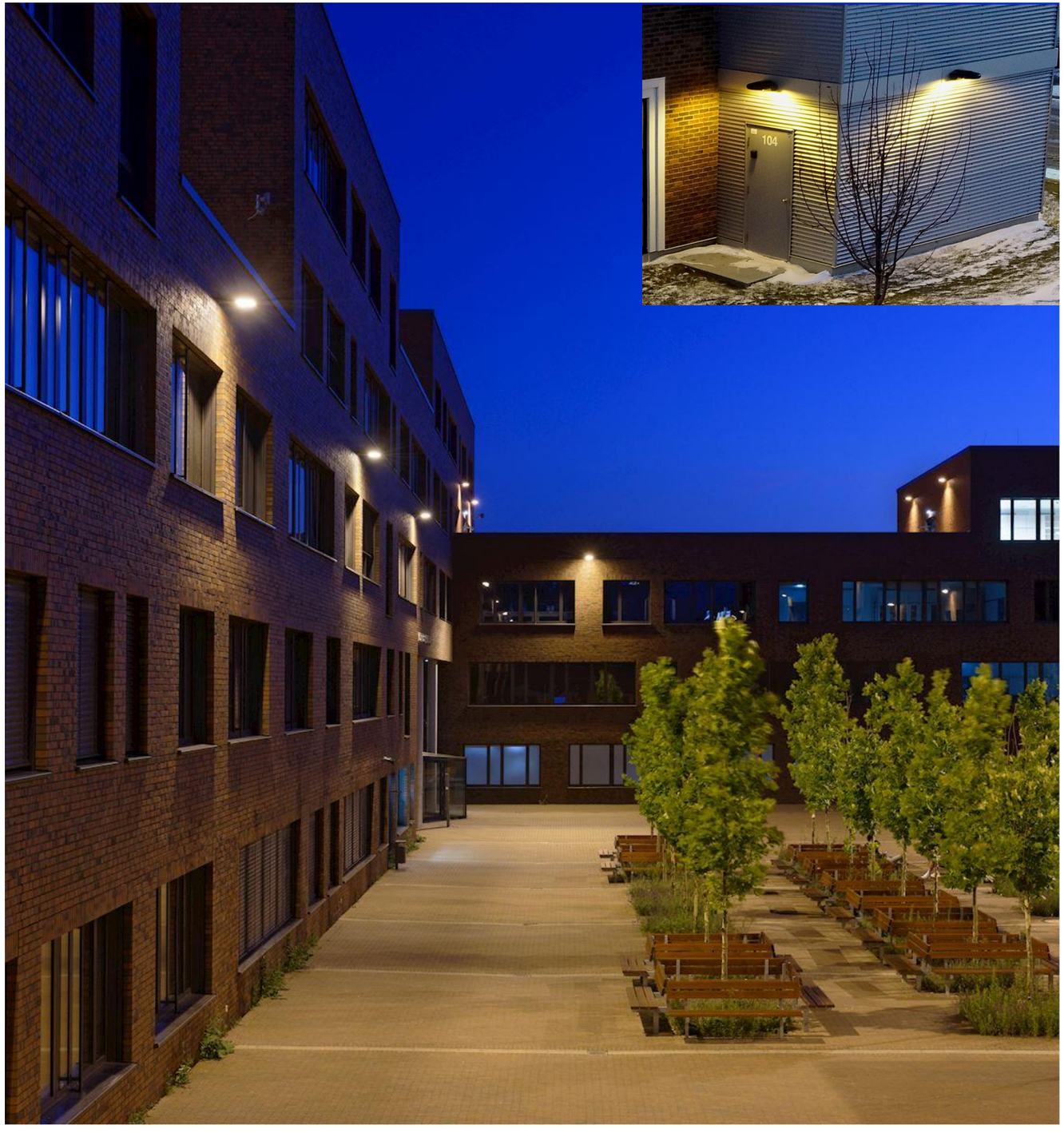
RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

5/24/2022

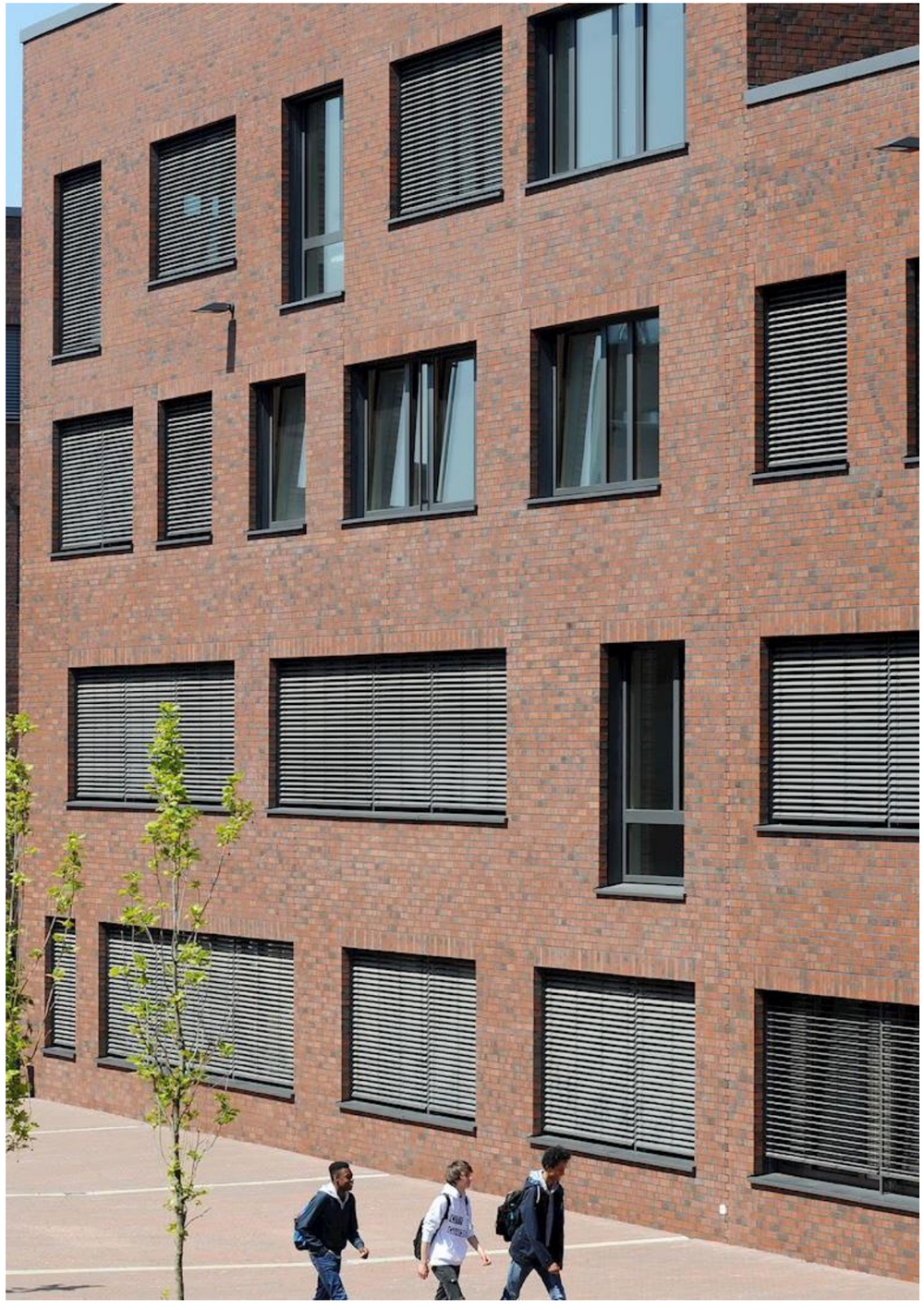
LIGHTBOX STUDIOS™ DESIMONE JBB MARKET SQUARE ARCHITECTS SGA TWO INTERNATIONAL GROUP Tighe&Bond HALVORSON Tighe&Bond STUDIO



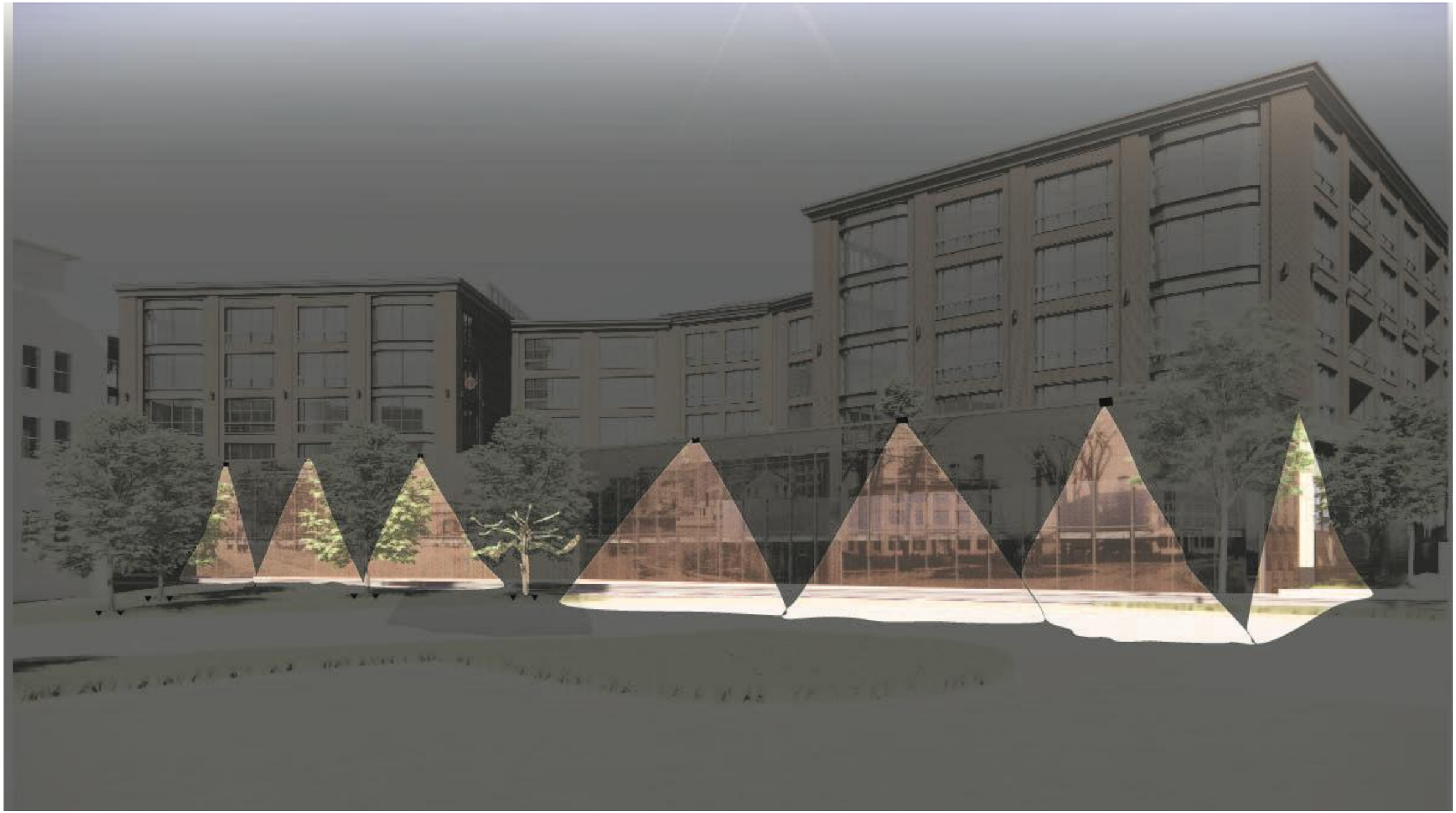
OVERAL SITE LIGHTING PLAN



RUSSELL STREET - Application Images #2



Application Images #3



RUSSELL STREET- Full Cut-off Optics

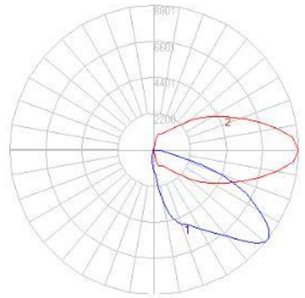
RUSSELL STREET - Application Image #1

Photometrics - Full Cut-off Optics

BEGA

Photometric Filename: 24816.ies

TEST: BE_24816
TEST LAB: BEGA
DATE: 11/30/2016
LUMINAIRE: 24 816
LAMP: 55.3W LED



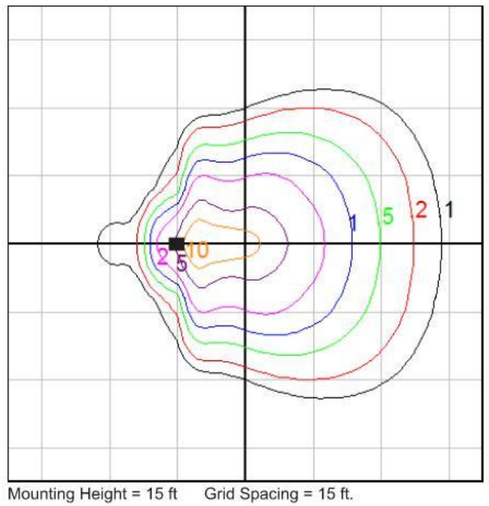
Characteristics

IES Classification	Type III
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	6672
Downward Total Efficiency	N.A.
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	109
Total Luminaire Watts	61
Ballast Factor	1.00
Upward Waste Light Ratio	N.A.
Max. Cd.	8801 (0H, 52.5V)
Max. Cd. (<90 Vert.)	8801 (0H, 52.5V)
Max. Cd. (At 90 Deg. Vert.)	2.4 (0.0%Lum)
Max. Cd. (80 to <90 Deg. Vert.)	551.2 (8.3%Lum)
Cutoff Classification (deprecated)	N.A. (absolute)

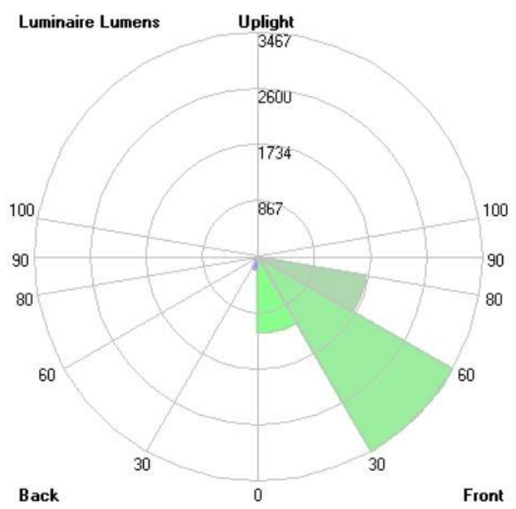
Lum. Classification System (LCS)

LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	1181.6	N.A.	17.7
FM (30-60)	3467.0	N.A.	52.0
FH (60-80)	1690.9	N.A.	25.3
FVH (80-90)	39.4	N.A.	0.6
BL (0-30)	203.0	N.A.	3.0
BM (30-60)	72.8	N.A.	1.1
BH (60-80)	14.8	N.A.	0.2
BVH (80-90)	2.4	N.A.	0.0
UL (90-100)	0.0	N.A.	0.0
UH (100-180)	0.0	N.A.	0.0
Total	6672.0	N.A.	100.0

BUG Rating **B1-U0-G1**



Mounting Height = 15 ft Grid Spacing = 15 ft.



In the interest of product improvement, BEGA reserves the right to make technical changes without notice.
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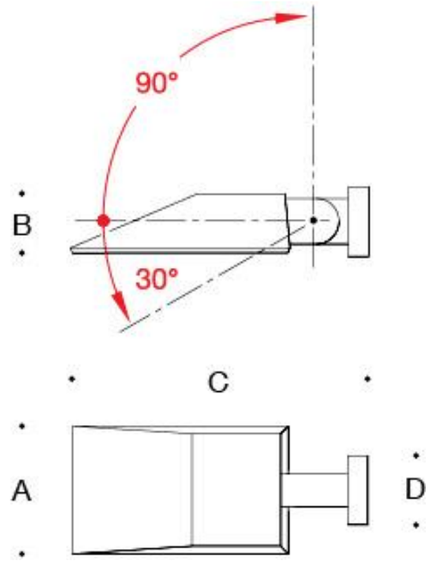
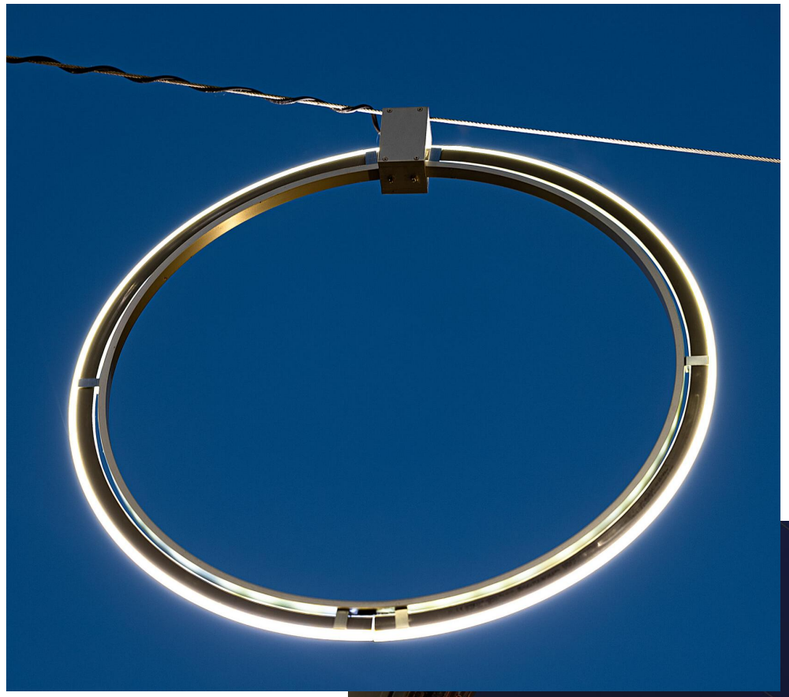
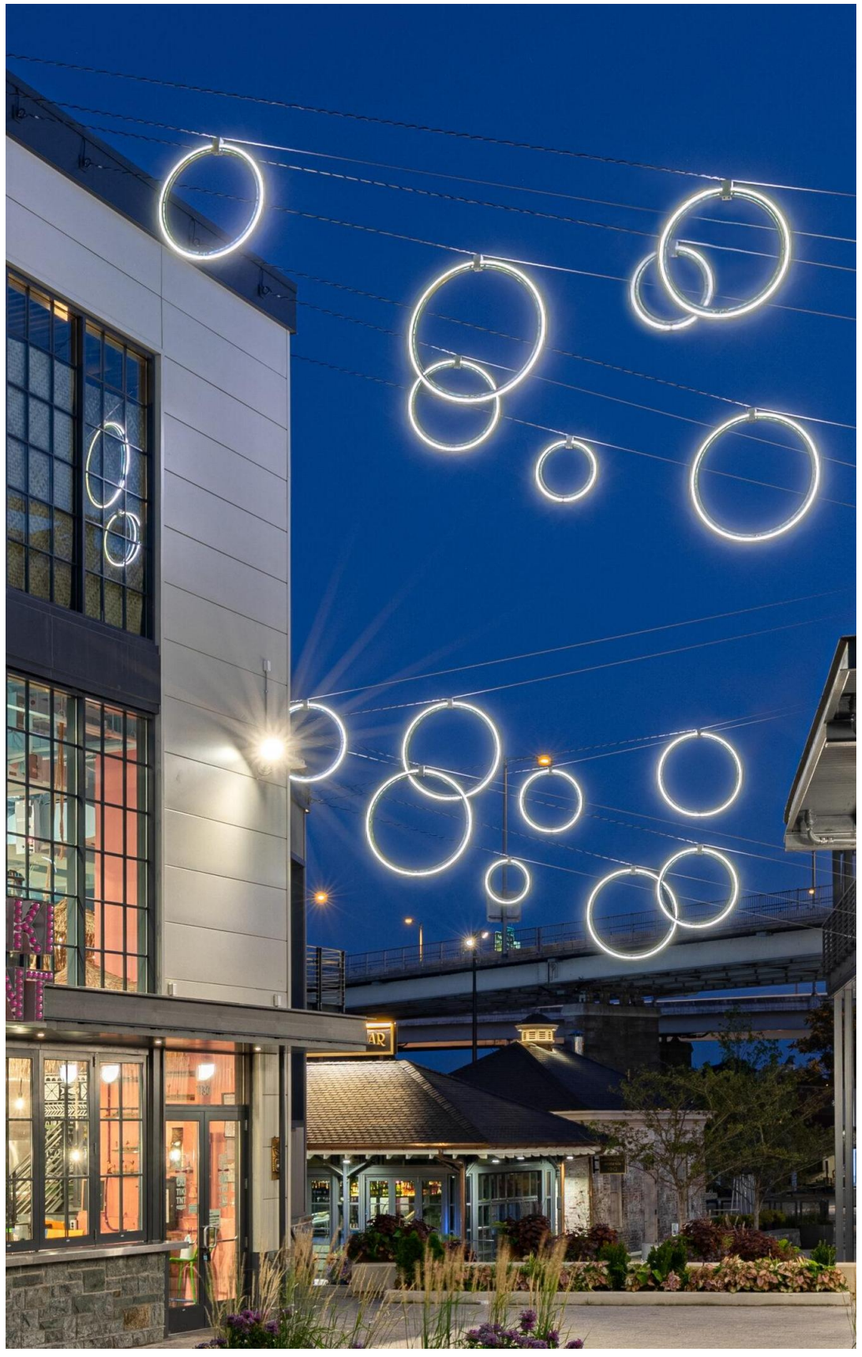
Forward Throw Fixture



RUSSELL STREET - Stair Rails

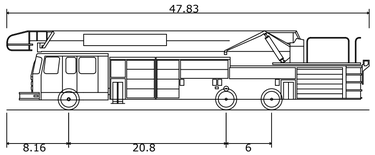




PUBLIC REALM - Catenary

NORTH END MIXED USE DEVELOPMENT
RUSSELL STREET & DEER STREET
PORTSMOUTH, NEW HAMPSHIRE

FIRE TRUCK TURNING EXHIBIT



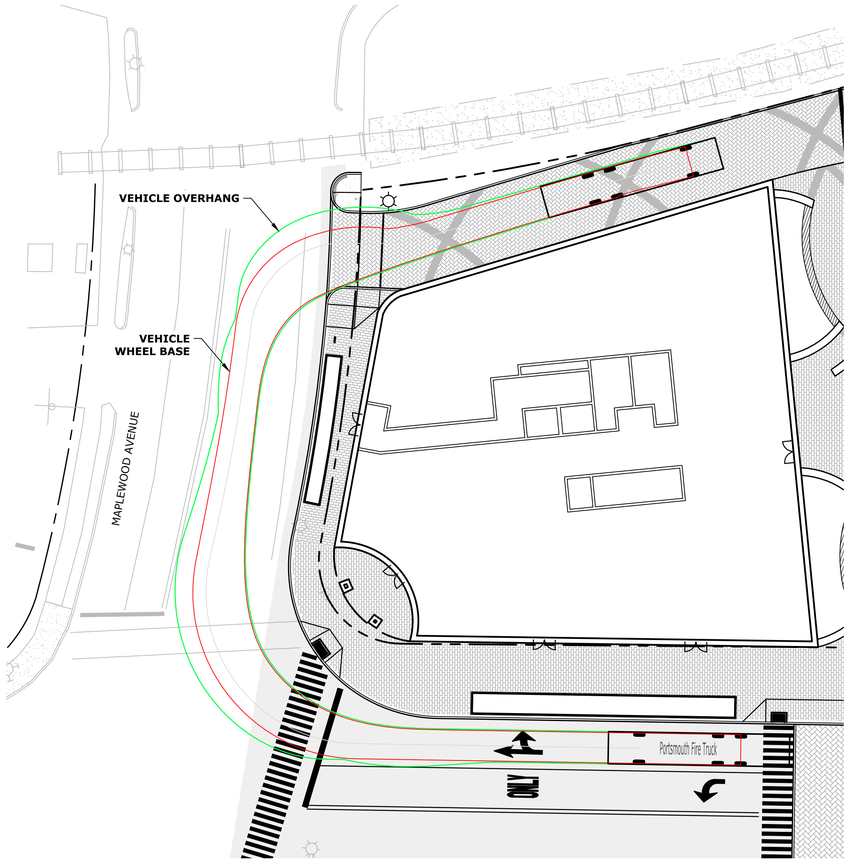
Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

LEGEND

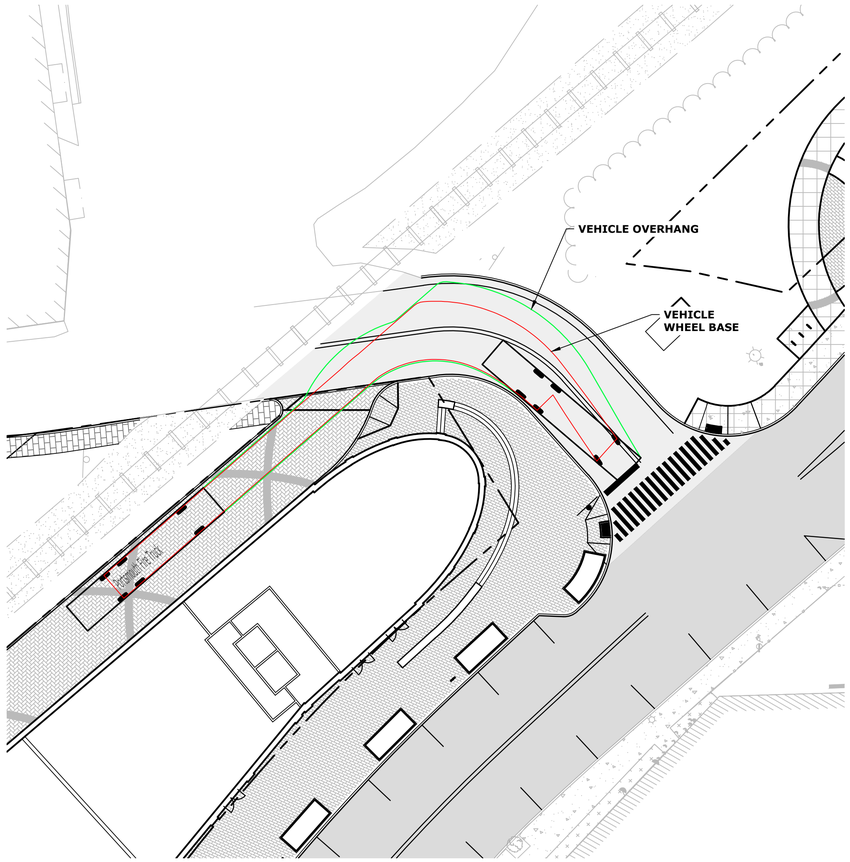
VEHICLE WHEEL BASE

VEHICLE OVERHANG

MAPLEWOOD AVENUE ENTRANCE



GREEN STREET EXIT



N

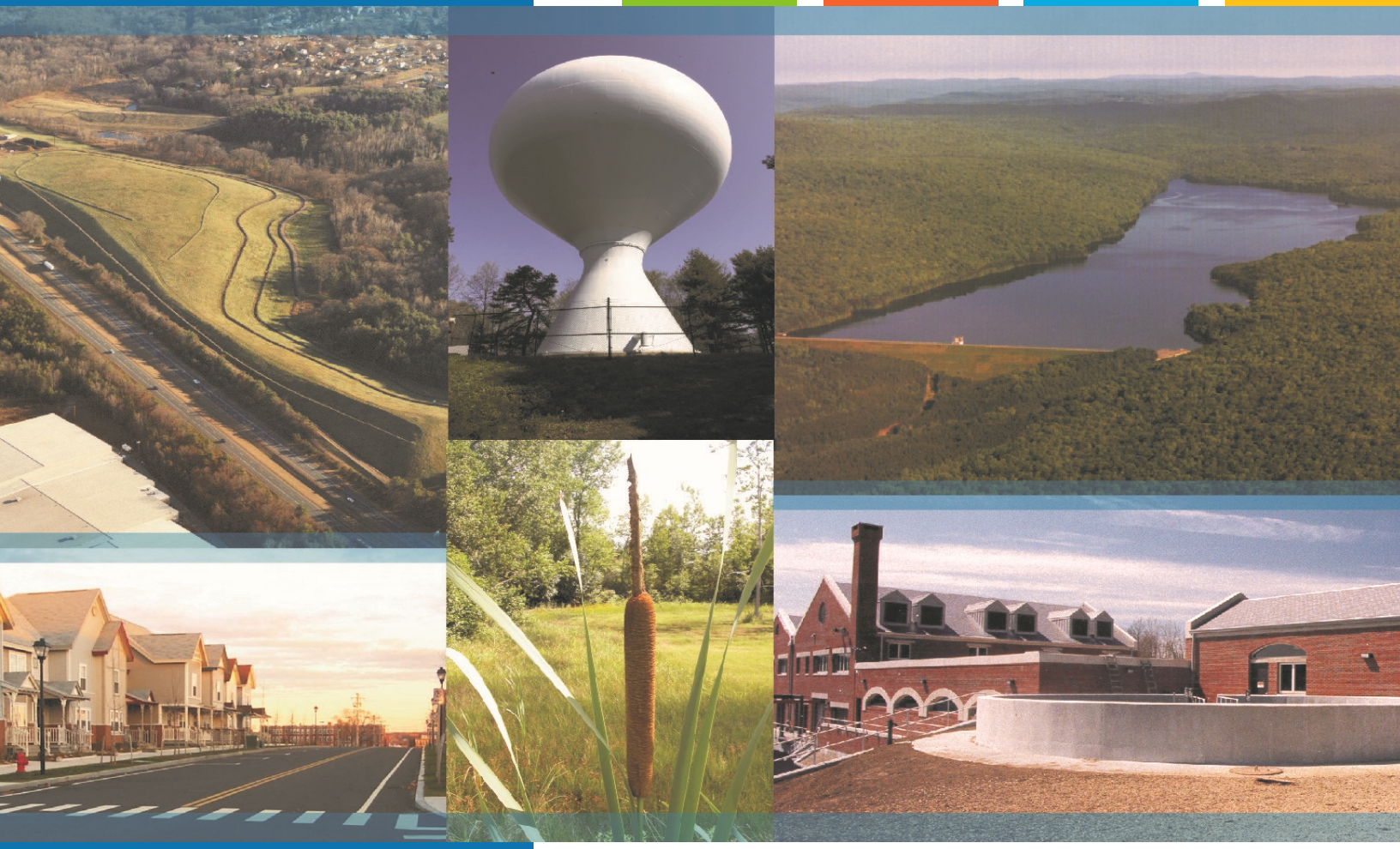
0 20' 40'

GRAPHIC SCALE

Tighe&Bond

May 24, 2022
T5037-002-C-DSGN.dwg

Last Save Date: May 24, 2022 1:58 PM By: NAHANSEN
Plot Date: Tuesday, May 24, 2022 Plotted By: Neil A. Hansen
T&B File Location: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\AutoCAD\T5037-002-C-DSGN.dwg Layout Tab: FIRE



Russell Street Mixed Use Development
Portsmouth, New Hampshire

TRAFFIC IMPACT STUDY

Two International Group

May 24, 2022

Tighe&Bond

100% Recyclable

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C. Traffic Volume Adjustment Calculations
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E. Capacity Analyses Worksheets
F. Site Development Plans
G. Other Development Traffic Volumes
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Section 1
Introduction & Summary

Tighe & Bond has prepared this *Traffic Impact Study* to summarize the potential changes in the traffic operations resulting from the proposed Russell Street Mixed Use Development which will include 80 residential units, 46,000 square feet (SF) of office space, and 18,500 SF of retail space, (the Project) located at Russell Street and Deer Street in Portsmouth, New Hampshire (the Site).

The Site is bounded by Russell Street to the northeast, Deer Street to the southeast, Maplewood Avenue to the southwest, and the Pan Am Railroad to the northwest. The Site is currently functioning as the Sheraton Portsmouth Harborside public parking lot. Vehicular access to the Site will be provided via a new driveway located just south of the existing parking lot driveway on Russell Street directly across from the existing Sheraton Hotel driveway. The Project includes approximately 189 parking spaces between the upper and lower parking levels beneath the building.

The trip generation analysis indicates that the Project can be expected to generate approximately 136 new vehicular trips during the weekday morning peak hour (91 entering trips, 45 exiting trips), and 177 new vehicular trips during the weekday afternoon peak hour (70 entering trips, 107 exiting trips).

A traffic operations analysis was conducted for the study intersections during the weekday morning and weekday afternoon peak hours. The analysis was conducted for the following four scenarios:

- 2025 No-Build Scenario – Future Projected Traffic Volumes without Site Generated Traffic
- 2025 Build Scenario – Future Projected Traffic Volumes with Site Generated Traffic
- 2035 No-Build Scenario – Future Projected Traffic Volumes without Site Generated Traffic (10-year Horizon)
- 2035 Build Scenario – Future Projected Traffic Volumes with Site Generated Traffic (10-year Horizon)

The Study builds off the previous Maplewood Avenue Traffic Evaluation conducted in 2019 and Raynes Avenue Traffic Impact Study conducted in 2021. Previously collected traffic volume data was utilized where possible. Additional traffic volume information was collected in February 2022 for study intersections where no previous and or recent data was available. The February 2022 traffic counts were validated by comparing 2022 traffic volumes to historical traffic volumes as further detailed in Section 2.3. The traffic counts were projected to and analyzed for the expected 2025 opening year and 10-year Horizon year of 2035 per NHDOT guidelines.

The remainder of the report summarizes the traffic evaluation which includes a description of the study area, traffic volumes during the weekday morning and weekday afternoon peak hours, trip generation estimates for the Project, estimated trip distribution patterns for the new site generated trips, traffic volume projections for the analysis scenarios, traffic operations analysis for the study area intersections, and a summary of the study findings and recommendations.

Based on the analyses conducted, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the Russell Street Mixed Use Development is not expected to have a significant impact to traffic operations on the surrounding roadway network.

Section 2
Existing Conditions

The following section includes a description of existing study area roadway geometry, intersection geometry, intersection traffic control, and data collection efforts within the study area. Figure 1 shows the location of the Site in relation to the surrounding roadway network and study area.

2.1 Roadway Descriptions

Russell Street is a two-lane roadway (one lane in each direction) that runs northeast-southwest between Deer Street and Market Street. On-street parallel parking and sidewalks are provided on both sides of Russell Street in the vicinity of the Project. The roadway has a posted speed limit of 25 miles per hour (mph) near the Site.

The other study area roadways (Maplewood Avenue, Deer Street, Russell Street, Green, Street, and Market Street) within the study area have similar urban characteristics: two-lane roadways, on-street parallel parking, sidewalks, and low speed limits (25 mph or less). Land uses near the Site are a mix of commercial businesses, restaurants, hotels and residential.

2.2 Study Area Intersections

Seven existing intersections were included for analysis in the study area. The study area was previously approved by the City of Portsmouth.

Maplewood Avenue at Deer Street

Deer Street intersects Maplewood Avenue from the east and west to form a four-way signalized intersection. Maplewood Avenue southbound approach consists of left turn only lane and a right/through shared lane. Maplewood Avenue northbound approach consists of an exclusive left turn lane, exclusive through lane and an exclusive right turn lane. Deer Street eastbound approach consists of a single lane. Deer Street westbound approach consists of an exclusive left turn lane and a right/through shared lane. The intersection is equipped with an exclusive actuated pedestrian phase. Each leg of the intersection has painted crosswalks.

Maplewood Avenue at Hanover Street

Hanover Street intersects Maplewood Avenue from the east and west to form a four-way signalized intersection. Maplewood Avenue southbound approach consists of left turn only lane and a right/through shared lane. Maplewood Avenue northbound approach consists of one left/through shared lane and one right/through shared lane. Hanover Street eastbound approach consists of an exclusive left turn lane and a right/through shared lane. Hanover Street westbound approach consists of an exclusive right turn lane and a left/through shared lane. The intersection is equipped with an exclusive actuated pedestrian phase. Each leg of the intersection has painted crosswalks.

Maplewood Avenue at U.S. Route 1 Bypass SB Ramps (Cutts Street) and Cutts Street

The U.S. Route 1 Bypass SB Ramps (Cutts Street) intersect Maplewood Avenue from the north and south to form a four-way unsignalized. Both roadways provide a single lane of travel in each direction. Vehicles exiting from the U.S. Route 1 Bypass SB Ramps (Cutts Street) and Cutts Street operate under stop control with a flashing beacon. Maplewood Avenue consists of 11-foot travel lanes and 4-foot shoulders. The U.S. Route 1 Bypass SB Ramps (Cutts Street) consist of 14-foot travel lanes and 1-foot shoulders.

Maplewood Avenue at U.S. Route 1 Bypass NB Ramps

The U.S. Route 1 Bypass NB Ramps intersect Maplewood Avenue from the south, forming a three-way unsignalized intersection. Both roadways provide a single lane of travel in each direction. Vehicles exiting from the U.S. Route 1 Bypass NB ramps operate under stop control. Maplewood Avenue consists of 11-foot travel lanes and 8-foot shoulders. The U.S. Route 1 Bypass NB Ramps consist of 12-foot travel lanes and 1-foot shoulders.

Deer Street at Russell Street

Russell Street intersects Deer Street from the north to form a three-way unsignalized intersection. The southbound approach on Russell Street provides a single lane that operates under a stop control. The westbound and eastbound approaches on Deer Street both provide a single lane. The intersection provides sidewalks on all sides of the intersection approaches. A crosswalk is available for pedestrians crossing Deer Street east of Russell Street.

Russell Street at Sheraton Driveway and Parking Lot Driveway

The Sheraton Harborside driveway and parking lot driveway intersect Russell Street from the east and west respectively, to form a four-way unsignalized intersection. All approaches provide a single lane of travel in each direction. Vehicles exiting from the Sheraton and parking lot driveways operate under stop control. Sidewalk is provided on both sides of Russell Street with a crosswalk and in-road pedestrian crossing sign provided at the intersection. On-street metered parking is provided on Russell Street north and south of the intersection.

Russell Street at Green Street

Green Street intersects Russell Street from the west, forming a three-way unsignalized intersection. All approaches provide a single travel lane. The Green Street approach is under stop control. Sidewalk is provided on both sides of Russell Street with a crosswalk provided across Green Street. On-street metered parking is provided on both sides of Russell Street south of the intersection.

Market Street at Russell Street

Russell Street intersects Market Street from the southwest, forming a three-way unsignalized intersection. Market Street southbound consists of a through lane and a channelized right turn lane that operates as free flow movements. The northbound approach consists of a single through lane. The intersection geometry is designed to prohibit northbound left turns from Market Street to Russell Street. The Russell Street approach is a single lane that is wide enough for right turning vehicles to bypass waiting left turning vehicles. The Russell Street approach operates under stop control. Pedestrian crosswalks are provided along Russell Street and the westbound Market Street approach

with sidewalks provided on all approaches. It is noted that the intersection is fully signalized with mast arms, vehicular and pedestrian signal heads, etc. However, the signal indications are in flashing mode, with yellow indications facing Market Street and red indication facing Russell Street.

2.3 Existing Traffic Data

Evaluation of the traffic impacts related to the Project requires the quantification of existing roadway and traffic conditions throughout the study area. Turning movement counts (TMC) from traffic studies collected prior to the start of the COVID-19 pandemic were used where possible. Because the study area includes three additional intersections not included in recent previous studies, additional turning movement counts were collected in February 2022. Automatic traffic recorder (ATR) data was collected concurrently to validate the turning movement counts.

Manual turning movement counts at the study area intersections for the previous study were collected in January 2019 during the weekday afternoon peak period (4:00 PM to 6:00 PM). Traffic counts for both the morning (7:00 AM to 9:00 AM) and afternoon peak periods (4:00 PM to 6:00 PM) were collected in February 2022 for the remaining intersections. The raw traffic counts are enclosed in Appendix A.

The February 2022 turning movement counts collected were validated by comparing the automatic traffic recorder (ATR) volumes collected concurrently to historical NHDOT volumes at the same location, on Maplewood Avenue approximately 100 feet southeast of Raynes Avenue. The ATR volumes during the peak hours were compared to the historical NHDOT volumes. The detailed comparison and 2019 NHDOT traffic volumes are included in Appendix C. Additionally, as shown in Table 1 below, average daily traffic volumes were observed to have been higher in 2022 than those collected prior to the start of the pandemic, further validating the volumes. The historical NHDOT average daily traffic volumes are also included in Appendix C.

TABLE 1

Maplewood Avenue Historical Average Annual Daily Traffic (ADT)

Year	ADT (vehicles per day)	Source
2017	6,474	NHDOT AADT (ID 82379035)
2018	6,603	NHDOT Growth Estimate
2019	6,682	NHDOT Growth Estimate
2020	5,727	NHDOT AADT (ID 82379035)
2022	7,596	Tighe & Bond February 2022 ATR

2.3.1 Seasonal Variation

The raw traffic counts were seasonally adjusted to peak month conditions based on the 2019 Urban Highway Group 4 Seasonal Adjustment Factors published by the New Hampshire Department of Transportation (NHDOT). Seasonal adjustment factors of 1.23 and 1.18 were applied to traffic volumes collected in January 2019 and February 2022, respectively. The NHDOT Group 4 Seasonal Adjustment Factor worksheet is enclosed in Appendix B.

Section 3
No-Build Conditions

The following section describes the estimation of traffic volumes in the study area for the No-Build Conditions. The 2025 and 2035 No-Build Conditions will serve as the baseline for comparison purposes to measure the impacts of the Project.

3.1 Planned Roadway and Intersection Projects

Information obtained from the City traffic department staff was used to identify planned roadway improvement and new development projects in the area that could affect future traffic conditions. One improvement was identified within the study area and considered when developing the No-Build conditions analysis.

Market Street and Russell Street Roundabout: The City is in the early planning stages of a proposed roundabout at the intersection of Market Street and Russell Street. Funding for the design of the project is included in the City's Capital Improvements Plan (CIP) for FY 2026. Potential funding sources for construction has not been identified. This improvement is modeled under the 2035 Future Build-Improved Conditions.

3.2 Traffic Growth

The 2025 No-Build Conditions traffic volumes were developed by growing the existing traffic volumes for the weekday morning and afternoon peak hours to the projected build year. Two components of traffic growth were incorporated. The first component was to estimate an annual average traffic growth rate. Based on a review of recent studies in the vicinity of the Project and NHDOT standards, a one percent per year background traffic growth rate was assumed in the analysis.

The second component to determining traffic growth was identifying any proposed development projects that are near or within the study area. Based on discussions with the City of Portsmouth staff during the previous study, it was determined that the following projects are approved or pending:

- *Deer Street Garage and Mixed-Use Development:* This project will be located in the northwest corner of the Maplewood Avenue/Deer Street intersection. The traffic study for the project indicates that the full build-out of the project consists of a 600-stall municipal public parking garage with 4,700 SF of integral retail; and four mixed-use buildings. The four mixed-use buildings include a combination of 80 residential apartments, 108 hotel rooms, 41,300 SF of office, 20,000 SF of retail, 9,900 SF of restaurants, a 4,700 SF bar, and a 2,700 SF bank. The project is currently approved with no imminent construction start date. The project traffic volumes were included in the 2035 No-Build conditions analyses.

- *Raynes Avenue Development:* This project located on Raynes Avenue includes the construction of a 128-room hotel, 60-unit residential building, 5,200 SF of retail space, and 4,400 SF of restaurant space. The project has been approved but is currently pending. The development traffic volumes are incorporated into the 2025 No-Build conditions analyses.

Traffic volumes related to these projects were obtained from record studies and assigned to the study area intersections to develop the 2025 and 2035 No-Build conditions traffic volumes. The traffic volumes from these other major developments are included in Appendix G. It is assumed that other smaller developments or small vacancies in existing developments are captured by the background traffic growth rate previously mentioned.

The 2025 and 2035 No-Build conditions volumes for the weekday morning and weekday afternoon peak hours are shown in Figures 2 and 3, respectively.

3.3 Traffic Operations Analysis – No-Build Conditions

Capacity and queue analyses were conducted for the 2025 and 2035 No-Build Conditions during the weekday morning and afternoon peak hours using Trafficware Synchro Studio 11 – Traffic Analysis Software. The software conducts the analysis based up on the methodology provided in the Highway Capacity Manual, 6th Edition, 2016. The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operation conditions based on the calculated average delay per vehicle. A summary of the HCM capacity analysis methodology and a detailed definition of LOS is provided in Appendix D. The queue analysis results are summarized in terms of the 50th percentile queue length, and the 95th percentile queue length. The 50th percentile queue length represents the approximate average queue length, and the 95th percentile queue length represents the design queue length under peak traffic conditions. Tables 2 and 3 summarize the capacity and queue analyses results, respectively. Capacity analyses worksheets with full inputs, settings, and results are provided in Appendix E.

During the weekday morning peak hour all movements at the Maplewood Avenue at Deer Street intersection experience LOS D or better during the weekday morning peak hour under 2025 and 2035 No-Build Conditions except the southbound shared through/ right movement which experiences LOS E under 2035 No-Build Conditions. Overall failing operations of LOS E and LOS F are experienced at the intersection during the weekday afternoon peak hour under 2025 No-Build Conditions and 2035 No-Build Conditions, respectively. Vehicular queues exceed available storage on the westbound left-turn lanes under 2025 and 2035 No-Build Conditions during both peak periods. Queues exceed the available storage on the northbound approach at the intersection under both 2025 and 2035 No-Build Conditions during the weekday afternoon peak hour.

Acceptable operations of LOS D or better are experienced on all approaches of the Maplewood Avenue at Hanover Street intersection except for the westbound shared through/ left movement which experiences LOS E under the 2035 No-Build Conditions during the weekday afternoon peak hour. Queues at the intersection are within available storage.

The unsignalized intersections experience operations of LOS D or better on all movements/approaches under 2025 No-Build Conditions during both peak hours. During the 2035 No-Build Conditions, LOS D or better operation is present for all movements/approaches during the weekday morning peak hour except for the Cutts Street southbound approach to Maplewood Avenue which operates at LOS E. Under the 2035 No-Build Conditions during the afternoon peak hour, the additional traffic volumes realized by the ambient background growth rate for the 10-year horizon to 2035 results in the following approaches/movements exceeding capacity and experiencing failing operations:

- Maplewood Avenue at Cutts Street (U.S. Route 1 SB Ramps) northbound and southbound approaches
- Maplewood Avenue at U.S. Route 1 Bypass NB Ramps northbound approach
- Market Street at Russell Street eastbound left movement

Significant queuing is experienced on the eastbound left movement at the intersection of Market Street at Russell Street under both 2025 and 2035 No-Build Conditions during the weekday afternoon peak hour. The remainder of the movements/approaches to the unsignalized intersections have queues that are within available storage lengths.

Section 4
Proposed Conditions

The proposed development includes three separate building units. The proposed 46,000 SF four-story office building is located on the west side of the Site. The center five-story building is comprised of 56 residential units with approximately 10,000 SF of retail space located on the ground floor. The final building, a five-story structure located on the northeast side of the Site includes 24 residential units with 8,500 SF of retail space on the ground floor as well. Approximately 189 parking spaces will be provided on Site for the proposed development on the lower and ground levels. The following sections describe the methodology to estimate the total number of site generated trips and their distribution within the study area roadway network.

4.1 Site Access

Three driveways are proposed to provide access to the upper level and lower-level parking areas. The upper-level parking access will be provided via one unsignalized full access driveway on Russell Street, directly across from the existing Sheraton Harborside driveway. The lower-level entrance is proposed on Maplewood Avenue, approximately 100 feet north of Deer Street. The lower-level exit is proposed 50 feet west of Russell Street and exit only on Green Street, west of Russell Street.

Intersection sight distance was reviewed at the proposed Site driveways on Russell Street and Green Street in accordance with criteria set forth in the AASHTO publication *A Policy on the Geometric Design of Highways and Streets*, 7th Edition, 2018. Available site distances were estimated based on the site layout plan and available aerial mapping. Based on AASHTO guidelines and the posted speed on Russell Street, the intersection sight distance requirement is 239 feet looking left to the north and 276 feet looking right to the south on Russell Street at the Site driveway. The available intersection sight distance is approximately 450 feet looking left to the north and 145 feet looking right to the south on Russell Street. While sight distance looking left to the north is in excess of the requirements, the sight distance looking right to the south is limited due to the termination of Russell Street. It is important to note that the proposed upper-level Site driveway will replace an existing parking lot driveway. Similar to the upper-level Site driveway, the required sight distance at the proposed lower-level Site driveway exit on Green Street is 239 feet looking left to the west and 276 feet looking right to the east based on the posted speed. The available sight distance looking left is approximately 330 feet, which is in excess of the requirement. While sight distance is not met looking right with only 75 feet of available sight distance due to the termination of Green Street, all site traffic is anticipated to exit to the right toward Russell Street which provides adequate sight distance as previously mentioned. Finally, it is important to note that meeting sight distance requirements is not always possible in dense urban environments due to closely spaced intersections and geometric limitations as is experienced at both site driveways.

The Project will include geometric roadway improvements to Deer Street, and Russell Street as shown on the proposed Site Plan (C-102.1), enclosed in Appendix F. The following improvements are proposed:

- Curb extensions and crosswalks on all approaches at the proposed Site driveway intersection and the Russell Street at Deer Street intersections
- Minor re-alignment of Russell Street and removal of the existing median island to eliminate the approach skew at the intersection with Deer Street
- Pavement marking improvements on Green Street at the intersection with Russell Street
- Pedestrian crosswalk across Deer Street at Portwalk Place
- Bi-directional bicycle lanes on Russell Street from Deer Street to Green Street
- Landscaping and streetscape improvements along Russell Street and Deer Street

In addition to the improvements listed above, the existing railroad crossing beacon located on the east side of Maplewood Avenue is proposed to be relocated to accommodate the proposed lower-level site entrance driveway on Maplewood Avenue. This work will be coordinated with the rail owner.

4.2 Trip Generation

Site generated traffic volumes for the Project were estimated using rates published in the Institute of Transportation Engineers (ITE) Trip Generation, 11th edition, 2021. ITE provides data to estimate the total number of vehicular trips associated with a site based on the specific land uses. To estimate the trip generation for the Project, ITE Land Use Code (LUC) 221 – Multifamily Housing (Mid-Rise), LUC 710 – General Office Building, and LUC 822 – Strip Retail Plaza Center (<40,000 SF).

Mixed-use developments typically generate shared trips, also known as internal capture. The internal capture rate for the proposed development was determined using the *National Cooperative Highway Research Program (NCHRP) Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* by the Transportation Research Board, 2011. The internal capture rate is estimated to be 4% for entering vehicles and 8% for exiting vehicles during the weekday morning peak hour, and 23% for entering vehicles and 16% for exiting vehicles during the weekday afternoon peak hour. The detailed calculation spreadsheet is included in Appendix H.

Because the existing traffic volumes entering and exiting the existing Sheraton Public Parking Lot driveway from Russell Street were minimal, these traffic volumes were not deducted from the trip generation estimate. This results in a conservative existing traffic volume estimate as the parking lot is currently utilized and will be replaced with the proposed development.

Based on the ITE data and the calculated internal capture rates, the proposed development is expected to generate approximately 136 trips (91 entering, 45 exiting) during the weekday morning peak hour and 177 trips (70 entering, 107 exiting) during the weekday afternoon peak hour. The proposed trip generation for the weekday morning and afternoon peak hours is presented in Table 4.

4.3 Arrival and Departure Distribution

The trip distribution identifies the various travel paths for vehicles arriving and departing the Project site. Trip distribution patterns for the Project were based on a review of previous traffic studies conducted for nearby projects, observed travel patterns, and the proposed parking layout. Because the upper and lower parking levels are not interconnected, the trip distribution was based on the parking provided on each level. Trip distributions of 55% and 45% were applied to the lower-level and upper-level site driveways, respectively.

The following arrival/ departure distributions are anticipated for the residential trips:

Arrival
- 40% from the west via Maplewood Avenue
- 35% from the east via Maplewood Avenue
- 25% from the northwest via Market Street

Departure
- 5% to the west via Maplewood Avenue
- 35% to the east via Maplewood Avenue
- 60% to the northwest via Market Street

The following arrival/ departure distributions are anticipated for the office trips:

Arrival
- 50% from the west via Maplewood Avenue
- 20% from the east via Maplewood Avenue
- 30% from the northwest via Market Street

Departure
- 5% to the west via Maplewood Avenue
- 20% to the east via Maplewood Avenue
- 75% to the northwest via Market Street

The following arrival/ departure distributions are anticipated for the retail trips:

Arrival
- 30% from the west via Maplewood Avenue
- 55% from the east via Maplewood Avenue
- 15% from the northwest via Market Street

Departure
- 5% to the west via Maplewood Avenue
- 55% to the east via Maplewood Avenue
- 40% to the northwest via Market Street

The trip distribution patterns for the residential, office, and retail uses are shown in Figure 4. The vehicular trips associated with the Project were assigned to the study area and are shown in Figure 5 for the weekday morning and weekday afternoon peak hours.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2025 and 2035 No-Build Conditions traffic volumes to develop the 2025 and 2035 Build Conditions traffic volumes for both peak periods. The 2025 and 2035 Build Conditions traffic volumes are presented in Figures 6 and 7, respectively.

5.1 Capacity and Queue Analyses – Build Conditions

Capacity and queue analyses were conducted for the 2025 and 2035 Build Conditions for the peak hours using the methodology described in Section 3.3. Tables 2 and 3 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix E.

A majority of the study area intersections and movements will continue to operate with the same LOS under Build Conditions as No-Build Conditions during both peak hours.

Under 2025 Build Conditions, the movements/approaches to all intersections either operate at the same LOS under Build Conditions when compared to No-Build Conditions or operate at LOS D or better with one exception. During the weekday afternoon peak hour, the intersection of Maplewood Avenue at Deer Street continues to operate at overall LOS E under 2025 Build Conditions with timing optimization. The southbound left movement experiences degradation in LOS from C to D under 2025 Build Conditions but still experiences acceptable operations.

Under 2035 Build Conditions, the movements/approaches to all intersections operate at No-Build LOS or operate at LOS D or better with four exceptions. In the morning peak hour, the U.S. Route 1 northbound ramp approach to Maplewood Avenue operates at LOS E, though queues remain within available storage. Similar to 2035 No-Build Conditions, the Maplewood Avenue at Deer Street intersection eastbound approach continues to operate at LOS F during the afternoon peak hour with optimization. The eastbound approach does experience a degradation in LOS from E to F under 2035 Build Conditions, but remains below capacity (v/c = 0.98). The Site Driveway and Sheraton Harborside Driveway approaches to Russell Street operate at LOS E in the afternoon peak hour.

As mentioned in Section 3.1, a modern roundabout is planned for the Market Street and Russell Street intersection in FY 2026. Because the roundabout will not be constructed prior to the 2025 opening year, the improvement was analyzed under 2035 Build Conditions only. Under the improved condition the intersection experiences improved operations of overall LOS A during the weekday morning peak hour and LOS C during the weekday afternoon peak hour. Additionally, vehicular queues that exceed available storage under 2035 No-Build and 2035 Build Conditions with the existing configuration are now accommodated within available storage during the weekday afternoon peak hour.

Based on the capacity analysis results, the proposed development and its site generated traffic is not expected to have a significant detrimental effect on the intersection operations beyond what is already expected to be experienced under 2025 and 2035 No-Build Conditions.

Section 6
Conclusions and Recommendations

1. The proposed Russell Street Mixed Use development is proposing to replace the existing parking lot currently utilized by the Sheraton Hotel on Russell Street with a mixed-use development to include 80 residential units, 46,000 SF of office space, and 18,500 SF of retail space. Approximately 189 parking spaces will be provided as part of the development. The proposed development is estimated to be constructed and occupied in 2025.

2. The traffic volumes utilized in the study were a compilation of previous traffic counts collected in January 2019 and February 2022. The traffic counts were seasonally adjusted. The February 2022 traffic volumes were validated by comparing collected traffic volume data along Maplewood Avenue to historic NHDOT traffic volume data at the same location to confirm traffic volumes reflect typical conditions.

3. The proposed development is expected to generate approximately 136 vehicular trips during the weekday morning peak hour (91 entering trips, 45 exiting trips), and 177 new vehicular trips during the weekday afternoon peak hour (70 entering trips, 107 exiting trips). Due to the mixed-use nature of the development, an internal capture calculation was applied to the trip generation calculation. This methodology aligns with industry standard practices and was utilized for the previously approved studies in the area.

4. Proposed roadway, pavement marking, and signage improvements along Russell Street, Green Street, Maplewood Avenue, and Deer Street as discussed in Section 4.1 will improve safety for vehicles, pedestrians, and bicyclists.

5. As discussed in Section 3.1, the intersection of Market Street at Russell Street is currently programmed for design of a proposed roundabout in FY 2026. The roundabout aims to improve both existing and future deficiencies at the existing condition stop-controlled intersection. As mentioned in Section 5.1, acceptable traffic operations are experienced under 2035 Build Conditions during the weekday morning and afternoon peak hours with the improvement.

6. The traffic capacity and queue analyses results indicate that when potential future projects in the area are all constructed, substantial traffic volumes will be added to the study area network which will cause increases congestion at a number of intersections within the study area which will exacerbate existing capacity issues at select intersection approaches. Site generated traffic represents a relatively small percentage of the cumulative traffic volume expected to be generated by the potential future projects. Following optimization and installation of planed roadway improvements, the proposed development is not expected to have a significant detrimental effect on the intersection operations beyond what is already expected to be experienced under 2025 and 2035 No-Build Conditions.

7. While signal timing optimization is recommended at the intersection of Maplewood Avenue at Deer Street during the afternoon peak hour as mentioned in Section 5.1, signal timing optimization should also be reviewed regularly as other planned projects get implemented to improve intersection operations in the study area.

8. The existing railroad crossing beacon on the east side of Maplewood Avenue will be relocated in coordination with the rail owner to support the proposed lower-level site driveway entrance on Maplewood Avenue.

9. System-wide traffic improvement measures, such as promotion of reduced automobile usage, enhanced transit services to the area and promotion of remote/underutilized parking areas can also be considered by the City to reduce the volume of vehicular traffic generated within the downtown street network during peak times.

10. Based on the results of the analysis, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed Russell Street Mixed Use Development is not expected to have a significant impact to traffic operations on the surrounding roadway network.

Section 7
Additional Tables

TABLE 2
Intersection Operation Summary - Capacity

	Lane Use	Weekday Morning Peak Hour												Weekday Afternoon Peak Hour									
		2025 No Build			2025 Build			2035 No Build			2035 Build			2025 No Build			2025 Build			2035 No Build			2035 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Maplewood Avenue at Deer Street																							
Overall		**C**	**25.3**	**0.74**	**C**	**25.2**	**0.74**	**D**	**40.1**	**0.98**	**D**	**41.4**	**0.98**	**E**	**66.2**	**1.11**	**E**	**79.9**	**1.27**	**F**	**86.9**	**1.29**	**F**	**82.0**	**1.21**
	EB	C	20.9	0.10	C	20.9	0.10	C	26.0	0.31	C	26.0	0.31	F	87.1	0.99	F	87.0	0.96	E	74.4	0.97	F	84.7	0.98
Deer Street	WBL	C	28.3	0.32	C	28.9	0.36	C	29.7	0.38	C	30.6	0.42	F	120.1	1.10	F	177.3	1.27	D	43.9	0.71	D	54.8	0.83
	WBTR	C	20.2	0.13	B	19.9	0.13	C	23.5	0.19	C	23.4	0.20	C	30.8	0.39	C	29.5	0.39	C	24.7	0.32	C	24.6	0.33
	NBL	B	11.5	0.04	B	10.7	0.04	D	49.1	0.56	D	49.7	0.56	C	20.3	0.08	C	21.0	0.09	D	50.0	0.51	D	48.3	0.52
	NBT	C	21.6	0.54	C	22.2	0.58	C	23.7	0.60	C	26.0	0.64	F	98.9	1.11	F	108.8	1.14	F	175.6	1.29	F	139.8	1.21
Maplewood Avenue	NBR	A	3.5	0.21	A	3.6	0.23	A	3.1	0.23	A	3.4	0.25	A	4.0	0.39	A	3.9	0.41	A	6.9	0.45	A	6.2	0.44
	SBL	B	19.8	0.09	B	20.0	0.11	B	19.9	0.11	C	20.3	0.13	C	26.4	0.45	D	42.8	0.66	C	24.3	0.34	C	30.3	0.48
	SBTR	C	33.7	0.74	C	33.7	0.74	E	65.9	0.98	E	69.7	0.98	D	39.3	0.81	D	42.2	0.83	F	96.4	1.00	F	100.7	1.00
Traffic Signal - Maplewood Avenue at Hanover Street																							
Overall		**B**	**19.0**	**0.43**	**B**	**18.5**	**0.44**	**B**	**19.5**	**0.49**	**B**	**19.4**	**0.51**	**C**	**20.6**	**0.60**	**C**	**20.9**	**0.64**	**C**	**22.5**	**0.61**	**C**	**23.2**	**0.65**
	EBL	D	44.9	0.21	D	44.9	0.21	D	44.8	0.22	D	44.8	0.22	D	54.0	0.52	D	54.0	0.52	D	49.4	0.42	D	49.4	0.42
Hanover Street	EBTR	D	36.7	0.35	D	36.7	0.35	C	33.4	0.45	C	33.4	0.45	C	32.6	0.21	C	32.6	0.21	C	22.3	0.37	C	22.3	0.37
	WBLT	D	51.8	0.39	D	51.8	0.39	D	52.9	0.43	D	52.9	0.43	D	49.2	0.43	D	49.2	0.43	E	55.7	0.57	E	55.7	0.57
	WBR	A	8.4	0.17	A	8.4	0.17	A	7.8	0.18	A	7.8	0.18	A	6.2	0.28	A	6.2	0.28	A	6.0	0.35	A	6.0	0.35
	NB	B	19.1	0.26	B	19.4	0.28	C	21.1	0.35	C	21.5	0.37	C	26.7	0.49	C	27.5	0.51	C	27.8	0.59	C	28.6	0.62
Maplewood Avenue	SBL	B	13.5	0.14	B	12.3	0.14	B	11.9	0.17	B	11.4	0.17	A	9.3	0.33	A	8.3	0.35	B	11.7	0.38	B	11.3	0.40
	SBTR	B	15.2	0.43	B	14.1	0.44	B	14.7	0.49	B	14.4	0.51	B	12.0	0.60	B	12.5	0.64	B	16.0	0.61	B	17.0	0.65
Unsignalized TWSC - Maplewood Avenue at Cutts Street (U.S. Route 1 Bypass SB Ramps)/ Cutts Street																							
Maplewood Avenue	EBL	A	7.4	0.00	A	7.4	0.00	A	7.5	0.00	A	7.5	0.00	A	7.6	0.00	A	7.6	0.00	A	7.8	0.00	A	7.8	0.00
	WBL	A	8.2	0.19	A	8.2	0.19	A	8.5	0.25	A	8.6	0.25	A	9.0	0.35	A	9.0	0.36	B	10.9	0.55	B	11.0	0.55
Cutts Street (U.S. Route 1 Bypass SB Ramps)	NB	B	13.3	0.15	B	13.1	0.16	C	17.0	0.23	C	16.7	0.24	D	26.7	0.34	D	26.5	0.35	F	389.0	1.48	F	396.8	1.51
Cutts Street	SB	C	23.8	0.00	C	24.3	0.24	E	37.3	0.37	E	38.5	0.38	F	62	0.37	F	64.2	0.38	F	638.1	1.52	F	731.9	1.67
Unsignalized TWSC - Maplewood Avenue at U.S. Route 1 Bypass NB Ramps																							
Maplewood Avenue	WBL	A	7.8	0.01	A	7.8	0.01	A	7.9	0.01	A	7.9	0.01	A	8	0.02	A	7.7	0.02	A	8.0	0.03	A	8.0	0.03
U.S. Route 1 Bypass NB Ramps	NB	C	15.8	0.58	C	17.4	0.64	D	26.5	0.80	D	32.5	0.86	C	19.3	0.59	C	20.4	0.62	F	71.6	1.00	F	83.1	1.04
Unsignalized TWSC - Russell Street at Deer Street																							
Deer Street	EBL	A	7.6	0.08	A	7.6	0.09	A	7.6	0.10	A	7.7	0.12	A	8.2	0.24	A	8.3	0.25	A	8.7	0.29	A	8.8	0.31
Russel Street	SB	A	9.8	0.25	B	10.0	0.28	B	10.4	0.33	B	10.5	0.35	C	16	0.61	C	18.4	0.67	C	18.9	0.68	C	21.9	0.74
Unsignalized TWSC - Russell Street at Site Driveway (Upper Level)/ Sheratron Driveway																							
Site Driveway (Existing Parking Lot)	EB	B	12.0	0.02	B	12.2	0.11	B	13.3	0.02	B	13.5	0.13	C	15.5	0.09	C	23.9	0.43	C	18.5	0.14	E	38.0	0.63
Sheraton Harborside Dwy	WB	A	9.5	0.03	A	9.7	0.03	A	9.7	0.04	B	10.0	0.04	C	16.0	0.06	C	19.1	0.07	C	20.7	0.23	D	27.1	0.30
Russell Street	NBL	A	7.8	0.01	A	7.9	0.02	A	7.9	0.01	A	8.1	0.02	A	8.3	0.01	A	8.5	0.03	A	8.5	0.01	A	8.7	0.04
	SBL	A	7.5	0.01	A	7.5	0.01	A	7.5	0.01	A	7.5	0.01	A	8.0	0.01	A	8.0	0.01	A	8.2	0.01	A	8.2	0.01
Unsignalized TWSC - Russell Street at Green Street																							
Green Street	EB	B	10.2	0.03	B	10.8	0.08	B	10.8	0.04	B	11.6	0.09	C	16.8	0.16	C	19.6	0.34	C	20.4	0.22	D	25.3	0.42
Russell Street	NBL	A	7.8	0.00	A	7.8	0.00	A	8.0	0.00	A	8.0	0.00	A	8.4	0.01	A	8.4	0.01	A	8.6	0.01	A	8.7	0.01
Unsignalized TWSC - Maplewood Avenue at Site Entrance (Lower Level)																							
Maplewood Avenue	SBL	--	--	--	A	8.1	0.03	--	--	--	A	8.2	0.03	--	--	--	A	9.1	0.02	--	--	--	A	9.8	0.03
Unsignalized TWSC - Green Street at Site Exit (Lower Level)																							
Site Exit (Lower Level)	NB	--	--	--	A	8.5	0.03	--	--	--	A	8.5	0.03	--	--	--	A	8.8	0.06	--	--	--	A	8.8	0.06

TABLE 2 (CONTINUED)
Intersection Operation Summary - Capacity

	Lane Use	Weekday Morning Peak Hour															Weekday Afternoon Peak Hour											
		2025 No Build			2025 Build			2035 No Build			2035 Build			2025 Build-Improved			2025 No Build			2025 Build			2035 No Build			2035 Build			2025 Build-Improved		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Unsignalized TWSC - Market Street at Russell Street																														
Overall		--	--	--	--	--	--	--	--	--	--	--	--	**A**	**7.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	**C**	**18.0**	--
Russell Street	EBL	B	14.4	0.26	C	15.1	0.32	C	16.5	0.36	C	17.6	0.42	--	--	--	F	454.5	1.89	F	598.9	2.22	F	549.5	2.12	F	684.9	2.42	--	--	--
	EBR	B	10.4	0.01	B	10.4	0.01	B	10.7	0.01	B	10.7	0.01	--	--	--	B	10.9	0.02	B	10.9	0.02	B	11.6	0.02	B	11.6	0.02	--	--	--
Market Street	EB	--	--	--	--	--	--	--	--	--	--	--	--	A	6.0	--	--	--	--	--	--	--	--	--	--	--	--	--	B	15.0	--
	NB	--	--	--	--	--	--	--	--	--	--	--	--	A	5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	D	25.4	--
	SB	--	--	--	--	--	--	--	--	--	--	--	--	A	8.4	--	--	--	--	--	--	--	--	--	--	--	--	--	C	15.2	--

TABLE 3
Intersection Operation Summary - Queues

			Weekday Morning Peak Hour								Weekday Afternoon Peak Hour							
	Lane Use	Available Storage	2025 No Build		2025 Build		2035 No Build		2035 Build		2025 No Build		2025 Build		2035 No Build		2035 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Maplewood Avenue at Deer Street																		
	EB	590	13	55	13	55	50	144	50	144	257	356	249	349	211	586	212	588
Deer Street	WBL	100	60	163	68	182	68	185	77	220	275	291	351	354	114	363	143	433
	WBTR	350	22	78	22	78	44	124	44	126	107	143	107	142	74	194	75	197
	NBL	100	3	5	2	4	25	81	22	82	2	6	2	6	10	47	10	22
	NBT	350	165	137	173	70	180	112	193	296	434	585	422	565	481	691	474	660
Maplewood Avenue	NBR	350	23	0	33	1	9	14	2	22	0	34	0	39	14	43	21	47
	SBL	150	11	29	13	33	12	30	14	34	41	47	44	51	27	57	29	59
	SBTR	>500	253	380	253	380	384	627	384	627	315	418	321	426	407	652	407	652
Traffic Signal - Maplewood Avenue at Hanover Street																		
	EBL	90	14	36	14	36	16	38	16	38	47	55	47	55	35	67	35	67
Hanover Street	EBTR	90	21	52	21	52	24	58	24	58	15	25	15	25	12	44	12	44
	WBLT	250	28	49	28	49	31	54	31	54	40	76	40	76	53	80	53	80
	WBR	75	0	19	0	19	0	20	0	20	0	37	0	37	0	23	0	23
	NB	325	98	141	108	154	132	185	143	199	185	261	199	278	263	353	281	381
Maplewood Avenue	SBL	175	29	24	27	24	32	22	31	22	14	31	12	29	46	34	48	32
	SBTR	350	218	277	213	281	260	251	263	266	128	287	183	304	290	325	320	415
Unsignalized TWSC - Maplewood Avenue at Cutts Street (U.S. Route 1 Bypass SB Ramps)/ Cutts Street																		
Maplewood Avenue	EBL	>500	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
	WBL	>500	--	18	--	18	--	25	--	25	--	40	--	40	--	88	--	88
Cutts Street (U.S. Route 1 Bypass SB Ramps)	NB	350	--	13	--	15	--	23	--	23	--	35	--	38	--	208	--	217
Cutts Street	SB	>500	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Maplewood Avenue at U.S. Route 1 Bypass NB Ramps																		
Maplewood Avenue	WBL	>500	--	0	--	0	--	0	--	0	--	3	--	3	--	3	--	3
U.S. Route 1 Bypass NB Ramps	NB	800	--	95	--	115	--	208	--	258	--	95	--	105	--	333	--	373
Unsignalized TWSC - Russell Street at Deer Street																		
Deer Street	EBL	390	--	8	--	8	--	8	--	10	--	23	--	25	--	30	--	33
Russell Street	SB	150	--	25	--	28	--	35	--	40	--	105	--	133	--	135	--	170
Unsignalized TWSC - Russell Street at Site Driveway (Upper Level)/ Sheratron Driveway																		
Site Driveway (Existing Parking Lot)	EB	300	--	0	--	10	--	3	--	10	--	8	--	53	--	13	--	98
Sheraton Harborside Dwy	WB	100	--	3	--	3	--	3	--	3	--	5	--	5	--	23	--	30
Russell Street	NBL	150	--	0	--	3	--	0	--	3	--	0	--	3	--	0	--	3
	SBL	200	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Russell Street at Green Street																		
Green Street	EB	75	--	3	--	5	--	3	--	8	--	15	--	35	--	20	--	50
Russell Street	NBL	225	--	0	--	0	--	0	--	0	--	0	--	0	--	0	--	0
Unsignalized TWSC - Maplewood Avenue at Site Entrance (Lower Level)																		
Maplewood Avenue	SBL	50	--	--	--	3	--	--	--	3	--	--	--	3	--	--	--	3
Unsignalized TWSC - Green Street at Site Exit (Lower Level)																		
Site Exit (Lower Level)	NB	225	--	--	--	3	--	--	--	3	--	--	--	5	--	--	--	5

TABLE 3 (CONTINUED)
Intersection Operation Summary - Queues

	Lane Use	Available Storage	Weekday Morning Peak Hour										Weekday Afternoon Peak Hour									
			2025 No Build		2025 Build		2035 No Build		2035 Build		2035 Build-Improved		2025 No Build		2025 Build		2035 No Build		2035 Build		2035 Build-Improved	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Unsignalized TWSC - Market Street at Russell Street																						
Russell Street	EBL	150	--	28	--	35	--	40	--	50	--	--	--	763	--	982	--	973	--	1198	--	--
	EBR	150	--	0	--	0	--	0	--	0	--	--	--	3	--	3	--	3	--	3	--	--
Market Street	EB	150	--	--	--	--	--	--	--	--	--	20	--	--	--	--	--	--	--	--	--	120
	NB	575	--	--	--	--	--	--	--	--	--	15	--	--	--	--	--	--	--	--	--	208
	SB	400	--	--	--	--	--	--	--	--	--	80	--	--	--	--	--	--	--	--	--	208

TABLE 4
Site-Generated Traffic Summary

Proposed - 80 Residential Units **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning	7	23	30
Weekday Afternoon	19	12	31

Proposed - 46,000 SF Office Space **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning	62	8	70
Weekday Afternoon	11	55	66

Proposed - 18,500 SF Retail Space **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning	26	18	44
Weekday Afternoon	61	61	122

Total Trips **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning	95	49	144
Weekday Afternoon	91	128	219

Internal Capture[1] **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning[2]	4	4	8
Weekday Afternoon[3]	21	21	42

Net Vehicular Trips (Total minus Internal Capture) **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning	**91**	**45**	**136**
Weekday Afternoon	**70**	**107**	**177**

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021.
Land Use - 221 Multifamily Housing (Mid-Rise)
Land Use - 710 General Office Building
Land Use - 822 Strip Retail Plaza (<40,000 SF)

[1]NCHRP Report 684-Enhancing Internal Trip Capture Estimation for Mixed-Use Developments, Transportation Research Board, Washington, DC, 2011

[2]Based on NCHRP 8-51 Table 5-A Computations Summary (4% Entering, 8% Exiting)

[3]Based on NCHRP 8-51 Table 5-P Computations Summary (23% Entering, 16% Exiting)

Section 8
Figures

LEGEND

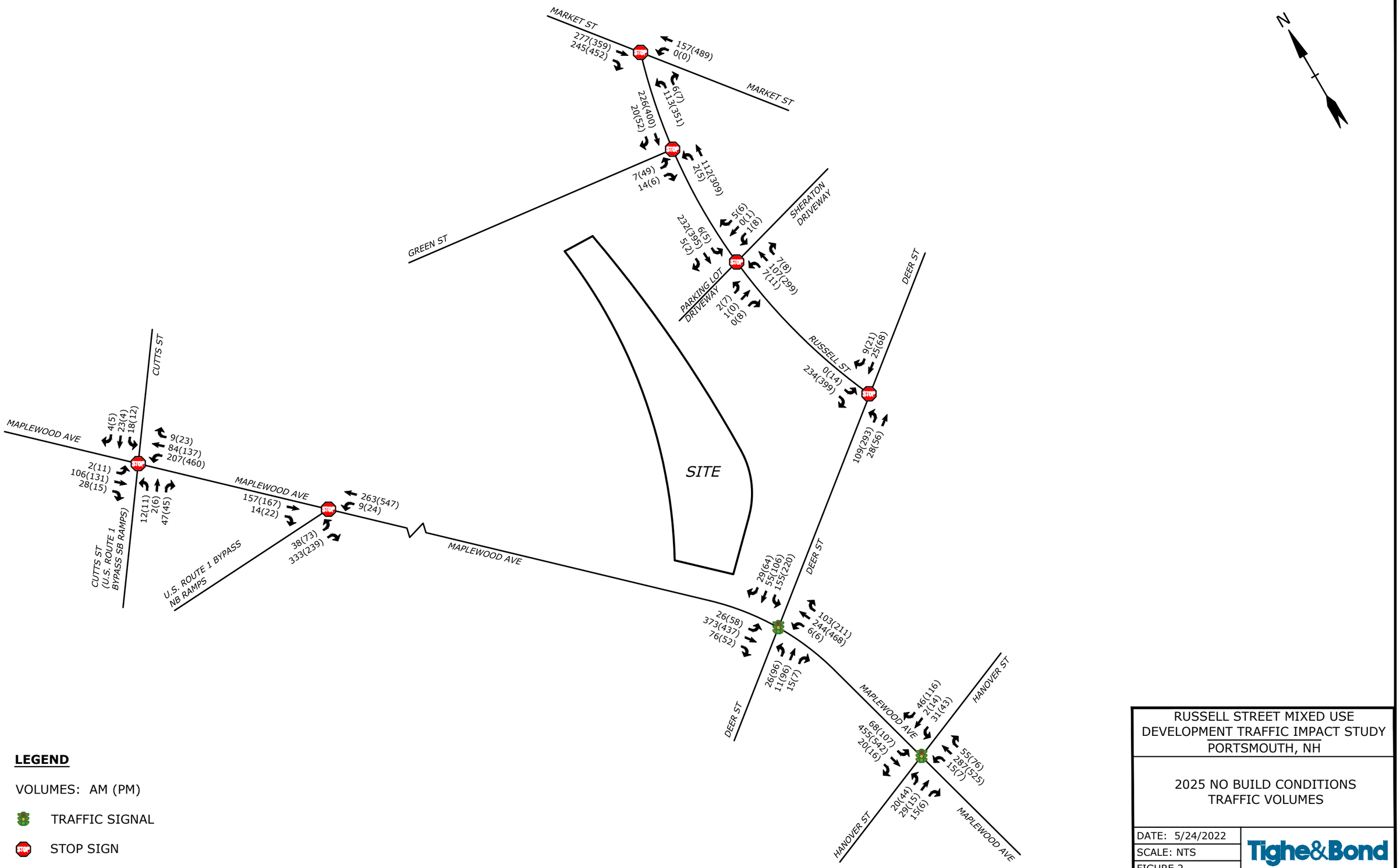
STUDY AREA INTERSECTION

RUSSELL STREET MIXED USE DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

TRAFFIC IMPACT STUDY AREA

DATE: 5/24/2022	Tighe&Bond
SCALE: 1" = 400'	
FIGURE 1	

May 18, 2022-8:48am Plotted By: MStoutz
Tighe & Bond, Inc. J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\AutoCAD\Sheet\Traffic Study Area - expanded.dwg



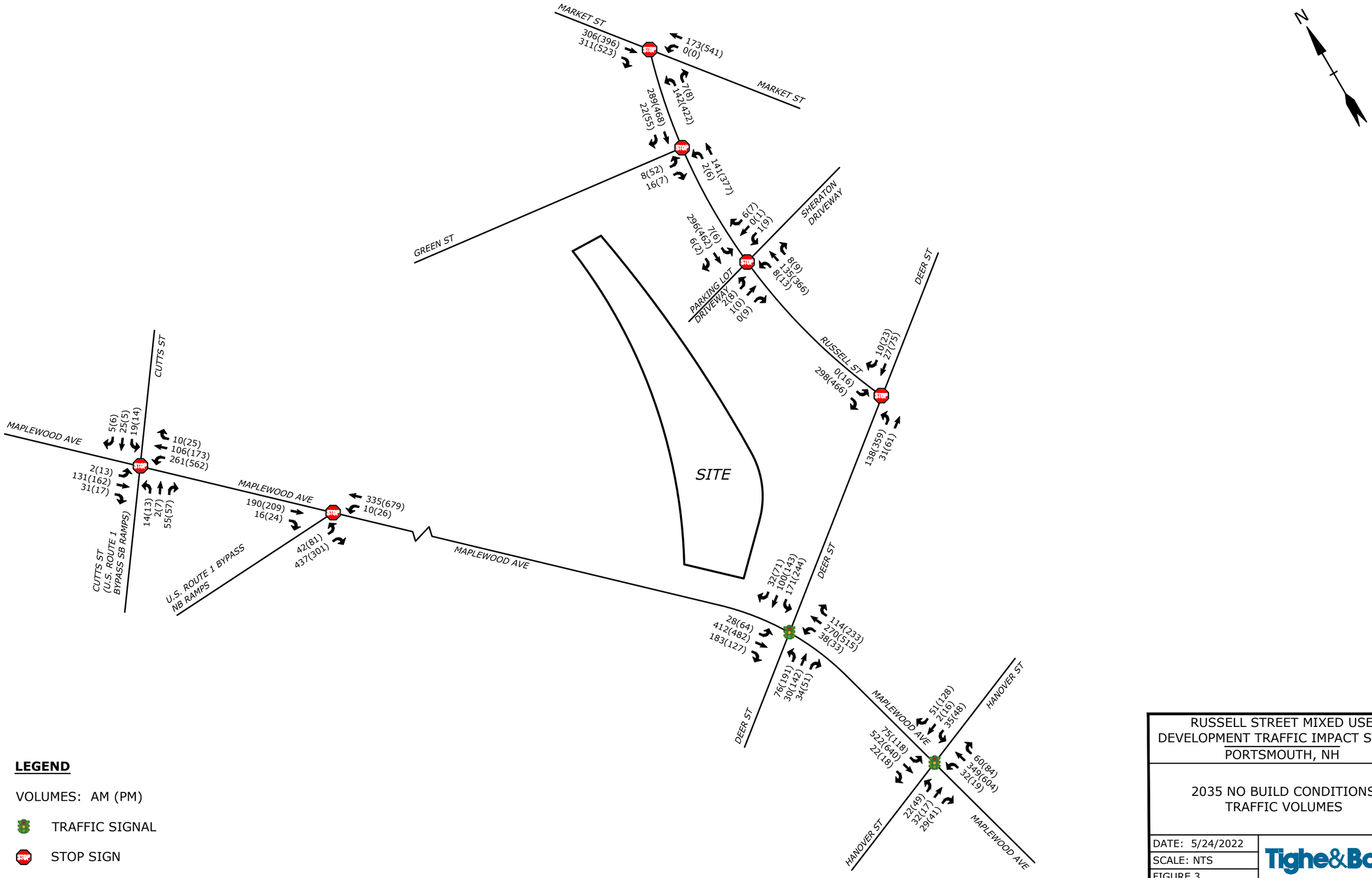
RUSSELL STREET MIXED USE DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

2025 NO BUILD CONDITIONS TRAFFIC VOLUMES

DATE: 5/24/2022
SCALE: NTS
FIGURE 2

Tighe&Bond

Plotted On:May 18, 2022-3:09pm By: MStoutz
Tighe & Bond:J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\Figures\T5037-002-TRAFFIC-VOLUME-FIGURES.dwg



LEGEND

VOLUMES: AM (PM)

TRAFFIC SIGNAL

STOP SIGN

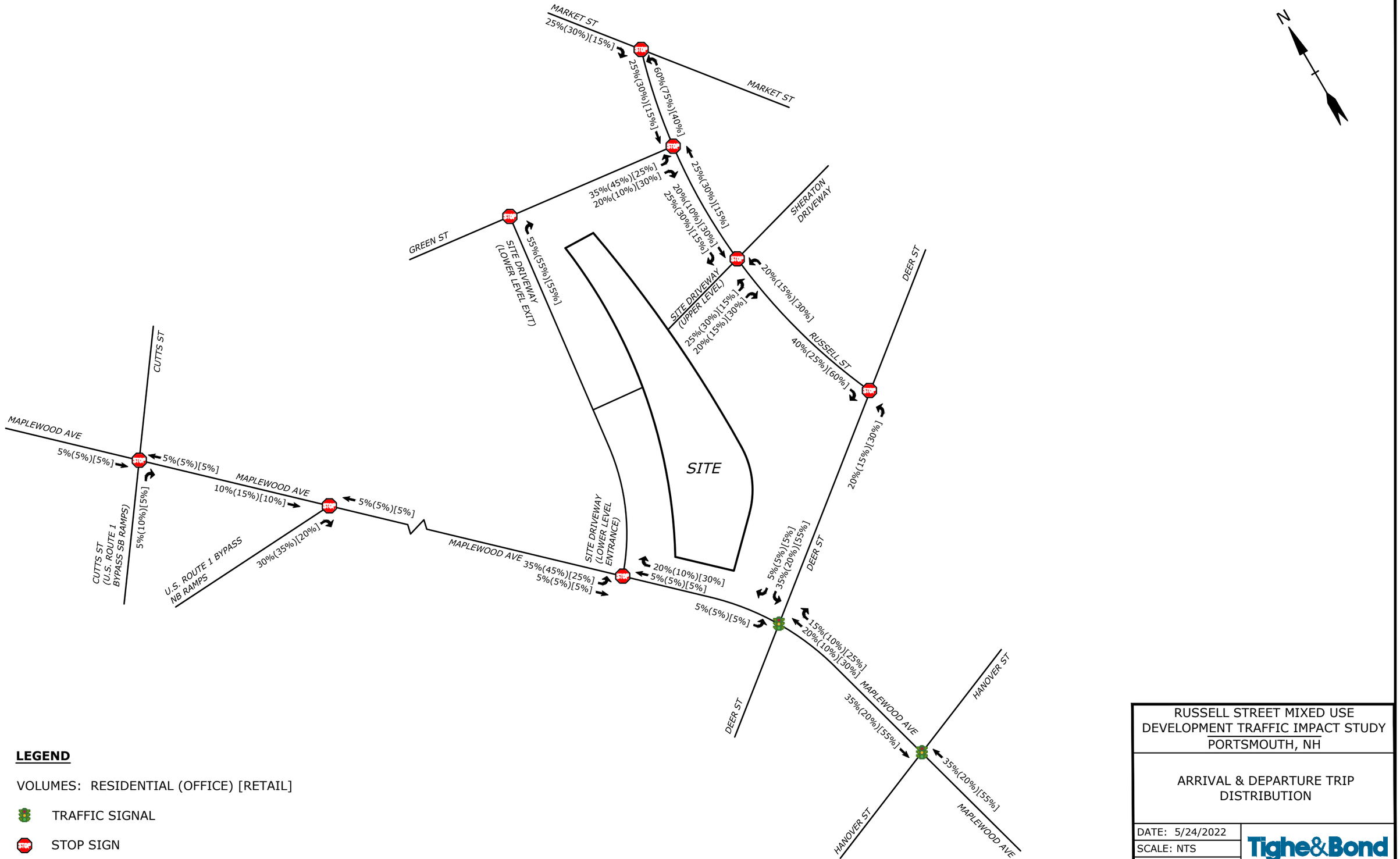
RUSSELL STREET MIXED USE DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

2035 NO BUILD CONDITIONS TRAFFIC VOLUMES

DATE: 5/24/2022
SCALE: NTS
FIGURE 3

Tighe&Bond

Plotted On:May 18, 2022-3:09pm By: MStoutz
Tighe & Bond:J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\Figures\T5037-002-TRAFFIC-VOLUME-FIGURES.dwg



LEGEND

VOLUMES: RESIDENTIAL (OFFICE) [RETAIL]

TRAFFIC SIGNAL

STOP SIGN

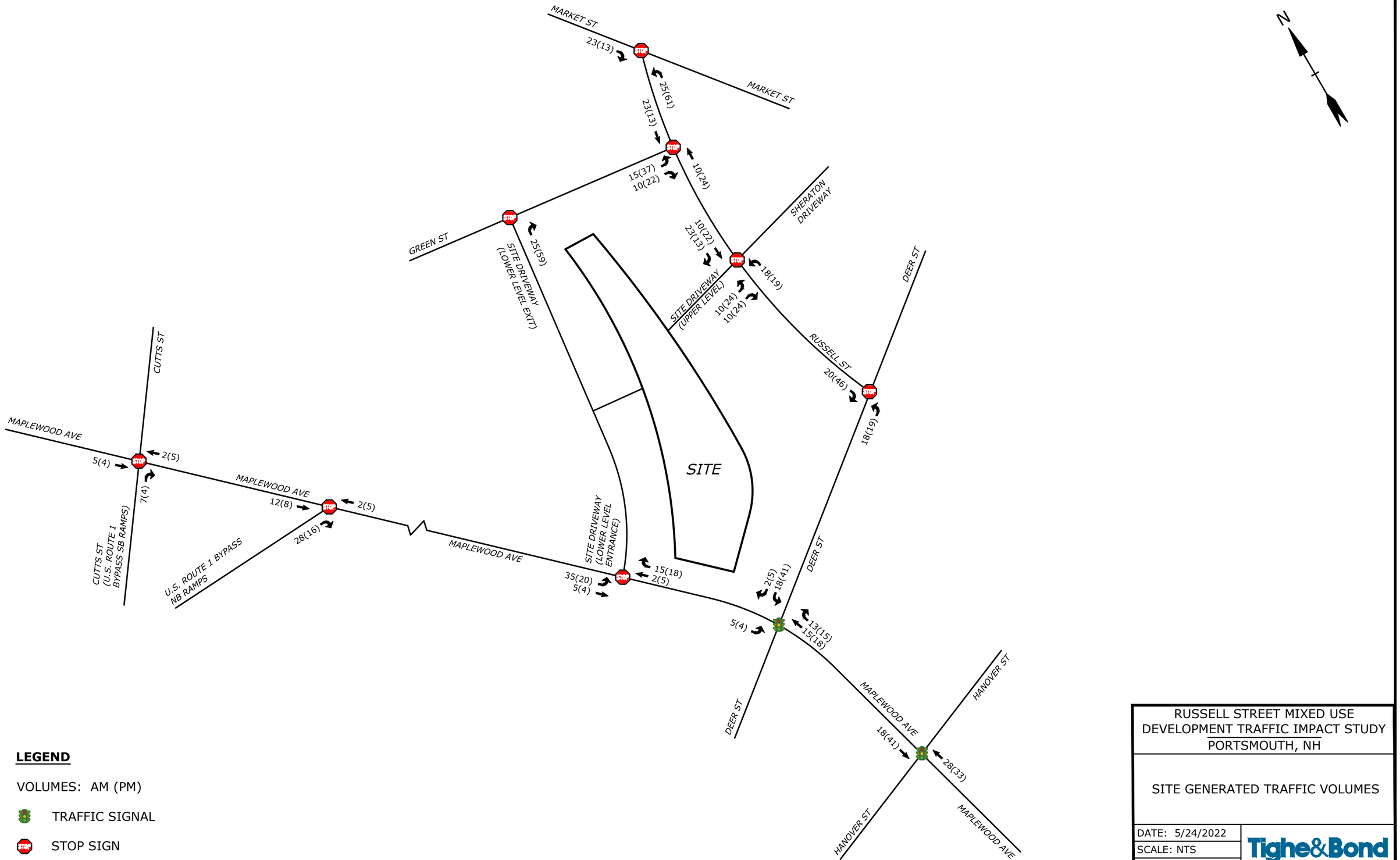
RUSSELL STREET MIXED USE DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

ARRIVAL & DEPARTURE TRIP DISTRIBUTION

DATE: 5/24/2022
SCALE: NTS
FIGURE 4

Tighe&Bond

Plotted On:May 18, 2022-3:09pm By: MStoutz
Tighe & Bond:J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\Figures\T5037-002-TRAFFIC-VOLUME-FIGURES.dwg



LEGEND

VOLUMES: AM (PM)

TRAFFIC SIGNAL

STOP SIGN

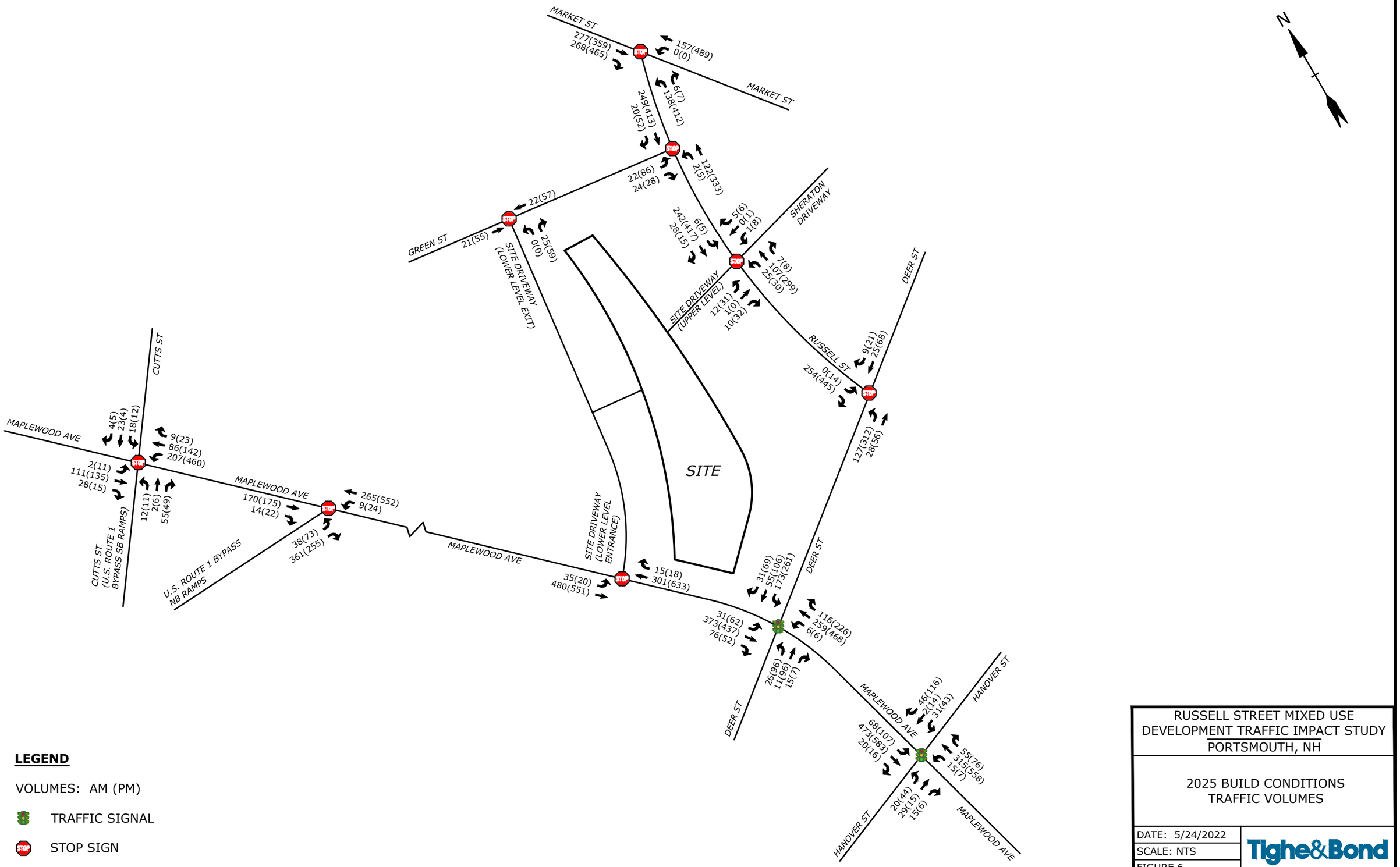
RUSSELL STREET MIXED USE
DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

SITE GENERATED TRAFFIC VOLUMES

DATE: 5/24/2022
SCALE: NTS
FIGURE 5

Tighe&Bond

Plotted On:May 18, 2022-3:09pm By: MStoutz
Tighe & Bond:J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\Figures\T5037-002-TRAFFIC-VOLUME-FIGURES.dwg



LEGEND

VOLUMES: AM (PM)

TRAFFIC SIGNAL

STOP SIGN

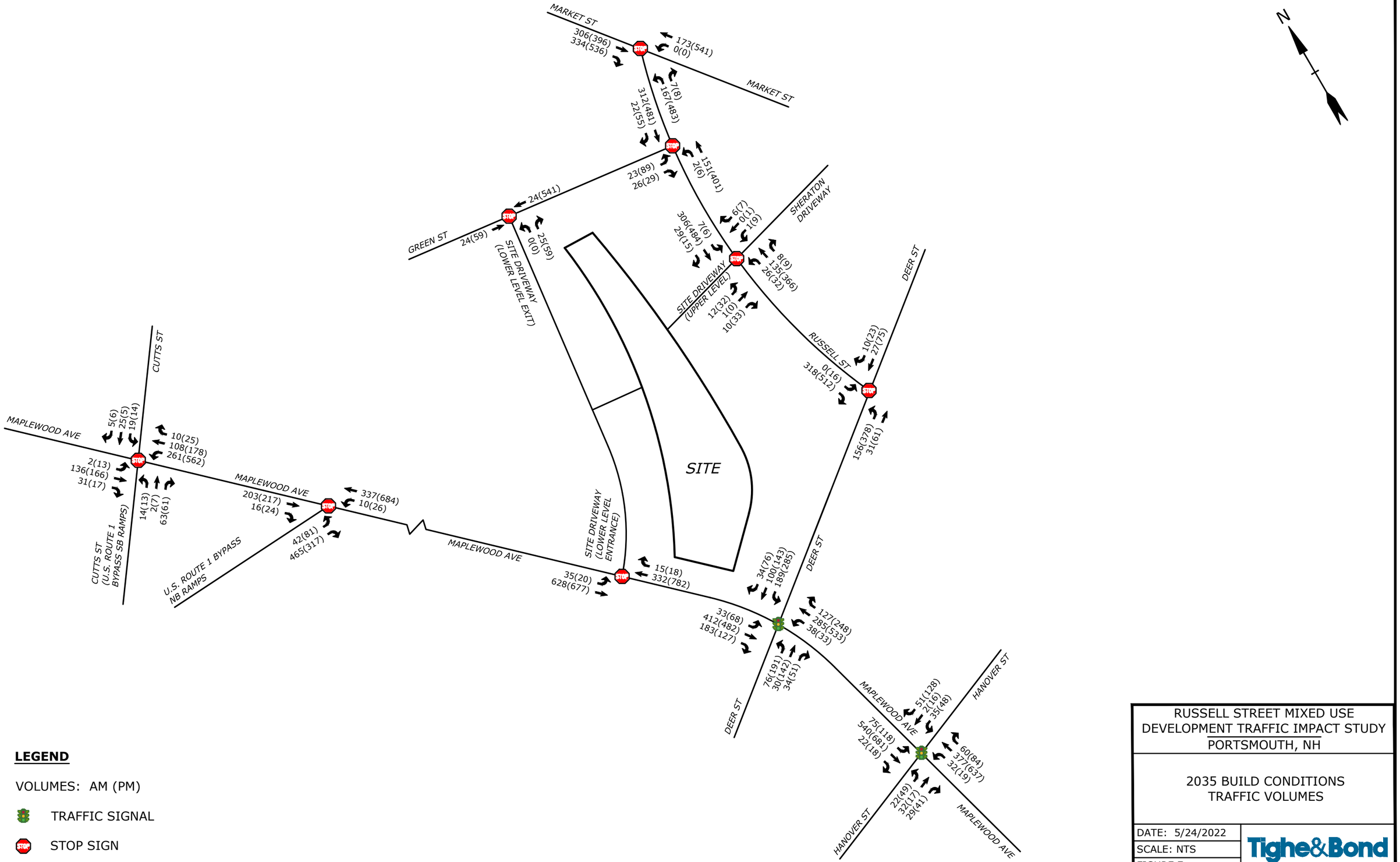
RUSSELL STREET MIXED USE
DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

2025 BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 5/24/2022
SCALE: NTS
FIGURE 6

Tighe&Bond

Plotted On:May 18, 2022-3:09pm By: MStoutz
Tighe & Bond:J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\Figures\T5037-002-TRAFFIC-VOLUME-FIGURES.dwg



LEGEND

VOLUMES: AM (PM)

TRAFFIC SIGNAL

STOP SIGN

RUSSELL STREET MIXED USE
DEVELOPMENT TRAFFIC IMPACT STUDY
PORTSMOUTH, NH

2035 BUILD CONDITIONS
TRAFFIC VOLUMES

DATE: 5/24/2022
SCALE: NTS
FIGURE 7

Tighe&Bond

Plotted On:May 18, 2022-3:09pm By: MStoutz
Tighe & Bond:J:\T\T5037 Two International Group\002 Russell Street Development\Drawings_Figures\Figures\T5037-002-TRAFFIC-VOLUME-FIGURES.dwg

APPENDIX A
Traffic Count Data

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Deer Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Deer Street Eastbound				Deer Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	19	10	0	4	33	3	0	4	1	0	0	15	4	6
7:15 AM	0	0	25	19	0	7	44	3	0	3	4	0	0	21	4	6
7:30 AM	0	0	44	20	0	8	37	5	0	3	2	0	0	24	10	1
7:45 AM	0	0	41	16	0	7	80	18	0	7	2	2	0	35	13	5
8:00 AM	0	2	48	21	0	8	73	12	0	4	0	7	0	36	8	8
8:15 AM	0	3	53	24	0	3	83	19	0	6	3	3	0	34	7	5
8:30 AM	0	0	59	24	0	3	71	14	0	4	4	1	0	22	17	6
8:45 AM	0	1	30	14	0	7	72	19	0	7	7	2	0	29	18	1

AM PEAK HOUR 7:45 AM to 8:45 AM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Deer Street Eastbound				Deer Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**5**	**201**	**85**	**0**	**21**	**307**	**63**	**0**	**21**	**9**	**13**	**0**	**127**	**45**	**24**
PHF	**0.88**				**0.93**				**0.90**				**0.92**			
HV %	**0.0%**	**20.0%**	**10.0%**	**4.7%**	**0.0%**	**0.0%**	**2.0%**	**6.3%**	**0.0%**	**9.5%**	**11.1%**	**7.7%**	**0.0%**	**5.5%**	**8.9%**	**4.2%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Deer Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
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www.BostonTrafficData.com

HEAVY VEHICLES

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Deer Street Eastbound				Deer Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	1	0	0	3	0	0	1	0	0	0	2	0	0
7:15 AM	0	0	0	1	0	1	5	1	0	0	0	0	0	1	2	0
7:30 AM	0	0	3	1	0	0	2	0	0	0	0	0	0	1	0	0
7:45 AM	0	0	2	0	0	0	0	3	0	0	0	0	0	3	0	0
8:00 AM	0	1	1	0	0	0	4	0	0	0	0	1	0	2	3	1
8:15 AM	0	0	4	1	0	0	1	1	0	1	0	0	0	1	1	0
8:30 AM	0	0	13	3	0	0	1	0	0	1	1	0	0	1	0	0
8:45 AM	0	0	3	0	0	0	1	2	0	1	1	1	0	2	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Deer Street Eastbound				Deer Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**21**	**4**	**0**	**0**	**7**	**3**	**0**	**3**	**2**	**2**	**0**	**6**	**4**	**1**
PHF	**0.41**				**0.63**				**0.58**				**0.46**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Deer Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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PEDESTRIANS & BICYCLES

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Deer Street Eastbound				Deer Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1
7:30 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
8:00 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	2	1	0	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	5	0	0	0	1	0	0	0	3

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Deer Street Eastbound				Deer Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	7	1	0	0	3	0	0	0	3	0	0	0	1

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

PDI File #: **196718 D**
Location: **N: Maplewood Avenue S: Maplewood Avenue**
Location: **E: Deer Street W: Deer Street**
City, State: **Portsmouth, NH**
Client: **Tighe & Bond/ M. Santos**
Site Code: **200076019**
Count Date: **Thursday, January 31, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Cars and Heavy Vehicles (Combined)**

	Maplewood Avenue from North					Deer Street from East					Maplewood Avenue from South					Deer Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	13	57	11	0	81	10	9	29	0	48	43	66	1	0	110	1	18	12	0	31	270
4:15 PM	14	57	12	0	83	11	13	25	0	49	39	78	3	0	120	2	14	17	0	33	285
4:30 PM	13	57	7	0	77	8	18	24	0	50	50	81	4	0	135	3	7	17	0	27	289
4:45 PM	11	70	12	0	93	8	12	43	0	63	31	76	3	0	110	3	14	16	0	33	299
Total	51	241	42	0	334	37	52	121	0	210	163	301	11	0	475	9	53	62	0	124	1143
5:00 PM	10	71	7	0	88	13	27	37	0	77	45	99	2	0	146	1	21	36	0	58	369
5:15 PM	11	77	8	0	96	15	14	34	0	63	39	79	1	0	119	1	21	12	0	34	312
5:30 PM	10	95	19	0	124	13	22	63	0	98	37	82	2	0	121	0	23	13	0	36	379
5:45 PM	9	81	10	0	100	8	18	35	0	61	41	83	0	0	124	4	8	12	0	24	309
Total	40	324	44	0	408	49	81	169	0	299	162	343	5	0	510	6	73	73	0	152	1369
Grand Total	91	565	86	0	742	86	133	290	0	509	325	644	16	0	985	15	126	135	0	276	2512
Approach %	12.3	76.1	11.6	0.0		16.9	26.1	57.0	0.0		33.0	65.4	1.6	0.0		5.4	45.7	48.9	0.0		
Total %	3.6	22.5	3.4	0.0	29.5	3.4	5.3	11.5	0.0	20.3	12.9	25.6	0.6	0.0	39.2	0.6	5.0	5.4	0.0	11.0	
Exiting Leg Total					865					537					870					240	2512
Cars	90	562	86	0	738	86	133	284	0	503	318	638	14	0	970	15	125	134	0	274	2485
% Cars	98.9	99.5	100.0	0.0	99.5	100.0	100.0	97.9	0.0	98.8	97.8	99.1	87.5	0.0	98.5	100.0	99.2	99.3	0.0	99.3	98.9
Exiting Leg Total					858					529					861					237	2485
Heavy Vehicles	1	3	0	0	4	0	0	6	0	6	7	6	2	0	15	0	1	1	0	2	27
% Heavy Vehicles	1.1	0.5	0.0	0.0	0.5	0.0	0.0	2.1	0.0	1.2	2.2	0.9	12.5	0.0	1.5	0.0	0.8	0.7	0.0	0.7	1.1
Exiting Leg Total					7					8					9					3	27

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Maplewood Avenue from North					Deer Street from East					Maplewood Avenue from South					Deer Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	10	71	7	0	88	13	27	37	0	77	45	99	2	0	146	1	21	36	0	58	369
5:15 PM	11	77	8	0	96	15	14	34	0	63	39	79	1	0	119	1	21	12	0	34	312
5:30 PM	10	95	19	0	124	13	22	63	0	98	37	82	2	0	121	0	23	13	0	36	379
5:45 PM	9	81	10	0	100	8	18	35	0	61	41	83	0	0	124	4	8	12	0	24	309
Total Volume	40	324	44	0	408	49	81	169	0	299	162	343	5	0	510	6	73	73	0	152	1369
% Approach Total	9.8	79.4	10.8	0.0		16.4	27.1	56.5	0.0		31.8	67.3	1.0	0.0		3.9	48.0	48.0	0.0		
PHF	0.909	0.853	0.579	0.000	0.823	0.817	0.750	0.671	0.000	0.763	0.900	0.866	0.625	0.000	0.873	0.375	0.793	0.507	0.000	0.655	0.903
Cars	40	324	44	0	408	49	81	166	0	296	158	341	5	0	504	6	73	73	0	152	1360
Cars %	100.0	100.0	100.0	0.0	100.0	100.0	100.0	98.2	0.0	99.0	97.5	99.4	100.0	0.0	98.8	100.0	100.0	100.0	0.0	100.0	99.3
Heavy Vehicles	0	0	0	0	0	0	0	3	0	3	4	2	0	0	6	0	0	0	0	0	9
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	1.0	2.5	0.6	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.7
Cars Enter Leg	40	324	44	0	408	49	81	166	0	296	158	341	5	0	504	6	73	73	0	152	1360
Heavy Enter Leg	0	0	0	0	0	0	0	3	0	3	4	2	0	0	6	0	0	0	0	0	9
Total Entering Leg	40	324	44	0	408	49	81	169	0	299	162	343	5	0	510	6	73	73	0	152	1369
Cars Exiting Leg					463					275					496					126	1360
Heavy Exiting Leg					2					4					3					0	9
Total Exiting Leg					465					279					499					126	1369

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Hanover Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	24	3	0	4	45	0	0	2	4	1	0	2	0	5
7:15 AM	0	0	38	3	0	4	56	3	0	3	0	2	0	4	3	3
7:30 AM	0	4	47	8	0	4	58	1	0	5	3	1	0	5	1	11
7:45 AM	0	1	49	11	0	16	99	1	0	0	7	3	0	12	1	9
8:00 AM	0	2	51	9	0	13	97	3	0	7	4	5	0	6	0	9
8:15 AM	0	4	68	10	0	15	105	3	0	3	6	4	0	3	0	10
8:30 AM	0	6	68	15	0	12	73	9	0	6	7	1	0	4	1	10
8:45 AM	0	5	36	6	0	22	71	9	0	1	4	0	0	5	3	6

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	82	11	0	12	58	3	0	2	1	0	0	4	3	14
4:15 PM	0	1	78	14	0	11	65	0	0	5	4	6	0	6	2	13
4:30 PM	0	1	92	16	0	16	67	2	0	20	1	1	0	9	1	21
4:45 PM	0	3	89	8	0	16	92	2	0	5	3	0	0	7	1	19
5:00 PM	0	1	105	19	0	14	74	4	0	6	7	1	0	15	4	16
5:15 PM	0	1	91	20	0	14	70	1	0	1	2	3	0	5	6	27
5:30 PM	0	5	81	18	0	21	58	2	0	4	8	4	0	9	4	24
5:45 PM	0	8	53	14	0	22	72	6	0	0	2	2	0	8	5	18

AM PEAK HOUR 7:45 AM to 8:45 AM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**13**	**236**	**45**	**0**	**56**	**374**	**16**	**0**	**16**	**24**	**13**	**0**	**25**	**2**	**38**
PHF	**0.83**				**0.91**				**0.83**				**0.74**			
HV %	**0.0%**	**23.1%**	**9.7%**	**2.2%**	**0.0%**	**10.7%**	**2.1%**	**0.0%**	**0.0%**	**6.3%**	**12.5%**	**38.5%**	**0.0%**	**4.0%**	**0.0%**	**2.6%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**6**	**377**	**63**	**0**	**60**	**303**	**9**	**0**	**32**	**13**	**5**	**0**	**36**	**12**	**83**
PHF	**0.89**				**0.85**				**0.57**				**0.86**			
HV %	**0.0%**	**0.0%**	**2.1%**	**0.0%**	**0.0%**	**6.7%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**23.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Hanover Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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HEAVY VEHICLES

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	2	1	0	2	3	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	2	1	0	1	5	0	0	0	0	1	0	1	0	0
7:30 AM	0	1	3	0	0	1	2	0	0	0	1	0	0	0	0	0
7:45 AM	0	1	2	0	0	2	1	0	0	0	0	3	0	1	0	0
8:00 AM	0	0	2	1	0	1	5	0	0	0	1	2	0	0	0	0
8:15 AM	0	1	6	0	0	2	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	13	0	0	1	1	0	0	1	2	0	0	0	0	1
8:45 AM	0	3	2	0	0	2	2	0	0	0	0	0	0	0	0	1

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	3	0	0	2	0	0	0	0	1	0	0	0	0	0
4:45 PM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
5:15 PM	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0
5:45 PM	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1

AM PEAK HOUR 7:45 AM to 8:45 AM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**23**	**1**	**0**	**6**	**8**	**0**	**0**	**1**	**3**	**5**	**0**	**1**	**0**	**1**
PHF	**0.48**				**0.58**				**0.75**				**0.50**			

PM PEAK HOUR 4:30 PM to 5:30 PM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**8**	**0**	**0**	**4**	**3**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.44**				**0.38**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Hanover Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PEDESTRIANS & BICYCLES

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	2
7:30 AM	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	6	0	0	0	1	0	0	0	1	0	0	0	0
8:00 AM	0	0	0	6	0	0	0	2	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	9	0	0	0	3	0	0	0	1	0	0	0	1
8:30 AM	0	0	0	2	0	0	0	5	0	0	0	1	0	0	0	0
8:45 AM	0	0	0	9	0	0	0	6	0	0	0	2	0	0	0	1

	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	19	0	0	0	2	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	3
4:30 PM	0	0	0	13	0	1	0	3	0	0	0	6	0	0	0	0
4:45 PM	0	0	0	7	0	0	0	6	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	14	0	0	0	5	0	0	0	2	0	0	0	1
5:15 PM	0	0	0	8	0	0	0	4	0	0	0	1	0	0	0	0
5:30 PM	0	0	0	8	0	0	0	8	0	0	0	2	0	0	0	2
5:45 PM	0	0	0	9	0	0	0	3	0	0	0	1	0	0	0	2

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	23	0	0	0	11	0	0	0	4	0	0	0	1

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Maplewood Avenue Northbound				Maplewood Avenue Southbound				Hanover Street Eastbound				Hanover Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	42	0	1	0	18	0	0	0	9	0	0	0	3

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Route 1 ByPass SB Ramp (Cutts St)
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	0	6	0	1	2	1	0	0	4	6	0	21	6	0
7:15 AM	0	1	0	4	0	1	4	0	0	0	17	11	0	37	7	1
7:30 AM	0	0	2	6	0	0	3	0	0	1	12	3	0	44	11	0
7:45 AM	0	1	0	7	0	4	5	1	0	0	29	6	0	46	12	3
8:00 AM	0	3	0	11	0	6	6	0	0	2	24	6	0	40	14	2
8:15 AM	0	3	1	9	0	3	2	1	0	0	20	8	0	35	13	1
8:30 AM	0	3	1	12	0	1	6	1	0	0	14	3	0	48	30	2
8:45 AM	0	0	0	9	0	0	1	0	0	0	13	4	0	31	10	1

	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	3	0	5	0	0	3	2	0	4	19	4	0	81	26	4
4:15 PM	0	1	0	7	0	0	3	0	0	0	24	4	0	69	22	2
4:30 PM	0	1	1	6	0	2	0	1	0	1	19	3	0	95	31	4
4:45 PM	0	4	2	11	0	1	1	0	0	3	33	2	0	88	17	6
5:00 PM	0	2	1	9	0	2	1	1	0	5	24	7	0	102	26	5
5:15 PM	0	2	1	10	0	4	1	2	0	0	26	1	0	83	35	3
5:30 PM	0	3	1	4	0	2	1	1	0	2	15	1	0	88	21	3
5:45 PM	0	1	1	2	0	1	2	0	0	1	22	3	0	47	17	2

AM PEAK HOUR 7:45 AM to 8:45 AM	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**10**	**2**	**39**	**0**	**14**	**19**	**3**	**0**	**2**	**87**	**23**	**0**	**169**	**69**	**8**
PHF	**0.80**				**0.75**				**0.80**				**0.77**			
HV %	**0.0%**	**20.0%**	**0.0%**	**2.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.6%**	**13.0%**	**0.0%**	**4.1%**	**24.6%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**9**	**5**	**36**	**0**	**9**	**3**	**4**	**0**	**9**	**102**	**13**	**0**	**368**	**109**	**18**
PHF	**0.74**				**0.57**				**0.82**				**0.93**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**	**3.7%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Route 1 ByPass SB Ramp (Cutts St)
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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HEAVY VEHICLES

	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	3	3	0	2	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	1	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	1	1	0	3	1	0
8:30 AM	0	1	0	1	0	0	0	0	0	0	1	0	0	2	13	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0

	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	4	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**3**	**0**	**7**	**17**	**0**
PHF	**0.38**				**0.00**				**0.88**				**0.40**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**6**	**6**	**0**
PHF	**0.00**				**0.00**				**0.25**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Route 1 ByPass SB Ramp (Cutts St)
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PEDESTRIANS & BICYCLES

	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
8:30 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	1	0	0	0	3	0	0	0	3	0	1	0	1

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Route 1 ByPass SB Ramp (Cutts Street) Northbound				Cutts Street Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Route 1 ByPass NB Ramp
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	5	0	33	0	0	0	0	0	0	8	3	0	2	23	0
7:15 AM	0	7	0	40	0	0	0	0	0	0	17	4	0	4	40	0
7:30 AM	0	6	0	35	0	0	0	0	0	0	14	5	0	2	47	0
7:45 AM	0	7	0	75	0	0	0	0	0	0	36	4	0	2	54	0
8:00 AM	0	7	0	49	0	0	0	0	0	0	37	4	0	2	48	0
8:15 AM	0	7	0	66	0	0	0	0	0	0	31	2	0	3	45	0
8:30 AM	0	10	0	84	0	0	0	0	0	0	24	2	0	1	69	0
8:45 AM	0	3	0	69	0	0	0	0	0	0	20	3	0	2	38	0

	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	15	0	40	0	0	0	0	0	0	24	2	0	8	97	0
4:15 PM	0	15	0	34	0	0	0	0	0	0	22	8	0	4	78	0
4:30 PM	0	11	0	39	0	0	0	0	0	0	22	5	0	5	119	0
4:45 PM	0	16	0	53	0	0	0	0	0	0	40	5	0	6	96	0
5:00 PM	0	15	0	49	0	0	0	0	0	0	30	4	0	3	118	0
5:15 PM	0	18	0	44	0	0	0	0	0	0	37	4	0	5	104	0
5:30 PM	0	16	0	48	0	0	0	0	0	0	18	4	0	8	92	0
5:45 PM	0	13	0	73	0	0	0	0	0	0	20	5	0	4	55	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**31**	**0**	**274**	**0**	**0**	**0**	**0**	**0**	**0**	**128**	**12**	**0**	**8**	**216**	**0**
PHF	**0.81**				**0.00**				**0.85**				**0.80**			
HV %	**0.0%**	**12.9%**	**0.0%**	**1.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.9%**	**8.3%**	**0.0%**	**12.5%**	**10.2%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**60**	**0**	**185**	**0**	**0**	**0**	**0**	**0**	**0**	**129**	**18**	**0**	**19**	**437**	**0**
PHF	**0.89**				**0.00**				**0.82**				**0.92**			
HV %	**0.0%**	**5.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Route 1 ByPass NB Ramp
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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HEAVY VEHICLES

	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	3	0	0	0	0	0	0	1	0	0	0	2	0
7:15 AM	0	1	0	3	0	0	0	0	0	0	3	1	0	0	1	0
7:30 AM	0	0	0	2	0	0	0	0	0	0	1	0	0	0	2	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	2	0	0	1	4	0
8:00 AM	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	0
8:15 AM	0	1	0	1	0	0	0	0	0	0	1	0	0	0	4	0
8:30 AM	0	2	0	1	0	0	0	0	0	0	1	1	0	0	14	0
8:45 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	1	4	0

	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**4**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**1**	**22**	**0**
PHF	**0.75**				**0.00**				**0.75**				**0.41**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**5**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**
PHF	**0.58**				**0.00**				**0.00**				**0.44**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 6
Location:	Portsmouth, NH
Street 1:	Maplewood Avenue
Street 2:	Route 1 ByPass NB Ramp
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PEDESTRIANS & BICYCLES

	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
7:45 AM to 8:45 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1]	Route 1 ByPass NB Ramp Northbound				Southbound				Maplewood Avenue Eastbound				Maplewood Avenue Westbound			
4:30 PM to 5:30 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Deer Street
Street 2:	Russell Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Russell Street Southbound				Deer Street Eastbound				Deer Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	25	0	12	2	0	0	0	3	2
7:15 AM	0	0	0	0	0	1	0	27	0	22	5	0	0	0	4	0
7:30 AM	0	0	0	0	0	0	0	37	0	25	4	0	0	0	4	0
7:45 AM	0	0	0	0	0	0	0	50	0	18	3	0	0	0	6	0
8:00 AM	0	0	0	0	0	0	0	50	0	19	6	0	0	0	8	5
8:15 AM	0	0	0	0	0	0	0	49	0	23	9	0	0	0	2	2
8:30 AM	0	0	0	0	0	0	0	41	0	29	2	0	0	0	6	1
8:45 AM	0	0	0	0	0	0	0	52	0	19	6	0	0	0	4	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Northbound				Russell Street Southbound				Deer Street Eastbound				Deer Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**192**	**0**	**90**	**23**	**0**	**0**	**0**	**20**	**8**
PHF	**0.00**				**0.92**				**0.88**				**0.54**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**6.3%**	**0.0%**	**3.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**5.0%**	**37.5%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Deer Street
Street 2:	Russell Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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HEAVY VEHICLES

	Northbound				Russell Street Southbound				Deer Street Eastbound				Deer Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	2	0	1	1	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	3	0	1	0	0	0	0	1	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Northbound				Russell Street Southbound				Deer Street Eastbound				Deer Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**3**
PHF	**0.00**				**0.50**				**0.38**				**0.33**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Deer Street
Street 2:	Russell Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PEDESTRIANS & BICYCLES

	Northbound				Russell Street Southbound				Deer Street Eastbound				Deer Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1

AM PEAK HOUR[1] 8:00 AM to 9:00 AM	Northbound				Russell Street Southbound				Deer Street Eastbound				Deer Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	1

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

PDI File #: **196718 H**
Location: **N: Russell Street**
Location: **E: Deer Street W: Deer Street**
City, State: **Portsmouth, NH**
Client: **Tighe & Bond/ M. Santos**
Site Code: **200076019**
Count Date: **Thursday, January 31, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

Class: **Cars and Heavy Vehicles (Combined)**

	Russell Street				Deer Street				Deer Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	48	2	0	50	4	8	0	12	5	55	0	60	122
4:15 PM	40	3	0	43	4	16	1	21	8	50	0	58	122
4:30 PM	51	7	0	58	5	9	0	14	9	50	0	59	131
4:45 PM	52	3	0	55	6	18	0	24	15	36	0	51	130
Total	191	15	0	206	19	51	1	71	37	191	0	228	505
5:00 PM	76	6	0	82	7	9	0	16	8	63	0	71	169
5:15 PM	65	0	1	66	3	16	0	19	10	51	0	61	146
5:30 PM	86	2	0	88	3	16	0	19	15	54	0	69	176
5:45 PM	79	2	0	81	2	11	0	13	9	46	1	56	150
Total	306	10	1	317	15	52	0	67	42	214	1	257	641
Grand Total	497	25	1	523	34	103	1	138	79	405	1	485	1146
Approach %	95.0	4.8	0.2		24.6	74.6	0.7		16.3	83.5	0.2		
Total %	43.4	2.2	0.1	45.6	3.0	9.0	0.1	12.0	6.9	35.3	0.1	42.3	
Exiting Leg Total				440				105				601	1146
Cars	488	25	1	514	34	103	1	138	79	398	1	478	1130
% Cars	98.2	100.0	100.0	98.3	100.0	100.0	100.0	100.0	100.0	98.3	100.0	98.6	98.6
Exiting Leg Total				433				105				592	1130
Heavy Vehicles	9	0	0	9	0	0	0	0	0	7	0	7	16
% Heavy Vehicles	1.8	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	1.7	0.0	1.4	1.4
Exiting Leg Total				7				0				9	16

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Russell Street				Deer Street				Deer Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
5:00 PM	76	6	0	82	7	9	0	16	8	63	0	71	169
5:15 PM	65	0	1	66	3	16	0	19	10	51	0	61	146
5:30 PM	86	2	0	88	3	16	0	19	15	54	0	69	176
5:45 PM	79	2	0	81	2	11	0	13	9	46	1	56	150
Total Volume	306	10	1	317	15	52	0	67	42	214	1	257	641
% Approach Total	96.5	3.2	0.3		22.4	77.6	0.0		16.3	83.3	0.4		
PHF	0.890	0.417	0.250	0.901	0.536	0.813	0.000	0.882	0.700	0.849	0.250	0.905	0.911
Cars	301	10	1	312	15	52	0	67	42	210	1	253	632
Cars %	98.4	100.0	100.0	98.4	100.0	100.0	0.0	100.0	100.0	98.1	100.0	98.4	98.6
Heavy Vehicles	5	0	0	5	0	0	0	0	0	4	0	4	9
Heavy Vehicles %	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	1.9	0.0	1.6	1.4
Cars Enter Leg	301	10	1	312	15	52	0	67	42	210	1	253	632
Heavy Enter Leg	5	0	0	5	0	0	0	0	0	4	0	4	9
Total Entering Leg	306	10	1	317	15	52	0	67	42	214	1	257	641
Cars Exiting Leg				226				52				354	632
Heavy Exiting Leg				4				0				5	9
Total Exiting Leg				230				52				359	641

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Russell Street
Street 2:	Sheraton Portsmouth Harborside Dr
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	12	1	0	0	21	2	0	0	2	2	0	1	0	2
7:15 AM	0	1	20	1	0	1	26	2	0	1	0	2	0	0	0	2
7:30 AM	0	4	20	1	0	0	36	1	0	0	0	2	0	0	0	1
7:45 AM	0	0	15	2	0	1	51	2	0	1	0	0	0	0	0	0
8:00 AM	0	4	21	1	0	1	50	0	0	1	0	0	0	0	0	0
8:15 AM	0	0	22	4	0	3	49	1	0	0	0	0	0	0	0	0
8:30 AM	0	1	27	0	0	0	40	0	0	1	1	0	0	1	0	4
8:45 AM	0	1	18	1	0	1	52	3	0	0	0	0	0	0	0	0

	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	33	1	0	1	31	0	0	1	0	2	0	3	0	3
4:15 PM	0	1	38	2	0	2	46	0	0	5	0	0	0	2	0	1
4:30 PM	0	1	35	1	0	0	36	1	0	0	0	2	0	0	0	1
4:45 PM	0	2	31	0	0	2	38	0	0	0	0	1	0	1	0	2
5:00 PM	0	2	46	1	0	0	40	1	0	1	0	0	0	0	1	1
5:15 PM	0	1	44	1	0	0	37	2	0	3	0	2	0	0	0	2
5:30 PM	0	0	26	1	0	0	42	1	0	2	0	1	0	1	0	2
5:45 PM	0	3	17	0	0	0	39	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**6**	**88**	**6**	**0**	**5**	**191**	**4**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**4**
PHF	**0.89**				**0.89**				**0.38**				**0.25**			
HV %	**0.0%**	**0.0%**	**8.0%**	**0.0%**	**0.0%**	**0.0%**	**7.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**6**	**150**	**4**	**0**	**4**	**160**	**2**	**0**	**6**	**0**	**3**	**0**	**3**	**1**	**5**
PHF	**0.82**				**0.86**				**0.45**				**0.75**			
HV %	**0.0%**	**0.0%**	**2.0%**	**0.0%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Russell Street
Street 2:	Sheraton Portsmouth Harborside Dr
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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HEAVY VEHICLES

	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	3	0	0	0	2	0	0	0	1	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	3	0	0	0	7	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0

	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**6**	**0**	**0**	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.57**				**0.00**				**0.00**			

PM PEAK HOUR 5:00 PM to 6:00 PM	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**5**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.42**				**0.42**				**0.00**				**0.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Russell Street
Street 2:	Sheraton Portsmouth Harborside Dr
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PEDESTRIANS & BICYCLES

	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	10	0	0	0	1	0	0	0	0

	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	1	0	0	0	6	0	0	0	1	0	0	0	0
4:15 PM	0	0	0	3	0	0	0	7	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	6	0	0	0	2	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
5:00 PM	0	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	1	0	0	0	5	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	3	0	0	0	3	0	0	0	1	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0

AM PEAK HOUR[1] 8:00 AM to 9:00 AM	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	18	0	0	0	2	0	0	0	0

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	Russell Street Northbound				Russell Street Southbound				Sheraton Public Parking Drive Eastbound				Sheraton Portsmouth Harborside Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	5	0	0	0	20	0	0	0	3	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Russell Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Russell Street Northbound				Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	14	0	2	0	0	0	0	0	0	19	24	0	0	17	0
7:15 AM	0	24	0	0	0	0	0	0	0	0	23	34	0	0	18	0
7:30 AM	0	23	0	1	0	0	0	0	0	0	45	40	0	0	15	0
7:45 AM	0	17	0	1	0	0	0	0	0	0	72	58	0	0	35	0
8:00 AM	0	23	0	2	0	0	0	0	0	0	50	49	0	0	28	0
8:15 AM	0	23	0	2	0	0	0	0	0	0	54	56	0	0	33	0
8:30 AM	0	30	0	0	0	0	0	0	0	0	52	39	0	0	33	0
8:45 AM	0	20	0	1	0	0	0	0	0	0	64	58	0	0	24	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Russell Street Northbound				Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**93**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**228**	**202**	**0**	**0**	**129**	**0**
PHF	**0.82**				**0.00**				**0.83**				**0.92**			
HV %	**0.0%**	**5.4%**	**0.0%**	**20.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.5%**	**5.9%**	**0.0%**	**0.0%**	**7.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Russell Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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HEAVY VEHICLES

	Russell Street Northbound				Russell Street Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	3	0	1	0	0	0	0	0	0	0	2	0	0	2	0
7:15 AM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	1	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	2	0
8:00 AM	0	2	0	1	0	0	0	0	0	0	2	7	0	0	2	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0
8:30 AM	0	3	0	0	0	0	0	0	0	0	3	1	0	0	2	0
8:45 AM	0	1	0	0	0	0	0	0	0	0	4	3	0	0	2	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Russell Street Northbound				Russell Street Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**12**	**0**	**0**	**9**	**0**
PHF	**0.58**				**0.00**				**0.67**				**0.75**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	857_002_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Russell Street
Count Date:	2/1/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 30°F

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PEDESTRIANS & BICYCLES

	Russell Street Northbound				Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1]	Russell Street Northbound				Southbound				Market Street Eastbound				Market Street Westbound			
7:45 AM																
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

PDI File #: **196718 J**
Location: **S: Russell Street**
Location: **E: Market Street W: Market Street**
City, State: **Portsmouth, NH**
Client: **Tighe & Bond/ M. Santos**
Site Code: **200076019**
Count Date: **Thursday, January 31, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Cars and Heavy Vehicles (Combined)**

	Market Street from East				Russell Street from South				Market Street from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	72	0	0	72	2	62	0	64	48	39	0	87	223
4:15 PM	78	0	0	78	0	57	0	57	54	53	0	107	242
4:30 PM	88	0	0	88	4	54	0	58	62	60	1	123	269
4:45 PM	86	0	0	86	2	53	0	55	55	71	0	126	267
Total	324	0	0	324	8	226	0	234	219	223	1	443	1001
5:00 PM	132	0	0	132	3	78	0	81	81	63	0	144	357
5:15 PM	84	0	0	84	0	64	0	64	69	59	0	128	276
5:30 PM	78	0	0	78	3	54	0	57	95	84	0	179	314
5:45 PM	81	0	0	81	0	60	0	60	84	69	0	153	294
Total	375	0	0	375	6	256	0	262	329	275	0	604	1241
Grand Total	699	0	0	699	14	482	0	496	548	498	1	1047	2242
Approach %	100.0	0.0	0.0		2.8	97.2	0.0		52.3	47.6	0.1		
Total %	31.2	0.0	0.0	31.2	0.6	21.5	0.0	22.1	24.4	22.2	0.0	46.7	
Exiting Leg Total				512				548				1182	2242
Cars	697	0	0	697	14	475	0	489	539	495	1	1035	2221
% Cars	99.7	0.0	0.0	99.7	100.0	98.5	0.0	98.6	98.4	99.4	100.0	98.9	99.1
Exiting Leg Total				509				539				1173	2221
Heavy Vehicles	2	0	0	2	0	7	0	7	9	3	0	12	21
% Heavy Vehicles	0.3	0.0	0.0	0.3	0.0	1.5	0.0	1.4	1.6	0.6	0.0	1.1	0.9
Exiting Leg Total				3				9				9	21

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Market Street from East				Russell Street from South				Market Street from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
5:00 PM	132	0	0	132	3	78	0	81	81	63	0	144	357
5:15 PM	84	0	0	84	0	64	0	64	69	59	0	128	276
5:30 PM	78	0	0	78	3	54	0	57	95	84	0	179	314
5:45 PM	81	0	0	81	0	60	0	60	84	69	0	153	294
Total Volume	375	0	0	375	6	256	0	262	329	275	0	604	1241
% Approach Total	100.0	0.0	0.0		2.3	97.7	0.0		54.5	45.5	0.0		
PHF	0.710	0.000	0.000	0.710	0.500	0.821	0.000	0.809	0.866	0.818	0.000	0.844	0.869
Cars	375	0	0	375	6	252	0	258	324	273	0	597	1230
Cars %	100.0	0.0	0.0	100.0	100.0	98.4	0.0	98.5	98.5	99.3	0.0	98.8	99.1
Heavy Vehicles	0	0	0	0	0	4	0	4	5	2	0	7	11
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.5	1.5	0.7	0.0	1.2	0.9
Cars Enter Leg	375	0	0	375	6	252	0	258	324	273	0	597	1230
Heavy Enter Leg	0	0	0	0	0	4	0	4	5	2	0	7	11
Total Entering Leg	375	0	0	375	6	256	0	262	329	275	0	604	1241
Cars Exiting Leg				279				324				627	1230
Heavy Exiting Leg				2				5				4	11
Total Exiting Leg				281				329				631	1241

Volume Report

Job 857_002_TB_ATR
Area Portsmouth, NH
Location Maplewood Avenue, 100’ east of Raynes Avenue

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Tuesday, February 1, 2022

Time	Total		EB		WB		Time	Total		EB		WB	
0000	10		1		9		1200	128		58		70	
0015	6		2		4		1215	125		58		67	
0030	1		0		1		1230	140		63		77	
0045	9	26	5	8	4	18	1245	120	513	57	236	63	277
0100	4		2		2		1300	117		55		62	
0115	5		0		5		1315	141		67		74	
0130	6		1		5		1330	121		67		54	
0145	3	18	1	4	2	14	1345	121	500	58	247	63	253
0200	4		2		2		1400	115		58		57	
0215	2		0		2		1415	151		79		72	
0230	4		3		1		1430	143		73		70	
0245	4	14	3	8	1	6	1445	153	562	72	282	81	280
0300	6		2		4		1500	155		74		81	
0315	2		0		2		1515	184		74		110	
0330	1		0		1		1530	162		72		90	
0345	1	10	1	3	0	7	1545	177	678	86	306	91	372
0400	1		1		0		1600	184		76		108	
0415	7		2		5		1615	146		70		76	
0430	4		2		2		1630	211		81		130	
0445	9	21	5	10	4	11	1645	192	733	86	313	106	420
0500	8		4		4		1700	200		83		117	
0515	13		6		7		1715	175		68		107	
0530	18		12		6		1730	165		68		97	
0545	29	68	21	43	8	25	1745	158	698	91	310	67	388
0600	28		20		8		1800	131		63		68	
0615	39		25		14		1815	139		64		75	
0630	56		35		21		1830	110		57		53	
0645	82	205	50	130	32	75	1845	106	486	49	233	57	253
0700	69		45		24		1900	93		40		53	
0715	91		57		34		1915	70		28		42	
0730	102		58		44		1930	68		23		45	
0745	184	446	131	291	53	155	1945	63	294	26	117	37	177
0800	143		94		49		2000	80		33		47	
0815	167		117		50		2015	62		24		38	
0830	176		104		72		2030	61		26		35	
0845	135	621	100	415	35	206	2045	34	237	14	97	20	140
0900	98		62		36		2100	39		16		23	
0915	98		57		41		2115	51		17		34	
0930	98		52		46		2130	45		11		34	
0945	101	395	73	244	28	151	2145	26	161	7	51	19	110
1000	100		63		37		2200	38		12		26	
1015	84		43		41		2215	1		1		0	
1030	104		50		54		2230	0		0		0	
1045	113	401	63	219	50	182	2245	0	39	0	13	0	26
1100	97		43		54		2300	0		0		0	
1115	110		55		55		2315	0		0		0	
1130	136		70		66		2330	0		0		0	
1145	127	470	67	235	60	235	2345	0	0	0	0	0	0
							Total	**7596**		**3815**		**3781**	

APPENDIX B

NHDOT Seasonal Adjustment Factors

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22

Average ADT: 12,838
Peak ADT: 14,016

GROUP	COUNTER	TOWN	LOCATION
04	02051003	BOW	NH 3A south of Robinson Rd
04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
04	02133021	DURHAM	US 4 east of NH 108
04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*02229022*	*HUDSON**	*Circumferential Hwy east of Nashua TL*
04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*MILFORD**	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*NASHUA**	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
04	*62387052*	*RINDGE**	*US 202 at Jaffrey TL (north of County Rd)*
04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

** denotes counter that is not included in calculation*

APPENDIX C

Traffic Volume Adjustment Calculations

COVID-19 Pandemic Adjustment Factor Calculation

February 2022 Traffic Counts				NHDOT Count Station Data (Loc ID 82379035)							
Peak Hour (Based on TMC)		February 2022 ATR	2022 ATR - Seasonally Adjusted[1]	Aug 2017	Grown to 2018[2]	Grown to 2019[3]	Grown to 2020[4]	Grown to 2021[4]	Grown to 2022[4]	Percent Change	Adjustment
AM Peak	8:00-9:00 am	621	733	596	608	614	620	626	633	-14%	None
PM Peak	5:00-6:00 pm	698	824	648	661	668	674	681	688	-16%	None

[1] 2019 NHDOT Group 4 February Seasonal Adjustment Factor to Peak (1.18)

[2] Maplewood Avenue annual growth rate from 2017 to 2018

[3] Maplewood Avenue annual growth rate from 2018 to 2019

[4] Estimated annual growth rate

Location Info	
Location ID	82379035
Type	I-SECTION
Functional Class	4
Located On	Maplewood Ave
Direction	2-WAY
Community	PORTSMOUTH
MPO_ID	
HPMS ID	
Agency	New Hampshire DOT

Count Data Info	
Start Date	8/30/2017
End Date	8/31/2017
Start Time	12:00 AM
End Time	12:00 AM
Direction	
Notes	nhdot
Count Source	8.2379E+11
File Name	823790350000.prn
Weather	
Study	
Owner	iwong
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	30
01:00 - 02:00	13
02:00 - 03:00	8
03:00 - 04:00	4
04:00 - 05:00	42
05:00 - 06:00	91
06:00 - 07:00	202
07:00 - 08:00	416
08:00 - 09:00	596
09:00 - 10:00	452
10:00 - 11:00	392
11:00 - 12:00	435
12:00 - 13:00	523
13:00 - 14:00	525
14:00 - 15:00	523
15:00 - 16:00	549
16:00 - 17:00	596
17:00 - 18:00	648
18:00 - 19:00	472
19:00 - 20:00	361
20:00 - 21:00	276
21:00 - 22:00	220
22:00 - 23:00	114
23:00 - 24:00	72
TOTAL	7560

List View | All DIRs

Record 1 of 1 Goto Record go

Location ID	82379035	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	L3790368__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	Maplewood Ave		
Loc On Alias	MAPLEWOOD AVENUE EAST OF RAYNES AVENUE		

More Detail

STATION DATA

Directions: 2-WAY

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2020	5,727	580	10		5,213 (91%)	514 (9%)	
	2019	6,682[3]		10		6,121 (92%)	561 (8%)	Grown from 2018
	2018	6,603[3]		10		6,087 (92%)	516 (8%)	Grown from 2017
	2017	6,474	648	10		6,010 (93%)	464 (7%)	
	2016	7,564[3]				6,898 (91%)	666 (9%)	Grown from 2015

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Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Thu 8/13/2020	60	7,025
	Wed 8/12/2020	60	6,688
	Tue 8/11/2020	60	6,568
	Thu 8/31/2017	60	7,305
	Wed 8/30/2017	60	7,560
	Tue 8/29/2017	60	7,433
	Thu 8/7/2014	60	8,598
	Wed 8/6/2014	60	8,961
	Tue 8/5/2014	60	8,284
	Mon 8/4/2014	60	7,973

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mm/dd/yyyy To Date

VOLUME TREND

Year	Annual Growth
2020	-14%
2019	1%
2018	2%
2017	-14%
2016	2%
2015	3%
2014	-13%
2011	0%
2008	-1%
2002	0%

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SPEED

CLASSIFICATION

APPENDIX D

Capacity Analysis Methodology

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[1] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

[1] *Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	**Signalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**Unsignalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**V/C Ratio >1.00[a]**
A	≤10	≤10	F
B	>10 and ≤20	>10 and ≤15	F
C	>20 and ≤35	>15 and ≤25	F
D	>35 and ≤55	>25 and ≤35	F
E	>55 and ≤80	>35 and ≤50	F
F	>80	>50	F

Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

APPENDIX E

Capacity Analysis Worksheets

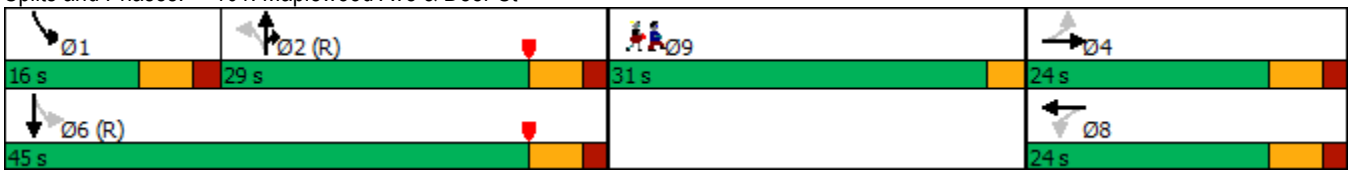
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	11	15	155	55	29	6	244	103	26	373	76
Future Volume (vph)	26	11	15	155	55	29	6	244	103	26	373	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.948				0.850		0.975	
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1620	0	1805	1858	0	1586	1655	1545	1646	1656	0
Flt Permitted		0.860		0.719			0.367			0.350		
Satd. Flow (perm)	0	1428	0	1366	1858	0	613	1655	1545	606	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			23				131		12	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93
Heavy Vehicles (%)	20%	10%	5%	0%	2%	6%	10%	11%	8%	6%	9%	4%
Adj. Flow (vph)	29	12	17	168	60	32	7	277	117	28	401	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	168	92	0	7	277	117	28	483	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	29.0	29.0	16.0	45.0	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		29.0%	29.0%	29.0%	16.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		38.6		38.6	38.6		31.0	31.0	31.0	39.0	39.0	
Actuated g/C Ratio		0.39		0.39	0.39		0.31	0.31	0.31	0.39	0.39	
v/c Ratio		0.10		0.32	0.13		0.04	0.54	0.21	0.09	0.74	
Control Delay		20.9		28.3	20.2		11.5	21.6	3.5	19.8	33.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		20.9		28.3	20.2		11.5	21.6	3.5	19.8	33.7	
LOS		C		C	C		B	C	A	B	C	
Approach Delay		20.9			25.4			16.2			32.9	
Approach LOS		C			C			B			C	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	31.0
Total Split (%)	31%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		13		60	22		3	165	23	11	253	
Queue Length 95th (ft)		55		163	78		m5	137	0	29	380	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		561		527	731		190	513	569	340	653	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.10		0.32	0.13		0.04	0.54	0.21	0.08	0.74	

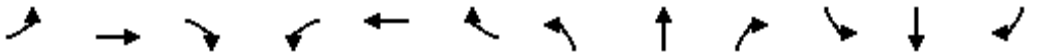
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	29	15	31	2	46	15	287	55	68	455	20
Future Volume (vph)	20	29	15	31	2	46	15	287	55	68	455	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.949				0.850		0.977			0.994	
Flt Protected	0.950				0.955			0.998		0.950		
Satd. Flow (prot)	1703	1492	0	0	1749	1568	0	3220	0	1626	1853	0
Flt Permitted	0.728				0.702			0.924		0.437		
Satd. Flow (perm)	1305	1492	0	0	1286	1568	0	2981	0	748	1853	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18				62		21			3	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.83	0.83	0.83	0.74	0.74	0.74	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	6%	12%	38%	4%	0%	3%	23%	10%	2%	11%	2%	0%
Adj. Flow (vph)	24	35	18	42	3	62	18	346	66	75	500	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	53	0	0	45	62	0	430	0	75	522	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	9.0	9.0			9.0	20.4		54.3		64.5	65.7	
Actuated g/C Ratio	0.09	0.09			0.09	0.20		0.54		0.64	0.66	
v/c Ratio	0.21	0.35			0.39	0.17		0.26		0.14	0.43	
Control Delay	44.9	36.7			51.8	8.4		19.1		13.5	14.9	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.2	
Total Delay	44.9	36.7			51.8	8.4		19.1		13.5	15.2	
LOS	D	D			D	A		B		B	B	
Approach Delay		39.2			26.7			19.1			15.0	
Approach LOS		D			C			B			B	
Queue Length 50th (ft)	14	21			28	0		98		29	218	

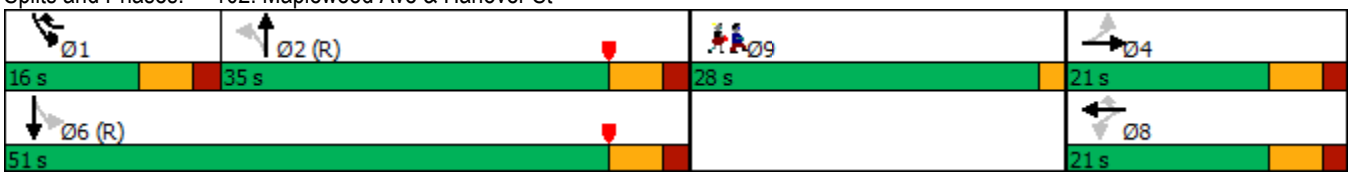
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	36	52			49	19		141		m24	277	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	195	239			192	404		1628		571	1218	
Starvation Cap Reductn	0	0			0	0		0		0	207	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.12	0.22			0.23	0.15		0.26		0.13	0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 19.0		Intersection LOS: B	
Intersection Capacity Utilization 58.8%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	106	28	207	84	9	12	2	47	18	23	4
Future Vol, veh/h	2	106	28	207	84	9	12	2	47	18	23	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	77	77	77	80	80	80	75	75	75
Heavy Vehicles, %	0	5	13	4	25	0	20	0	3	0	0	0
Mvmt Flow	3	133	35	269	109	12	15	3	59	24	31	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	121	0	0	168	0	0	828	816	151	841	827	115
Stage 1	-	-	-	-	-	-	157	157	-	653	653	-
Stage 2	-	-	-	-	-	-	671	659	-	188	174	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.3	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.68	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1479	-	-	1398	-	-	271	314	893	287	309	943
Stage 1	-	-	-	-	-	-	804	772	-	460	467	-
Stage 2	-	-	-	-	-	-	418	464	-	818	759	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1479	-	-	1398	-	-	205	248	893	223	244	943
Mov Cap-2 Maneuver	-	-	-	-	-	-	205	248	-	223	244	-
Stage 1	-	-	-	-	-	-	802	770	-	459	370	-
Stage 2	-	-	-	-	-	-	302	368	-	760	757	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.6	13.3	23.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	512	1479	-	-	1398	-	-	251
HCM Lane V/C Ratio	0.149	0.002	-	-	0.192	-	-	0.239
HCM Control Delay (s)	13.3	7.4	0	-	8.2	0	-	23.8
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.7	-	-	0.9

Intersection	
Int Delay, s/veh	7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	157	14	9	263	38	333
Future Vol, veh/h	157	14	9	263	38	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	80	80	81	81
Heavy Vehicles, %	4	8	12	10	13	2
Mvmt Flow	185	16	11	329	47	411

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	201	0	544	193
Stage 1	-	-	-	-	193	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	-	-	4.22	-	6.53	6.22
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	-	-	2.308	-	3.617	3.318
Pot Cap-1 Maneuver	-	-	1313	-	482	849
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1313	-	477	849
Mov Cap-2 Maneuver	-	-	-	-	477	-
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	786	-	-	1313	-
HCM Lane V/C Ratio	0.583	-	-	0.009	-
HCM Control Delay (s)	15.8	-	-	7.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3.8	-	-	0	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	109	28	25	9	0	234
Future Vol, veh/h	109	28	25	9	0	234
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	54	54	92	92
Heavy Vehicles, %	3	0	5	38	0	6
Mvmt Flow	124	32	46	17	0	254

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	63	0	-	0	335	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	280	-
Critical Hdwy	4.13	-	-	-	6.4	6.26
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.354
Pot Cap-1 Maneuver	1533	-	-	-	664	1001
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1533	-	-	-	610	1001
Mov Cap-2 Maneuver	-	-	-	-	610	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	772	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1533	-	-	-	1001
HCM Lane V/C Ratio	0.081	-	-	-	0.254
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.3	-	-	-	1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	1	0	1	0	5	7	107	7	6	232	5
Future Vol, veh/h	2	1	0	1	0	5	7	107	7	6	232	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	25	25	25	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	8	0	0	8	0
Mvmt Flow	5	3	0	4	0	20	8	120	8	7	261	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	428	422	264	420	421	124	267	0	0	128	0	0
Stage 1	278	278	-	140	140	-	-	-	-	-	-	-
Stage 2	150	144	-	280	281	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	541	526	780	547	527	932	1308	-	-	1470	-	-
Stage 1	733	684	-	868	785	-	-	-	-	-	-	-
Stage 2	857	782	-	731	682	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	524	519	780	539	520	932	1308	-	-	1470	-	-
Mov Cap-2 Maneuver	524	519	-	539	520	-	-	-	-	-	-	-
Stage 1	728	680	-	862	780	-	-	-	-	-	-	-
Stage 2	833	777	-	724	678	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	9.5	0.4	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1308	-	-	522	831	1470	-	-
HCM Lane V/C Ratio	0.006	-	-	0.015	0.029	0.005	-	-
HCM Control Delay (s)	7.8	0	-	12	9.5	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	14	2	112	226	20
Future Vol, veh/h	7	14	2	112	226	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	15	2	122	246	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	383	257	268	0	-	0
Stage 1	257	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	620	782	1296	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	900	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	619	782	1296	-	-	-
Mov Cap-2 Maneuver	619	-	-	-	-	-
Stage 1	784	-	-	-	-	-
Stage 2	900	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1296	-	719	-	-
HCM Lane V/C Ratio	0.002	-	0.032	-	-
HCM Control Delay (s)	7.8	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

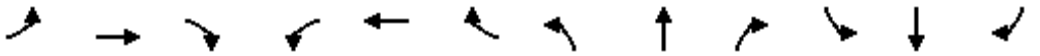
Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	6	0	157	277	245
Future Vol, veh/h	113	6	0	157	277	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	83	83
Heavy Vehicles, %	5	20	0	7	4	6
Mvmt Flow	138	7	0	171	334	295

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	505	334	-	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	-	-
Pot Cap-1 Maneuver	522	668	0	-	-	0
Stage 1	719	-	0	-	-	0
Stage 2	852	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	522	668	-	-	-	-
Mov Cap-2 Maneuver	522	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	522	668	-
HCM Lane V/C Ratio	-	0.264	0.011	-
HCM Control Delay (s)	-	14.4	10.4	-
HCM Lane LOS	-	B	B	-
HCM 95th %tile Q(veh)	-	1.1	0	-



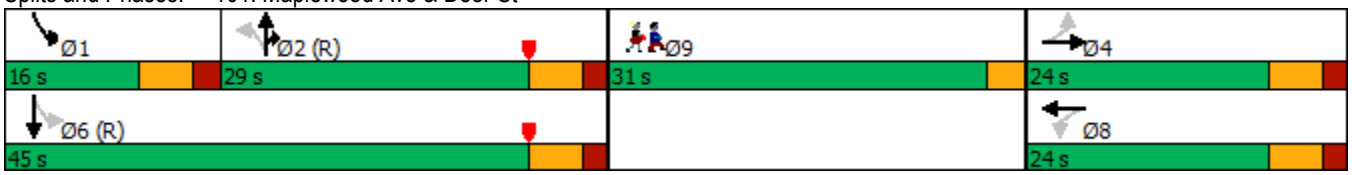
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	96	7	220	106	64	6	468	211	58	437	52
Future Volume (vph)	96	96	7	220	106	64	6	468	211	58	437	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.947				0.850		0.985	
Flt Protected		0.972		0.950			0.950			0.950		
Satd. Flow (prot)	0	1877	0	1770	1919	0	1558	1818	1636	1745	1807	0
Flt Permitted		0.606		0.568			0.284			0.129		
Satd. Flow (perm)	0	1170	0	1058	1919	0	466	1818	1636	237	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			24				224		7	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.51	0.79	0.38	0.67	0.75	0.82	0.63	0.87	0.90	0.58	0.85	0.91
Heavy Vehicles (%)	1%	1%	0%	2%	0%	0%	12%	1%	2%	0%	0%	1%
Adj. Flow (vph)	188	122	18	328	141	78	10	538	234	100	514	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	328	0	328	219	0	10	538	234	100	571	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	29.0	29.0	16.0	45.0	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		29.0%	29.0%	29.0%	16.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		28.2		28.2	28.2		26.8	26.8	26.8	39.0	39.0	
Actuated g/C Ratio		0.28		0.28	0.28		0.27	0.27	0.27	0.39	0.39	
v/c Ratio		0.99		1.10	0.39		0.08	1.11	0.39	0.45	0.81	
Control Delay		87.1		120.1	30.8		20.3	98.9	4.0	26.4	37.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	2.0	
Total Delay		87.1		120.1	30.8		20.3	98.9	4.0	26.4	39.3	
LOS		F		F	C		C	F	A	C	D	
Approach Delay		87.1			84.4			69.5			37.4	
Approach LOS		F			F			E			D	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	31.0
Total Split (%)	31%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		~257		~275	107		2	~434	0	41	315	
Queue Length 95th (ft)		#356		#291	143		m6	#585	34	47	418	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		332		298	558		124	486	601	243	709	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	53	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.99		1.10	0.39		0.08	1.11	0.39	0.41	0.87	

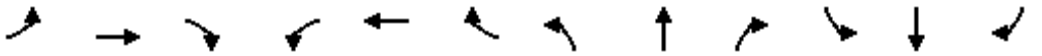
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 66.2		Intersection LOS: E	
Intersection Capacity Utilization 77.5%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	15	6	43	14	116	7	525	76	107	542	16
Future Volume (vph)	44	15	6	43	14	116	7	525	76	107	542	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.955				0.850		0.981			0.996	
Flt Protected	0.950				0.964			0.999		0.950		
Satd. Flow (prot)	1805	1562	0	0	1832	1615	0	3478	0	1687	1874	0
Flt Permitted	0.714				0.754			0.947		0.268		
Satd. Flow (perm)	1357	1562	0	0	1433	1615	0	3297	0	476	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				135		16			2	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.57	0.57	0.57	0.86	0.86	0.86	0.89	0.89	0.89	0.85	0.85	0.85
Heavy Vehicles (%)	0%	23%	0%	0%	0%	0%	0%	2%	0%	7%	1%	0%
Adj. Flow (vph)	77	26	11	50	16	135	8	590	85	126	638	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	37	0	0	66	135	0	683	0	126	657	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	10.8	10.8			10.7	23.3		42.3		57.2	58.4	
Actuated g/C Ratio	0.11	0.11			0.11	0.23		0.42		0.57	0.58	
v/c Ratio	0.52	0.21			0.43	0.28		0.49		0.33	0.60	
Control Delay	54.0	32.6			49.2	6.2		26.7		9.3	11.6	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.5	
Total Delay	54.0	32.6			49.2	6.2		26.7		9.3	12.0	
LOS	D	C			D	A		C		A	B	
Approach Delay		47.1			20.3			26.7			11.6	
Approach LOS		D			C			C			B	
Queue Length 50th (ft)	47	15			40	0		185		14	128	

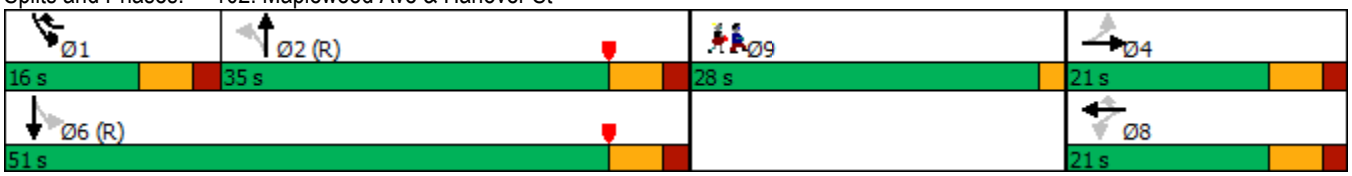
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	55	25			76	37		261		m31	m287	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	203	243			214	499		1404		395	1095	
Starvation Cap Reductn	0	0			0	0		0		0	132	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.38	0.15			0.31	0.27		0.49		0.32	0.68	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 71.4%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	131	15	460	137	23	11	6	45	12	4	5
Future Vol, veh/h	11	131	15	460	137	23	11	6	45	12	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	74	74	74	57	57	57
Heavy Vehicles, %	0	0	0	2	4	0	0	0	0	0	0	0
Mvmt Flow	13	160	18	495	147	25	15	8	61	21	7	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	172	0	0	178	0	0	1353	1357	169	1380	1354	160
Stage 1	-	-	-	-	-	-	195	195	-	1150	1150	-
Stage 2	-	-	-	-	-	-	1158	1162	-	230	204	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1417	-	-	1398	-	-	128	150	880	123	151	890
Stage 1	-	-	-	-	-	-	811	743	-	243	275	-
Stage 2	-	-	-	-	-	-	241	272	-	777	737	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1417	-	-	1398	-	-	83	90	880	74	91	890
Mov Cap-2 Maneuver	-	-	-	-	-	-	83	90	-	74	91	-
Stage 1	-	-	-	-	-	-	803	736	-	241	167	-
Stage 2	-	-	-	-	-	-	139	165	-	708	730	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	6.7	26.7	61.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	248	1417	-	-	1398	-	-	99
HCM Lane V/C Ratio	0.338	0.009	-	-	0.354	-	-	0.372
HCM Control Delay (s)	26.7	7.6	0	-	9	0	-	61.5
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.4	0	-	-	1.6	-	-	1.5

Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	167	22	24	547	73	239
Future Vol, veh/h	167	22	24	547	73	239
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	89	89
Heavy Vehicles, %	1	0	0	1	5	0
Mvmt Flow	204	27	26	595	82	269

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	231	0	865	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	4.1	-	6.45	6.2
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.2	-	3.545	3.3
Pot Cap-1 Maneuver	-	-	1349	-	320	827
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1349	-	311	827
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	501	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	19.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	596	-	-	1349	-
HCM Lane V/C Ratio	0.588	-	-	0.019	-
HCM Control Delay (s)	19.3	-	-	7.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	293	56	68	21	14	399
Future Vol, veh/h	293	56	68	21	14	399
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	70	81	54	42	89
Heavy Vehicles, %	2	0	0	0	0	2
Mvmt Flow	345	80	84	39	33	448

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	123	0	-	0	874	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	770	-
Critical Hdwy	4.12	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	1464	-	-	-	323	951
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	460	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1464	-	-	-	243	951
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	460	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	791
HCM Lane V/C Ratio	0.235	-	-	-	0.609
HCM Control Delay (s)	8.2	0	-	-	16.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	4.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	0	8	8	1	6	11	299	8	5	395	2
Future Vol, veh/h	7	0	8	8	1	6	11	299	8	5	395	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	45	45	75	75	75	82	82	82	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	16	0	18	11	1	8	13	365	10	6	459	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	873	873	460	877	869	370	461	0	0	375	0	0
Stage 1	472	472	-	396	396	-	-	-	-	-	-	-
Stage 2	401	401	-	481	473	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	273	291	605	271	292	680	1111	-	-	1195	-	-
Stage 1	576	562	-	633	607	-	-	-	-	-	-	-
Stage 2	630	604	-	570	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	264	285	605	259	286	680	1111	-	-	1195	-	-
Mov Cap-2 Maneuver	264	285	-	259	286	-	-	-	-	-	-	-
Stage 1	567	558	-	624	598	-	-	-	-	-	-	-
Stage 2	612	595	-	549	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	16	0.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1111	-	-	377	347	1195	-	-
HCM Lane V/C Ratio	0.012	-	-	0.088	0.058	0.005	-	-
HCM Control Delay (s)	8.3	0	-	15.5	16	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	49	6	5	309	400	52
Future Vol, veh/h	49	6	5	309	400	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	7	5	336	435	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	810	464	492	0	-	0
Stage 1	464	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	349	598	1071	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	347	598	1071	-	-	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1071	-	364	-	-
HCM Lane V/C Ratio	0.005	-	0.164	-	-
HCM Control Delay (s)	8.4	0	16.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	124.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	351	7	0	489	359	452
Future Vol, veh/h	351	7	0	489	359	452
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	50	25	71	82	87
Heavy Vehicles, %	2	0	0	0	1	2
Mvmt Flow	428	14	0	689	438	520

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1127	438	-	0	-	0
Stage 1	438	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	-	-
Pot Cap-1 Maneuver	~ 226	623	0	-	-	0
Stage 1	651	-	0	-	-	0
Stage 2	498	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 226	623	-	-	-	-
Mov Cap-2 Maneuver	~ 226	-	-	-	-	-
Stage 1	651	-	-	-	-	-
Stage 2	498	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 440.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	226	623	-
HCM Lane V/C Ratio	-	1.894	0.022	-
HCM Control Delay (s)	-	$ 454.5	10.9	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	30.5	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

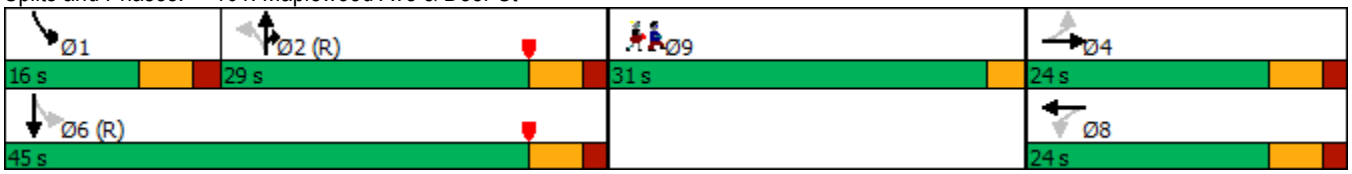
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	30	34	171	100	32	38	270	114	28	412	183
Future Volume (vph)	76	30	34	171	100	32	38	270	114	28	412	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.964				0.850		0.954	
Flt Protected		0.974		0.950			0.950			0.950		
Satd. Flow (prot)	0	1619	0	1805	1897	0	1586	1655	1545	1646	1631	0
Flt Permitted		0.773		0.669			0.149			0.310		
Satd. Flow (perm)	0	1285	0	1271	1897	0	249	1655	1545	537	1631	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			14				131		26	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93
Heavy Vehicles (%)	20%	10%	5%	0%	2%	6%	10%	11%	8%	6%	9%	4%
Adj. Flow (vph)	84	33	38	186	109	35	43	307	130	30	443	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	186	144	0	43	307	130	30	640	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	29.0	29.0	16.0	45.0	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		29.0%	29.0%	29.0%	16.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		38.6		38.6	38.6		31.0	31.0	31.0	39.0	39.0	
Actuated g/C Ratio		0.39		0.39	0.39		0.31	0.31	0.31	0.39	0.39	
v/c Ratio		0.31		0.38	0.19		0.56	0.60	0.23	0.11	0.98	
Control Delay		26.0		29.7	23.5		49.1	23.7	3.1	19.9	61.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	4.1	
Total Delay		26.0		29.7	23.5		49.1	23.7	3.1	19.9	65.9	
LOS		C		C	C		D	C	A	B	E	
Approach Delay		26.0			27.0			20.4			63.8	
Approach LOS		C			C			C			E	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	31.0
Total Split (%)	31%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		50		68	44		25	180	9	12	384	
Queue Length 95th (ft)		144		185	124		#81	#112	14	30	#627	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		504		490	740		77	512	569	320	651	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	12	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.31		0.38	0.19		0.56	0.60	0.23	0.09	1.00	

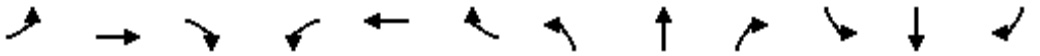
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 40.1		Intersection LOS: D	
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	32	29	35	2	51	32	349	60	75	522	22
Future Volume (vph)	22	32	29	35	2	51	32	349	60	75	522	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.929				0.850		0.980			0.994	
Flt Protected	0.950				0.955			0.996		0.950		
Satd. Flow (prot)	1703	1420	0	0	1749	1568	0	3207	0	1626	1853	0
Flt Permitted	0.724				0.685			0.874		0.378		
Satd. Flow (perm)	1298	1420	0	0	1254	1568	0	2814	0	647	1853	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35				69		18			3	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.83	0.83	0.83	0.74	0.74	0.74	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	6%	12%	38%	4%	0%	3%	23%	10%	2%	11%	2%	0%
Adj. Flow (vph)	27	39	35	47	3	69	39	420	72	82	574	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	74	0	0	50	69	0	531	0	82	598	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	9.4	9.4			9.4	21.1		53.6		64.1	65.3	
Actuated g/C Ratio	0.09	0.09			0.09	0.21		0.54		0.64	0.65	
v/c Ratio	0.22	0.45			0.43	0.18		0.35		0.17	0.49	
Control Delay	44.8	33.4			52.9	7.8		21.1		11.9	14.4	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.4	
Total Delay	44.8	33.4			52.9	7.8		21.1		11.9	14.7	
LOS	D	C			D	A		C		B	B	
Approach Delay		36.5			26.7			21.1			14.4	
Approach LOS		D			C			C			B	
Queue Length 50th (ft)	16	24			31	0		132		32	260	

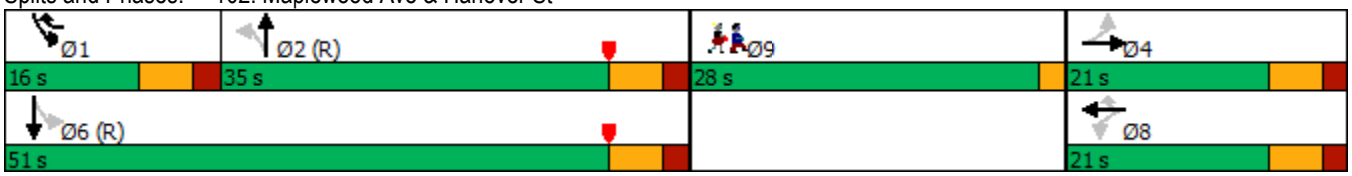
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	38	58			54	20		185		m22	m251	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	194	242			188	417		1517		514	1211	
Starvation Cap Reductn	0	0			0	0		0		0	213	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.14	0.31			0.27	0.17		0.35		0.16	0.60	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	131	31	261	106	10	14	2	55	19	25	5
Future Vol, veh/h	2	131	31	261	106	10	14	2	55	19	25	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	77	77	77	80	80	80	75	75	75
Heavy Vehicles, %	0	5	13	4	25	0	20	0	3	0	0	0
Mvmt Flow	3	164	39	339	138	13	18	3	69	25	33	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	151	0	0	203	0	0	1033	1019	184	1049	1032	145
Stage 1	-	-	-	-	-	-	190	190	-	823	823	-
Stage 2	-	-	-	-	-	-	843	829	-	226	209	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.3	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.68	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1442	-	-	1357	-	-	195	239	856	207	235	908
Stage 1	-	-	-	-	-	-	772	747	-	371	391	-
Stage 2	-	-	-	-	-	-	334	388	-	781	733	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1442	-	-	1357	-	-	131	174	856	148	171	908
Mov Cap-2 Maneuver	-	-	-	-	-	-	131	174	-	148	171	-
Stage 1	-	-	-	-	-	-	770	746	-	370	284	-
Stage 2	-	-	-	-	-	-	213	282	-	714	732	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.9	17	37.3
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	389	1442	-	-	1357	-	-	175
HCM Lane V/C Ratio	0.228	0.002	-	-	0.25	-	-	0.373
HCM Control Delay (s)	17	7.5	0	-	8.5	0	-	37.3
HCM Lane LOS	C	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.9	0	-	-	1	-	-	1.6

Intersection	
Int Delay, s/veh	12.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	190	16	10	335	42	437
Future Vol, veh/h	190	16	10	335	42	437
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	80	80	81	81
Heavy Vehicles, %	4	8	12	10	13	2
Mvmt Flow	224	19	13	419	52	540

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	243	0	679	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.22	-	6.53	6.22
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	-	-	2.308	-	3.617	3.318
Pot Cap-1 Maneuver	-	-	1267	-	401	805
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1267	-	396	805
Mov Cap-2 Maneuver	-	-	-	-	396	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	615	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	26.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	738	-	-	1267	-
HCM Lane V/C Ratio	0.801	-	-	0.01	-
HCM Control Delay (s)	26.5	-	-	7.9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	8.3	-	-	0	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	138	31	27	10	0	298
Future Vol, veh/h	138	31	27	10	0	298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	54	54	92	92
Heavy Vehicles, %	3	0	5	38	0	6
Mvmt Flow	157	35	50	19	0	324

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	69	0	-	0	409	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	4.13	-	-	-	6.4	6.26
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.354
Pot Cap-1 Maneuver	1526	-	-	-	602	994
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1526	-	-	-	539	994
Mov Cap-2 Maneuver	-	-	-	-	539	-
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1526	-	-	-	994
HCM Lane V/C Ratio	0.103	-	-	-	0.326
HCM Control Delay (s)	7.6	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.4

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	1	0	1	0	6	8	135	8	7	296	6
Future Vol, veh/h	2	1	0	1	0	6	8	135	8	7	296	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	25	25	25	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	8	0	0	8	0
Mvmt Flow	5	3	0	4	0	24	9	152	9	8	333	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	540	532	337	529	531	157	340	0	0	161	0	0
Stage 1	353	353	-	175	175	-	-	-	-	-	-	-
Stage 2	187	179	-	354	356	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	456	456	710	463	457	894	1230	-	-	1430	-	-
Stage 1	668	634	-	832	758	-	-	-	-	-	-	-
Stage 2	819	755	-	667	633	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	439	449	710	456	450	894	1230	-	-	1430	-	-
Mov Cap-2 Maneuver	439	449	-	456	450	-	-	-	-	-	-	-
Stage 1	663	630	-	825	752	-	-	-	-	-	-	-
Stage 2	791	749	-	660	629	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	9.7	0.4	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1230	-	-	442	786	1430	-	-
HCM Lane V/C Ratio	0.007	-	-	0.018	0.036	0.006	-	-
HCM Control Delay (s)	7.9	0	-	13.3	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	16	2	141	289	22
Future Vol, veh/h	8	16	2	141	289	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	17	2	153	314	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	483	326	338	0	-	0
Stage 1	326	-	-	-	-	-
Stage 2	157	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	542	715	1221	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	541	715	1221	-	-	-
Mov Cap-2 Maneuver	541	-	-	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1221	-	646	-	-
HCM Lane V/C Ratio	0.002	-	0.04	-	-
HCM Control Delay (s)	8	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	142	7	0	173	306	311
Future Vol, veh/h	142	7	0	173	306	311
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	83	83
Heavy Vehicles, %	5	20	0	7	4	6
Mvmt Flow	173	9	0	188	369	375

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	557	369	-	0	-	0
Stage 1	369	-	-	-	-	-
Stage 2	188	-	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	-	-
Pot Cap-1 Maneuver	486	638	0	-	-	0
Stage 1	693	-	0	-	-	0
Stage 2	837	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	486	638	-	-	-	-
Mov Cap-2 Maneuver	486	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	837	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	486	638	-
HCM Lane V/C Ratio	-	0.356	0.013	-
HCM Control Delay (s)	-	16.5	10.7	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.6	0	-

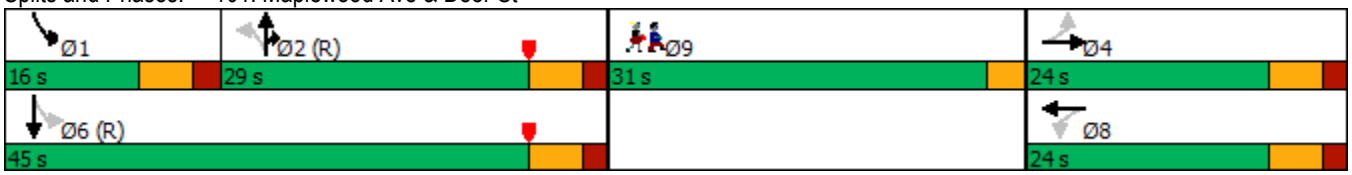
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	142	51	244	143	71	33	515	233	64	482	127
Future Volume (vph)	191	142	51	244	143	71	33	515	233	64	482	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.950				0.850		0.969	
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1646	0	1805	1863	0	1586	1655	1545	1646	1649	0
Flt Permitted		0.669		0.509			0.165			0.132		
Satd. Flow (perm)	0	1128	0	967	1863	0	276	1655	1545	229	1649	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			22				233		16	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93
Heavy Vehicles (%)	20%	10%	5%	0%	2%	6%	10%	11%	8%	6%	9%	4%
Adj. Flow (vph)	212	158	57	265	155	77	38	585	265	69	518	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	427	0	265	232	0	38	585	265	69	655	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	29.0	29.0	16.0	45.0	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		29.0%	29.0%	29.0%	16.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		38.6		38.6	38.6		27.3	27.3	27.3	39.0	39.0	
Actuated g/C Ratio		0.39		0.39	0.39		0.27	0.27	0.27	0.39	0.39	
v/c Ratio		0.97		0.71	0.32		0.51	1.29	0.45	0.34	1.00	
Control Delay		70.6		43.6	24.7		50.0	175.6	6.9	24.3	67.5	
Queue Delay		3.8		0.3	0.0		0.0	0.0	0.0	0.0	28.9	
Total Delay		74.4		43.9	24.7		50.0	175.6	6.9	24.3	96.4	
LOS		E		D	C		D	F	A	C	F	
Approach Delay		74.4			34.9			119.9			89.6	
Approach LOS		E			C			F			F	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	31.0
Total Split (%)	31%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		211		114	74		10	~481	14	27	~407	
Queue Length 95th (ft)		#586		#363	194		m#47	#691	43	57	#652	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		439		373	732		75	452	591	231	652	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		8		7	0		0	0	0	0	51	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.99		0.72	0.32		0.51	1.29	0.45	0.30	1.09	

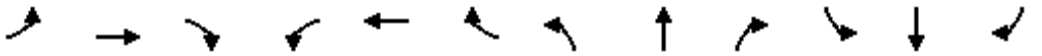
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 86.9		Intersection LOS: F	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	17	41	48	16	128	19	604	84	118	640	18
Future Volume (vph)	49	17	41	48	16	128	19	604	84	118	640	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.893				0.850		0.982			0.996	
Flt Protected	0.950				0.964			0.999		0.950		
Satd. Flow (prot)	1703	1301	0	0	1778	1568	0	3237	0	1626	1856	0
Flt Permitted	0.701				0.736			0.922		0.216		
Satd. Flow (perm)	1257	1301	0	0	1358	1568	0	2988	0	370	1856	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				173		15			2	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.83	0.83	0.83	0.74	0.74	0.74	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	6%	12%	38%	4%	0%	3%	23%	10%	2%	11%	2%	0%
Adj. Flow (vph)	59	20	49	65	22	173	23	728	101	130	703	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	69	0	0	87	173	0	852	0	130	723	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	11.1	11.1			11.3	23.5		47.7		62.4	63.6	
Actuated g/C Ratio	0.11	0.11			0.11	0.24		0.48		0.62	0.64	
v/c Ratio	0.42	0.37			0.57	0.35		0.59		0.38	0.61	
Control Delay	49.4	22.3			55.7	6.0		27.8		11.7	15.5	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.5	
Total Delay	49.4	22.3			55.7	6.0		27.8		11.7	16.0	
LOS	D	C			E	A		C		B	B	
Approach Delay		34.8			22.7			27.8			15.3	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	35	12			53	0		263		46	290	

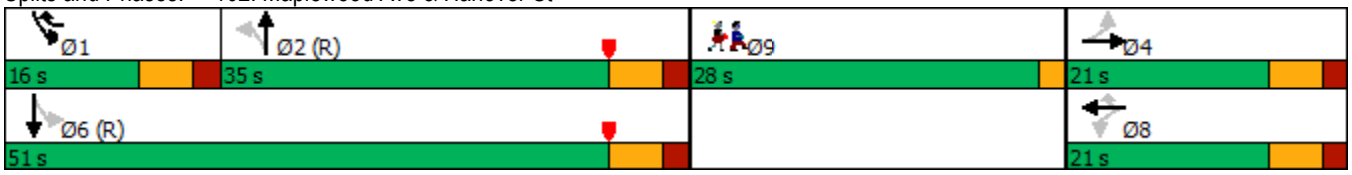
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	67	44			80	23		#353		m34	m325	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	188	236			203	522		1432		359	1180	
Starvation Cap Reductn	0	0			0	0		0		0	148	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.31	0.29			0.43	0.33		0.59		0.36	0.70	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 79.9%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	49.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	162	17	562	173	25	13	7	57	14	5	6
Future Vol, veh/h	13	162	17	562	173	25	13	7	57	14	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	77	77	77	80	80	80	75	75	75
Heavy Vehicles, %	0	5	13	4	25	0	20	0	3	0	0	0
Mvmt Flow	16	203	21	730	225	32	16	9	71	19	7	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	257	0	0	224	0	0	1955	1963	214	1987	1957	241
Stage 1	-	-	-	-	-	-	246	246	-	1701	1701	-
Stage 2	-	-	-	-	-	-	1709	1717	-	286	256	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.3	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.68	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1320	-	-	1333	-	-	43	64	823	46	64	803
Stage 1	-	-	-	-	-	-	719	706	-	118	149	-
Stage 2	-	-	-	-	-	-	104	146	-	726	699	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1320	-	-	1333	-	-	~ 16	23	823	~ 15	23	803
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 16	23	-	~ 15	23	-
Stage 1	-	-	-	-	-	-	709	696	-	116	53	-
Stage 2	-	-	-	-	-	-	32	52	-	646	689	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	8.1	$ 389	$ 638.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	65	1320	-	-	1333	-	-	22
HCM Lane V/C Ratio	1.481	0.012	-	-	0.548	-	-	1.515
HCM Control Delay (s)	$ 389	7.8	0	-	10.9	0	-	$ 638.1
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	8.3	0	-	-	3.5	-	-	4.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	20.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	209	24	26	679	81	301
Future Vol, veh/h	209	24	26	679	81	301
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	80	80	81	81
Heavy Vehicles, %	4	8	12	10	13	2
Mvmt Flow	246	28	33	849	100	372

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	274	0	1175	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	915	-
Critical Hdwy	-	-	4.22	-	6.53	6.22
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	-	-	2.308	-	3.617	3.318
Pot Cap-1 Maneuver	-	-	1234	-	201	779
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	373	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1234	-	191	779
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	354	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	71.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	-	-	1234	-
HCM Lane V/C Ratio	1.001	-	-	0.026	-
HCM Control Delay (s)	71.6	-	-	8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	13.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	11.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	359	61	75	23	16	466
Future Vol, veh/h	359	61	75	23	16	466
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	54	54	92	92
Heavy Vehicles, %	3	0	5	38	0	6
Mvmt Flow	408	69	139	43	17	507

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	182	0	-	0	1046	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	885	-
Critical Hdwy	4.13	-	-	-	6.4	6.26
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.354
Pot Cap-1 Maneuver	1387	-	-	-	255	874
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	407	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	177	874
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	407	-

Approach	EB	WB	SB
HCM Control Delay, s	7.4	0	18.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	773
HCM Lane V/C Ratio	0.294	-	-	-	0.678
HCM Control Delay (s)	8.7	0	-	-	18.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	1.2	-	-	-	5.4

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	8	0	9	9	1	7	13	366	9	6	462	2
Future Vol, veh/h	8	0	9	9	1	7	13	366	9	6	462	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	25	25	25	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	8	0	0	8	0
Mvmt Flow	21	0	24	36	4	28	15	411	10	7	519	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	996	985	520	992	981	416	521	0	0	421	0	0
Stage 1	534	534	-	446	446	-	-	-	-	-	-	-
Stage 2	462	451	-	546	535	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	225	250	560	227	251	641	1056	-	-	1149	-	-
Stage 1	534	528	-	595	577	-	-	-	-	-	-	-
Stage 2	584	574	-	526	527	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	208	243	560	213	244	641	1056	-	-	1149	-	-
Mov Cap-2 Maneuver	208	243	-	213	244	-	-	-	-	-	-	-
Stage 1	524	523	-	584	566	-	-	-	-	-	-	-
Stage 2	544	563	-	499	522	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	20.7	0.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1056	-	-	312	297	1149	-	-
HCM Lane V/C Ratio	0.014	-	-	0.143	0.229	0.006	-	-
HCM Control Delay (s)	8.5	0	-	18.5	20.7	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.9	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	7	6	377	468	55
Future Vol, veh/h	52	7	6	377	468	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	8	7	410	509	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	963	539	569	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	284	542	1003	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	281	542	1003	-	-	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	660	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.4	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1003	-	298	-	-
HCM Lane V/C Ratio	0.007	-	0.215	-	-
HCM Control Delay (s)	8.6	0	20.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection	
Int Delay, s/veh	178

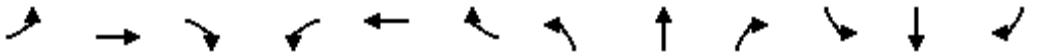
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	422	8	0	541	396	523
Future Vol, veh/h	422	8	0	541	396	523
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	83	83
Heavy Vehicles, %	5	20	0	7	4	6
Mvmt Flow	515	10	0	588	477	630

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1065	477	-	0	-	0
Stage 1	477	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	-	-
Pot Cap-1 Maneuver	~ 243	553	0	-	-	0
Stage 1	618	-	0	-	-	0
Stage 2	549	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 243	553	-	-	-	-
Mov Cap-2 Maneuver	~ 243	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 539.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	243	553	-
HCM Lane V/C Ratio	-	2.118	0.018	-
HCM Control Delay (s)	-	$ 549.5	11.6	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	38.9	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



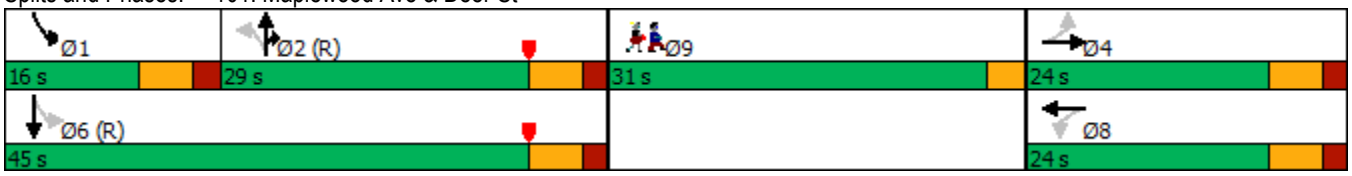
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	11	15	173	55	31	6	259	116	31	373	76
Future Volume (vph)	26	11	15	173	55	31	6	259	116	31	373	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.946				0.850		0.975	
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1620	0	1805	1853	0	1586	1655	1545	1646	1656	0
Flt Permitted		0.859		0.719			0.368			0.326		
Satd. Flow (perm)	0	1426	0	1366	1853	0	614	1655	1545	565	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			25				132		12	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93
Heavy Vehicles (%)	20%	10%	5%	0%	2%	6%	10%	11%	8%	6%	9%	4%
Adj. Flow (vph)	29	12	17	188	60	34	7	294	132	33	401	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	188	94	0	7	294	132	33	483	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	29.0	29.0	16.0	45.0	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		29.0%	29.0%	29.0%	16.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		38.6		38.6	38.6		30.9	30.9	30.9	39.0	39.0	
Actuated g/C Ratio		0.39		0.39	0.39		0.31	0.31	0.31	0.39	0.39	
v/c Ratio		0.10		0.36	0.13		0.04	0.58	0.23	0.11	0.74	
Control Delay		20.9		28.9	19.9		10.7	22.2	3.6	20.0	33.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		20.9		28.9	19.9		10.7	22.2	3.6	20.0	33.7	
LOS		C		C	B		B	C	A	B	C	
Approach Delay		20.9			25.9			16.4			32.8	
Approach LOS		C			C			B			C	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	31.0
Total Split (%)	31%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		13		68	22		2	173	33	13	253	
Queue Length 95th (ft)		55		182	78		m4	#70	1	33	380	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		561		527	730		189	511	568	328	653	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.10		0.36	0.13		0.04	0.58	0.23	0.10	0.74	

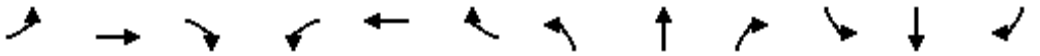
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 25.2		Intersection LOS: C	
Intersection Capacity Utilization 52.0%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	29	15	31	2	46	15	315	55	68	473	20
Future Volume (vph)	20	29	15	31	2	46	15	315	55	68	473	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.949				0.850		0.979			0.994	
Flt Protected	0.950				0.955			0.998		0.950		
Satd. Flow (prot)	1703	1492	0	0	1749	1568	0	3225	0	1626	1853	0
Flt Permitted	0.728				0.702			0.925		0.417		
Satd. Flow (perm)	1305	1492	0	0	1286	1568	0	2989	0	714	1853	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18				62		19			3	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.83	0.83	0.83	0.74	0.74	0.74	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	6%	12%	38%	4%	0%	3%	23%	10%	2%	11%	2%	0%
Adj. Flow (vph)	24	35	18	42	3	62	18	380	66	75	520	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	53	0	0	45	62	0	464	0	75	542	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	9.0	9.0			9.0	20.4		54.3		64.5	65.7	
Actuated g/C Ratio	0.09	0.09			0.09	0.20		0.54		0.64	0.66	
v/c Ratio	0.21	0.35			0.39	0.17		0.28		0.14	0.44	
Control Delay	44.9	36.7			51.8	8.4		19.4		12.3	13.8	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.2	
Total Delay	44.9	36.7			51.8	8.4		19.4		12.3	14.1	
LOS	D	D			D	A		B		B	B	
Approach Delay		39.2			26.7			19.4			13.9	
Approach LOS		D			C			B			B	
Queue Length 50th (ft)	14	21			28	0		108		27	213	

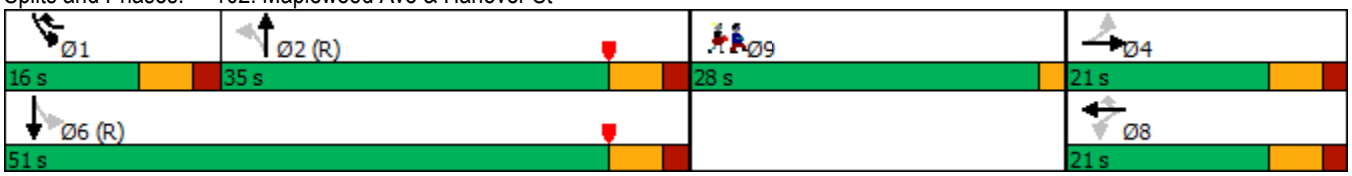
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	36	52			49	19		154		m24	281	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	195	239			192	404		1631		552	1218	
Starvation Cap Reductn	0	0			0	0		0		0	198	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.12	0.22			0.23	0.15		0.28		0.14	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	111	28	207	86	9	12	2	55	18	23	4
Future Vol, veh/h	2	111	28	207	86	9	12	2	55	18	23	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	77	77	77	80	80	80	75	75	75
Heavy Vehicles, %	0	5	13	4	25	0	20	0	3	0	0	0
Mvmt Flow	3	139	35	269	112	12	15	3	69	24	31	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	124	0	0	174	0	0	837	825	157	855	836	118
Stage 1	-	-	-	-	-	-	163	163	-	656	656	-
Stage 2	-	-	-	-	-	-	674	662	-	199	180	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.3	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.68	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1475	-	-	1391	-	-	267	310	886	281	305	939
Stage 1	-	-	-	-	-	-	798	767	-	458	465	-
Stage 2	-	-	-	-	-	-	416	462	-	807	754	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1475	-	-	1391	-	-	202	245	886	216	241	939
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	245	-	216	241	-
Stage 1	-	-	-	-	-	-	796	765	-	457	368	-
Stage 2	-	-	-	-	-	-	300	366	-	740	752	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.6	13.1	24.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	532	1475	-	-	1391	-	-	246
HCM Lane V/C Ratio	0.162	0.002	-	-	0.193	-	-	0.244
HCM Control Delay (s)	13.1	7.4	0	-	8.2	0	-	24.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.7	-	-	0.9

Intersection	
Int Delay, s/veh	8.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	170	14	9	265	38	361
Future Vol, veh/h	170	14	9	265	38	361
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	80	80	81	81
Heavy Vehicles, %	4	8	12	10	13	2
Mvmt Flow	200	16	11	331	47	446

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	216	0	561	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	353	-
Critical Hdwy	-	-	4.22	-	6.53	6.22
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	-	-	2.308	-	3.617	3.318
Pot Cap-1 Maneuver	-	-	1297	-	471	832
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1297	-	466	832
Mov Cap-2 Maneuver	-	-	-	-	466	-
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	680	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	774	-	-	1297	-
HCM Lane V/C Ratio	0.636	-	-	0.009	-
HCM Control Delay (s)	17.4	-	-	7.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	4.6	-	-	0	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	127	28	25	9	0	254
Future Vol, veh/h	127	28	25	9	0	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	54	54	92	92
Heavy Vehicles, %	3	0	5	38	0	6
Mvmt Flow	144	32	46	17	0	276

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	63	0	-	0	375	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	4.13	-	-	-	6.4	6.26
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.354
Pot Cap-1 Maneuver	1533	-	-	-	630	1001
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1533	-	-	-	570	1001
Mov Cap-2 Maneuver	-	-	-	-	570	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	741	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1533	-	-	-	1001
HCM Lane V/C Ratio	0.094	-	-	-	0.276
HCM Control Delay (s)	7.6	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.1

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	1	10	1	0	5	25	107	7	6	242	28
Future Vol, veh/h	12	1	10	1	0	5	25	107	7	6	242	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	25	25	25	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	8	0	0	8	0
Mvmt Flow	32	3	26	4	0	20	28	120	8	7	272	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	492	486	288	496	497	124	303	0	0	128	0	0
Stage 1	302	302	-	180	180	-	-	-	-	-	-	-
Stage 2	190	184	-	316	317	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	490	484	756	487	477	932	1269	-	-	1470	-	-
Stage 1	712	668	-	826	754	-	-	-	-	-	-	-
Stage 2	816	751	-	699	658	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	468	469	756	457	463	932	1269	-	-	1470	-	-
Mov Cap-2 Maneuver	468	469	-	457	463	-	-	-	-	-	-	-
Stage 1	695	664	-	806	736	-	-	-	-	-	-	-
Stage 2	779	733	-	668	654	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.2	9.7	1.4	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	561	794	1470	-	-
HCM Lane V/C Ratio	0.022	-	-	0.108	0.03	0.005	-	-
HCM Control Delay (s)	7.9	0	-	12.2	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	24	2	122	249	20
Future Vol, veh/h	22	24	2	122	249	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	26	2	133	271	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	419	282	293	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	137	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	591	757	1269	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	590	757	1269	-	-	-
Mov Cap-2 Maneuver	590	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	667	-	-
HCM Lane V/C Ratio	0.002	-	0.075	-	-
HCM Control Delay (s)	7.8	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	138	6	0	157	277	268
Future Vol, veh/h	138	6	0	157	277	268
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	83	83
Heavy Vehicles, %	5	20	0	7	4	6
Mvmt Flow	168	7	0	171	334	323

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	505	334	-	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	-	-
Pot Cap-1 Maneuver	522	668	0	-	-	0
Stage 1	719	-	0	-	-	0
Stage 2	852	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	522	668	-	-	-	-
Mov Cap-2 Maneuver	522	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	522	668	-
HCM Lane V/C Ratio	-	0.322	0.011	-
HCM Control Delay (s)	-	15.1	10.4	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	1.4	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	301	15	35	480
Future Vol, veh/h	0	0	301	15	35	480
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	327	16	38	522

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	933	335	0	0	343	0
Stage 1	335	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	295	707	-	-	1216	-
Stage 1	725	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	282	707	-	-	1216	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	525	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1216	-
HCM Lane V/C Ratio	-	-	-	0.031	-
HCM Control Delay (s)	-	-	0	8.1	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↱	
Traffic Vol, veh/h	21	0	0	22	0	25
Future Vol, veh/h	21	0	0	22	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	0	0	24	0	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	47	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	24	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	0	-	963	1054
Stage 1	-	0	0	-	1000	-
Stage 2	-	0	0	-	999	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	963	1054
Mov Cap-2 Maneuver	-	-	-	-	963	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	999	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1054	-	-
HCM Lane V/C Ratio	0.026	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

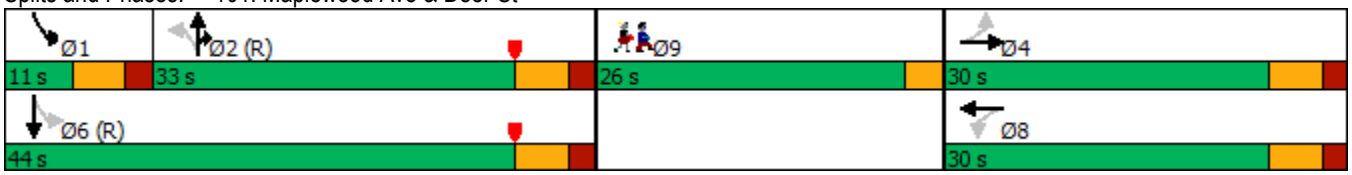
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	96	7	261	106	69	6	486	226	62	437	52
Future Volume (vph)	96	96	7	261	106	69	6	486	226	62	437	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.944				0.850		0.985	
Flt Protected		0.972		0.950			0.950			0.950		
Satd. Flow (prot)	0	1877	0	1770	1913	0	1558	1818	1636	1745	1807	0
Flt Permitted		0.603		0.568			0.244			0.123		
Satd. Flow (perm)	0	1165	0	1058	1913	0	400	1818	1636	226	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			28				244		6	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.51	0.79	0.38	0.67	0.75	0.82	0.63	0.87	0.90	0.58	0.85	0.91
Heavy Vehicles (%)	1%	1%	0%	2%	0%	0%	12%	1%	2%	0%	0%	1%
Adj. Flow (vph)	188	122	18	390	141	84	10	559	251	107	514	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	328	0	390	225	0	10	559	251	107	571	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	30.0	30.0		30.0	30.0		33.0	33.0	33.0	11.0	44.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		33.0%	33.0%	33.0%	11.0%	44.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		29.2		29.2	29.2		27.0	27.0	27.0	38.0	38.0	
Actuated g/C Ratio		0.29		0.29	0.29		0.27	0.27	0.27	0.38	0.38	
v/c Ratio		0.96		1.27	0.39		0.09	1.14	0.41	0.66	0.83	
Control Delay		79.0		176.9	29.5		21.0	108.8	3.9	42.8	39.8	
Queue Delay		8.0		0.4	0.0		0.0	0.0	0.0	0.0	2.4	
Total Delay		87.0		177.3	29.5		21.0	108.8	3.9	42.8	42.2	
LOS		F		F	C		C	F	A	D	D	
Approach Delay		87.0			123.2			75.6			42.3	
Approach LOS		F			F			E			D	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	26%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		~249		~351	107		2	~422	0	44	321	
Queue Length 95th (ft)		#349		#354	142		m6	#565	39	51	426	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		342		308	578		108	490	619	161	690	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		13		11	0		0	0	0	0	48	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		1.00		1.31	0.39		0.09	1.14	0.41	0.66	0.89	

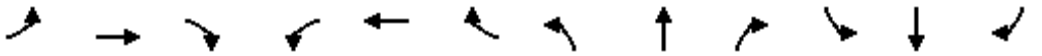
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 79.9		Intersection LOS: E	
Intersection Capacity Utilization 79.7%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	15	6	43	14	116	7	558	76	107	583	16
Future Volume (vph)	44	15	6	43	14	116	7	558	76	107	583	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.955				0.850		0.982			0.996	
Flt Protected	0.950				0.964			0.999		0.950		
Satd. Flow (prot)	1805	1562	0	0	1832	1615	0	3481	0	1687	1874	0
Flt Permitted	0.714				0.754			0.946		0.250		
Satd. Flow (perm)	1357	1562	0	0	1433	1615	0	3296	0	444	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				135		15			2	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.57	0.57	0.57	0.86	0.86	0.86	0.89	0.89	0.89	0.85	0.85	0.85
Heavy Vehicles (%)	0%	23%	0%	0%	0%	0%	0%	2%	0%	7%	1%	0%
Adj. Flow (vph)	77	26	11	50	16	135	8	627	85	126	686	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	37	0	0	66	135	0	720	0	126	705	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	10.8	10.8			10.7	23.3		42.3		57.2	58.4	
Actuated g/C Ratio	0.11	0.11			0.11	0.23		0.42		0.57	0.58	
v/c Ratio	0.52	0.21			0.43	0.28		0.51		0.35	0.64	
Control Delay	54.0	32.6			49.2	6.2		27.3		8.3	11.8	
Queue Delay	0.0	0.0			0.0	0.0		0.2		0.0	0.6	
Total Delay	54.0	32.6			49.2	6.2		27.5		8.3	12.5	
LOS	D	C			D	A		C		A	B	
Approach Delay		47.1			20.3			27.5			11.8	
Approach LOS		D			C			C			B	
Queue Length 50th (ft)	47	15			40	0		199		12	183	

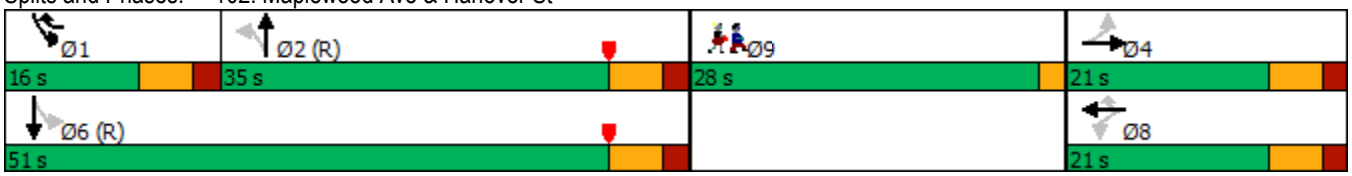
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	55	25			76	37		278		m29	m304	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	203	243			214	499		1403		380	1095	
Starvation Cap Reductn	0	0			0	0		0		0	133	
Spillback Cap Reductn	0	0			0	7		184		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.38	0.15			0.31	0.27		0.59		0.33	0.73	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	135	15	460	142	23	11	6	49	12	4	5
Future Vol, veh/h	11	135	15	460	142	23	11	6	49	12	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	74	74	74	57	57	57
Heavy Vehicles, %	0	0	0	2	4	0	0	0	0	0	0	0
Mvmt Flow	13	165	18	495	153	25	15	8	66	21	7	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	178	0	0	183	0	0	1364	1368	174	1393	1365	166
Stage 1	-	-	-	-	-	-	200	200	-	1156	1156	-
Stage 2	-	-	-	-	-	-	1164	1168	-	237	209	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1410	-	-	1392	-	-	126	148	875	120	149	884
Stage 1	-	-	-	-	-	-	806	739	-	242	273	-
Stage 2	-	-	-	-	-	-	239	270	-	771	733	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1410	-	-	1392	-	-	81	89	875	71	89	884
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	89	-	71	89	-
Stage 1	-	-	-	-	-	-	798	732	-	240	165	-
Stage 2	-	-	-	-	-	-	137	163	-	698	726	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	6.6	26.5	64.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	255	1410	-	-	1392	-	-	96
HCM Lane V/C Ratio	0.35	0.01	-	-	0.355	-	-	0.384
HCM Control Delay (s)	26.5	7.6	0	-	9	0	-	64.2
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.5	0	-	-	1.6	-	-	1.5

Intersection	
Int Delay, s/veh	6.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	175	22	24	552	73	255
Future Vol, veh/h	175	22	24	552	73	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	89	89
Heavy Vehicles, %	1	0	0	1	5	0
Mvmt Flow	213	27	26	600	82	287

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	240	0	879	227
Stage 1	-	-	-	-	227	-
Stage 2	-	-	-	-	652	-
Critical Hdwy	-	-	4.1	-	6.45	6.2
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.2	-	3.545	3.3
Pot Cap-1 Maneuver	-	-	1339	-	314	817
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	513	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1339	-	305	817
Mov Cap-2 Maneuver	-	-	-	-	305	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	498	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	595	-	-	1339	-
HCM Lane V/C Ratio	0.619	-	-	0.019	-
HCM Control Delay (s)	20.4	-	-	7.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	4.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	11.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	312	56	68	21	14	445
Future Vol, veh/h	312	56	68	21	14	445
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	70	81	54	42	89
Heavy Vehicles, %	2	0	0	0	0	2
Mvmt Flow	367	80	84	39	33	500

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	123	0	-	0	918	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	814	-
Critical Hdwy	4.12	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	1464	-	-	-	304	951
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	439	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1464	-	-	-	224	951
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	439	-

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	791
HCM Lane V/C Ratio	0.251	-	-	-	0.674
HCM Control Delay (s)	8.3	0	-	-	18.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	1	-	-	-	5.3

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	0	32	8	1	6	30	299	8	5	417	15
Future Vol, veh/h	31	0	32	8	1	6	30	299	8	5	417	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	45	45	75	75	75	82	82	82	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	69	0	71	11	1	8	37	365	10	6	485	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	955	955	494	985	958	370	502	0	0	375	0	0
Stage 1	506	506	-	444	444	-	-	-	-	-	-	-
Stage 2	449	449	-	541	514	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	240	260	579	229	259	680	1073	-	-	1195	-	-
Stage 1	552	543	-	597	579	-	-	-	-	-	-	-
Stage 2	593	576	-	529	539	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	227	247	579	193	246	680	1073	-	-	1195	-	-
Mov Cap-2 Maneuver	227	247	-	193	246	-	-	-	-	-	-	-
Stage 1	528	539	-	571	554	-	-	-	-	-	-	-
Stage 2	559	551	-	461	535	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.9	19.1	0.8	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1073	-	-	328	276	1195	-	-
HCM Lane V/C Ratio	0.034	-	-	0.427	0.072	0.005	-	-
HCM Control Delay (s)	8.5	0	-	23.9	19.1	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	86	28	5	333	413	52
Future Vol, veh/h	86	28	5	333	413	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	93	30	5	362	449	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	850	478	506	0	-	0
Stage 1	478	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	331	587	1059	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	329	587	1059	-	-	-
Mov Cap-2 Maneuver	329	-	-	-	-	-
Stage 1	620	-	-	-	-	-
Stage 2	697	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1059	-	369	-	-
HCM Lane V/C Ratio	0.005	-	0.336	-	-
HCM Control Delay (s)	8.4	0	19.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	1.4	-	-

Intersection	
Int Delay, s/veh	183.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	412	7	0	489	359	465
Future Vol, veh/h	412	7	0	489	359	465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	50	25	71	82	87
Heavy Vehicles, %	2	0	0	0	1	2
Mvmt Flow	502	14	0	689	438	534

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1127	438	-	0	-	0
Stage 1	438	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	-	-
Pot Cap-1 Maneuver	~ 226	623	0	-	-	0
Stage 1	651	-	0	-	-	0
Stage 2	~ 498	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 226	623	-	-	-	-
Mov Cap-2 Maneuver	~ 226	-	-	-	-	-
Stage 1	651	-	-	-	-	-
Stage 2	~ 498	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 583	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	226	623	-
HCM Lane V/C Ratio	-	2.223	0.022	-
HCM Control Delay (s)	-	$ 598.9	10.9	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	39.3	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	633	18	20	551
Future Vol, veh/h	0	0	633	18	20	551
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	688	20	22	599

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1341	698	0	0	708	0
Stage 1	698	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	168	440	-	-	891	-
Stage 1	494	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	162	440	-	-	891	-
Mov Cap-2 Maneuver	162	-	-	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	504	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	891	-
HCM Lane V/C Ratio	-	-	-	0.024	-
HCM Control Delay (s)	-	-	0	9.1	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	55	0	0	57	0	59
Future Vol, veh/h	55	0	0	57	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	0	0	62	0	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	122	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	62	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	0	-	873	1005
Stage 1	-	0	0	-	963	-
Stage 2	-	0	0	-	961	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	873	1005
Mov Cap-2 Maneuver	-	-	-	-	873	-
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	961	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1005	-	-
HCM Lane V/C Ratio	0.064	-	-
HCM Control Delay (s)	8.8	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	136	31	261	108	10	14	2	63	19	25	5
Future Vol, veh/h	2	136	31	261	108	10	14	2	63	19	25	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	77	77	77	80	80	80	75	75	75
Heavy Vehicles, %	0	5	13	4	25	0	20	0	3	0	0	0
Mvmt Flow	3	170	39	339	140	13	18	3	79	25	33	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	153	0	0	209	0	0	1041	1027	190	1062	1040	147
Stage 1	-	-	-	-	-	-	196	196	-	825	825	-
Stage 2	-	-	-	-	-	-	845	831	-	237	215	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.3	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.68	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1440	-	-	1350	-	-	193	236	849	203	232	905
Stage 1	-	-	-	-	-	-	766	742	-	370	390	-
Stage 2	-	-	-	-	-	-	333	387	-	771	729	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1440	-	-	1350	-	-	129	171	849	143	168	905
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	171	-	143	168	-
Stage 1	-	-	-	-	-	-	764	741	-	369	283	-
Stage 2	-	-	-	-	-	-	211	281	-	696	728	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.9	16.7	38.5
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	406	1440	-	-	1350	-	-	171
HCM Lane V/C Ratio	0.243	0.002	-	-	0.251	-	-	0.382
HCM Control Delay (s)	16.7	7.5	0	-	8.6	0	-	38.5
HCM Lane LOS	C	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.9	0	-	-	1	-	-	1.6

Intersection	
Int Delay, s/veh	15.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	203	16	10	337	42	465
Future Vol, veh/h	203	16	10	337	42	465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	80	80	81	81
Heavy Vehicles, %	4	8	12	10	13	2
Mvmt Flow	239	19	13	421	52	574

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	258	0	696	249
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.22	-	6.53	6.22
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	-	-	2.308	-	3.617	3.318
Pot Cap-1 Maneuver	-	-	1251	-	391	790
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	622	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1251	-	386	790
Mov Cap-2 Maneuver	-	-	-	-	386	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	32.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	727	-	-	1251	-
HCM Lane V/C Ratio	0.861	-	-	0.01	-
HCM Control Delay (s)	32.5	-	-	7.9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	10.3	-	-	0	-

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	156	31	27	10	0	318
Future Vol, veh/h	156	31	27	10	0	318
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	54	54	92	92
Heavy Vehicles, %	3	0	5	38	0	6
Mvmt Flow	177	35	50	19	0	346

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	69	0	-	0	449	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	389	-
Critical Hdwy	4.13	-	-	-	6.4	6.26
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.354
Pot Cap-1 Maneuver	1526	-	-	-	571	994
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1526	-	-	-	504	994
Mov Cap-2 Maneuver	-	-	-	-	504	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	689	-

Approach	EB	WB	SB
HCM Control Delay, s	6.4	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1526	-	-	-	994
HCM Lane V/C Ratio	0.116	-	-	-	0.348
HCM Control Delay (s)	7.7	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.6

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	12	1	10	1	0	6	26	135	8	7	306	29
Future Vol, veh/h	12	1	10	1	0	6	26	135	8	7	306	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	25	25	25	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	8	0	0	8	0
Mvmt Flow	32	3	26	4	0	24	29	152	9	8	344	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	604	596	361	606	608	157	377	0	0	161	0	0
Stage 1	377	377	-	215	215	-	-	-	-	-	-	-
Stage 2	227	219	-	391	393	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	413	420	688	412	413	894	1193	-	-	1430	-	-
Stage 1	649	619	-	792	729	-	-	-	-	-	-	-
Stage 2	780	726	-	637	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	392	406	688	384	399	894	1193	-	-	1430	-	-
Mov Cap-2 Maneuver	392	406	-	384	399	-	-	-	-	-	-	-
Stage 1	631	615	-	771	709	-	-	-	-	-	-	-
Stage 2	739	706	-	606	605	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	10	1.2	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1193	-	-	483	751	1430	-	-
HCM Lane V/C Ratio	0.024	-	-	0.125	0.037	0.006	-	-
HCM Control Delay (s)	8.1	0	-	13.5	10	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	26	2	151	312	22
Future Vol, veh/h	23	26	2	151	312	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	28	2	164	339	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	519	351	363	0	-	0
Stage 1	351	-	-	-	-	-
Stage 2	168	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	517	692	1196	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	516	692	1196	-	-	-
Mov Cap-2 Maneuver	516	-	-	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	862	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1196	-	596	-	-
HCM Lane V/C Ratio	0.002	-	0.089	-	-
HCM Control Delay (s)	8	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	167	7	0	173	306	334
Future Vol, veh/h	167	7	0	173	306	334
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	83	83
Heavy Vehicles, %	5	20	0	7	4	6
Mvmt Flow	204	9	0	188	369	402

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	557	369	-	0	-	0
Stage 1	369	-	-	-	-	-
Stage 2	188	-	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	-	-
Pot Cap-1 Maneuver	486	638	0	-	-	0
Stage 1	693	-	0	-	-	0
Stage 2	837	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	486	638	-	-	-	-
Mov Cap-2 Maneuver	486	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	837	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	486	638	-
HCM Lane V/C Ratio	-	0.419	0.013	-
HCM Control Delay (s)	-	17.6	10.7	-
HCM Lane LOS	-	C	B	-
HCM 95th %tile Q(veh)	-	2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	332	15	35	628
Future Vol, veh/h	0	0	332	15	35	628
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	361	16	38	683

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1128	369	0	0	377	0
Stage 1	369	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	226	677	-	-	1181	-
Stage 1	699	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	214	677	-	-	1181	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	438	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1181	-
HCM Lane V/C Ratio	-	-	-	0.032	-
HCM Control Delay (s)	-	-	0	8.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	-

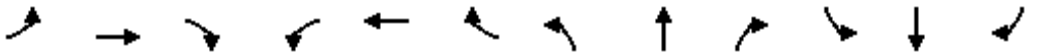
Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	24	0	0	24	0	25
Future Vol, veh/h	24	0	0	24	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	0	0	26	0	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	52	26
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	26	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	0	-	957	1050
Stage 1	-	0	0	-	997	-
Stage 2	-	0	0	-	997	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	957	1050
Mov Cap-2 Maneuver	-	-	-	-	957	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	997	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1050	-	-
HCM Lane V/C Ratio	0.026	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-



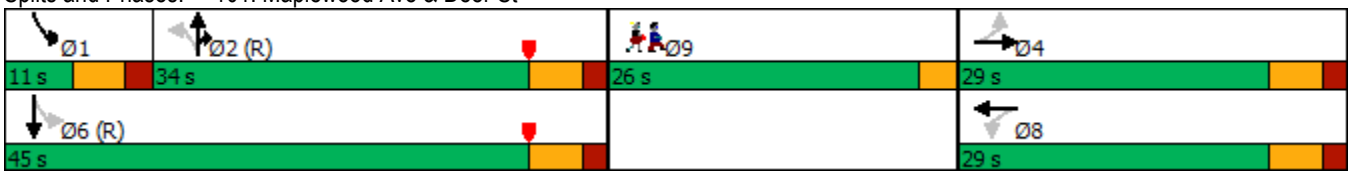
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	142	51	285	143	76	33	533	248	68	482	127
Future Volume (vph)	191	142	51	285	143	76	33	533	248	68	482	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.948				0.850		0.969	
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1646	0	1805	1858	0	1586	1655	1545	1646	1649	0
Flt Permitted		0.661		0.509			0.147			0.120		
Satd. Flow (perm)	0	1115	0	967	1858	0	245	1655	1545	208	1649	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			25				256		16	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93
Heavy Vehicles (%)	20%	10%	5%	0%	2%	6%	10%	11%	8%	6%	9%	4%
Adj. Flow (vph)	212	158	57	310	155	83	38	606	282	73	518	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	427	0	310	238	0	38	606	282	73	655	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	29.0	29.0		29.0	29.0		34.0	34.0	34.0	11.0	45.0	
Total Split (%)	29.0%	29.0%		29.0%	29.0%		34.0%	34.0%	34.0%	11.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		38.6		38.6	38.6		30.2	30.2	30.2	39.0	39.0	
Actuated g/C Ratio		0.39		0.39	0.39		0.30	0.30	0.30	0.39	0.39	
v/c Ratio		0.98		0.83	0.33		0.52	1.21	0.44	0.48	1.00	
Control Delay		73.6		52.8	24.6		48.3	139.8	6.2	30.3	67.5	
Queue Delay		11.0		2.0	0.0		0.0	0.0	0.0	0.0	33.2	
Total Delay		84.7		54.8	24.6		48.3	139.8	6.2	30.3	100.7	
LOS		F		D	C		D	F	A	C	F	
Approach Delay		84.7			41.7			95.4			93.6	
Approach LOS		F			D			F			F	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	26%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		212		143	75		10	~474	21	29	~407	
Queue Length 95th (ft)		#588		#433	197		m22	#660	47	59	#652	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		434		373	732		73	499	644	153	652	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		18		15	0		0	0	0	0	74	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		1.03		0.87	0.33		0.52	1.21	0.44	0.48	1.13	

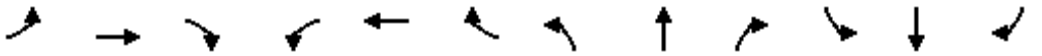
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 82.0		Intersection LOS: F	
Intersection Capacity Utilization 98.4%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	17	41	48	16	128	19	637	84	118	681	18
Future Volume (vph)	49	17	41	48	16	128	19	637	84	118	681	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.893				0.850		0.983			0.996	
Flt Protected	0.950				0.964			0.999		0.950		
Satd. Flow (prot)	1703	1301	0	0	1778	1568	0	3240	0	1626	1856	0
Flt Permitted	0.701				0.736			0.921		0.201		
Satd. Flow (perm)	1257	1301	0	0	1358	1568	0	2987	0	344	1856	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				173		14			2	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.83	0.83	0.83	0.74	0.74	0.74	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	6%	12%	38%	4%	0%	3%	23%	10%	2%	11%	2%	0%
Adj. Flow (vph)	59	20	49	65	22	173	23	767	101	130	748	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	69	0	0	87	173	0	891	0	130	768	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	11.1	11.1			11.3	23.5		47.7		62.4	63.6	
Actuated g/C Ratio	0.11	0.11			0.11	0.24		0.48		0.62	0.64	
v/c Ratio	0.42	0.37			0.57	0.35		0.62		0.40	0.65	
Control Delay	49.4	22.3			55.7	6.0		28.6		11.3	16.4	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.6	
Total Delay	49.4	22.3			55.7	6.0		28.6		11.3	17.0	
LOS	D	C			E	A		C		B	B	
Approach Delay		34.8			22.7			28.6			16.2	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	35	12			53	0		281		48	320	

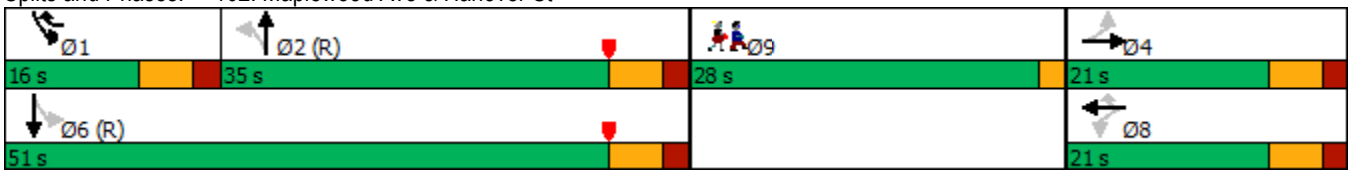
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	67	44			80	23		#381		m32	m415	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	188	236			203	522		1431		345	1180	
Starvation Cap Reductn	0	0			0	0		0		0	147	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.31	0.29			0.43	0.33		0.62		0.38	0.74	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 82.9%	ICU Level of Service E
Analysis Period (min) 15	

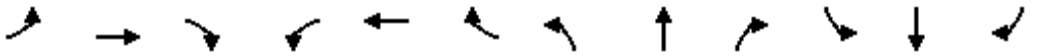
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	30	34	189	100	34	38	285	127	33	412	183
Future Volume (vph)	76	30	34	189	100	34	38	285	127	33	412	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	14	14	11	11	13	11	11	11
Storage Length (ft)	0		0	75		100	75		0	100		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			75			75			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.962				0.850		0.954	
Flt Protected		0.974		0.950			0.950			0.950		
Satd. Flow (prot)	0	1619	0	1805	1893	0	1586	1655	1545	1646	1631	0
Flt Permitted		0.772		0.669			0.150			0.286		
Satd. Flow (perm)	0	1284	0	1271	1893	0	250	1655	1545	496	1631	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			15				144		26	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		305			453			435			141	
Travel Time (s)		8.3			12.4			11.9			3.2	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93
Heavy Vehicles (%)	20%	10%	5%	0%	2%	6%	10%	11%	8%	6%	9%	4%
Adj. Flow (vph)	84	33	38	205	109	37	43	324	144	35	443	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	205	146	0	43	324	144	35	640	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Prot	pm+pt	NA	
Protected Phases		4			8			2	2	1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	11.0	16.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	29.0	29.0	16.0	45.0	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		29.0%	29.0%	29.0%	16.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		38.6		38.6	38.6		30.8	30.8	30.8	39.0	39.0	
Actuated g/C Ratio		0.39		0.39	0.39		0.31	0.31	0.31	0.39	0.39	
v/c Ratio		0.31		0.42	0.20		0.56	0.64	0.25	0.13	0.98	
Control Delay		26.0		30.6	23.4		49.7	26.0	3.4	20.3	61.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	8.0	
Total Delay		26.0		30.6	23.4		49.7	26.0	3.4	20.3	69.7	
LOS		C		C	C		D	C	A	C	E	
Approach Delay		26.0			27.6			21.6			67.1	
Approach LOS		C			C			C			E	

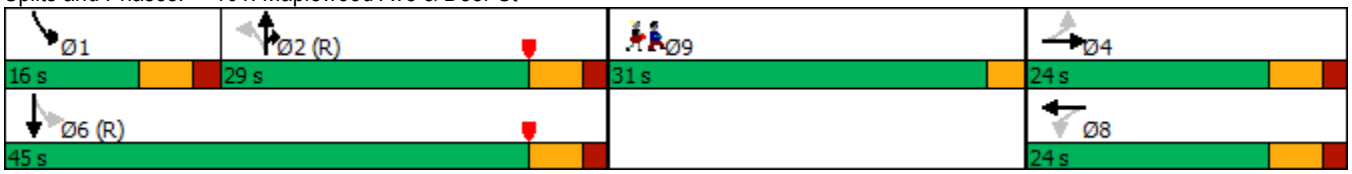
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	26.0
Total Split (s)	31.0
Total Split (%)	31%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		50		77	44		22	193	2	14	384	
Queue Length 95th (ft)		144		#220	126		#82	#296	22	34	#627	
Internal Link Dist (ft)		225			373			355			61	
Turn Bay Length (ft)				75			75			100		
Base Capacity (vph)		504		490	739		77	510	575	308	651	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	21	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.31		0.42	0.20		0.56	0.64	0.25	0.11	1.02	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 41.4		Intersection LOS: D	
Intersection Capacity Utilization 66.2%		ICU Level of Service C	
Analysis Period (min) 15			

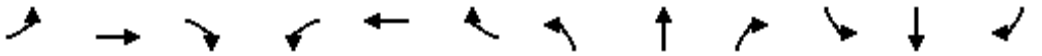
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Maplewood Ave & Deer St



Lane Group	Ø9
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	32	29	35	2	51	32	377	60	75	540	22
Future Volume (vph)	22	32	29	35	2	51	32	377	60	75	540	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		75	0		0	175		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.929				0.850		0.981			0.994	
Flt Protected	0.950				0.955			0.997		0.950		
Satd. Flow (prot)	1703	1420	0	0	1749	1568	0	3213	0	1626	1853	0
Flt Permitted	0.724				0.685			0.875		0.360		
Satd. Flow (perm)	1298	1420	0	0	1254	1568	0	2820	0	616	1853	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35				69		16			3	
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		152			315			356			435	
Travel Time (s)		4.1			8.6			9.7			9.9	
Peak Hour Factor	0.83	0.83	0.83	0.74	0.74	0.74	0.83	0.83	0.83	0.91	0.91	0.91
Heavy Vehicles (%)	6%	12%	38%	4%	0%	3%	23%	10%	2%	11%	2%	0%
Adj. Flow (vph)	27	39	35	47	3	69	39	454	72	82	593	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	74	0	0	50	69	0	565	0	82	617	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		pm+pt	NA	
Protected Phases		4			8	1		2		1	6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	1	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	16.0	16.0		11.0	16.0	
Total Split (s)	21.0	21.0		21.0	21.0	16.0	35.0	35.0		16.0	51.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	16.0%	35.0%	35.0%		16.0%	51.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0			6.0	6.0		6.0		6.0	6.0	
Lead/Lag						Lead	Lag	Lag		Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		Yes		
Recall Mode	None	None		None	None	None	C-Min	C-Min		None	C-Min	
Act Effct Green (s)	9.4	9.4			9.4	21.1		53.6		64.1	65.3	
Actuated g/C Ratio	0.09	0.09			0.09	0.21		0.54		0.64	0.65	
v/c Ratio	0.22	0.45			0.43	0.18		0.37		0.17	0.51	
Control Delay	44.8	33.4			52.9	7.8		21.5		11.4	14.0	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.4	
Total Delay	44.8	33.4			52.9	7.8		21.5		11.4	14.4	
LOS	D	C			D	A		C		B	B	
Approach Delay		36.5			26.7			21.5			14.0	
Approach LOS		D			C			C			B	
Queue Length 50th (ft)	16	24			31	0		143		31	263	

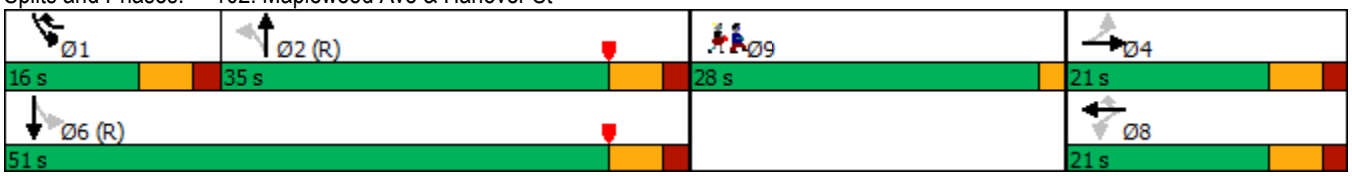
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	38	58			54	20		199		m22	m266	
Internal Link Dist (ft)		72			235			276			355	
Turn Bay Length (ft)						75				175		
Base Capacity (vph)	194	242			188	417		1520		498	1211	
Starvation Cap Reductn	0	0			0	0		0		0	201	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.14	0.31			0.27	0.17		0.37		0.16	0.61	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 19.4		Intersection LOS: B	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Maplewood Ave & Hanover St



Lane Group	Ø9
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	53

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	166	17	562	178	25	13	7	61	14	5	6
Future Vol, veh/h	13	166	17	562	178	25	13	7	61	14	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	77	77	77	80	80	80	75	75	75
Heavy Vehicles, %	0	5	13	4	25	0	20	0	3	0	0	0
Mvmt Flow	16	208	21	730	231	32	16	9	76	19	7	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	263	0	0	229	0	0	1966	1974	219	2000	1968	247
Stage 1	-	-	-	-	-	-	251	251	-	1707	1707	-
Stage 2	-	-	-	-	-	-	1715	1723	-	293	261	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.3	6.5	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.68	4	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1313	-	-	1327	-	-	42	63	818	45	63	797
Stage 1	-	-	-	-	-	-	715	703	-	117	148	-
Stage 2	-	-	-	-	-	-	103	145	-	719	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1313	-	-	1327	-	-	~ 16	22	818	~ 14	22	797
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 16	22	-	~ 14	22	-
Stage 1	-	-	-	-	-	-	705	693	-	115	52	-
Stage 2	-	-	-	-	-	-	31	51	-	635	686	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	8.1	$ 396.8	$ 731.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	67	1313	-	-	1327	-	-	20
HCM Lane V/C Ratio	1.511	0.012	-	-	0.55	-	-	1.667
HCM Control Delay (s)	$ 396.8	7.8	0	-	11	0	-	$ 731.9
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	8.7	0	-	-	3.5	-	-	4.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	24.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	217	24	26	684	81	317
Future Vol, veh/h	217	24	26	684	81	317
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	80	80	81	81
Heavy Vehicles, %	4	8	12	10	13	2
Mvmt Flow	255	28	33	855	100	391

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	283	0	1190	269
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	921	-
Critical Hdwy	-	-	4.22	-	6.53	6.22
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	-	-	2.308	-	3.617	3.318
Pot Cap-1 Maneuver	-	-	1224	-	197	770
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	371	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1224	-	187	770
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	352	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	83.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	-	-	1224	-
HCM Lane V/C Ratio	1.043	-	-	0.027	-
HCM Control Delay (s)	83.1	-	-	8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	14.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	13

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	378	61	75	23	16	512
Future Vol, veh/h	378	61	75	23	16	512
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	54	54	92	92
Heavy Vehicles, %	3	0	5	38	0	6
Mvmt Flow	430	69	139	43	17	557

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	182	0	-	0	1090	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	929	-
Critical Hdwy	4.13	-	-	-	6.4	6.26
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.354
Pot Cap-1 Maneuver	1387	-	-	-	240	874
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	388	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	163	874
Mov Cap-2 Maneuver	-	-	-	-	163	-
Stage 1	-	-	-	-	592	-
Stage 2	-	-	-	-	388	-

Approach	EB	WB	SB
HCM Control Delay, s	7.5	0	21.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	772
HCM Lane V/C Ratio	0.31	-	-	-	0.743
HCM Control Delay (s)	8.8	0	-	-	21.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	1.3	-	-	-	6.8

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	32	0	33	9	1	7	32	366	9	6	484	15
Future Vol, veh/h	32	0	33	9	1	7	32	366	9	6	484	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	38	38	25	25	25	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	8	0	0	8	0
Mvmt Flow	84	0	87	36	4	28	36	411	10	7	544	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1071	1060	553	1098	1063	416	561	0	0	421	0	0
Stage 1	567	567	-	488	488	-	-	-	-	-	-	-
Stage 2	504	493	-	610	575	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	200	226	537	192	225	641	1020	-	-	1149	-	-
Stage 1	512	510	-	565	553	-	-	-	-	-	-	-
Stage 2	554	550	-	485	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	181	214	537	154	213	641	1020	-	-	1149	-	-
Mov Cap-2 Maneuver	181	214	-	154	213	-	-	-	-	-	-	-
Stage 1	488	505	-	539	528	-	-	-	-	-	-	-
Stage 2	502	525	-	403	501	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38	27.1	0.7	0.1
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1020	-	-	273	230	1149	-	-
HCM Lane V/C Ratio	0.035	-	-	0.627	0.296	0.006	-	-
HCM Control Delay (s)	8.7	0	-	38	27.1	8.2	0	-
HCM Lane LOS	A	A	-	E	D	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.9	1.2	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	89	29	6	401	481	55
Future Vol, veh/h	89	29	6	401	481	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	32	7	436	523	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1003	553	583	0	-	0
Stage 1	553	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	268	533	991	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	266	533	991	-	-	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	571	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.3	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	991	-	303	-	-
HCM Lane V/C Ratio	0.007	-	0.423	-	-
HCM Control Delay (s)	8.7	0	25.3	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	2	-	-

Intersection	
Int Delay, s/veh	242.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	483	8	0	541	396	536
Future Vol, veh/h	483	8	0	541	396	536
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	25	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	92	92	83	83
Heavy Vehicles, %	5	20	0	7	4	6
Mvmt Flow	589	10	0	588	477	646

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1065	477	-	0	-	0
Stage 1	477	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Critical Hdwy	6.45	6.4	-	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.48	-	-	-	-
Pot Cap-1 Maneuver	~ 243	553	0	-	-	0
Stage 1	618	-	0	-	-	0
Stage 2	~ 549	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 243	553	-	-	-	-
Mov Cap-2 Maneuver	~ 243	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	~ 549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 673.9	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	243	553	-
HCM Lane V/C Ratio	-	2.424	0.018	-
HCM Control Delay (s)	-	$ 684.9	11.6	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	47.9	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	782	18	20	677
Future Vol, veh/h	0	0	782	18	20	677
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	850	20	22	736

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1640	860	0	0	870	0
Stage 1	860	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	110	356	-	-	775	-
Stage 1	414	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	105	356	-	-	775	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	414	-	-	-	-	-
Stage 2	430	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	775	-
HCM Lane V/C Ratio	-	-	-	0.028	-
HCM Control Delay (s)	-	-	0	9.8	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↱	
Traffic Vol, veh/h	59	0	0	61	0	59
Future Vol, veh/h	59	0	0	61	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	0	0	66	0	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	130	64
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	66	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	0	-	864	1000
Stage 1	-	0	0	-	959	-
Stage 2	-	0	0	-	957	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	864	1000
Mov Cap-2 Maneuver	-	-	-	-	864	-
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1000	-	-
HCM Lane V/C Ratio	0.064	-	-
HCM Control Delay (s)	8.8	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-

HCS7 Roundabouts Report

General Information

Analyst	Tighe & Bond
Agency or Co.	
Date Performed	5/19/2022
Analysis Year	2035
Time Analyzed	Weekday AM Peak Hour
Project Description	Russell Street Development Build Conditi...

Site Information

Intersection	Market St at Russell St
E/W Street Name	Russell Street
N/S Street Name	Market Street
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	Portsmouth

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
Lane Assignment			LR								LT				TR	
Volume (V), veh/h	0	167		7					0	0	173		0		306	334
Percent Heavy Vehicles, %	0	5		20					0	0	7		0		4	6
Flow Rate (v_{PCE}), pc/h	0	191		9					0	0	201		0		346	385
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1								1				1			
Pedestrians Crossing, p/h	0								0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763						4.9763			4.9763	
Follow-Up Headway (s)		2.6087						2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		200.00						201.00			731.00	
Entry Volume veh/h		189.40						187.85			695.90	
Circulating Flow (v_c), pc/h	346			392			191			0		
Exiting Flow (v_{ex}), pc/h	0			385			392			355		
Capacity (c_{pce}), pc/h		969.64						1135.72			1380.00	
Capacity (c), veh/h		918.27						1061.42			1313.73	
v/c Ratio (x)		0.21						0.18			0.53	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.0						5.0			8.4	
Lane LOS		A						A			A	
95% Queue, veh		0.8						0.6			3.2	
Approach Delay, s/veh	6.0						5.0			8.4		
Approach LOS	A						A			A		
Intersection Delay, s/veh | LOS	7.4						A					

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HCS7 Roundabouts Report

General Information

Analyst	Tighe & Bond
Agency or Co.	
Date Performed	5/19/2022
Analysis Year	2035
Time Analyzed	Weekday PM Peak Hour
Project Description	Russell Street Development Build Conditions

Site Information

Intersection	Market St at Russell St
E/W Street Name	Russell Street
N/S Street Name	Market Street
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	Portsmouth

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
Lane Assignment			LR								LT				TR	
Volume (V), veh/h	0	483		8					0	0	541		0		396	536
Percent Heavy Vehicles, %	0	5		20					0	0	7		0		4	6
Flow Rate (v_{PCE}), pc/h	0	551		10					0	0	629		0		448	618
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1								1				1			
Pedestrians Crossing, p/h	0								0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763						4.9763			4.9763	
Follow-Up Headway (s)		2.6087						2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		561.00						629.00			1066.00	
Entry Volume veh/h		533.10						587.85			1013.79	
Circulating Flow (v_c), pc/h	448			1180			551			0		
Exiting Flow (v_{ex}), pc/h	0			618			1180			458		
Capacity (c_{pce}), pc/h		873.83						786.68			1380.00	
Capacity (c), veh/h		830.36						735.22			1312.41	
v/c Ratio (x)		0.64						0.80			0.77	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		15.0						25.4			15.2	
Lane LOS		B						D			C	
95% Queue, veh		4.8						8.3			8.3	
Approach Delay, s/veh	15.0						25.4			15.2		
Approach LOS	B						D			C		
Intersection Delay, s/veh | LOS	18.0						C					

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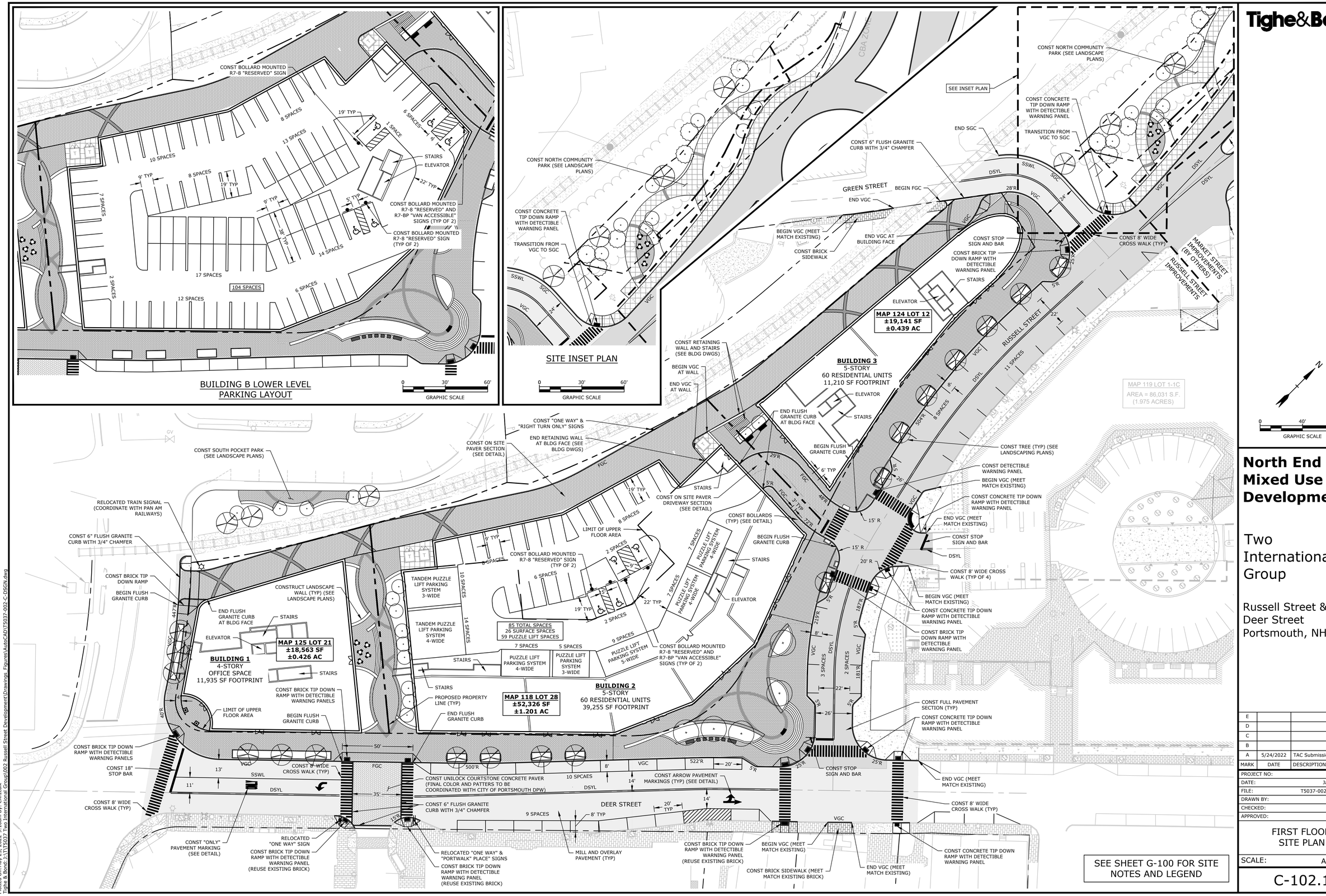
APPENDIX F
Site Development Plan

BUILDING B LOWER LEVEL
PARKING LAYOUT

0 30' 60'
GRAPHIC SCALE

SITE INSET PLAN

0 30' 60'
GRAPHIC SCALE



SEE SHEET G-100 FOR SITE NOTES AND LEGEND

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

North End Mixed Use Development

Two International Group

Russell Street &
Deer Street
Portsmouth, NH

MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A	5/24/2022	TAC Submission

PROJECT NO:	T5037-002
DATE:	January 4, 2022
FILE:	T5037-002-C-DSGN.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

FIRST FLOOR
SITE PLAN

SCALE: AS SHOWN

C-102.1

Last Saved: 5/23/2022
Plotted: Jun 03, 2022 - 9:16am By: CKircuik
Tighe & Bond: J:\T\T5037 Two International Group\002 Russell Street Development\Drawings, Figures\AutoCAD\T5037-002-C-DSGN.dwg

APPENDIX G

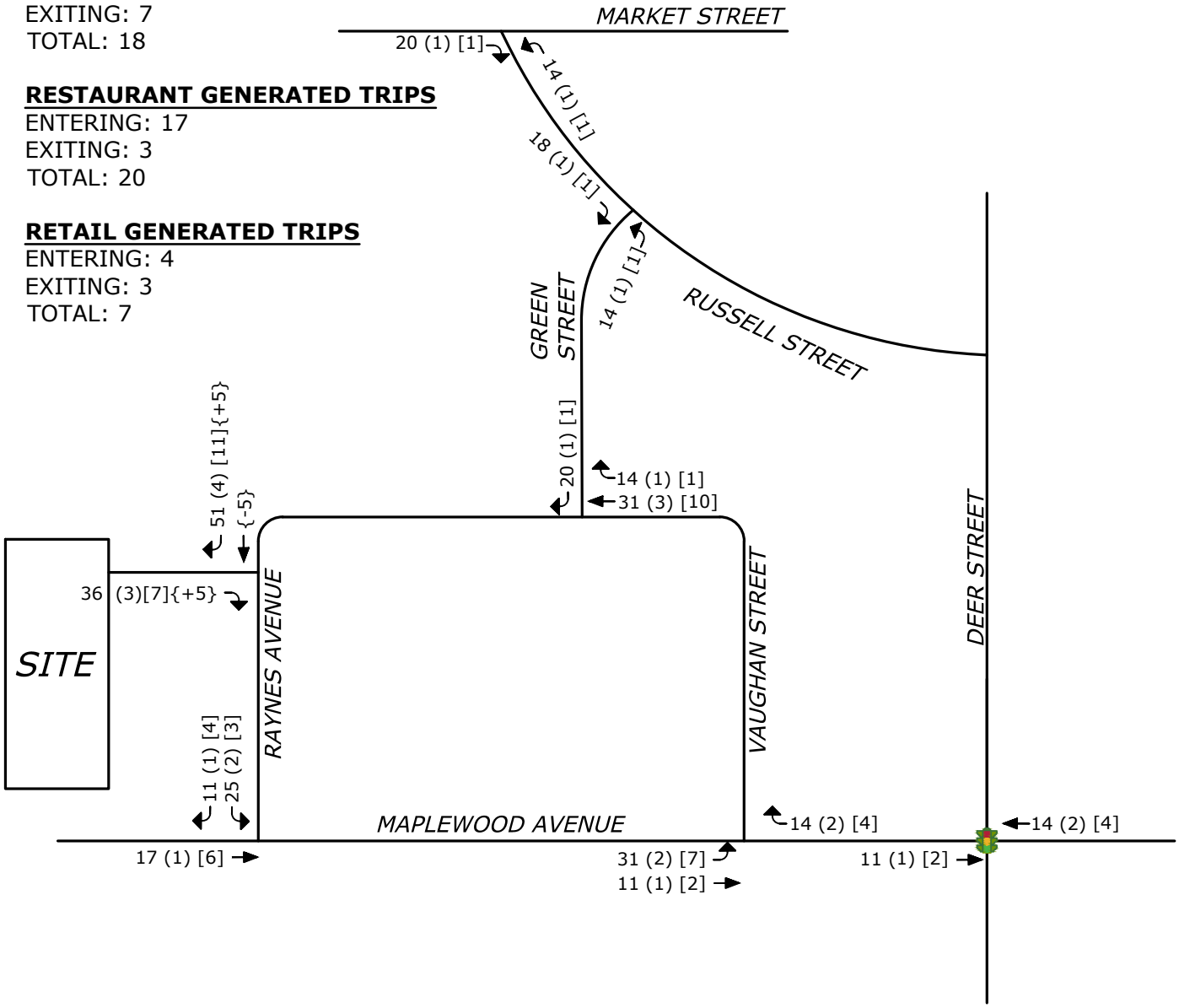
Other Development Traffic Volumes

HOTEL GENERATED TRIPS
ENTERING: 34
EXITING: 33
TOTAL: 67

RESIDENTIAL GENERATED TRIPS
ENTERING: 11
EXITING: 7
TOTAL: 18

RESTAURANT GENERATED TRIPS
ENTERING: 17
EXITING: 3
TOTAL: 20

RETAIL GENERATED TRIPS
ENTERING: 4
EXITING: 3
TOTAL: 7



LEGEND

TRAFFIC SIGNAL

XX HOTEL & RESTAURANT TRIPS
(XX) RETAIL TRIPS
[XX] RESIDENTIAL TRIPS
{XX} PASS-BY TRIPS

PROPOSED MIXED-USE DEVELOPMENT
RAYNES AVENUE, PORTSMOUTH, NH

WEEKDAY AFTERNOON PEAK HOUR SITE GENERATED TRIPS

DATE: 7/14/2021
SCALE: NO SCALE
FIGURE 13

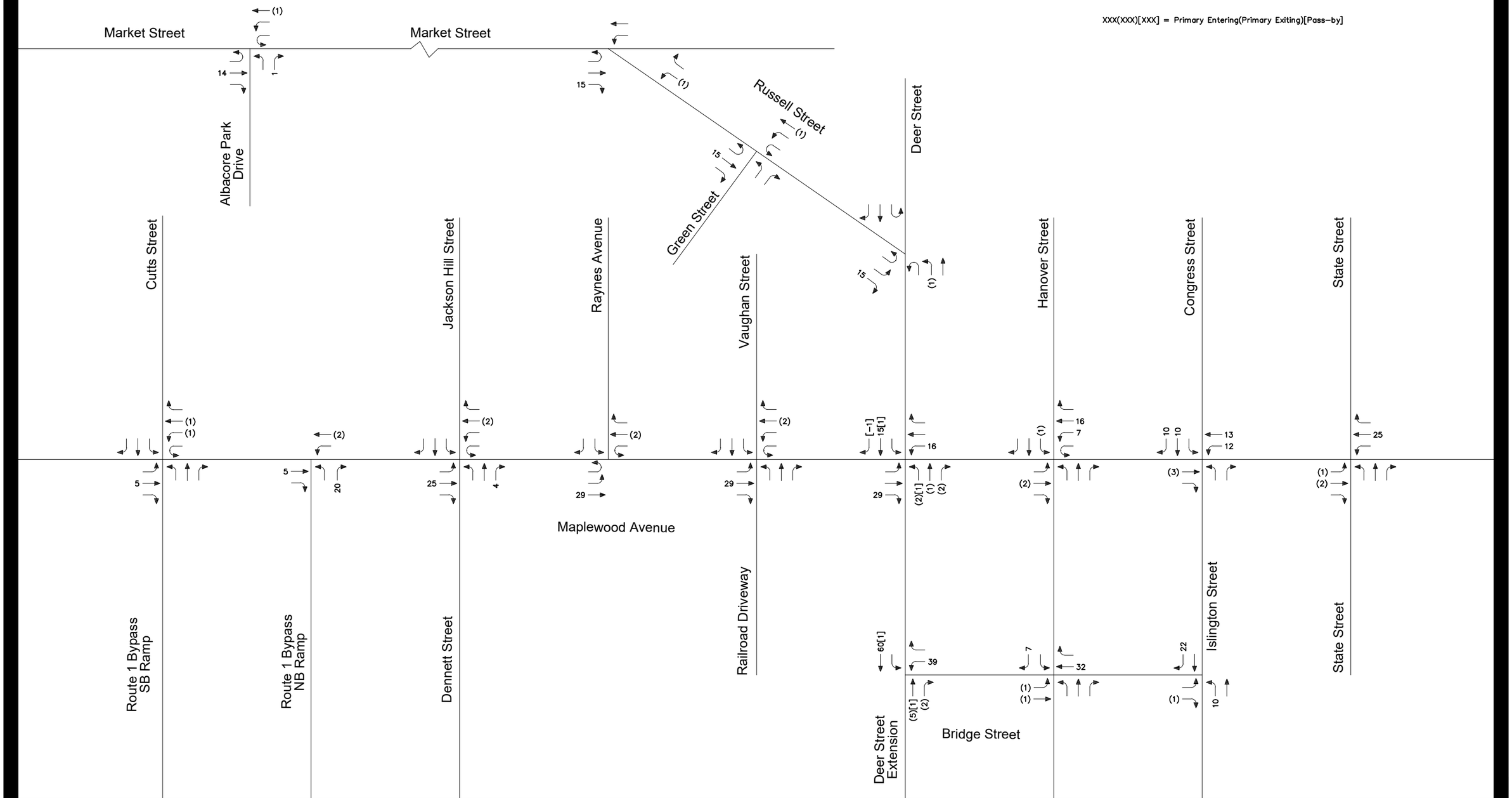
Tighe&Bond
www.tighebond.com

Jul 16, 2021-8:00am Plotted By: MStoutz
Tighe & Bond, Inc. C:\Users\MStoutz\appdata\local\temp\AcPublish_31176\Traffic Volume Figures.dwg

NOT TO SCALE

Deer Street Parking Garage & Deer Street Development - Portsmouth, New Hampshire
Traffic Impact and Access Study

XXX(XXX)[XXX] = Primary Entering(Primary Exiting)[Pass-by]



TEC, Inc.
65 Glenn Street | Lawrence, MA 01843 | (978) 794.1792
169 Ocean Blvd, Unit 101 | Hampton, NH 03842 | (603) 601.8154
www.TheEngineeringCorp.com

Figure 11A

Phase 1: Deer Street Parking Garage
Site Generated Trip Assignment
Weekday Morning
Peak Hour Traffic Volumes

T:\T0666\CAD\Highway\Graphics\T0666.01_TIA_Traffic Networks.dwg 12/16/2016 9:11:23 AM

NOT TO SCALE

XXX(XXX)[XXX] = Primary Entering(Primary Exiting)[Pass-by]

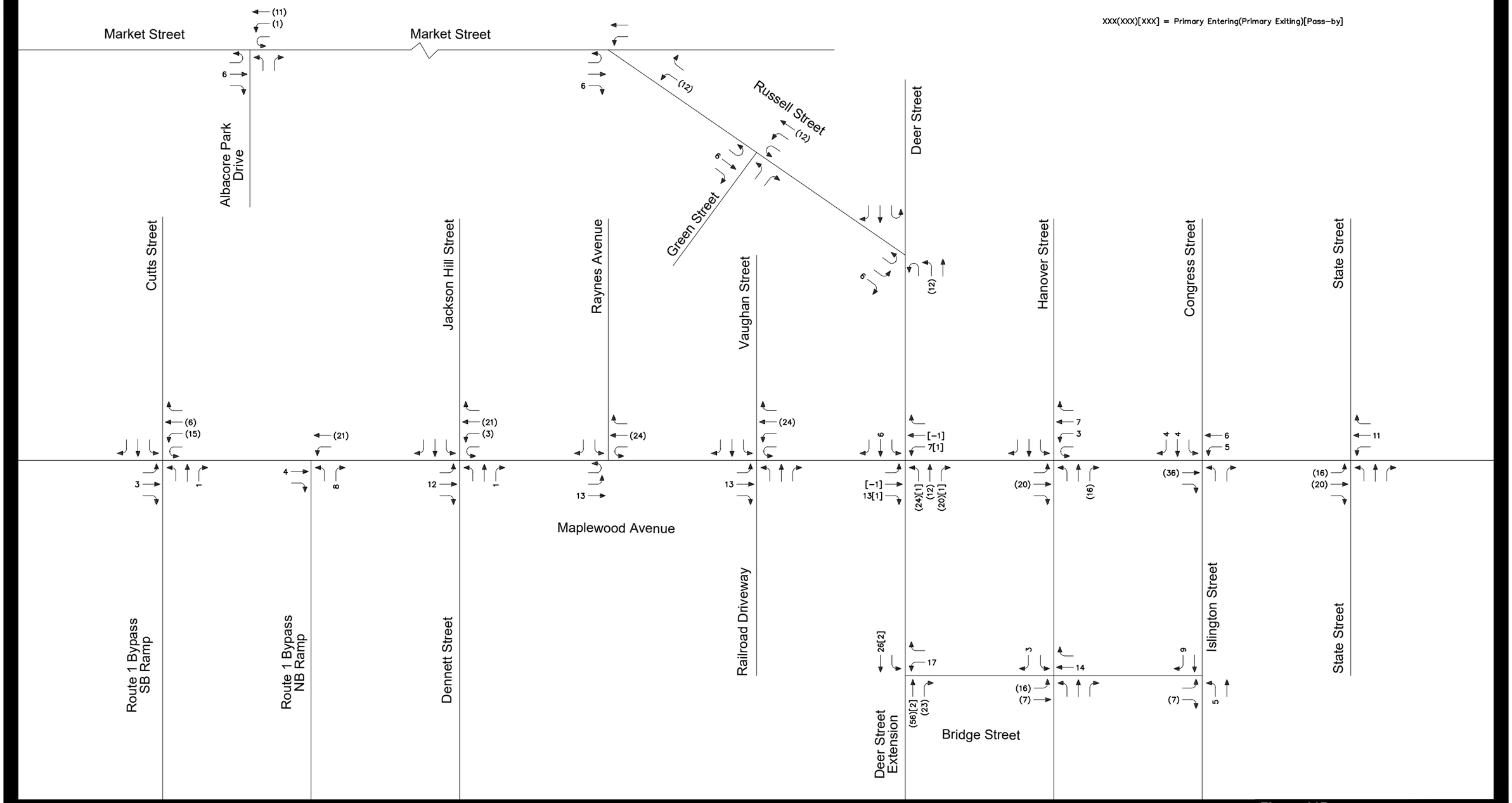


Figure 11B

Phase 1: Deer Street Parking Garage
Site Generated Trip Assignment
Weekday Evening
Peak Hour Traffic Volumes

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(978) 794.1792
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Hampton, NH 03842
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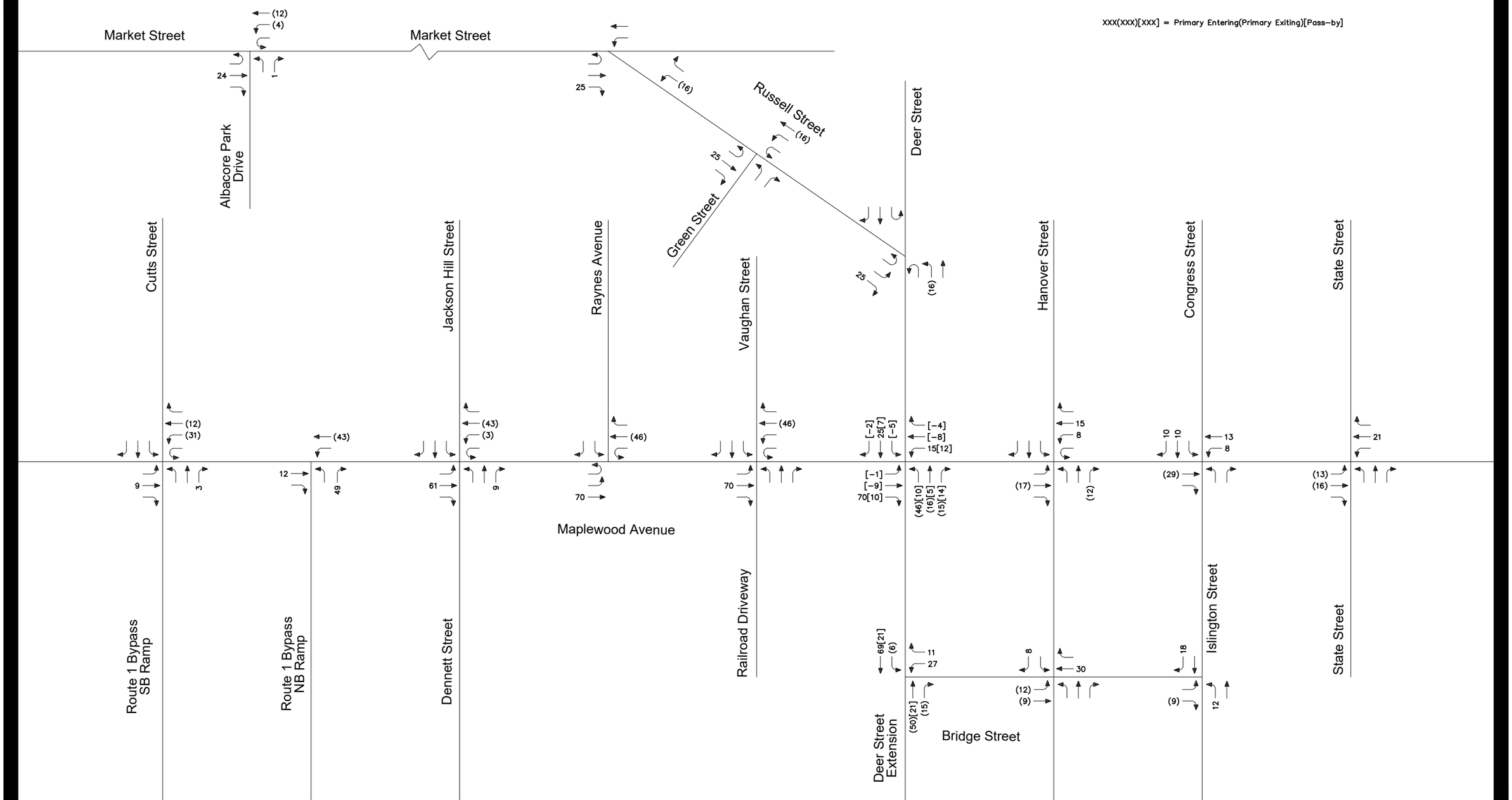
T:\T0666\CAD\Highway\Graphics\T0666.01_TIA_Traffic Networks.dwg 12/16/2016 9:11:42 AM

NOT TO SCALE

XXX(XXX)[XXX] = Primary Entering(Primary Exiting)[Pass-by]



TEC, Inc.
65 Glenn Street | 169 Ocean Blvd, Unit 101
Lawrence, MA 01843 | Hampton, NH 03842
(978) 794.1792 | (603) 601.8154
www.TheEngineeringCorp.com

Figure 14A

Phases 2-4: Total Deer Street Development
Site Generated Trip Assignment
Weekday Morning
Peak Hour Traffic Volumes

T:\T0666\CAD\Highway\Graphics\T0666.01_TIA_Traffic Networks.dwg 12/16/2016 9:13:05 AM

NOT TO SCALE

Deer Street Parking Garage & Deer Street Development - Portsmouth, New Hampshire

Traffic Impact and Access Study

XXX(XXX)[XXX] = Primary Entering(Primary Exiting)[Pass-by]

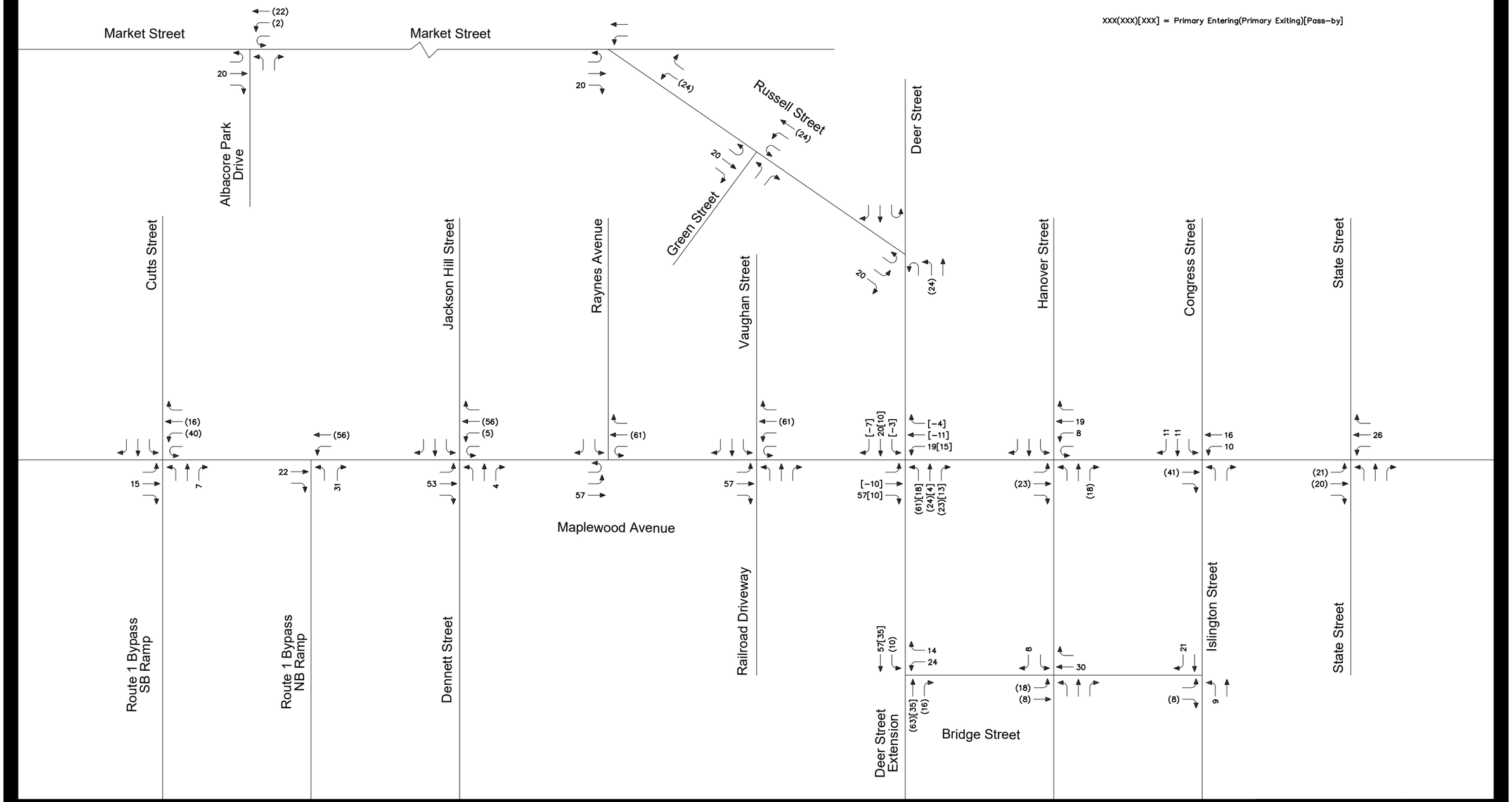


Figure 14B

Phases 2-4: Total Deer Street Development
Site Generated Trip Assignment
Weekday Evening
Peak Hour Traffic Volumes

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Lawrence, MA 01843
(978) 794.1792
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Hampton, NH 03842
(603) 601.8154
www.TheEngineeringCorp.com

T:\T0666\CAD\Highway\Graphics\T0666.01_TIA_Traffic Networks.dwg 12/16/2016 9:13:23 AM

APPENDIX H
Internal Capture Calculation

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Russell Street Development	**Organization:**	Tighe & Bond
Project Location:	Portsmouth, NH	**Performed By:**	Ryan Case
Scenario Description:		**Date:**	2/22/2022
Analysis Year:	2022	**Checked By:**	Matt Stoutz
Analysis Period:	**AM Street Peak Hour**	**Date:**	3/2/2022

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				70	62	8
Retail				44	26	18
Restaurant				0		
Cinema/Entertainment				0		
Residential				30	7	23
Hotel				0		
All Other Land Uses[2]				0		
Total				144	95	49

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	2		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	144	95	49
Internal Capture Percentage	6%	4%	8%
External Vehicle-Trips[3]	136	91	45
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	3%	25%
Retail	8%	11%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	0%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Russell Street Development
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	62	62	1.00	8	8
Retail	1.00	26	26	1.00	18	18
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	7	7	1.00	23	23
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	5	0	0	0
Retail	5		2	0	3	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	5	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	0	0	0	0
Retail	2		0	0	0	0
Restaurant	9	2		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	4	0	0		0
Hotel	2	1	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	2	60	62	60	0	0
Retail	2	24	26	24	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	7	7	7	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	2	6	8	6	0	0
Retail	2	16	18	16	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	23	23	23	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Russell Street Development	**Organization:**	Tighe & Bond
Project Location:	Portsmouth, NH	**Performed By:**	Ryan Case
Scenario Description:		**Date:**	2/22/2022
Analysis Year:	2022	**Checked By:**	Matt Stoutz
Analysis Period:	**PM Street Peak Hour**	**Date:**	3/2/2022

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				66	11	55
Retail				122	61	61
Restaurant				0		
Cinema/Entertainment				0		
Residential				31	19	12
Hotel				0		
All Other Land Uses[2]				0		
Total				219	91	128

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	1	0
Retail	1		0	0	9	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	5	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	219	91	128
Internal Capture Percentage	19%	23%	16%
External Vehicle-Trips[3]	177	70	107
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	9%	11%
Retail	16%	16%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	53%	42%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Russell Street Development
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	11	11	1.00	55	55
Retail	1.00	61	61	1.00	61	61
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	19	19	1.00	12	12
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		11	2	0	1	0
Retail	1		18	2	16	3
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	5	3	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	1	0
Retail	3		0	0	9	0
Restaurant	3	31		0	3	0
Cinema/Entertainment	1	2	0		1	0
Residential	6	6	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	1	10	11	10	0	0
Retail	10	51	61	51	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	10	9	19	9	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	6	49	55	49	0	0
Retail	10	51	61	51	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	7	12	7	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

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EVERSOURCE ENERGY

May 23, 2022

1700 Lafayette Road
Portsmouth, NH 03801

Michael J Busby
603-436-7708 x555-5678
michael.busby@eversource.com

Neil Hansen, PE
Tighe & Bond, Inc.
177 Corporate Drive
Portsmouth, NH 03801

Dear Neil:

I am responding to your request to confirm the availability of electric service for the proposed North End Mixed Use Development project being constructed for/by Port Harbor Land, LLC.

The proposed project consists of a 4-story building with approximately 44,325 s/f of retail/office space, a 5-story building with 60 residential units approximately 10,500 s/f of retail/office space at the ground level and parking below grade, and a 5-story building with 24 residential units approximately 8,100 s/f of retail/office space at the ground level. The proposed development will be constructed at the corner of Russell Street and Deer Street.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan C-104. The proposed building service will be fed from Maplewood Ave, to be determined by Eversource Engineering as depicted on utility plan C-104. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground 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 "Utilities Plan" dated 05/24/2022, shows transformer locations to service your proposed project.

Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our 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

Unitil
Northern Utilities, Inc.

April 19th, 2022

Neil Hansen, PE
Project Engineer
Tighe & Bond
177 Corporate Drive, Portsmouth, NH, 03801

Natural Gas to 2 Russell Street Project in Portsmouth, NH

Hi Neil,

Unitil/Northern Utilities Natural Gas Division has reviewed the requested site for natural gas service:

Unitil hereby confirms that natural gas is available for the proposed mixed-use development at 2 Russell Street in Portsmouth, NH.

If you have any questions, please contact me at 603-534-2379.

Sincerely,

Dave MacLean
Senior Business Development Rep
Unitil
T 603.294.5261 **M** 603.534.2379 **F** 603.294.5264
Email macleand@unitil.com

GREEN BUILDING STATEMENT

RUSSELL STREET
004979.00

RUSSELL STREET
DEVELOPMENT
PORTSMOUTH, NH
03801

05/23/22

ARCHITECTURE | PLANNING
INTERIOR DESIGN | VDC
BRANDED ENVIRONMENTS

NEW YORK
54 W 21ST ST, SUITE 1201
NEW YORK, NY 10010

BOSTON
200 HIGH ST, FLOOR 2
BOSTON, MA 02110

SGA-ARCH.COM
857.300.2610

GREEN BUILDING STATEMENT

2 RUSSELL STREET, PORTSMOUTH, NH

The development at 2 Russell Street is a combination of three buildings with varying uses. Building 1 will accommodate office use, while Building 2 and 3 will provide residential units with an active, ground floor retail component. Each building is being designed to meet or exceed the current energy code requirements. An energy model will be developed and a tabular analysis of the envelope thermal performance will be submitted along with the building permit application.

New Hampshire is currently operating under the 2015 International Energy Conservation Code with amendments. The design of each of the new buildings will be constructed with best practices and will be designed to meet or exceed these standards where possible.

- **Foundation System:** Below-grade foundation walls and/or slabs on grade will include continuous extruded polystyrene (XPS) insulation (R-5 per inch).
- **Exterior Walls:** Exterior opaque wall assemblies will consist of a back-up wall construction consisting of either concrete masonry units (CMU's) or exterior sheathing on cold formed metal framing, continuous waterproofing and air barrier membrane, continuous mineral wool (R-4.3 per inch) insulation, and rainscreen cladding or veneer (e.g., metal panel or brick).
- **Exterior Windows:** Exterior fenestration, including fixed and operable windows and storefronts, will consist of aluminum-framed, thermally-broken glazing systems with insulating glass unit (IGU) infill including low emissivity (low e) coating. Systems may either be unitized or stick-built or a combination of both.
- **Roofing system:** will include two primary assembly configurations: Protected membrane roofing (PMR) systems at occupied terraces and conventional (aka "built-up") roofing systems at unoccupied (e.g., mechanical roofs) and bulkheads. PMR consists of roofing membrane applied to structural concrete slabs, drainage board, minimum 60 psi extruded polystyrene (XPS) or other roofing insulation, with precast concrete pavers on pedestals or landscape overburden acting as ballast. Conventional roofing systems will consist of tapered insulation (either polyisocyanurate or expanded polystyrene), roofing cover board, and roofing membrane on cover board. For both systems, roofing membrane material to be 2-ply SBS modified bitumen (or equivalent) with cold, fluid-applied PMMA flashings.

GREEN BUILDING STATEMENT

RUSSELL STREET
004979.00

RUSSELL STREET
DEVELOPMENT
PORTSMOUTH, NH
03801

05/23/22

ARCHITECTURE | PLANNING
INTERIOR DESIGN | VDC
BRANDED ENVIRONMENTS

NEW YORK
54 W 21ST ST, SUITE 1201
NEW YORK, NY 10010

BOSTON
200 HIGH ST, FLOOR 2
BOSTON, MA 02110

SGA-ARCH.COM
857.300.2610

- **HVAC System**: Condominiums and Office spaces will be served by high-efficiency, air-cooled, variable refrigerant flow heat pump systems. Ventilation will be provided by high-efficiency, air-cooled DX, and dedicated outdoor air units with heat recovery wheels, which will provide outdoor air to Condominium Units, Office Floors, and common spaces. Toilet exhaust will be the medium for heat recovery.
- **Plumbing:** All fixtures will be low flow fixtures. The domestic hot water for the Condominium Buildings will be provided by central high-efficiency, gas-fired condensing hot water heaters for each building. The domestic hot water for the Office building will be provided by local electric storage-type domestic water heaters.
- **Lighting:** All lighting exterior lighting will be LED fixtures with dedicated controls to limit night time light pollution and unnecessary electrical expenditure while providing a safe and welcoming environment. All interior fixtures will be LED and provided with occupancy sensors where applicable.
- **Interior Appliances**: All residential appliances will be Energy Star certified.
- **Landscaping:** Local species that are drought tolerant will be incorporated into the plantings list.

Brooks Slocum, AIA

Principal, SGA

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 2 Russell St **Map/Lot:** 118/28, 119/1-1C & 4, 124/12 & 125/21

Applicant: Port Harbor Land, LLC

All development

Base fee $500 $500.00

Plus $5.00 per $1,000 of site costs

Site costs $1,000,000 + $5,000.00

Plus $10.00 per 1,000 S.F. of site development area

Site development area 99,794 S.F. + $997.94

Fee **$6,497.94**

Maximum fee: $15,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Kimley»Horn

Transmittal

Date: 5/24/2022 Job Number: 118252004

Project Name: Portsmouth Regional Hospital - Radiation Oncology Addition

To: City of Portsmouth Planning Department, Attn: Peter Britz

1 Junkins Ave,

Portsmouth, NH 03801

We are sending these by

☐ US Mail ☐ FedEx ☐ UPS

☐ Hand Deliver ☐ Courier ☑ Other

We are sending you

☑ Attached ☐ Under separate cover via _____ the following items

☐ Shop drawings ☑ Prints/Plans ☐ Samples ☐ Specifications ☐ Change Order ☑ Other

Number	Date	Copy	Description
1	5/5/22		Project Narrative
2	10/15/19		Wetland Delineation Report by Grove Environmental Services, Inc.
3	5/5/22		Full Size (22x34) Drawing Set
4	2/23/22		City GIS Parcel Summary
5	5/5/22		Exhibits for wetlands and ponds & HydroFlow Pond Summary
6	5/5/22		Maintenance Agreement

These are transmitted as checked below:

☑ For your use ☐ Approved as submitted ☐ Resubmit

☐ As requested ☐ Approved as noted ☐ Submit

☐ For review and comment ☐ Returned for corrections ☐ Return

☐ Copies for approval ☐ Copies for distribution ☐ Corrected prints

Copy to:

Signed: Zack Newman

Phone: (615) 314-5617

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: Kimley Horn & Associates, Inc. Date Submitted: May 23, 2022

Application # (in City's online permitting): LU-22-35

Site Address: 333 Borthwick Ave., Portsmouth, NH 03801 Map: 240 Lot: 2-1

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	LU-22-35	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)**	ATTACHED	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)**	COVER SHEET C0.00 SITE DATA TABLE	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	COVER SHEET C0.00 SITE DATA TABLE	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 C0.00	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plan	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	COVER SHEET C0.00	N/A
☑	List of reference plans. **(2.5.3.1H)**	COVER SHEET C0.00	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	COVER SHEET C0.00	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)**	SHEETS C0.02 (SURVEY BY OTHERS), C1.00 & C4.00, C401 NOTES	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)**	C1.00, C4.00, C401	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Required on all plan sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Required on all plan sheets	N/A
☑	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☑	Source and date of data displayed on the plan. **(2.5.4.2D)**	Required on all plan sheets	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	SITE SURVEY BY OTHERS C1.00 & COVER SHEET (DATA TABLE) C0.00 & C4.01 PARKING TABLE C1.00 EXISTING CONDITIONS PLAN C1.00, C4.00, C4.01, DATA TABLE ON C0.00 IMPERVIOUS AREA ON POND EXHIBIT LOD ON SITE DATA TABLE: C0.00 & C4.01 L1.00, C1.00, C0.02 (SURVEY), C2.00 WETLAND EXHIBIT, C1.00, C4.00, & C4.01 N/A - C1.00 & C4.00	
☑	**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.	ARCH. PLANS A1.01B, A1.02A, A2.01, SITE PLAN - C4.01 & GRADING PLAN C5.00 ELEVATIONS & FACADE: A2.01 FLOOR AREA: C0.00 SITE DATA TABLE ARCH. PLANS A1.01B, A1.02A, A2.01 FLOOR AREA: C0.00 SITE DATA TABLE	
☑	**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 LAYOUT C4.01; EXISTING FACILITY	
☑	**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 LAYOUT C4.01 SITE DATA TABLE & PARKING TABLE	
☑	**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).	SITE UTILITY PLAN C6.00; INTERNALLY FED	
☑	**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.	SITE UTILITY PLAN C6.00; TIE INTO EXST	

☑	**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.	SITE UTILITY PLAN C6.00	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**	N/A	
	• The size, type and location of solid waste facilities.	N/A; EXISTING	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	GRADING & DRAINAGE SHEET C5.00	
☑	**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.	LANDSCAPE PLAN - L100; EXISITNG IRRIGATION SYSTEM TO BE EXTENDED	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading and Drainage Plan Sheet C500	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	C0.00 & C4.01 & DRAINAGE AREA MAP	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	C1.00 & C4.00	
☑	**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 DATA TABLE C0.00 & C4.01	
☑	**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.	GRADING & DRAINAGE C5.00 UTILITY PLAN C6.00	

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)**	ATTACHED STORMWATER MANAGEMENT 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)**	C3.00, C3.01, C3.02 & STORMWATER MANAGEMENT PLAN	
☑	Inspection and Maintenance Plan **(7.6.5)**	ATTACHED	

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)**	LU-22-35: AWAITING CONDITIONAL APPROVAL LETTER FROM CONSERVATION COMMITTEE FROM 5/11/22 MEETING. BOA BUILDING SETBACK VARIANCE APPROVAL ATTACHED	
☑	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)**	ATTACHED	
☑	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; EXISTING BUILDING	

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)**	N/A	
☑	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 LAYOUT C4.01 NOTE #14	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 LAYOUT C4.01 NOTE #15	N/A

Applicant's Signature: ____ _____ **Date:** 5/24/2022

February 22, 2022
Updated May 5, 2022

City of Portsmouth

RE: *Portsmouth Regional Hospital – Radiation Oncology Project Narrative*

The existing Portsmouth Regional Hospital is located at 333 Borthwick Ave, Portsmouth, NH 03801 (Map 240, Lot 2-1). The medical campus is located on the east side of Blue Star Turnpike (I-95), the west side of Borthwick Avenue, and can be accessed via multiple entrances from Borthwick Avenue. The scope of the proposed Radiation Oncology project consists of internal renovations, and a 1-story building addition located on the southeast corner of the existing hospital building.

The proposed footprint of the building addition is approximately ±8,700 square feet. The proposed sitework is anticipated to consist of asphalt, concrete, utility, landscape, and drive-under canopy demolition where the current patient discharge canopy and associated drive are located as well as removal of existing sidewalk and landscaping located along the south side of the existing hospital building. Site improvements are anticipated to consist of the new building addition, new drive-under canopy and associated drive, sidewalk connectivity, new granite curb, new mobile imaging pad, and associated new utilities/ utility relocations.

A portion of the project scope is located adjacent to and partially within a previously man-made stormwater management area which is now delineated as a city jurisdictional inland wetland and has an associated 100-ft wetland buffer, in which a portion of the site improvements will occur. A small amount of disturbance to the actual wetland is being proposed. Refer to the attached wetland exhibit. Please note, the overall wetland data has been calculated with older drawings by others. Only the wetland adjacent to this project was delineated and flagged by Gove Environmental Services, Inc., and surveyed by James Verra and Associates, Inc. Refer to attached letter and site survey.

Wetlands and 100-foot buffer, Overall Site

- Subject Parcel: Map 240, Lot2-1 (±20.87 ac)
- Total wetland area onsite: approximately ±2.7 acres
- Total area of 100-foot wetland buffer onsite: approximately ±8.4 acres

Wetland and 100-foot buffer, Proposed Impact

- Area of inland wetland to be disturbed:
    - Permanent (due to proposed building location): ±200 square feet (sf)
    - Temporary (due to construction of proposed building and utility relocations, but will be planted back as wetlands): ±4,400 square feet (sf)
    - Total disturbance: ±4,600 square feet (sf)
- Area of 100-ft wetland buffer to be disturbed:
    - Permanent: ±13,200 sf
    - Temporary: ±4,300 sf

Stormwater drainage summary:

The drainage area to the existing man-made stormwater management area/ inland wetland that is located within the proposed project area (**Pond 1**) was analyzed utilizing provided site surveys as well as previous design drawings for the medical campus. It appears a portion of the southeastern parking lot drains to another existing man-made stormwater management area/ inland wetland that is located along the north side of Borthwick Avenue (**Pond 2**). Pond 2 drains to Pond 1 via a 21" RCP pipe. The drainage area to the Pond 2 remains the same as the current existing condition.

The drainage area to the Pond 1 also remains relatively the same as existing conditions as a portion of the existing hospital building roof will continue to drain to Pond 1, new roof for the proposed building addition is located where existing sidewalks and drives are currently located, and some existing pavement is being removed to allow Pond 1 to expand to provide additional pond volume to attempt to offset any pond volume lost due to the proposed project. The existing 24" RCP pipe outfall from Pond 1 remains in place. Refer to the attached drainage area exhibit.

Existing pond volume: ±54,190 cubic feet (cf)

Proposed pond volume: ±56,265 cubic feet (cf)

A HydroCAD stormwater model was utilized to analyze both the pre-developed and post-developed conditions, and the following results were generated for Type III, 24-hour storm events:

Total drainage area to Pond 1: +/-4.2 acres

	CN	2-yr (cfs)	10-yr (cfs)	25-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Pre-developed:	92	9.1	14.2	17.7	19.9	21.9
Post-Developed:	92	8.8	13.6	17.1	19.3	21.5

Per the table above, the stormwater discharge for the post-developed conditions from the revised Pond 1 are slightly less than the pre-developed conditions.

Please refer to the photos below, and attached supporting documentation. If you have any questions or need more information, please feel free to reach me by email (chris.akers@kimley-horn.com) or by phone at 615-476-4764.

Sincerely,
Chris Akers, Project Manager

Photographs	Observations
	Southern portion of hospital campus with subject wetland (image taken from internal front drive).

Photographs	Observations
	East elevation of hospital building where Radiation Oncology addition is proposed (image taken from internal front drive). Construction activity from current ICU Med/ Surg Stepdown project.

	Southern portion of hospital campus with subject wetland (image taken from internal ambulance/ ED drive).
Photographs	**Observations**
	Existing brick canopy at Patient Discharge to be removed. Construction activity from current ICU Med/ Surg Stepdown project.

	Brick emergency generator enclosure to remain.

Details

Property	
Location	333 BORTHWICK AVE
Map-Lot	0240-0002-0001
Vision Account Number	35555

Ownership	
Owner	HCA HEALTH SVC OF NH INC D/B/A PRH 32902 C/O DUCHARME MCMILLEN & ASSOC
Address	PO BOX 80610, INDIANAPOLIS, IN 46280

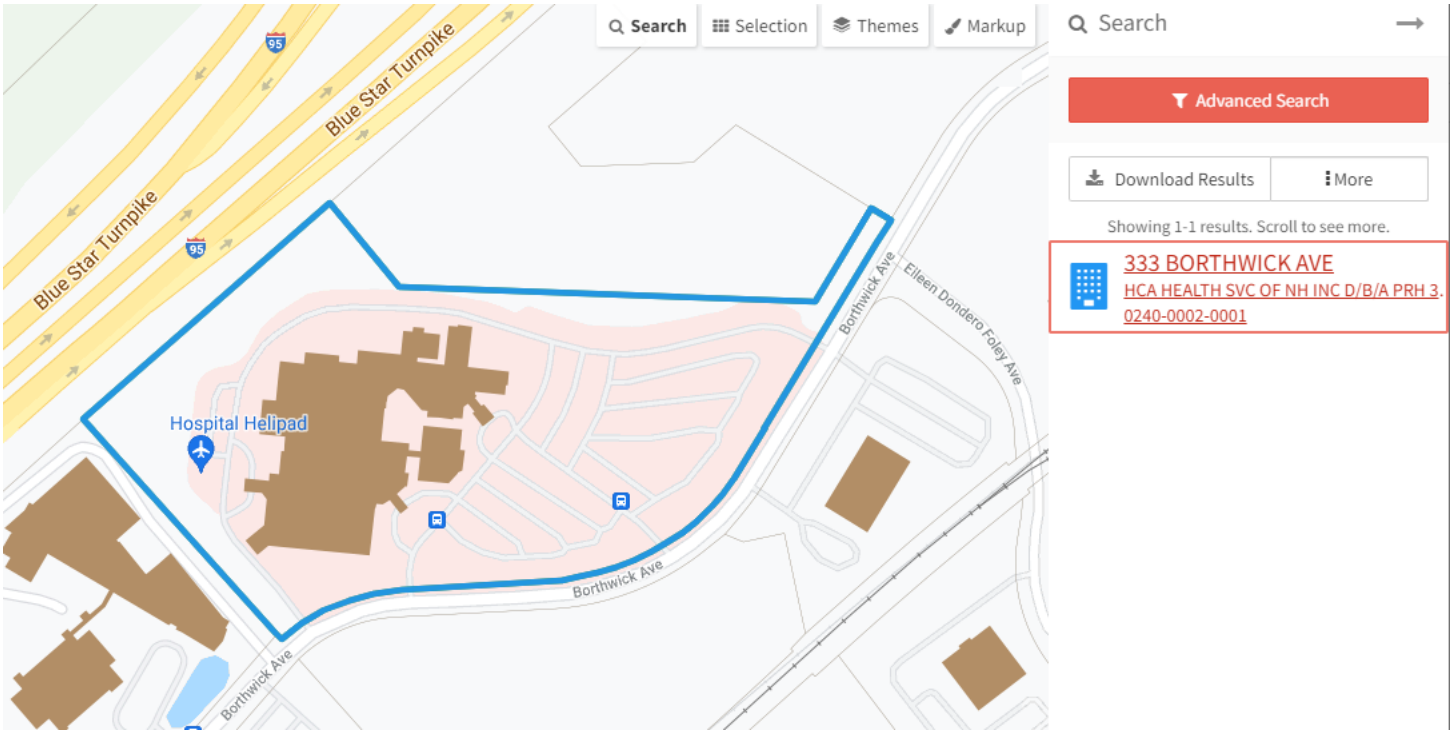
Valuation	
Total	$86,709,000
Last Sale	$0 on
Book/Page	2784/1340

Land	
Parcel Area (AC)	20.87

Zoning

Zoning

OR



Portsmouth Regional Hospital

February 21, 2022

Kimley-Horn and Associates, Inc.
10 Lea Avenue, Suite 400
Nashville, TN 37210

404 Wyman Street, Suite 385
Waltham, MA 02451

RE: ***Agent Authorization***

To Whom It May Concern:

Be advised that I am the Chief Executive Officer of the Portsmouth Regional Hospital located at 333 Borthwick Ave, Portsmouth, NH 03801. I am an authorized agent to the owners of HCA Health Services of New Hampshire, Inc. dba Portsmouth Regional Hospital. As the authorized agent, I hereby authorize and empower:

Kimley-Horn and Associates, Inc. to act as agent/ representative to communicate and submit required information as necessary in obtaining site-related approvals and permits for the proposed Radiation Oncology Addition project located at 333 Borthwick Ave, Portsmouth, NH 03801.

Owner's Signature
Dean M. Carucci, CEO

333 Borthwick Avenue
Portsmouth, NH 03801
Phone: 436-5110
1-800-685-8282
www.portsmouthhospital.com

SITE CIVIL PLANS FOR

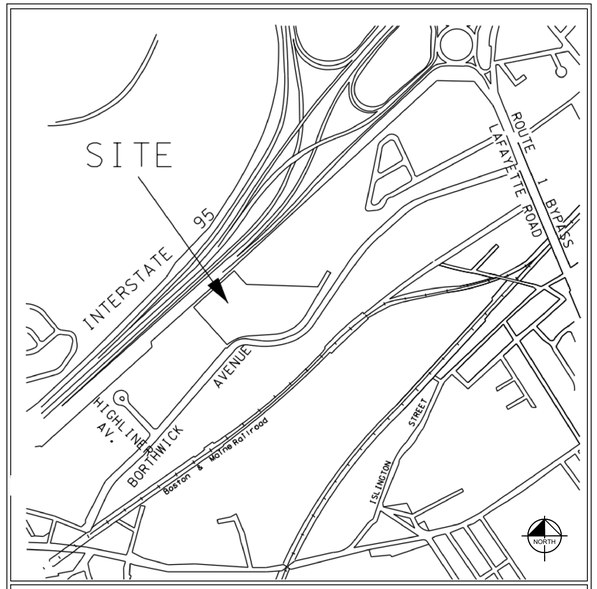
PORTSMOUTH REGIONAL HOSPITAL

RADIATION ONCOLOGY ADDITION

333 BORTHWICK AVENUE, PORTSMOUTH, NH 03801

TECHNICAL ADVISORY COMMITTEE: MAY 23, 2022

SITE DATA TABLE		
OWNER OF RECORD	HCA HEALTH SERVICES OF NH INC D/B/A PRH 32902	
SITE ADDRESS	333 BORTHWICK AVE, PORTSMOUTH, NH 03801	
SITE AREA	± 20.87 AC	
DISTURBANCE LIMITS W/ THIS PROJECT	± 0.7 AC	
TAX MAP & LOT	TAX MAP 240, LOT 2-1	
ZONING	OR - OFFICE RESEARCH	
SETBACKS	REQUIRED	PROPOSED
FRONT YARD SETBACK	50'-0"	±40'
REAR YARD SETBACK	50'-0"	±157'
SIDE YARD SETBACK	75'-0"	±71' * (EXISTING)
MIN. OPEN SPACE ON A LOT	30%	±38.3%
MAX BUILDING COVERAGE	30%	± 20.1%
BUILDING DATA		
	EXISTING	PROPOSED ADDITION
HOSPITAL BEDS	233	0
HOSPITAL/ MOB FLOOR PLATE	±173,916 SF	± 8,700 SF
HOSPITAL GROSS AREA	±427,495 SF	± 8,870 SF
MEDICAL OFFICE BUILDING GROSS AREA (ATTACHED TO HOSPITAL BUILDING)	±46,665 SF	0 SF
BUILDING HEIGHT	± 65'-4"	± 14'-8"



VICINITY MAP
NOT TO SCALE

Sheet List Table	
SHEET NUMBER	SHEET TITLE
C0.00	COVER SHEET
C0.01	GENERAL NOTES
C0.02	SURVEY BY OTHERS
C1.00	EXISTING CONDITIONS - OVERALL
C2.00	SITE DEMOLITION PLAN
C3.00	EROSION CONTROL PLAN - PHASE 1
C3.01	EROSION CONTROL PLAN - PHASE 2
C3.02	EROSION CONTROL DETAILS
C4.00	SITE LAYOUT - OVERALL
C4.01	SITE LAYOUT - ENLARGEMENT
C5.00	GRADING & DRAINAGE PLAN
C6.00	SITE UTILITY PLAN
C7.00	SITE DETAILS
C7.01	SITE DETAILS
L1.00	LANDSCAPE PLAN

PARKING SUMMARY				
	EXISTING	DEMOLISHED	PROPOSED	NET RESULT
ONSITE STANDARD SPACES	754	11	2	745
ONSITE ACCESSIBLE (INCLUDING VAN ACCESSIBLE)	29	4	6	31
OFFSITE STANDARD SPACES*	0	0	490	490
OFFSITE ACCESSIBLE (INCLUDING VAN ACCESSIBLE)*	0	0	11	11
TOTAL				1277

*PER SATELLITE PARKING LOT DRAWINGS PREPARED BY TIGHE & BOND

REFERENCE PLANS

1. "LOT LINE REVISION PLAN FOR PORTSMOUTH HOSPITAL OFFICE BUILDING ASSOCIATION, ISLINGTON WOOD, LLC AND HCA REALTY, INC. (TAX MAP 234, LOTS 7-4A & 7-4B) (TAX MAP 240, LOT 2-2) BORTHWICK AVENUE EXTENSION PORTSMOUTH, NEW HAMPSHIRE" DATED JAN 13, 2006 PREPARED BY DOUCET SURVEY, INC., R.C.R.D. PLAN #D-33642
2. "TOPOGRAPHIC PLAN" AT PORTSMOUTH REGIONAL HOSPITAL FOR HCA HEALTH SERVICES OF NH, INC. DATED OCTOBER 10, 2007 BY DOUCET SURVEY.
3. "SIDEWALK SITE PLAN" FOR PORTSMOUTH REGIONAL HOSPITAL FOR HCA HEALTH SERVICES OF NH, INC. DATED OCTOBER 22, 2003 BY MILLETTE, SPRAGUE & COLWELL
4. "SITE PLAN" FOR PORTSMOUTH REGIONAL HOSPITAL FOR HCA HEALTH SERVICES OF NH, INC. DATED AUGUST 19, 2002 BY MILLETTE, SPRAGUE & COLWELL SHEET 2 OF 3.
5. JURISDICTIONAL WETLANDS WERE DELINEATED BY NHSC, INC. ON SEPTEMBER 25, 2007 IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, AS REQUIRED BY THE NH DES WETLANDS BUREAU.
6. "TOPOGRAPHIC WORKSEET OF THE POWERLINES BY ISLINGTON & BORTHWICK AVE." PREPARED BY EASTERN TOPOGRAPHIC FOR DOUCET SURVEY, DATED SEPT 25, 2007.
7. "PORTSMOUTH REGIONAL HOSPITAL PHASE 1 ADDITIONS AND RENOVATIONS" BY APPLEDORE ENGINEERING, INC., DATED APRIL 1, 2008.
8. JURISDICTIONAL WETLANDS DELINEATION BY GOVE ENVIRONMENTAL SERVICES, INC. DATED OCTOBER 2019.
9. TOPOGRAPHIC SURVEY BY JAMES VERRA & ASSOCIATES, INC. DATED 10/2019.
10. SHEETS C-2 AND C-2A OF "PORTSMOUTH HOSPITAL EXPANSION" BY APPLEDORE ENGINEERING, DATED 8/4/11. "REVISED TO ADD REAR PARKING"

PROJECT DESIGN TEAM

ARCHITECT
GOULD TURNER GROUP, P.C.
615 3RD AVENUE SOUTH, SUITE 700
NASHVILLE, TN 37210
PHONE: (615) 254-1500
CONTACT: CHRIS DUMONT, AIA

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
404 WYMAN STREET, SUITE 385
WALTHAM, MA 02451
PHONE: (781) 328-0676
CONTACT: MATTHEW HAMBY

M,P,E & T CONSULTANTS
I.C. THOMASSON ASSOCIATES, INC.
2950 KRAFT DRIVE, SUITE 500
NASHVILLE, TN 37204
PHONE: (615) 346-3400
CONTACT: BOYD JOHNSON

SURVEY
JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8
NEWINGTON, NH 03801
PHONE: (603) 436-3557
CONTACT: JIM VERRA, LLS

ENVIRONMENTAL
GOVE ENVIRONMENTAL SERVICES, INC
8 CONTINENTAL DR, UNIT H
EXTER, NH 03833
PHONE: (603) 778-0654
CONTACT: BRENDEN WALDEN

STRUCTURAL ENGINEER
STANLEY D. LINDSEY & ASSOCIATES, LTD.
750 OLD HICKORY BLVD, BLD 1, SUITE 175
BRENTWOOD, TN 37027
PHONE: (615) 320-1735
CONTACT: MARK HILNER

UTILITY CONTACTS

WATER/ SANITARY SEWER
PORTSMOUTH DEPT OF
PUBLIC WORKS
MIKE JENKINS
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801
PHONE: (603) 427-1530

NATURAL GAS
NORTHERN UTILITIES, INC.
JEFF INGLISH
325 WEST ROAD
PORTSMOUTH, NH 03801
PHONE (603) 436-0310

TELEPHONE/ CABLE
CONSOLIDATED COMMUNICATIONS
1575 GREENLOAD ROAD
GREENLAND, NH 03840
PHONE: (800) 240-5019

ELECTRIC
PUBLIC SERVICES OF NH/ EVERSOURCE
WAYNE BROOKS
1700 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
PHONE:(800) 662-7764

811 Know what's below. Call before you dig.

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404 WYMAN STREET, SUITE 385 WALTHAM, MA 02451
MAIN:781.328.0676 | WWW.KIMLEY-HORN.COM

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

No.	DATE	BY	REVISIONS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

COVER SHEET

C0.00

CONTRACTOR RESPONSIBILITIES:

1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR:

   A. THE CONTRACTOR SHALL VERIFY ALL PROPOSED AND EXISTING CONDITIONS INCLUDING UTILITIES (INVERTS, CONNECTIONS, MATERIALS, ETC.) AND DIMENSIONS WITHIN THE LIMITS OF WORK PRIOR TO THE START OF CONSTRUCTION.

   B. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILED BUILDING INFORMATION.

   C. THE CONTRACTOR IS RESPONSIBLE FOR ALL NOTIFICATIONS AND LIAISONS WITH UTILITY COMPANIES DURING THE PROCESS OF LOCATING, RELOCATING, AND TYING INTO PUBLIC UTILITIES.

   D. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE SHALL OCCUR INSIDE THE APPROVED LIMITS INDICATED ON THE APPROVED PLANS.

2. DURING CONSTRUCTION:

   A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVIATIONS FROM THESE PLANS AND SPECIFICATIONS WITHOUT PRIOR WRITTEN CONSENT OF THE ENGINEER MAY CAUSE THE WORK TO BE UNACCEPTABLE.

   B. THE CONTRACTOR SHALL USE MATERIALS AND EMPLOY CONSTRUCTION METHODS IN ORDER TO COMPLY WITH THE DRAWINGS AND SPECIFICATIONS. WHERE A CONFLICT OCCURS, THE STRICTEST DESIGN SHALL GOVERN. THE ENGINEER'S REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC., DOES NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY SPECIFIC DEVIATIONS AND OBTAIN ENGINEER'S WRITTEN APPROVAL OF THE SPECIFIC DEVIATION.

   C. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.

   D. ALL CONSTRUCTION MUST CONFORM TO THE STANDARDS, SPECIFICATIONS, AND CODES OF THE GOVERNING MUNICIPALITIES.

   E. CONSTRUCTION SHALL MEET ALL CURRENT STANDARDS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT.

   F. IF THE CONTRACTOR DAMAGES ANY EXISTING UTILITIES DURING CONSTRUCTION, HE SHALL, AT HIS OWN EXPENSE, REPLACE OR REPAIR THE UTILITIES TO ORIGINAL CONDITION AND QUALITY AS APPROVED BY THE OWNER AND REPRESENTATIVE OF THE APPROPRIATE UTILITY COMPANY.

   G. SUFFICIENT BARRICADES, LIGHTS, SIGNS, AND OTHER TRAFFIC CONTROL METHODS IN ACCORDANCE WITH GOVERNING ORDINANCES MAY BE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC. SAID CONTROL DEVICES SHALL BE PER THE MANUAL OF TRAFFIC CONTROL DEVICES, M.U.T.C.D., CURRENT EDITION, AND SHALL BE PROVIDED AND MAINTAINED THROUGHOUT CONSTRUCTION.

   H. TRAFFIC CONTROLS AND OTHER WARNING DEVICES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORK ON CITY, COUNTY, OR NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION ROADS. THEY SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL THE CONCLUSION OF ALL WORK.

   I. ALL WARNING DEVICES SHALL BE EITHER TYPE I BARRICADES OR DRUMS WITH WARNING LIGHTS ON EVERY OTHER DEVICE. THEY SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION, AND PORTSMOUTH STANDARDS FOR COLOR, SIZE, REFLECTIVITY, HEIGHT, AND PLACEMENT.

   J. FIRE DEPARTMENT ACCESS SHALL BE MAINTAINED AT ALL TIMES.

   K. CONTRACTOR SHALL SHORE AND BRACE ALL EARTH, FORMS, CONCRETE, STEEL, WOOD, AND MASONRY TO RESIST GRAVITY, EARTH, WIND, THERMAL, CONSTRUCTION, AND MISCELLANEOUS LOADS DURING CONSTRUCTION.

   L. ON-SITE BURIAL OF DEBRIS IS PROHIBITED.

   M. UNLESS OTHERWISE NOTED THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL FABRICATED MATERIALS TO THE ENGINEER. DESIGN DOCUMENTS SHALL NOT BE REPRODUCED AS SHOP DRAWINGS.

   N. IN CASE OF UNFORESEEN CONSTRUCTION COMPLICATIONS OR DISCREPANCIES, THE CONTRACTOR IS TO IMMEDIATELY NOTIFY THE ENGINEER IN WRITING.

   O. ALL REQUIRED TESTING REPORTS SHALL BE AVAILABLE AT THE JOB SITE.

   P. AS-BUILT DRAWINGS OF ROADWAYS, STORM DRAINS, SANITARY SEWER AND WATER LINES, FIELD APPROVAL BY THE ENGINEER, AND ALL APPLICABLE BONDS ARE REQUIRED PRIOR TO FINAL ACCEPTANCE BY THE OWNER.

   Q. CONTRACTOR SHALL MAINTAIN CONTINUOUS UTILITY SERVICE TO ALL EXISTING BUILDINGS THROUGHOUT CONSTRUCTION UNLESS APPROVAL FOR SERVICE INTERRUPTION IS OBTAINED FROM THE OWNERS IN ADVANCE.

   R. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS TO ENSURE THAT THE NEW WORK SHALL FIT INTO THE EXISTING SITE IN THE MANNER INTENDED AND AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST THAT ARE CONTRARY TO THOSE SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO PERFORMING ANY WORK IN THE AREA INVOLVING DIFFERENCES. NOTIFICATION SHALL BE IN THE FORM OF A DRAWING OR SKETCH INDICATING FIELD MEASUREMENTS AND NOTES RELATING TO THE AREA.

   S. ANY FOREIGN ITEM FOUND DURING CONSTRUCTION IS THE PROPERTY OF THE OWNER. THIS INCLUDES, BUT IS NOT LIMITED TO, PRECIOUS METALS, COINS, PAPER CURRENCY, ARTIFACTS AND ANTIQUITIES.

   T. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE PREMISES OR ADJACENT PREMISES, OR INJURIES TO THE PUBLIC DURING THE CONSTRUCTION OF THE WORK, WHETHER CAUSED BY HIMSELF, HIS SUBCONTRACTORS, OR THE CARELESSNESS OF ANY OF HIS EMPLOYEES.

   U. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN ALL NECESSARY TEMPORARY WORKS FOR THE PROTECTION OF THE WORK AND THE PUBLIC, INCLUDING BARRICADES, WARNING SIGNS, LIGHTS, ETC.

   V. THE CONTRACTOR ACKNOWLEDGES & AGREES THAT THE WORK IS ENTIRELY AT HIS RISK UNTIL SITE IS ACCEPTED, AND HE WILL BE HELD RESPONSIBLE FOR ITS SAFETY BY THE OWNER. THE CONTRACTOR WILL INDEMNIFY THE OWNER & OWNER'S REPRESENTATIVE FROM LIABILITY AT THE SITE THROUGHOUT THE CONSTRUCTION PROCESS.

   W. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND OBTAIN ALL PERMITS AND PAY ALL LEGAL FEES. HE SHALL ALSO COMPLY WITH ALL CITY, COUNTY AND STATE BUILDING LAWS, ORDINANCES OR REGULATIONS RELATING TO BUILDING SIDEWALKS, STREETS, BLASTING, PUBLIC INFRASTRUCTURE, STORMWATER REGULATIONS, ETC.

   X. THE CONTRACTOR IS TO CHECK AND VERIFY ALL MEASUREMENTS, LEVELS, ETC. BEFORE ORDERING MATERIALS AND PROCEEDING WITH THE WORK, AND IS TO BE RESPONSIBLE FOR THE SAME.

CONTRACTOR RESPONSIBILITIES (CONT.):

   Y. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE DAMAGE OR LOSS OF ANY REFERENCE POINTS AND HUBS DURING THE CONSTRUCTION OF HIS WORK, AND SHALL BEAR THE COST OF REPLACING SAME.

   Z. CARE SHALL BE TAKEN TO PROTECT ANY UTILITIES, TREES, ETC. WHICH ARE TO REMAIN AND NOT TO BE DISTURBED BY THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO SUCH PROPERTY.

DEMOLITION INFORMATION:

1. NOTIFICATIONS:

   THE CONTRACTOR SHALL NOTIFY THE OWNER AND CITY INSPECTOR(S) 24 HOURS PRIOR TO ANY DEMOLITION OR CONSTRUCTION.

2. DISPOSAL GUIDELINES:

   A. ONLY ITEMS SPECIFICALLY NOTED TO BE DEMOLISHED SHALL BE REMOVED FROM THE SITE.

   B. REMOVE EXISTING PAVED AREAS AS SHOWN INCLUDING DRIVEWAYS, SIDEWALKS, PARKING AREAS, SERVICE AREAS, EQUIPMENT PADS, AND ALL MISCELLANEOUS PAVING.

   C. ALL DEBRIS RESULTING FROM DEMOLITION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY BY THE CONTRACTOR IN ACCORDANCE WITH LOCAL STATE AND FEDERAL REGULATIONS. BACKFILL ALL TRENCHES AND EXCAVATIONS RESULTING FROM DEMOLITION.

   D. ALL DEMOLISHED MATERIAL BECOMES THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE NOTED.

3. TREE PROTECTION GUIDELINES:

   PROTECT ALL EXISTING TREES NOTED "TO REMAIN" AND ALL ITEMS TO BE TURNED OVER TO THE OWNER DURING DEMOLITION. TAKE ALL NECESSARY PRECAUTIONS AND PROTECTIVE MEASURES. ANY EXISTING ITEMS TO BE TURNED OVER TO THE OWNER WHICH ARE DAMAGED DURING DEMOLITION SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. TREES WHICH ARE DAMAGED WILL BE REPLACED OR REIMBURSED AT A RATE TO BE DETERMINED BY THE OWNER.

4. UTILITIES:

   A. PRIOR TO REMOVING OR ABANDONING ANY UTILITY THE CONTRACTOR SHALL VERIFY THAT NO UPSTREAM SERVICE WILL BE TERMINATED. THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY TERMINATION NOT SHOWN ON THE PLANS.

   B. ALL ABANDONED WATER LINES, STORM SEWER PIPE, SANITARY SEWER PIPES, GAS LINES, OR ANY OTHER ABANDONED UNDERGROUND UTILITY SHALL BE ABANDONED IN PLACE UNLESS NOTED OTHERWISE.

SITE INFORMATION:

1. THE FOLLOWING ARE APPLICABLE TO ALL CIVIL DOCUMENTS:

   A. WHERE A DETAIL SECTION, TYPICAL SECTION, OR A NOTE IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS, UNLESS OTHERWISE NOTED ON THE PLANS.

   B. EXISTING AND PROPOSED CONTOURS ARE AT ONE (1) FOOT INTERVALS.

   C. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.

   D. ALL PIPE LENGTHS SPECIFIED IN THESE PLANS ARE THE HORIZONTAL DISTANCE AND ARE SHOWN FOR REFERENE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE ACTUAL LENGTHS BASED ON PROPOSED PIPE SLOPE.

   E. PIPE LENGTHS IN PLANS ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.

EROSION AND SEDIMENT CONTROL INFORMATION:

1. COMPREHENSIVE:

   A. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO OR CONCURRENT WITH LAND-DISTURBING ACTIVITIES.

   B. PROVISIONS TO PREVENT EROSION OF SOIL FROM THE SITE SHALL BE AT A MINIMUM IN CONFORMANCE WITH THE REQUIREMENTS OF THE NEW HAMPSHIRE EROSION AND SEDIMENT CONTROL HANDBOOKS. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

   C. FAILURE TO INSTALL, OPERATE, OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED BACK TO THE STANDARDS SPECIFIED IN THE NEW HAMPSHIRE EROSION AND SEDIMENT CONTROL HANDBOOKS, CURRENT EDITION.

   D. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

   E. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO LAND DISTURBANCE. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE APPROVED PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE FINAL PROPOSED DRAINAGE PATTERNS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

   F. THE CONSTRUCTION OF THE SITE WILL COMMENCE WITH THE INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION. ALL SEDIMENT CONTROL WILL BE MAINTAINED UNTIL ALL UPSTREAM GROUND WITHIN THE CONSTRUCTION AREA HAS BEEN COMPLETELY STABILIZED WITH PERMANENT VEGETATION AND ALL ROADS/DRIVEWAYS HAVE BEEN PAVED.

   G. CONSTRUCTION EXITS SHALL BE CONSTRUCTED AT EACH POINT OF ENTRY OR EXIT FROM THE SITE AND SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH STONE AS CONDITIONS DEMAND, REPAIR, AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES OFF SITE ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. ACCESS POINTS PROTECTED WITH A CONSTRUCTION EXIT SHALL BE OTHERWISE BARRICADED UNTIL THE SITE IS STABILIZED.

CONCRETE INFORMATION (SITE WORK ONLY):

1. PRODUCT CRITERIA:

   A. UNLESS OTHERWISE NOTED CEMENT SHALL BE TYPE I OR III CONFORMING TO ASTM C150. AGGREGATES SHALL BE NORMAL WEIGHT CONFORMING TO ASTM C33.

   B. CONCRETE SHALL CONFORM TO ACI BUILDING CODE (318-89). UNLESS NOTED CONCRETE SHALL BE NORMAL WEIGHT AND HAVE A 28 DAY COMPRESSIVE STRENGTH OF 3,500 P.S.I.

   C. SLUMP SHALL BE 3" TO 5" FOR REGULAR MIX. LARGER SLUMP SHALL BE PERMITTED WITH WATER REDUCING ADMIXTURES AND WRITTEN CONSENT OF THE ENGINEER.

   D. THE RELATIONSHIP BETWEEN MAXIMUM AGGREGATE SIZE TO MINIMUM AMOUNT OF CEMENT IN CONCRETE PAVEMENT (LB. PER C.Y. OR MIX) SHALL BE AS FOLLOWS: 1" - 520, 3/4" - 540, 1/2" - 590, 3/8" - 610.

2. CURING CRITERIA:

   A. CONCRETE CURING SHALL COMPLY WITH ACI 308. CURING PROCESS SHALL START IMMEDIATELY FOLLOWING INITIAL SET. CURING SHALL BE BY CURING COMPOUND.

   B. CONCRETE EXPOSED TO THE WEATHER SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ACI 318-89 TABLE 4.1.1. NORMAL WEIGHT CONCRETE SLABS SHALL HAVE AIR CONTENT IN ACCORDANCE WITH ACI 302.IR-89 TABLE 5.2.7A.

   C. HOT WEATHER CONCRETING SHALL COMPLY WITH ACI 305. NO CONCRETE ABOVE 90 DEGREES FAHRENHEIT SHALL BE POURED. LOWER CONCRETE TEMPERATURE BY COOLING WATER AND AGGREGATE. FORMS, STEEL, AND SUBGRADE SHALL BE SPRINKLED WITH COLD WATER. AFTER FINISHING CONCRETE USE LIGHT FOG SPRAY UNTIL CURING COMPOUND IS USED.

   D. COLD WEATHER CONCRETING SHALL COMPLY WITH ACI 306. SPECIAL MATERIAL PROCEDURES SHALL BE PROVIDED DURING PLACING AND CURING OF CONCRETE BELOW 40 DEGREES FAHRENHEIT.

   E. CURING, HOT, AND COLD WEATHER CONCRETING PROCEDURES ARE ONLY GIVEN AS A GUIDE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT CONCRETE DAMAGE AND CRACKS. DAMAGED OR CRACKED CONCRETE WILL NOT BE ACCEPTED.

REINFORCING STEEL INFORMATION (SITE WORK ONLY):

1. PRODUCT CRITERIA:

   A. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60 AND GRADE 40 FOR #3 AND SMALLER BARS. MINIMUM LAP 48" DIAMETER.

   B. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185, MINIMUM LAP SHALL BE 8".

   C. REINFORCING THAT IS WELDED SHALL BE WELDABLE TYPE AND CONFORM TO ASTM A-706.

PAVEMENT INFORMATION:

1. PAVEMENT:

   A. ALL MATERIALS, EQUIPMENT, METHODS OF CONSTRUCTION, AND WORKMANSHIP SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, NHDOT, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

   B. SEE PAVEMENT DETAILS ON CONSTRUCTION DOCUMENTS FOR SPECIFIC DESIGN INFORMATION AND REQUIREMENTS.

   C. ALL CURB AND GUTTER TO BE 24" AND CONSTRUCTED OF 3000 P.S.I. CONCRETE UNLESS OTHERWISE NOTED.

2. SIGNING AND STRIPING:

   A. SIGNING AND STRIPING TO BE PROVIDED BY THE CONTRACTOR ACCORDING TO THE DRAWINGS AND SPECIFICATIONS.

   B. ALL STRIPING TO BE THERMOPLASTIC UNLESS OTHERWISE NOTED.

STORM SEWER NOTES:

1. REINFORCED CONCRETE PIPE SHALL BE RCP CLASS III UNLESS OTHERWISE NOTED WITH BELL-AND-SPIGOT AND GASKETED JOINTS WITH ASTM C 443 RUBBER GASKETS.
2. FILL HEIGHTS OVER 13' REQUIRE CLASS IV RCP STORM PIPE.
3. STORM INLETS SHALL BE PRECAST IN ACCORDANCE WITH PORTSMOUTH PUBLIC WORKS SPECIFICATIONS WHICH MEET OR EXCEED ASTM C 478.
4. ALL MANHOLE FRAMES AND COVERS ARE TO BE PER PORTSMOUTH PUBLIC WORKS STANDARD DETAIL FOR DIMENSIONS AND MATERIALS AND AS BELOW IF NOT OTHERWISE INDICATED. FERROUS; 24-INCH (610-MM) ID BY 7- TO 9-INCH (175- TO 225-MM) RISER WITH 4-INCH- (102-MM-) MINIMUM WIDTH FLANGE AND 26-INCH- (660-MM-) DIAMETER COVER. INCLUDE INDENTED TOP DESIGN WITH LETTERING CAST INTO COVER, USING WORDING EQUIVALENT TO "STORM SEWER."
5. MATERIAL: GRAY IRON ASTM A48 CLASS 30 UNLESS OTHERWISE INDICATED.
6. ALL HDPE PIPE SHALL BE CORRUGATED HIGH DENSITY POLYETHYLENE SMOOTH INTERIOR PIPE. HDPE PIPE SHALL CONFORM TO ASTM D3350 WITH SOIL TIGHT JOINTS.
7. ALL HDPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND AASHTO SECTION 30.
8. CONTRACTOR TO PROVIDE AND INSTALL MANUFACTURER RECOMMENDED FITTINGS ON RCP CONNECTIONS TO HDPE STRUCTURES.
9. REFER TO PIPE CHART FOR CASTING TYPES. INSTALL REDUCERS AS NECESSARY PER MANUFACTURER'S SPECIFICATIONS TO ACCOMMODATE LARGER INLET SIZES.
10. FOLLOW CONSTRUCTION PLANS AND MANUFACTURER DETAILS, SPECIFICATIONS, AND INSTALLATION INSTRUCTION AS INCLUDED WITHIN THE PLANS AND PROVIDED BY MANUFACTURER FOR THE INSTALLATION OF WATER QUALITY AND DETENTION SYSTEMS.
11. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL STORM SEWER PIPE, STRUCTURES, WATER QUALITY STRUCTURES, AND DETENTION STRUCTURES FOR ENGINEER AND OWNER APPROVAL PRIOR TO ORDERING MATERIALS.

CLEARING AND GRUBBING:

   A. DO NOT EXCEED CLEARING AND GRUBBING LIMITS OF CONSTRUCTION LINES INDICATED ON THE PLANS.

   B. ALL AREAS OUTSIDE THE LIMITS OF CONSTRUCTION LINE SHALL NOT BE CROSSED BY HEAVY EQUIPMENT OR USED FOR STORING HEAVY EQUIPMENT OR MATERIALS.

   C. NO EQUIPMENT SHALL BE STORED UNDER THE DRIP LINE OF TREES TO REMAIN.

   D. DO NOT FALL ANY TREES OR PUSH PILES OF DEBRIS AGAINST ANY TREES TO REMAIN.

   E. REMOVE ALL STUMPS, ROCKS, ASPHALT & CONCRETE DEBRIS, ETC. AND DISPOSE OFF SITE IN ACCORDANCE WITH LOCAL, STATE & FEDERAL REGULATIONS.

   F. CONTACT ALL UTILITY AUTHORITIES WHO HAVE LINES WITHIN THE CLEARING AND GRUBBING LIMITS BEFORE STARTING WORK

   E. ALL EROSION CONTROL SEDIMENT BARRIERS, SILT FENCES, AND TREE PROTECTION DEVICES SHALL BE INSTALLED PRIOR TO STARTING CLEARING AND GRUBBING.

   F. AFTER STAKING IS COMPLETED, TREES WITHIN GRADING LIMITS TO BE SAVED WILL BE IDENTIFIED BY THE OWNER'S REPRESENTATIVE. FIELD CHANGES TO GRADING PLANS SHALL BE MADE FOR SMOOTH TRANSITION OF GRADES AROUND ALL TREES WHICH REQUITE TREE WELLS WITHIN THE GRADING LIMITS.

   G. ALL CLEARING SHALL BE LIMITED TO AREAS TO BE GRADED WITHIN 15 CALENDAR DAYS.

GRADING NOTES:

   A. TOPSOIL SHALL BE STORED ON SITE IN LOCATIONS APPROVED BY THE OWNER'S REPRESENTATIVE. DRAINAGE SHALL ROUT AROUND THESE TOPSOIL STOCKPILES FOR THE DURATION OF THE GRADING OPERATIONS. EROSION CONTROL MEASURES SHALL PREVENT THE LOSS OF TOPSOIL MATERIAL.

   B. UNSUITABLE SOILS SHALL BE UNIFORMLY SPREAD ACROSS NON-STRUCTURAL FILL AREAS AND COVERED WITH TOPSOIL AND SEEDED.

   C. FILL AREA SHALL BE PROOF-ROLLED WITH RUBBER-TIRED EQUIPMENT WITH A MINIMUM WEIGHT OF FIFTEEN TONS PRIOR TO BEGINNING FILL OPERATION. AREAS WHICH ARE SOFT OR UNSTABLE SHALL BE UNDERCUT UNTIL STABLE SOILS ARE FOUND. RE-COMPACTION OF THESE SOILS SHALL BE PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.

   D. CUT AREA SHALL BE PROOF-ROLLED AFTER FINAL SUBGRADE IS ACHIEVED IN THE SAME MANNER AS FILLED AREAS. SOFT OR UNSTABLE SOILS SHALL BE SCARIFIED TO A DEPTH OF 12" AND RE-COMPACTED PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.

   E. ALL GRADING SHALL BE COMPLETED TO THE LEVEL INDICATED BY THE SCOPE OF WORK LISTED IN THE BID DOCUMENTS.

   F. ELEVATIONS SHOWN ON THE PLANS IS THE FINISH GRADE ELEVATION.

   G. GRADING SHALL BE SEQUENCED SO THAT BASE STONE IS PLACED WITHIN 10 CALENDAR DAYS PF ACHIEVING OPTIMUM SUBGRADE COMPACTION.

   H. SOILS TESTING LABORATORY/ SOILS ENGINEER. CONTRACTOR WILL EMPLOY A QUALIFIED SOILS TESTING LABORATORY/ ENGINEER TO OBSERVE THIS WORK AND MAKE TESTS AS REQUIRED.

   I. HAVE EARTH BORROW FILL, AGGREGATE, AND TOPSOIL, AND STRUCTURAL FILL TESTED AND APPROVED BY DESIGNATED TESTING LABORATORY BEFORE MOVING IT TO THE JOB SITE.

   J. CONTRACTOR SHALL OBSERVE PROOF-ROLLING OF AREAS WHERE BUILDING AND PAVING WILL BE LOCATED TO DETERMINE ADEQUACY OF SOIL COMPACTION AND IN-PLACE SOILS. OTHER AREAS WILL BE INSPECTED BY SOILS ENGINEER TO DETERMINE ADEQUACY IN THOSE AREAS. IF SOILS ARE NOT ADEQUATE TO BEAR WEIGHTS THAT WILL BE IMPOSED, TESTING LABORATORY WILL OBSERVE AND REPORT CORRECTIVE ACTION TAKEN.

   K. TEST IN-PLACE SOIL AND FILLED AND COMPACTED AREAS. IF THESE ARE NOT ADEQUATE TO BEAR WEIGHTS IMPOSED, TESTING LABORATORY WILL ADVICE THE OWNER'S REPRESENTATIVE OF THEIR RECOMMENDATIONS. HE WILL DIRECT ANY CORRECTIVE MEASURES THAT ARE NECESSARY.

   L. SOILS COMPACTION TESTING OF IN-PLACE AND FILLED AND COMPACTED AREAS WILL BE PERFORMED BY TESTING LABORATORY IN ACCORDANCE WITH THEIR REQUIREMENTS.

   M. THE SOILS ENGINEER'S AND TESTING LABORATORY'S FEES WILL BE PAID BY THE CONTRACTOR.

   N. APPLICABLE SPECIFICATIONS FOR COMPACTED FILL: THE FOLLOWING CURRENT AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) STANDARDS ARE HEREBY MADE PART OF THIS SPECIFICATION:

   - D421-58, DRY PREPARATION OF SOIL SAMPLES FOR GRAIN-SIZE ANALYSIS AND DETERMINATION OF SOIL CONSTANTS.
   - D422-63, STANDARD METHOD OF PARTICLE SIZE ANALYSIS OF SOILS.
   - D1140-54, METHOD OF TEST FOR AMOUNT OF MATERIAL IN SOILS FINER THAN NO.200 SIEVE.
   - D698, METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT
   - D1557-78, STANDARD TEST METHODS FOR MOISTURE-DENSITY RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES USING 10 LB. (4.54-KG) RAMMER AND 18-INCH (457 MM) DROP.

   O. PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AT ALL LOCATIONS UNLESS OTHERWISE NOTED.

   P. CONTRACTOR SHALL REVIEW THE SITE SPECIFIC GEOTECHNICAL REPORT PRIOR TO COMMENCING WITH GRADING OPERATIONS. WHERE CONFLICTS BETWEEN THE GRADING NOTES AND GEOTECHNICAL REPORT EXIST, THE MORE STRINGENT REQUIREMENT SHALL APPLY.

   Q. CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING WITH LOAD TICKETS, PHOTOGRAPHS, LOG BOOK, VIDEO RECORDING AND OTHER MEANS AS NECESSARY TO VERIFY THE INSTALLATION OF STORMWATER BEST MANAGEMENT PRACTICES REQUIRED BY THE LOCAL MUNICIPALITY AND JURISDICTION. AS-BUILT TOPOGRAPHY AND UTILITY PLANS HAVING BEEN PREPARED BY A QUALIFIED LAND SURVEYOR ARE REQUIRED TO BE SUBMITTED TO KIMLEY-HORN AT THE CONCLUSION OF THE PROJECT FOR VERIFICATION OF DESIGN INTENT. ANY MODIFICATIONS TO THE GRADING AND UTILITY SYSTEMS REQUIRED, NOT PREVIOUSLY APPROVED BY THE OWNER AND ENGINEER ARE THE RESPONSIBILITY OF THE CONTRACTOR.

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

No.	REVISIONS	DATE	BY
1			
2			
3			
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5			
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7			
8			
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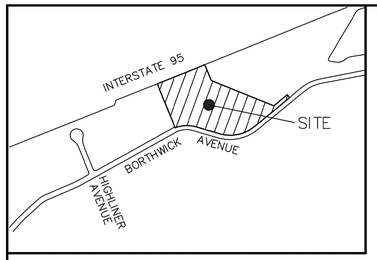
10			

DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

GENERAL NOTES

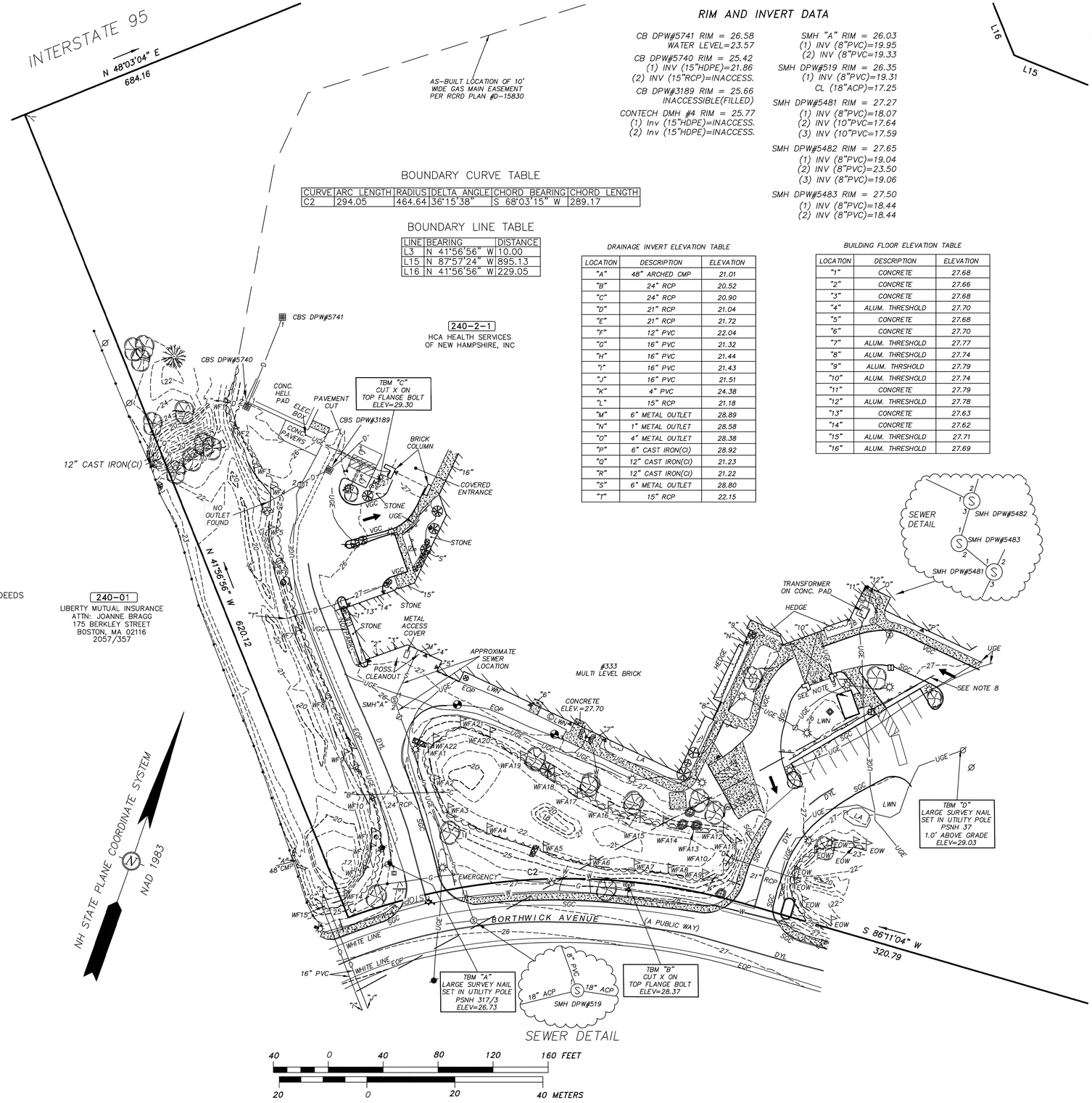
C0.01



LOCUS
(N.T.S.)

LEGEND:

- ◑ ..... IRON ROD (AS NOTED)
- ◬ ..... SURVEY NAIL (AS NOTED)
- ●—●—● ..... CHAIN LINK FENCE
- ⌀ ..... UTILITY POLE
- ⌀ ..... UTILITY POLE W/TRANSFORMER
- ◑ ..... GUY
- ☼ ..... LIGHT POLE
- ⋖ ..... DIRECTED WALL LIGHT
- —OHW— ..... OVERHEAD WIRES
- —OHE— ..... OVERHEAD ELECTRIC
- —OHC— ..... OVERHEAD COMMUNIUCATION WIRES
- —UGC— ..... UNDERGROUND COMMUNICATIONS
- —UGE— ..... UNDERGROUND ELECTRIC
- RCRD ..... ROCKINGHAM COUNTY REGISTRY OF DEEDS
- 240-02-01 ..... TAX SHEET / LOT NO.
- EOP ..... EDGE OF PAVEMENT
- LA ..... LANDSCAPED AREA
- RWS ..... STONE RETAINING WALL
- VCC ..... VERTICAL FACED GRANITE CURB
- SGC ..... SLOPED FACED GRANITE CURB
- PSNH ..... PUBLIC SERVICE CO. OF NH
- ♿ ..... HANDICAP SPACE
- ▤ ..... CATCH BASIN
- Ⓓ ..... DRAIN MANHOLE
- Ⓢ ..... SEWER MANHOLE
- ⊕ ..... BOLLARD
- ⊸ ..... SIGN
- ⊸● ..... DOUBLE POST SIGN
- ● ..... ELECTRICAL CONDUIT
- ▮ ..... ELECTRICAL PANEL
- ◪ ..... ELECTRICAL BOX
- Ⓔ ..... ELECTRIC METER
- ⚱ ..... GAS VALVE
- — W — ..... WATER *LINE*
- — S — ..... SEWER *LINE*
- —D— ..... DRAIN LINE
- — G — ..... GAS LINE
- ~~~~ ..... *BRUSH LINE*
- ✳ ..... CONIFEROUS TREE
- ✲ ..... DECIDUOUS TREE
- ~~~~ ..... TREE LINE
- ✳ ..... CONIFEROUS SHRUB
- ✲ ..... DECIDUOUS SHRUB
- ⊕ ..... TREE STUMP
- Ⓜ ..... MONITORING WELL
- ⋈ ..... WATER GATE VALVE
- ⚱ ..... WATER SHUT OFF VALVE
- Ⓥ ..... WATER METER PIT
- ⚲ ..... HYDRANT
- ⋖ ..... FIRE CONNECTION
- ⚱ ..... POST INDICATOR VALVE
- ▨ ..... RIP RAP
- ▩ ..... CEMENT CONCRETE PAD
- ● ..... BORING
- ▣ ..... CABLE TV VAULT
- DYL ..... DOUBLE YELLOW LINE
- ▨ ..... STONE RETAINING WALL



BOUNDARY CURVE TABLE

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C2	294.05	464.64	36°15'38"	S 68°03'15" W	289.17

BOUNDARY LINE TABLE

LINE	BEARING	DISTANCE
L3	N 41°56'56" W	10.00
L15	N 87°57'24" W	895.13
L16	N 41°56'56" W	229.05

RIM AND INVERT DATA

CB DPW#5741 RIM = 26.58
WATER LEVEL=23.57

CB DPW#5740 RIM = 25.42
(1) INV (15"HDPE)=21.86
(2) INV (15"RCP)=INACCESS.

CB DPW#3189 RIM = 25.66
INACCESSIBLE(FILLED)

CONTECH DMH #4 RIM = 25.77
(1) Inv (15"HDPE)=INACCESS.
(2) Inv (15"HDPE)=INACCESS.

SMH "A" RIM = 26.03
(1) INV (8"PVC)=19.95
(2) INV (8"PVC=19.33

SMH DPW#519 RIM = 26.35
(1) INV (8"PVC)=19.31
CL (18"ACP)=17.25

SMH DPW#5481 RIM = 27.27
(1) INV (8"PVC)=18.07
(2) INV (10"PVC=17.64
(3) INV (10"PVC=17.59

SMH DPW#5482 RIM = 27.65
(1) INV (8"PVC)=19.04
(2) INV (8"PVC)=23.50
(3) INV (8"PVC)=19.06

SMH DPW#5483 RIM = 27.50
(1) INV (8"PVC)=18.44
(2) INV (8"PVC)=18.44

DRAINAGE INVERT ELEVATION TABLE

LOCATION	DESCRIPTION	ELEVATION
"A"	48" ARCHED CMP	21.01
"B"	24" RCP	20.52
"C"	24" RCP	20.90
"D"	21" RCP	21.04
"E"	21" RCP	21.72
"F"	12" PVC	22.04
"G"	16" PVC	21.32
"H"	16" PVC	21.44
"I"	16" PVC	21.43
"J"	16" PVC	21.51
"K"	4" PVC	24.38
"L"	15" RCP	21.18
"M"	6" METAL OUTLET	28.89
"N"	1" METAL OUTLET	28.58
"O"	4" METAL OUTLET	28.38
"P"	6" CAST IRON(CI)	28.92
"Q"	12" CAST IRON(CI)	21.23
"R"	12" CAST IRON(CI)	21.22
"S"	6" METAL OUTLET	28.80
"T"	15" RCP	22.15

BUILDING FLOOR ELEVATION TABLE

LOCATION	DESCRIPTION	ELEVATION
"1"	CONCRETE	27.68
"2"	CONCRETE	27.66
"3"	CONCRETE	27.68
"4"	ALUM. THRESHOLD	27.70
"5"	CONCRETE	27.68
"6"	CONCRETE	27.70
"7"	ALUM. THRESHOLD	27.77
"8"	ALUM. THRESHOLD	27.74
"9"	ALUM. THRSHOLD	27.79
"10"	ALUM. THRESHOLD	27.74
"11"	CONCRETE	27.79
"12"	ALUM. THRESHOLD	27.78
"13"	CONCRETE	27.63
"14"	CONCRETE	27.62
"15"	ALUM. THRESHOLD	27.71
"16"	ALUM. THRESHOLD	27.69

NOTES:

1. OWNER OF RECORD.....HCA HEALTH SERVICES OF NH., D/B/A PRH 32902
C/O DUCHARME MCMILLEN & ASSOCIATES
ADDRESS.....PO BOX 80610, INDIANAPOLIS, IN 46280
DEED REFERENCE.....2784/1340
TAX SHEET / LOT.....240-02-01
PARCEL AREA.....846,664 S.F 19.44 ACRES
2. ZONED:.....OFFICE/RESEARCH (OR) FRONT YARD SETBACK....50'
MINIMUM LOT AREA..3 ACRES SIDE YARD SETBACK.....75'
FRONTAGE.....300' REAR YARD SETBACK.....50'
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 @ 1-888-DIG-SAFE.*
5. *HORIZONTAL DATUM: NAD 1983 ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND NGS "OPUS" SOLUTION. REFERENCE FRAME: NAD83 (2011)(EPOCH: 2010.0000), US SURVEY FOOT. VERTICAL DATUM: NAVD 1988. PRIMARY BENCHMARK: CITY OF PORTSMOUTH "ALBA"*
6. *ENGINEER OR CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC..*
7. *THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0260E, EFFECTIVE DATE MAY 17, 2005 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.*
8. *LIMIT OF 300' EVERSOURCE ELECTRIC EASEMENT.*
9. *BRICK GENERATOR ENCLOSURE. TOP OF CONCRETE ELEV.=27.20*
10. *THE DELINEATION OF THE WETLANDS SHOWN HEREON WAS BY BRENDEN WALDEN NEW HAMPSHIRE CERTIFIED WETLAND SCIENTIST #297, GOVE ENVIRONMENTAL SERVICES, LLC., 8 CONTINENTAL DRIVE, UNIT H, EXETER, NH 03833.*
11. *THE SUBSURFACE UTILITIES SHOWN HEREON WERE IDENTIFIED BY WADE HANSEN, GROUND PENETRATING RADAR SYSTEMS, INC., 5217 MONROE STREET, SUITE A, TOLEDO, OHIO 43623.*
12. *AN EXISTING UNITIL GAS LINE SOUTHWESTERLY OF THE HOSIPTAL IN THE VICINITY OF THE LIBERTY MUTUAL PARCEL & A 6" CLDI WATER LINE IN THE SAME AREA WERE NOT FIELD LOCATED BY GROUND PENETRATING RADAR SYSTEMS, INC.*

REFERENCE PLANS:

1. *GAS LINE AS-BUILT EASEMENT AND CONSERVATION PLAN, PREPARED FOR HOSPITAL CORPROATION OF AMERICA, PORTSMOUTH, NH, DATED 10/31/85. RCRD PLAN #D-15830.*
2. *SCHILLER S/S-OCEAN ROAD S/S, 115 KV TRANSMISSION LINE #U181, MILE 4, PLANR-6775-A, DATED 7/10/2009, BY NORTHEAST UTILITIES, NOT RECORDED.*
3. *SUBDIVISION OF LAND, FRANETAL REALTY TRUST COMPAMY, OPTIONED TO LIBERTY MUTUAL INSURANCE COMPANY, PORTSMOUTH, NEW HAMPSHIRE, REVISED TO 2/19/71 RCRD PLAN #2190.*

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.

James Verra — 11-19-2019
JAMES VERRA — DATE

STATE OF NEW HAMPSHIRE — No. 625 — JAMES VERRA — LICENSED LAND SURVEYOR — SIGNATURE

REV. NO.	DATE	DESCRIPTION	APPR'D
0	11-08-2019	FOR REVIEW & COMMENT	JV

LIMITED EXISTING CONDITIONS PLAN
333 BORTHWICK AVENUE
PORTSMOUTH, NEW HAMPSHIRE
ASSESSOR'S PARCEL #240-002-001
for
HCA HEALTH SERVICES OF NEW HAMPSHIRE

JAMES VERRA and ASSOCIATES, INC.
101 SHATTUCK WAY
SUITE 8
NEWINGTON, N.H., 03801-7876
603-436-3557

DATE:	11-19-2019
JOB NO:	23834
SCALE:	1" = 40'
DWG NAME:	23834
PLAN NO:	23834
SHEET:	1 of 1

GTD — PROJECT JV
GTD — DRAWN BY

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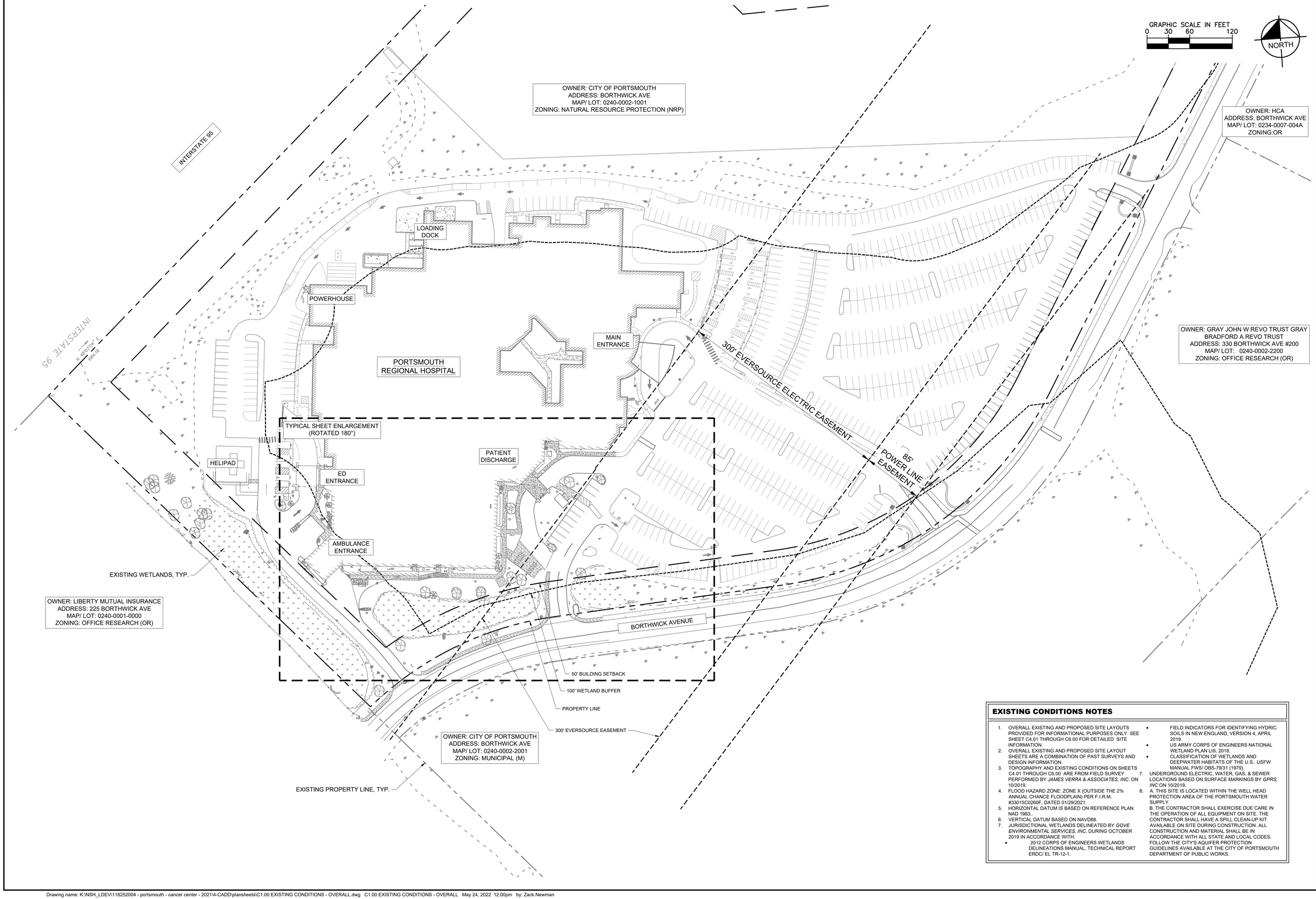

EXISTING CONDITIONS NOTES

1. OVERALL EXISTING AND PROPOSED SITE LAYOUTS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. SEE SHEET C4.01 THROUGH C6.00 FOR DETAILED SITE INFORMATION.
2. OVERALL EXISTING AND PROPOSED SITE LAYOUT SHEETS ARE A COMBINATION OF PAST SURVEYS AND DESIGN INFORMATION.
3. TOPOGRAPHY AND EXISTING CONDITIONS ON SHEETS C4.01 THROUGH C6.00 ARE FROM FIELD SURVEY PERFORMED BY *JAMES VERRA & ASSOCIATES, INC.* ON 10/2019.
4. FLOOD HAZARD ZONE: ZONE X (OUTSIDE THE 2% ANNUAL CHANCE FLOODPLAIN) PER F.I.R.M. #33015C0260F, DATED 01/29/2021.
5. HORIZONTAL DATUM IS BASED ON REFERENCE PLAN NAD 1983..
6. VERTICAL DATUM BASED ON NAVD88.
7. JURISDICTIONAL WETLANDS DELINEATED BY *GOVE ENVIRONMENTAL SERVICES, INC.* DURING OCTOBER 2019 IN ACCORDANCE WITH:
   - 2012 CORPS OF ENGINEERS WETLANDS DELINEATIONS MANUAL, TECHNICAL REPORT ERDC/ EL TR-12-1.
   - FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, APRIL 2019.
   - US ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLAN LIS, 2018.
   - CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE U.S., USFW MANUAL FWS/ OBS-79/31 (1979).
7. UNDERGROUND ELECTRIC, WATER, GAS, & SEWER LOCATIONS BASED ON SURFACE MARKINGS BY *GPRS, INC* ON 10/2019.
8. A. THIS SITE IS LOCATED WITHIN THE WELL HEAD PROTECTION AREA OF THE PORTSMOUTH WATER SUPPLY.
   B. THE CONTRACTOR SHALL EXERCISE DUE CARE IN THE OPERATION OF ALL EQUIPMENT ON SITE. THE CONTRACTOR SHALL HAVE A SPILL CLEAN-UP KIT AVAILABLE ON SITE DURING CONSTRUCTION. ALL CONSTRUCTION AND MATERIAL SHALL BE IN ACCORDANCE WITH ALL STATE AND LOCAL CODES. FOLLOW THE CITY'S AQUIFER PROTECTION GUIDELINES AVAILABLE AT THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

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404 WYMAN STREET, SUITE 385 WALTHAM, MA 02451
MAIN:781.328.0676 | WWW.KIMLEY-HORN.COM
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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

No.	REVISIONS	DATE	BY
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DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

EXISTING CONDITIONS - OVERALL

C1.00

DEMOLITION LEGEND

- REMOVE CONCRETE/ ASPHALT
- REMOVE CANOPY
- REMOVE UNDERGROUND UTILITY / STORM
- REMOVE CURB & GUTTER/ CURB
- REMOVE/ RELOCATE SITE OBJECT (HYDRANT, POLE, TREE, ETC.)
- LOD — LIMITS OF DISTURBANCE
- SAWCUT LINE

EXISTING UTILITIES NOTE

CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES AND/OR CONFLICTS WITH EXISTING OR PROPOSED UTILITIES PRIOR TO PROCEEDING.

CONTRACTOR NOTE

ALL EROSION CONTROL MEASURES SPECIFIED ON SHEET C3.00 SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK SHOWN ON THIS PLAN.

SEE DEMOLITION NOTES, SHEET C0.01.

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

BORTHWICK AVE

EXISTING GAS VALVE TO REMAIN
EXISTING 4" WATER LINE TO REMOTE FDC TO REMAIN
WETLAND LIMITS
EXISTING WETLANDS
EXISTING FIRE HYDRANT TO REMAIN
CONTRACTOR TO PROTECT WETLANDS AS NECESSARY
EXISTING FDC TO REMAIN
REMOVE PORTION OF 4" WATER LINE TO REMOTE FDC
APPROXIMATE SEWER LOCATION
REMOVE STUMPS
REMOVE TREE (TYP)
DECON TANK TO BE RELOCATED OUT OF NEW MOBILE IMAGING UNIT PAD
REMOVE TREES (TYP.)
EXISTING MONITORING WELL TO REMAIN
REMOVE ELECTRICAL BOX
REMOVE LIGHT POLE
RAMP TO BE REMOVED
SIDEWALK REMOVAL (TYP.)
REMOVE CONCRETE PAD
EXISTING 10" ROOF LEADER TO REMAIN
REMOVE LIGHT POLE
EXISTING SIDEWALK TO REMAIN IN PLACE
AMBULANCE ENTRANCE
REMOVE LIGHTING
REMOVE TREES (TYP.)
REMOVE LIGHTING
EXISTING 4" FIRE PROTECTION LINE TO REMAIN IN PLACE
REMOVE PORTION OF 6" FIRE LINE, PIV, AND BOLLARDS
PAVEMENT REMOVAL
REMOVE LIGHT POLE (TYP.)
REMOVE SIGN
ABANDON UNDERGROUND ELECTRIC IN PLACE
REMOVE LIGHTPOLE
REMOVE ELECTRICAL BOX
REMOVE EXISTING SIGN (TYP.)
FLAG POLE TO REMAIN
GENERATOR TO REMAIN
REMOVE SHRUBS
PORTSMOUTH REGIONAL HOSPITAL
REMOVE TREE
REMOVE SIGN
REMOVE SHRUBS
REMOVE CANOPY AND SUPPORT COLUMNS
REMOVE UNDERGROUND ELECTRIC
SANITARY SEWER TO REMAIN
REMOVE CURB
EXISTING ELECTRICAL LINES TO EXISTING TRANSFORMER TO REMAIN IN PLACE
EXISTING TRANSFORMER TO REMAIN
EXISTING SIDEWALK TO REMAIN IN PLACE

240-2-1

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

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DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

SITE DEMOLITION PLAN

C2.00

Drawing name: K:\NSH_LDEV\118252004 - portsmouth - cancer center - 2021\4-CADD\plansheets\C2.00 SITE DEMOLITION PLAN.dwg C2.00 SITE DEMOLITION PLAN May 23, 2022 1:33pm by: Zack.Newman

EROSION CONTROL NOTES

1. CONTRACTOR SHALL COORDINATE WITH CITY OF PORTSMOUTH GROWTH MANAGEMENT AND THE COUNTY'S ENVIRONMENTAL INSPECTOR.
2. ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES MAY BE REQUIRED, DURING ANY PHASE OF DEVELOPMENT, AT THE DISCRETION OF THE CITY OF PORTSMOUTH'S ENVIRONMENTAL INSPECTOR.
3. THE CONTRACTOR SHALL ENSURE THAT A FOREMAN OR SUPERVISOR WHO HAS BEEN CERTIFIED UNDER THE NEW HAMPSHIRE STORMWATER, EROSION AND SEDIMENTATION CONTROL INSPECTOR TRAINING PROGRAM IS AVAILABLE IN PERSON OR BY PHONE AT ALL TIMES DURING CONSTRUCTION ACTIVITIES. INSPECTOR TO BE DESIGNATED AND AVAILABLE AT THE PRE-CONSTRUCTION MEETING.
4. SILT FENCE SHOWN ON THESE PLANS SHALL BE INSTALLED GENERALLY IN THE LOCATIONS INDICATED, ADJUSTED FOR FIELD CONSTRAINTS. ALL PROPOSED SILT FENCE LOCATED WITHIN THE CRITICAL PROTECTION ZONE OF A TREE SHALL BE OF A NON-TRENCHED VARIETY, UNLESS ARBORICULTURAL MITIGATION STATES OTHERWISE.
5. CONTRACTOR SHALL INSPECT AND REPAIR ALL BMP's AT LEAST ONCE A WEEK, AND AFTER EVERY SIGNIFICANT RAIN EVENT (> 1/2" OF RAINFALL.) A LOG OF SUCH INSPECTIONS SHALL BE MAINTAINED AT THE SITE.
6. ANY BMP IN NEED OF REPAIR OR REINSTALLATION SHALL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS OF IDENTIFICATION OF THE NEED FOR SUCH CORRECTION.
7. ADDITIONAL BMP MEASURES MAY BE NECESSARY TO ENSURE THAT TURBID WATER IS NOT DISCHARGED FROM THE CONSTRUCTION SITE. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING COMPLIANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN, THE N.P.D.E.S. PERMIT AND THE CONDITIONS OF THE APPLICABLE ENVIRONMENTAL RESOURCE PERMIT.
9. ALL DISTURBED AREAS TO BE LEFT IDLE LONGER THAN 14 DAYS MUST BE STABILIZED WITH QUICK GROW GRASS SEED AND MULCH.
10. NO TRENCHING OR EXCAVATION SHALL BE ALLOWED WITHIN THE CPZ OF PROTECTED TREES, EXCEPT WHERE DEBITS HAVE BEEN NOTED ON THE TREE REMOVAL PLANS OR WHERE TREES ARE TO BE IMPACTED/MITIGATED PER THE TREE MITIGATION PLANS.
11. STREET SWEEPING WILL BE REQUIRED AS NECESSARY.
12. IMPROVEMENTS SHOWN FOR REFERENCE ONLY.
13. COORDINATE DISPOSAL OF EXCAVATED MATERIAL WITH OWNER.
14. ALL EROSION CONTROL MEASURES ARE TO BE MADE OF NATURAL MATERIALS.

EROSION CONTROL LEGEND

	IP	INLET PROTECTION
SF	SF	SILT FENCE
	EE	EROSION EELS
	OP	OUTLET PROTECTION
	CW	CONCRETE WASHOUT AREA
	CE	CONSTRUCTION ENTRANCE
		CONSTRUCTION SIGN
TP	TP	TREE PROTECTION

PROPOSED GROUND COVER LEGEND

	CONSERVATION SEED MIX
	FESCUE/ BLUEGRASS SEED MIX

SEE SHEET C3.02 FOR EROSION CONTROL DETAILS

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

BORTHWICK AVENUE (A PUBLIC WAY)

BORTHWICK AVE

PORTSMOUTH REGIONAL HOSPITAL

AMBULANCE ENTRANCE

SF EE CW CE TP OP

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

No.	REVISIONS	DATE	BY
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DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

EROSION CONTROL PLAN - PHASE 1

C3.00

Drawing name: K:\NSH_LDEV\118252004 - portsmouth - cancer center - 2021\4-CADD\plansheets\C3.00 EROSION CONTROL PLAN.dwg C3.00 EROSION CONTROL PLAN - PHASE 1 May 23, 2022 1:36pm by: Zack.Newman

EROSION CONTROL NOTES

1. CONTRACTOR SHALL COORDINATE WITH CITY OF PORTSMOUTH GROWTH MANAGEMENT AND THE COUNTY'S ENVIRONMENTAL INSPECTOR.
2. ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES MAY BE REQUIRED, DURING ANY PHASE OF DEVELOPMENT, AT THE DISCRETION OF THE CITY OF PORTSMOUTH'S ENVIRONMENTAL INSPECTOR.
3. THE CONTRACTOR SHALL ENSURE THAT A FOREMAN OR SUPERVISOR WHO HAS BEEN CERTIFIED UNDER THE NEW HAMPSHIRE STORMWATER, EROSION AND SEDIMENTATION CONTROL INSPECTOR TRAINING PROGRAM IS AVAILABLE IN PERSON OR BY PHONE AT ALL TIMES DURING CONSTRUCTION ACTIVITIES. INSPECTOR TO BE DESIGNATED AND AVAILABLE AT THE PRE-CONSTRUCTION MEETING.
4. SILT FENCE SHOWN ON THESE PLANS SHALL BE INSTALLED GENERALLY IN THE LOCATIONS INDICATED, ADJUSTED FOR FIELD CONSTRAINTS. ALL PROPOSED SILT FENCE LOCATED WITHIN THE CRITICAL PROTECTION ZONE OF A TREE SHALL BE OF A NON-TRENCHED VARIETY, UNLESS ARBORICULTURAL MITIGATION STATES OTHERWISE.
5. CONTRACTOR SHALL INSPECT AND REPAIR ALL BMP's AT LEAST ONCE A WEEK, AND AFTER EVERY SIGNIFICANT RAIN EVENT (> 1/2" OF RAINFALL.) A LOG OF SUCH INSPECTIONS SHALL BE MAINTAINED AT THE SITE.
6. ANY BMP IN NEED OF REPAIR OR REINSTALLATION SHALL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS OF IDENTIFICATION OF THE NEED FOR SUCH CORRECTION.
7. ADDITIONAL BMP MEASURES MAY BE NECESSARY TO ENSURE THAT TURBID WATER IS NOT DISCHARGED FROM THE CONSTRUCTION SITE. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING COMPLIANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN, THE N.P.D.E.S. PERMIT AND THE CONDITIONS OF THE APPLICABLE ENVIRONMENTAL RESOURCE PERMIT.
9. ALL DISTURBED AREAS TO BE LEFT IDLE LONGER THAN 14 DAYS MUST BE STABILIZED WITH QUICK GROW GRASS SEED AND MULCH.
10. NO TRENCHING OR EXCAVATION SHALL BE ALLOWED WITHIN THE CPZ OF PROTECTED TREES, EXCEPT WHERE DEBITS HAVE BEEN NOTED ON THE TREE REMOVAL PLANS OR WHERE TREES ARE TO BE IMPACTED/MITIGATED PER THE TREE MITIGATION PLANS.
11. STREET SWEEPING WILL BE REQUIRED AS NECESSARY.
12. IMPROVEMENTS SHOWN FOR REFERENCE ONLY.
13. COORDINATE DISPOSAL OF EXCAVATED MATERIAL WITH OWNER.
14. ALL EROSION CONTROL MEASURES ARE TO BE MADE OF NATURAL MATERIALS.

EROSION CONTROL LEGEND

IP	INLET PROTECTION
SF	SILT FENCE
EE	EROSION EELS
OP	OUTLET PROTECTION
CW	CONCRETE WASHOUT AREA
CE	CONSTRUCTION ENTRANCE
	CONSTRUCTION SIGN
TP	TREE PROTECTION

PROPOSED GROUND COVER LEGEND

	CONSERVATION SEED MIX
	FESCUE/ BLUEGRASS SEED MIX

SEE SHEET C3.02 FOR EROSION CONTROL DETAILS

GRAPHIC SCALE IN FEET
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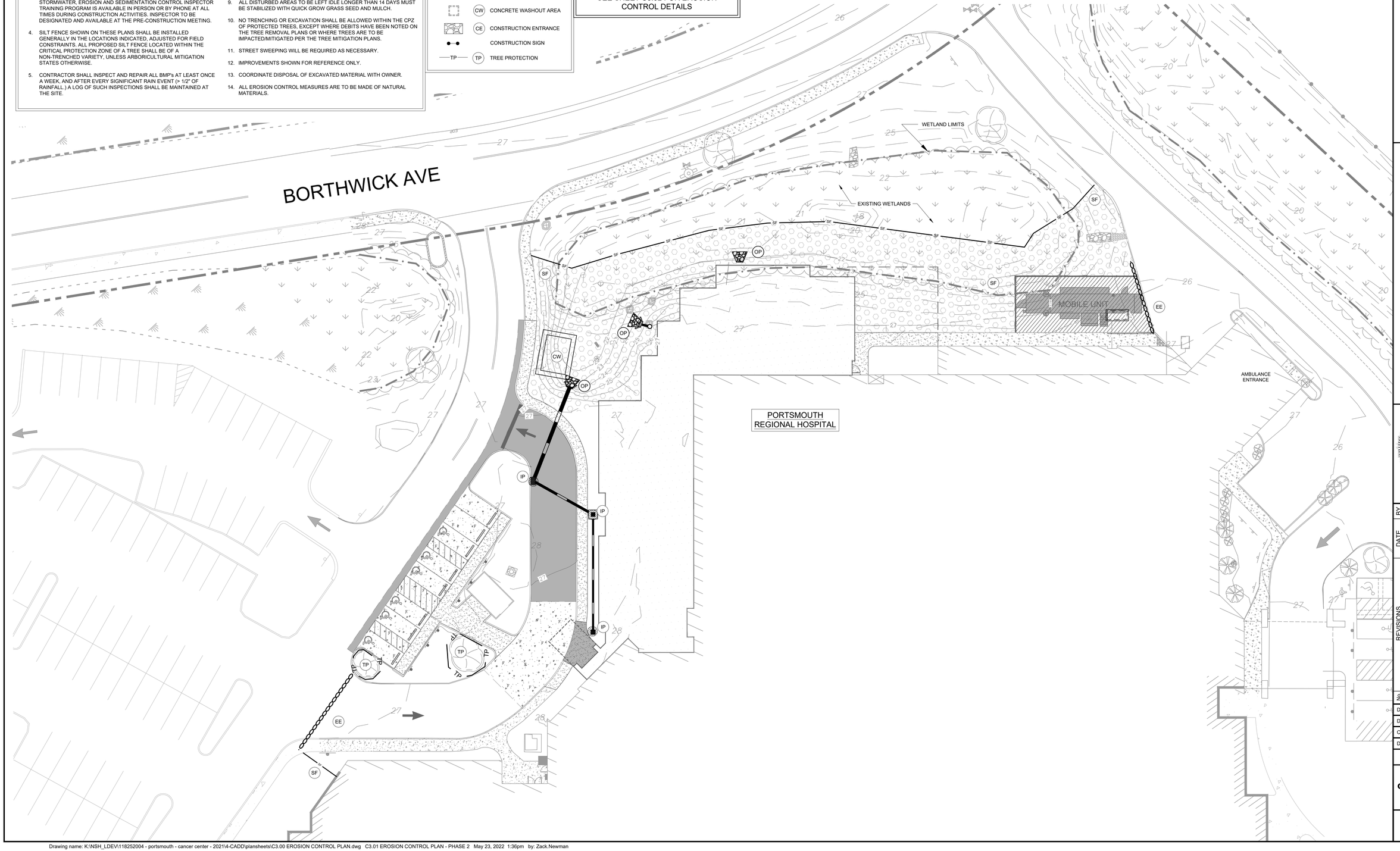
NORTH



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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE – ANDREW JAMES SCHALL No. 15914 – LICENSED PROFESSIONAL ENGINEER

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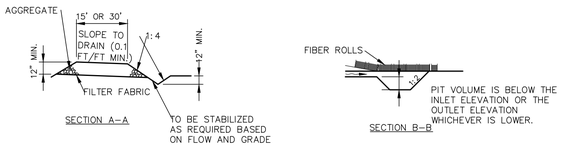
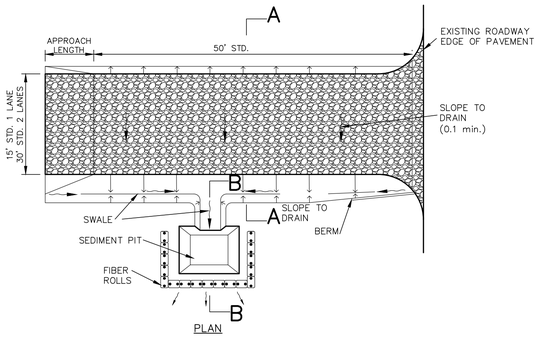
DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

EROSION CONTROL PLAN - PHASE 2

C3.01

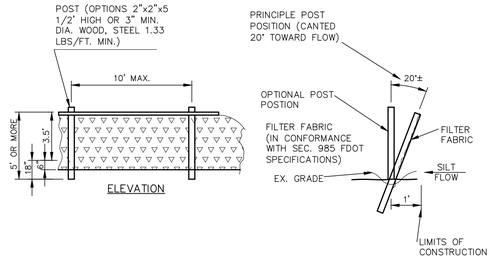
Drawing name: K:\NSH_LDEV\118252004 - portsmouth - cancer center - 2021\4-CADD\plansheets\C3.00 EROSION CONTROL PLAN.dwg C3.01 EROSION CONTROL PLAN - PHASE 2 May 23, 2022 1:36pm by: Zack.Newman



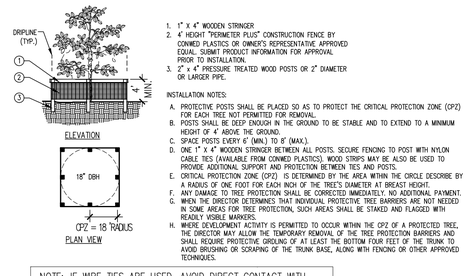


NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

CE CONSTRUCTION ENTRANCE (SOIL TRACKING PREVENTION)
NOT TO SCALE



SF SILT FENCE (SEDIMENT BARRIER)
NOT TO SCALE

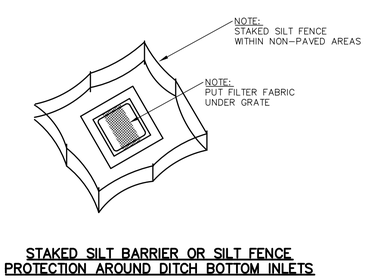


1. 1" X 4" WOODEN STRINGER
2. 4' HEIGHT "PERIMETER PLUS" CONSTRUCTION FENCE BY CONWED PLASTICS OR OWNER'S REPRESENTATIVE APPROVED EQUAL. SUBMIT PRODUCT INFORMATION FOR APPROVAL PRIOR TO INSTALLATION.
3. 2" x 4" PRESSURE TREATED WOOD POSTS OR 2" DIAMETER OR LARGER PIPE.

INSTALLATION NOTES:
A. PROTECTIVE POSTS SHALL BE PLACED SO AS TO PROTECT THE CRITICAL PROTECTION ZONE (CPZ) FOR EACH TREE NOT PERMITTED FOR REMOVAL.
B. POSTS SHALL BE DEEP ENOUGH IN THE GROUND TO BE STABLE AND TO EXTEND TO A MINIMUM HEIGHT OF 4' ABOVE THE GROUND.
C. SPACE POSTS EVERY 6' (MIN.) TO 8' (MAX.).
D. ONE 1" X 4" WOODEN STRINGER BETWEEN ALL POSTS. SECURE FENCING TO POST WITH NYLON CABLE TIES (AVAILABLE FROM CONWED PLASTICS). WOOD STRIPS MAY BE ALSO BE USED TO PROVIDE ADDITIONAL SUPPORT AND PROTECTION BETWEEN TIES AND POSTS.
E. CRITICAL PROTECTION ZONE (CPZ) IS DETERMINED BY THE AREA WITHIN THE CIRCLE DESCRIBE BY A RADIUS OF ONE FOOT FOR EACH INCH OF THE TREE'S DIAMETER AT BREAST HEIGHT.
F. ANY DAMAGE TO TREE PROTECTION SHALL BE CORRECTED IMMEDIATELY. NO ADDITIONAL PAYMENT.
G. WHEN THE DIRECTOR DETERMINES THAT INDIVIDUAL PROTECTIVE TREE BARRIERS ARE NOT NEEDED IN SOME AREAS FOR TREE PROTECTION, SUCH AREAS SHALL BE STAKED AND FLAGGED WITH READILY VISIBLE MARKERS.
H. WHERE DEVELOPMENT ACTIVITY IS PERMITTED TO OCCUR WITHIN THE CPZ OF A PROTECTED TREE, THE DIRECTOR MAY ALLOW THE TEMPORARY REMOVAL OF THE TREE PROTECTION BARRIERS AND SHALL REQUIRE PROTECTIVE GIRDLING OF AT LEAST THE BOTTOM FOUR FEET OF THE TRUNK TO AVOID BRUSHING OR SCRAPING OF THE TRUNK BASE, ALONG WITH FENCING OR OTHER APPROVED TECHNIQUES.

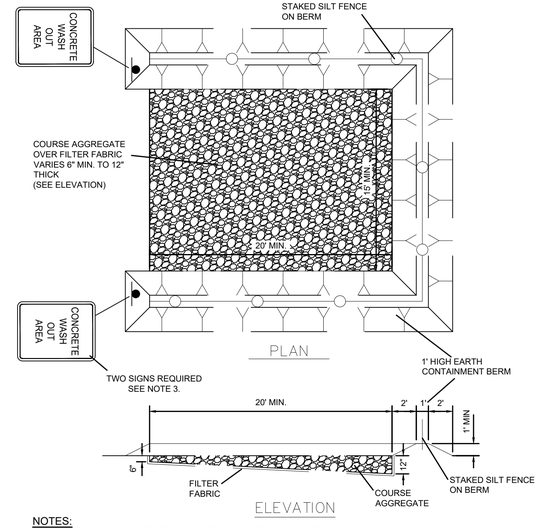
NOTE: IF WIRE TIES ARE USED, AVOID DIRECT CONTACT WITH FENCE. WIRE MAY DAMAGE FENCE OVER TIME.

TP TREE PROTECTION
NOT TO SCALE



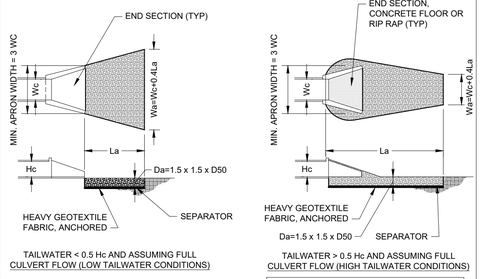
STAKED SILT BARRIER OR SILT FENCE PROTECTION AROUND DITCH BOTTOM INLETS

IP INLET PROTECTION
NOT TO SCALE



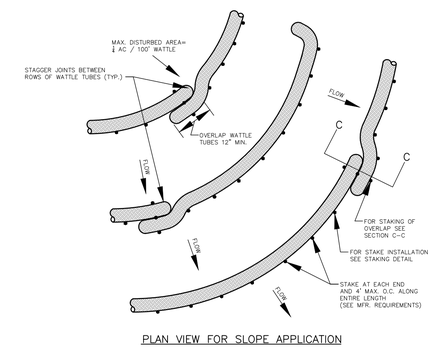
NOTES:
1. ALL MATERIAL SHALL BE REMOVED FROM THE SITE AT THE END OF THE PROJECT.
2. AGGREGATE SHALL BE REPLACED AS DIRECTED BY THE ENGINEER OF RECORD AND/OR THE CITY WHEN EXCESSIVE MATERIALS BUILDUP RENDERS THE WASH OUT AREA NO LONGER FUNCTIONAL.
3. SIGNS SHALL BE 18" X 12" MIN. SIZE WITH 2" BLACK LETTERING ON A WHITE BACKGROUND AND MOUNTED A MINIMUM OF 7 FEET ABOVE GRADE FROM THE LOWEST EDGE OF THE SIGN FACE.

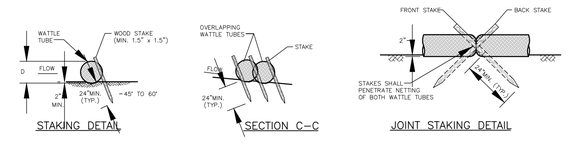
CW CONCRETE WASHOUT
NOT TO SCALE



H_c = HEIGHT OF CULVERT
W_c = WIDTH OF CULVERT
L_A = LENGTH OF RIP-RAP APRON
W_A = WIDTH OF RIP-RAP APRON AT END
D_{50} = MEDIAN SIZE OF RIP-RAP
D_{MAX} = MAXIMUM SIZE OF RIP-RAP = 1.5 D_{50}
D_A = DEPTH OF RIP-RAP APRON = 1.5 D_{MAX}
SEPARATOR = GEOTEXTILE UNDERLAYMENT OR GRAVEL FILTER BLANKET

OP OUTLET PROTECTION
NOT TO SCALE





EE EROSION EELS
NOT TO SCALE

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

No.	REVISIONS	DATE	BY
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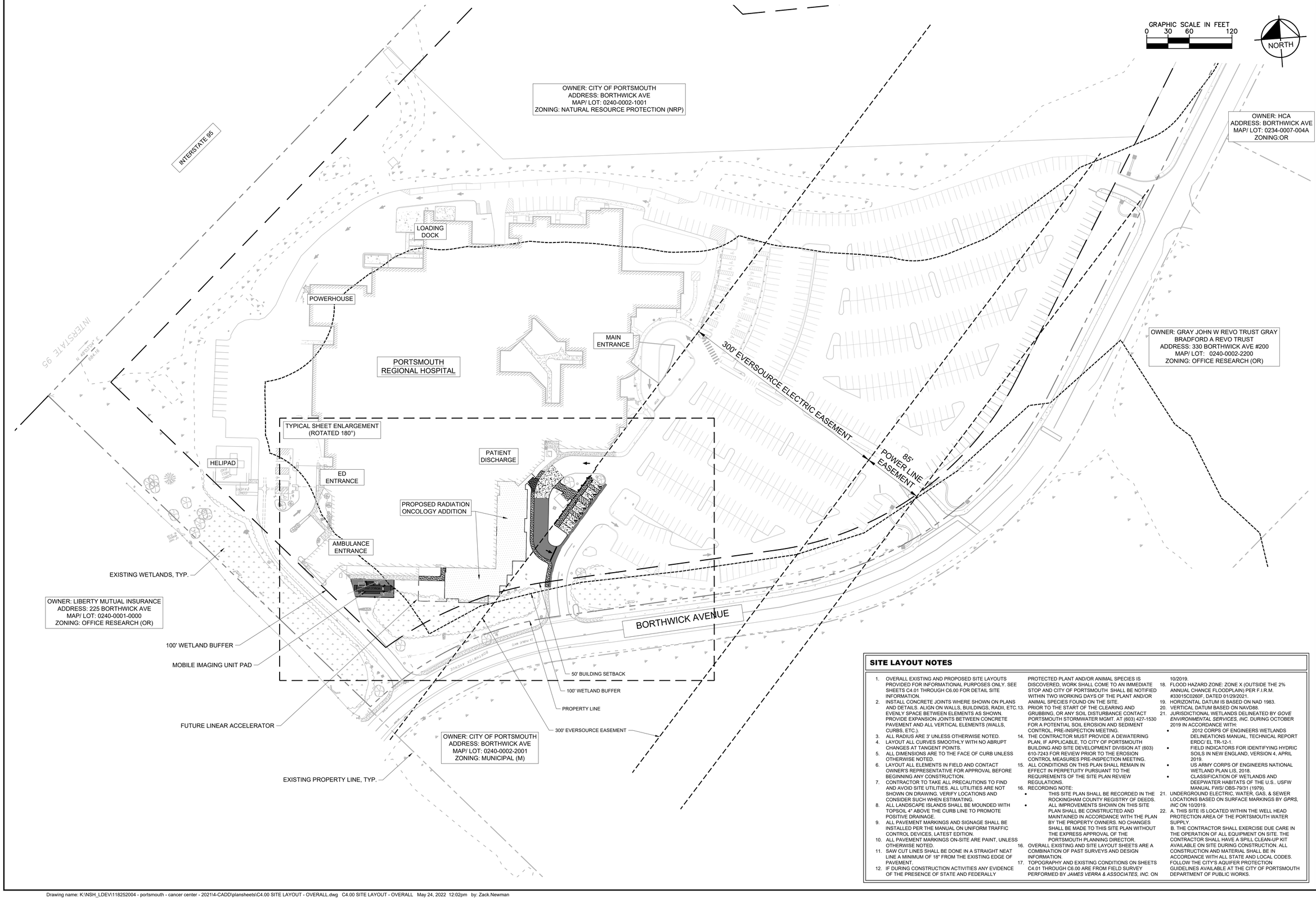
DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

EROSION CONTROL DETAILS

C3.02



SITE LAYOUT NOTES

1. OVERALL EXISTING AND PROPOSED SITE LAYOUTS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. SEE SHEETS C4.01 THROUGH C6.00 FOR DETAIL SITE INFORMATION.
2. INSTALL CONCRETE JOINTS WHERE SHOWN ON PLANS AND DETAILS. ALIGN ON WALLS, BUILDINGS, RADII, ETC. EVENLY SPACE BETWEEN ELEMENTS AS SHOWN. PROVIDE EXPANSION JOINTS BETWEEN CONCRETE PAVEMENT AND ALL VERTICAL ELEMENTS (WALLS, CURBS, ETC.).
3. ALL RADIUS ARE 3' UNLESS OTHERWISE NOTED.
4. LAYOUT ALL CURVES SMOOTHLY WITH NO ABRUPT CHANGES AT TANGENT POINTS.
5. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
6. LAYOUT ALL ELEMENTS IN FIELD AND CONTACT OWNERS REPRESENTATIVE FOR APPROVAL BEFORE BEGINNING ANY CONSTRUCTION.
7. CONTRACTOR TO TAKE ALL PRECAUTIONS TO FIND AND AVOID SITE UTILITIES. ALL UTILITIES ARE NOT SHOWN ON DRAWING. VERIFY LOCATIONS AND CONSIDER SUCH WHEN ESTIMATING.
8. ALL LANDSCAPE ISLANDS SHALL BE MOUNDED WITH TOPSOIL 4" ABOVE THE CURB LINE TO PROMOTE POSITIVE DRAINAGE.
9. ALL PAVEMENT MARKINGS AND SIGNAGE SHALL BE INSTALLED PER THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
10. ALL PAVEMENT MARKINGS ON-SITE ARE PAINT, UNLESS OTHERWISE NOTED.
11. SAW CUT LINES SHALL BE DONE IN A STRAIGHT NEAT LINE A MINIMUM OF 18" FROM THE EXISTING EDGE OF PAVEMENT.
12. IF DURING CONSTRUCTION ACTIVITIES ANY EVIDENCE OF THE PRESENCE OF STATE AND FEDERALLY PROTECTED PLANT AND/OR ANIMAL SPECIES IS DISCOVERED, WORK SHALL COME TO AN IMMEDIATE STOP AND CITY OF PORTSMOUTH SHALL BE NOTIFIED WITHIN TWO WORKING DAYS OF THE PLANT AND/OR ANIMAL SPECIES FOUND ON THE SITE.
13. PRIOR TO THE START OF THE CLEARING AND GRUBBING, OR ANY SOIL DISTURBANCE CONTACT PORTSMOUTH STORMWATER MGMT. AT (603) 427-1530 FOR A POTENTIAL SOIL EROSION AND SEDIMENT CONTROL, PRE-INSPECTION MEETING.
14. THE CONTRACTOR MUST PROVIDE A DEWATERING PLAN, IF APPLICABLE, TO CITY OF PORTSMOUTH BUILDING AND SITE DEVELOPMENT DIVISION AT (603) 610-7243 FOR REVIEW PRIOR TO THE EROSION CONTROL MEASURES PRE-INSPECTION MEETING.
15. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
16. RECORDING NOTE:
    - THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
    - ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
16. OVERALL EXISTING AND SITE LAYOUT SHEETS ARE A COMBINATION OF PAST SURVEYS AND DESIGN INFORMATION.
17. TOPOGRAPHY AND EXISTING CONDITIONS ON SHEETS C4.01 THROUGH C6.00 ARE FROM FIELD SURVEY PERFORMED BY *JAMES VERRA & ASSOCIATES, INC.* ON 10/2019.
18. FLOOD HAZARD ZONE: ZONE X (OUTSIDE THE 2% ANNUAL CHANCE FLOODPLAIN) PER F.I.R.M. #33015C0260F, DATED 01/29/2021.
19. HORIZONTAL DATUM IS BASED ON NAD 1983.
20. VERTICAL DATUM BASED ON NAVD88.
21. JURISDICTIONAL WETLANDS DELINEATED BY *GOVE ENVIRONMENTAL SERVICES, INC.* DURING OCTOBER 2019 IN ACCORDANCE WITH:
    - 2012 CORPS OF ENGINEERS WETLANDS DELINEATIONS MANUAL, TECHNICAL REPORT ERDC/ EL TR-12-1.
    - FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, APRIL 2019.
    - US ARMY CORPS OF ENGINEERS NATIONAL WETLAND PLAN LIS, 2018.
    - CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE U.S., USFW MANUAL FWS/ OBS-79/31 (1979).
21. UNDERGROUND ELECTRIC, WATER, GAS, & SEWER LOCATIONS BASED ON SURFACE MARKINGS BY *GPRS, INC* ON 10/2019.
22. A. THIS SITE IS LOCATED WITHIN THE WELL HEAD PROTECTION AREA OF THE PORTSMOUTH WATER SUPPLY.
    B. THE CONTRACTOR SHALL EXERCISE DUE CARE IN THE OPERATION OF ALL EQUIPMENT ON SITE. THE CONTRACTOR SHALL HAVE A SPILL CLEAN-UP KIT AVAILABLE ON SITE DURING CONSTRUCTION. ALL CONSTRUCTION AND MATERIAL SHALL BE IN ACCORDANCE WITH ALL STATE AND LOCAL CODES. FOLLOW THE CITY'S AQUIFER PROTECTION GUIDELINES AVAILABLE AT THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

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KIMLEY-HORN PROJECT NO. 118252004

SITE LAYOUT - OVERALL

C4.00

SITE DATA TABLE

OWNER OF RECORD	HCA HEALTH SERVICES OF NH INC D/B/A PRH 32902	
SITE ADDRESS	333 BORTHWICK AVE, PORTSMOUTH, NH 03801	
SITE AREA	± 20.87 AC	
DISTURBANCE LIMITS W/ THIS PROJECT	± 0.7 AC	
TAX MAP & LOT	TAX MAP 240, LOT 2-1	
ZONING	OR - OFFICE RESEARCH	
SETBACKS	REQUIRED	PROPOSED
FRONT YARD SETBACK	50'-0"	±40'
REAR YARD SETBACK	50'-0"	±157'
SIDE YARD SETBACK	75'-0"	±71' * (EXISTING)
MIN. OPEN SPACE ON A LOT	30%	± 38.3%
MAX BUILDING COVERAGE	30%	± 20.1%
BUILDING DATA		
	EXISTING	PROPOSED ADDITION
HOSPITAL BEDS	233	0
HOSPITAL/ MOB FLOOR PLATE	±173,916 SF	± 8,700 SF
HOSPITAL GROSS AREA	±427,495 SF	± 8,870 SF
MEDICAL OFFICE BUILDING GROSS AREA (ATTACHED TO HOSPITAL BUILDING)	±46,665 SF	0 SF
BUILDING HEIGHT	± 65'-4"	± 14'-8"

PAVEMENT LEGEND

	DESCRIPTION	DET #/ SHT #
	SIDEWALK CONCRETE	1 / C7.00
	ASPHALT PAVEMENT	2 / C7.00
	CONCRETE PAVEMENT	3 / C7.00
	MOBILE IMAGING CONCRETE PAD	4 / C7.00
	SPECIALITY SIDEWALK PAVEMENT	NOTE THIS SHEET

SPECIALITY SIDEWALK PAVEMENT NOTE

COLORED CONCRETE SURFACE WITH MEDIUM BROOM FINISH, CONSISTING OF SCOFIELD LITHOCHROME COLOR HARDENER, COLOR TO BE SELECTED BY ARCHITECT. SEAL CURED, COLORED SURFACE WITH SCOFIELD SCOFIELD CURESEAL-VOC MATTE FINISH CLEAR SEALANT. PREPARE SURFACES AND APPLY MATERIALS PER MANUFACTURER'S SPECIFICATIONS.

PARKING SUMMARY

	EXISTING	DEMOLISHED	PROPOSED	NET RESULT
ONSITE STANDARD SPACES	754	11	2	745
ONSITE ACCESSIBLE (INCLUDING VAN ACCESSIBLE)	29	4	6	31
OFFSITE STANDARD SPACES*	0	0	490	490
OFFSITE ACCESSIBLE (INCLUDING VAN ACCESSIBLE)*	0	0	11	11
TOTAL				1277

*PER SATELLITE PARKING LOT DRAWINGS PREPARED BY TIGHE & BOND

SITE LAYOUT NOTES

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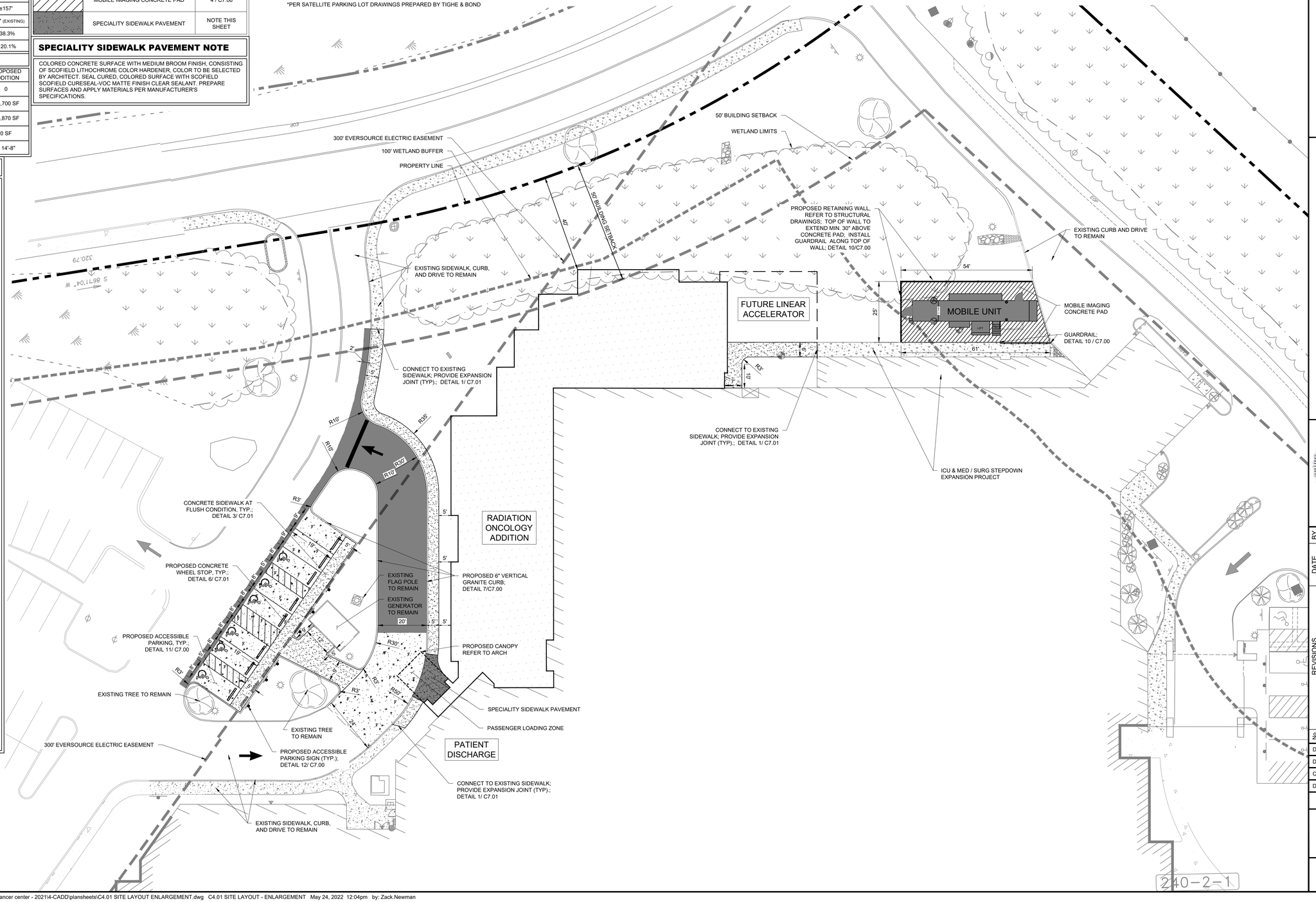

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ANDREW JAMES SCHALL
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DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

SITE LAYOUT - ENLARGEMENT

C4.01

Drawing name: K:\NSH_LDEV\118252004 - portsmouth - cancer center - 2021\4-CADD\plansheets\C4.01 SITE LAYOUT ENLARGEMENT.dwg C4.01 SITE LAYOUT - ENLARGEMENT May 24, 2022 12:04pm by: Zack.Newman

GRADING NOTES

1. CONTRACTOR RESPONSIBLE FOR VERIFYING LOCATION, SIZE, AND ELEVATIONS OF EXISTING UTILITIES AT CONNECTION POINTS PRIOR TO GRADING OR INSTALLATION OF ANY PROPOSED UTILITIES. CONTRACTOR TO IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE IF DISCREPANCIES ARE FOUND.
2. ADDITIONAL EROSION CONTROL DEVICES TO BE USED AS REQUIRED BY LOCAL INSPECTOR.
3. DISTURBED AREAS LEFT IDLE FOR FIVE DAYS, AND NOT TO FINAL GRADE, WILL BE ESTABLISHED TO TEMPORARY VEGETATION. MULCH, TEMPORARY VEGETATION OR PERMANENT VEGETATION SHALL BE COMPLETED ON ALL EXPOSED AREAS WITHIN 14 DAYS AFTER DISTURBANCE. ALL AREAS TO FINAL GRADE WILL BE ESTABLISHED TO PERMANENT VEGETATION UPON COMPLETION.
4. WHEN HAND PLANTING, MULCH (HAY OR STRAW) SHOULD BE UNIFORMLY SPREAD OVER SEEDED AREA WITHIN 24 HOURS OF SEEDING. IF UNABLE TO ACCOMPLISH, MULCH SHALL BE USED AS A TEMPORARY COVER. CONCENTRATED FLOW AREAS AND ALL SLOPES STEEPER THAN 2.5:1 AND WITH A HEIGHT OF TEN FEET OR GREATER (DOES NOT APPLY TO RETAINING WALLS), AND CUTS AND FILLS WITHIN BUFFERS, SHALL BE STABILIZED WITH THE APPROPRIATE EROSION CONTROL MATTING OR BLANKETS.
5. THE GRADING PERMIT/ SITE PERMIT MUST BE DISPLAYED ON SITE AT ALL TIMES DURING CONSTRUCTION AND IN PLAIN VIEW FROM A PUBLIC ROAD OR STREET.
6. EROSION AND SEDIMENT CONTROL DEVICES MUST BE DISPLAYED AND INSPECTED PRIOR TO ANY GRADING ON SITE. THE CONTRACTOR MUST CALL FOR AN INSPECTION TO OBTAIN A PERMIT TO GRADE. PLEASE CALL WITH ENOUGH LEAD-TIME FOR AN INSPECTION TO MEET YOUR SCHEDULE.
7. SEDIMENT/EROSION CONTROL DEVICES MUST BE INSPECTED ACCORDING TO LOCAL AND STATE REQUIREMENTS AND AS STIPULATED IN THE STORMWATER POLLUTION PREVENTION PLAN. EACH DEVICE IS TO BE MAINTAINED OR REPLACED IF SEDIMENT ACCUMULATION HAS REACHED ONE HALF THE CAPACITY OF THE DEVICE. ADDITIONAL DEVICES MAY BE NECESSARY AS THE PROJECT PROGRESSES AND NEW CHANNELS HAVE DEVELOPED.
8. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND-DISTURBING ACTIVITIES.
9. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION CONTROL AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
10. CONTRACTOR SHALL REVIEW SITE GEOTECHNICAL REPORT BEFORE COMMENCING GRADING OPERATIONS.
11. SEED ALL DISTURBED AREAS UNLESS OTHERWISE NOTED AS PART OF THIS CONTRACT. REFER TO LANDSCAPING PLANS FOR AREAS TO RECEIVE SOD.
12. INSTALL SOD OR RIPRAP IN SWALES AS INDICATED ON GRADING PLANS AND EROSION CONTROL PLANS
13. TOPSOIL ON SITE TO BE STRIPPED AND STOCKPILED FOR REUSE IN LAWN AREAS.
14. ADEQUATE DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES, BEST MANAGEMENT PRACTICES, AND/OR OTHER WATER QUALITY MANAGEMENT FACILITIES SHALL BE PROVIDED AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION. DAMAGES TO ADJACENT PROPERTY AND/OR THE CONSTRUCTION SITE CAUSED BY THE CONTRACTOR'S OR PROPERTY OWNER'S FAILURE TO PROVIDE AND MAINTAIN ADEQUATE DRAINAGE AND EROSION/SEDIMENT CONTROL FOR THE CONSTRUCTION AREA SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER AND/OR CONTRACTOR.
15. UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED BY THE OWNER, DESIGNER, OR THEIR REPRESENTATIVES. BEFORE YOU DIG CALL ONE CALL--811 OR 1-800-752-6007
16. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT RESULT FROM THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY UNDERGROUND UTILITIES TO REMAIN.
18. HORIZONTAL DATUM IS BASED ON NAD 1983.
19. VERTICAL DATUM BASED ON NAVD88.
20. CONTRACTOR TO FIELD VERIFY FINISHED FLOOR ELEVATION.

GRADING PLAN LEGEND

28.60	SPOT ELEVATION			
	HP	HIGH POINT	LP	LOW POINT
	TC	TOP OF CURB	BC	BOTTOM OF CURB / GUTTER LINE
	TW	GRADE AT TOPSIDE OF WALL	BW	GRADE AT BOTTOM SIDE OF WALL
	INV	INVERT	RIM	TOP OF GRATE / COVER
	ME	MATCH EXISTING		
FFE 28.60	FINISH FLOOR ELEVATION			
27	EXISTING CONTOUR			
27	PROPOSED CONTOUR			

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

PROPERTY LINE, TYP
EXISTING 24" RCP
RETAINING WALL; REFER TO STRUCTURAL DRAWINGS
BUILDING FOUNDATION WALL; REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS
12" ROOF LEADER TERMINATING AT BUILDING WALL; REFER TO MEP & STRUCTURAL DRAWINGS
PROPOSED WATER LINES. REFER TO C6.00
EXISTING 21" RCP
WETLAND LIMITS
HEADWALL (TYP.); DETAIL 4/ C4.01
EXISTING MONITORING WELL
HEADWALL (TYP.); DETAIL 4/ C4.01
PROPOSED POND EXPANSION
PROPOSED ROOF DRAIN CONNECTION. REFER TO MEP DRAWINGS FOR CONTINUATION
SLOPE FROM FLUSH CONDITION TO MOBILE IMAGING PAD
GUARDRAIL DETAIL 10 / C7.00
MOBILE UNIT
NEW MOBILE IMAGING PAD; MAXIMUM 2% SLOPE IN ANY DIRECTION
EXISTING 10" ROOF LEADER
A0
INV: 22.50
44 LF OF 16" RCP @ 4.55%
PROPOSED CURB INLET; DETAIL 11/ C7.01
A1
RIM: 26.60
INV IN: 23.35
INV OUT: 23.15
SLOPE NEW DRIVE TO EXISTING PAVEMENT ELEVATION
FLUSH SIDEWALK. MAX 2% CROSS SLOPE MAX 5% LONGITUDINAL SLOPE
SAWCUT LINE (TYP)
ACCESSIBLE PARKING; MAXIMUM 2% SLOPE IN ANY DIRECTION
TURNING MANEUVER MAX 2% SLOPE ANY DIRECTION
12" PVC @ 1.46%
30 LF OF
FFE = ±27.8
(MATCH EXISTING)
A2
RIM: 27.44
INV IN: 23.99
INV OUT: 23.79
PROPOSED AREA DRAIN / BUILDING ROOF DRAIN CONNECTION. REFER TO MEP DRAWINGS FOR CONTINUATION; DETAIL 10/ C7.01
32 LF OF 8" PVC @ 1.46%
A3
RIM: 27.76
INV OUT: 24.75
PROPOSED AREA DRAIN / CANOPY ROOF DRAIN CONNECTION. REFER TO MEP DRAWINGS FOR CONTINUATION; DETAIL 10/ C7.01
PASSENGER LOADING ZONE; MAXIMUM 2% SLOPE IN ANY DIRECTION
SLOPE NEW DRIVE TO EXISTING PAVEMENT ELEVATION
EXISTING SANITARY SEWER

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GRADING & DRAINAGE PLAN

C5.00

87,/,7< 127(6

1. CONTRACTOR RESPONSIBLE FOR VERIFYING EXISTING ELEVATIONS COMPARED TO THOSE SHOWN ON PLAN PRIOR TO GRADING. NOTIFY OWNER'S REPRESENTATIVE IF DISCREPANCIES ARE FOUND.
2. ALL WATER AND SEWER MATERIALS AND CONSTRUCTION SHALL BE IN COMPLIANCE WITH CITY OF PORTSMOUTH WATER/ SEWER DEPARTMENT STANDARD SPECIFICATIONS.
3. MAINTAIN MINIMUM 10 FEET HORIZONTAL SEPARATION BETWEEN WATER & SANITARY SEWER OR 18" VERTICAL SEPARATION AT CROSSING LOCATIONS.
4. REFER TO CITY OF PORTSMOUTH WATER/ SEWER DEPARTMENT STANDARD SPECIFICATIONS FOR PIPE BEDDING REQUIREMENTS.
5. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS OF WATER & SANITARY SEWER CONSTRUCTION PRIOR TO THE ACCEPTANCE OF THE PUBLIC UTILITIES.

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CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES AND/OR CONFLICTS WITH EXISTING OR PROPOSED UTILITIES PRIOR TO PROCEEDING.

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

EXISTING FDC
EXISTING FIRE HYDRANT
PROPERTY LINE
EXISTING 4" FIRE LINE TO REMOTE FDC
EXISTING 6" FIRE LINE
22.5° BEND
90° BEND
6"X6" TAPPING SLEEVE AND VALVE
RELOCATE 4" FIRE LINE TO REMOTE FDC AROUND NEW MOBILE IMAGING PAD
4"X4" TEE
45° BEND
RELOCATED DECON TANK; REFER TO MEP DRAWINGS AND DETAILS
MOBILE UNIT
EXISTING SEWER LINE
6" FIRE LINE TO EXISTING FIRE PUMP ROOM. REFER TO MEP DRAWINGS FOR CONTINUATION INSIDE BUILDING
6"X6" TAPPING SLEEVE AND VALVE ON EXISTING 6" FIRE LINE TO EXISTING FIRE PUMP ROOM
EXISTING 10" ROOF LEADER
POST INDICATOR VALVE; DETAIL 9, C7.01
45° BEND
NEW SEWER DOGHOUSE MANHOLE WITH INTERIOR DROP CONNECTION FOR NEW SEWER SERVICE LINE FOR NEW BUILDING EXPANSION; DETAIL 7/ C7.01
TC = +/-27.0'
EXISTING 10" INV = ± 17.0'
PROPOSED 6" INV = ± 18.9'
CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 10" SEWER PIPE AND INVERT
PROPOSED 42 LF OF 6" PVC AT 1% MIN. SLOPE
FFE = ±27.8
(MATCH EXISTING)
PROPOSED SEWER CLEANOUT
INV OUT = 21.0'
DETAIL 8/ C7..01
REFER TO MEP DRAWINGS FOR FOR CONTINUATION INSIDE BUILDING
EXISTING GENERATOR TO REMAIN
EXISTING 10" SEWER LINE
EXISTING TRANSFORMER TO REMAIN
EXISTING SEWER MANHOLE
TC = 27.27
10" INV = 17.59
21" RCP
24" RCP
APPROXIMATE SEWER LOCATION
240-2-1

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE
ANDREW JAMES SCHALL
No. 15914
LICENSED PROFESSIONAL ENGINEER

No.	REVISIONS	DATE	BY
1			
2			
3			
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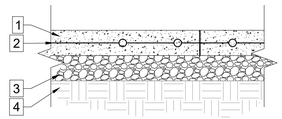
8			
9			
10			

DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

SITE UTILITY PLAN

C6.00

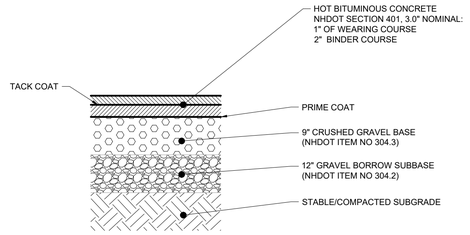


NOTES:
1. PAVEMENT SECTION TO BE PROVIDED BY GEOTECHN REPORT. FINAL PAVEMENT SECTION TO BE DETERMINED BY ONSITE GEOTECH BASED UPON EXISTING SOIL CONDITIONS.
2. FIBER MESH REINFORCING CAN BE SUBSTITUTED FOR WWM. APPLICATION RATES SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
3. ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH NH- DOT STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, LATEST EDITION.
4. LIGHT BROOM FINISH SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL.

PAVEMENT LEGEND

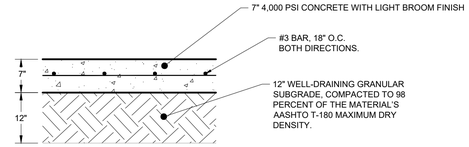
1	4" 3,500 PSI CONCRETE WITH LIGHT BROOM FINISH
2	6 X 6, 10, 10 W.W.M.
3	6" COMPACTED CRUSHED GRAVEL (NHDOT 304.3)
4	COMPACTED SUBGRADE

1 CONCRETE SIDEWALK
NOT TO SCALE



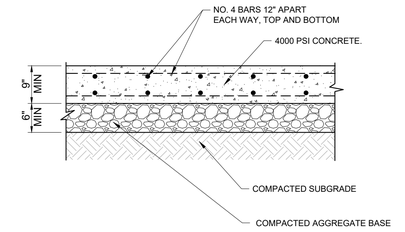
NOTES:
1. PAVEMENT SECTION PER GEOTECH ENGINEER REPORT PREPARED BY HALEY & ALDRICH, INC., DATED APRIL 2022. FINAL PAVEMENT SECTION TO BE DETERMINED BY ONSITE GEOTECH BASED UPON EXISTING SOIL CONDITIONS.
2. ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH NH-DOT STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, LATEST EDITION.

2 HEAVY DUT ASPHALT
NOT TO SCALE



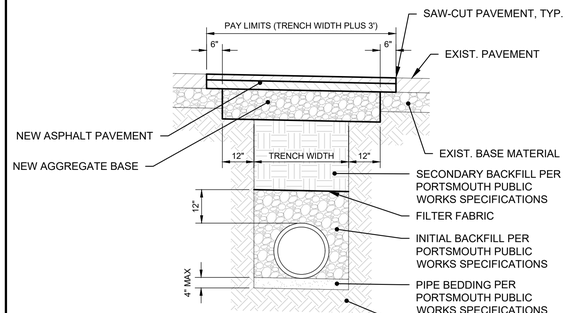
NOTES:
1. SEE GEOTECHNICAL SPECIFICATIONS FOR SUBGRADE REQUIREMENTS. PAVING SECTION PROVIDED IS TAKEN FROM THE ASSOCIATED GEOTECH REPORT.
2. ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH NHDOT STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, LATEST EDITION.
3. BROOM FINISH SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL.
4. PLACE EXPANSION JOINTS AT A MAXIMUM OF 75' O.C. AND 1.75" DEEP.
5. PLACE CONTROL JOINTS AT A MAXIMUM OF 14' O.C.

3 CONCRETE PAVEMENT
NOT TO SCALE



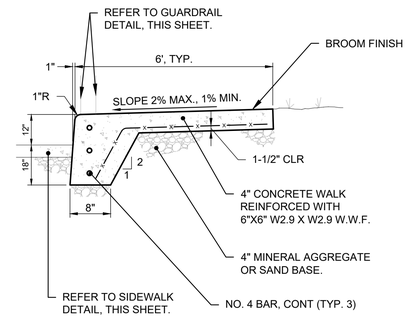
NOTE:
CONTRACTOR TO VERIFY SLAB THICKNESS AND REINFORCING WITH THE MOBILE IMAGING UNIT VENDOR. SOME SYSTEMS MAY REQUIRE THICKER PAVEMENT AND/OR NON-FERROUS REINFORCEMENT OR FIBERGLASS REINFORCED CONCRETE.

4 MOBILE IMAGING CONCRETE PAD
NOT TO SCALE



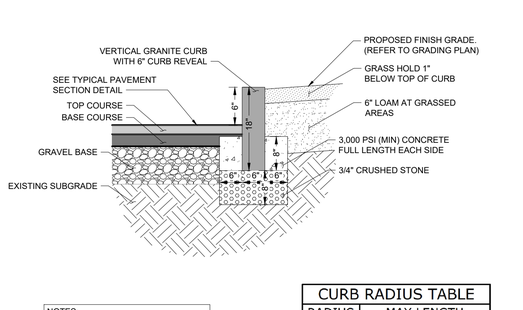
NOTES:
1. THE NEW ASPHALT PAVEMENT SHALL BE OF THE SAME TYPE AND, AT A MINIMUM, THE SAME THICKNESS AS THE EXISTING ASPHALT PAVEMENT.
2. THE NEW AGGREGATE BASE SHALL BE AT LEAST 1.5 TIMES THE THICKNESS OF THE EXISTING AGGREGATE BASE (6" MINIMUM).

5 PAVEMENT TRENCH REPAIR
NOT TO SCALE



NOTES:
1. USE 4000 PSI CONCRETE AND GRADE 60 STEEL.
2. PROVIDE CONTROL JOINTS 5' APART AND EXPANSION JOINTS 25' APART, AND WHERE SIDEWALKS ABUT RIGID MATERIALS.

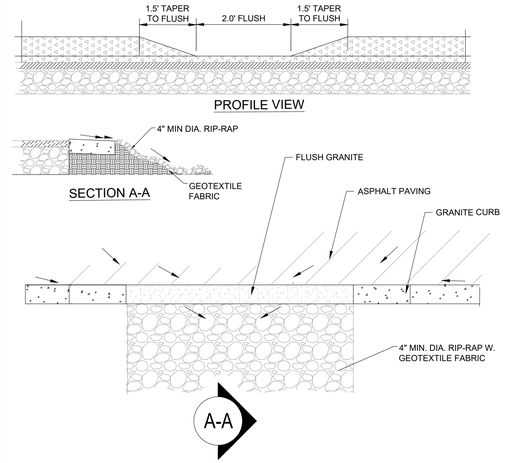
6 SIDEWALK WITH 12" TURNDOWN
NOT TO SCALE



NOTES:
1. ADJOINING STONES SHALL HAVE THE SAME LENGTH.
2. JOINTS BETWEEN STONES SHALL HAVE A MAX SPACING OF 1/2" AND SHALL BE MORTARED.

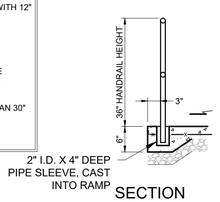
CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

7 6" VERTICAL GRANITE CURB
NOT TO SCALE

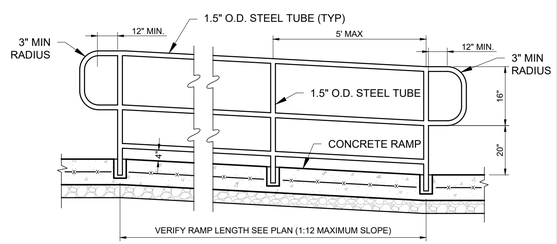


8 CURB CUT
NOT TO SCALE

NOTES:
1. PROVIDE 36" HEIGHT 1.5" O.D. HAND RAIL ON BOTH SIDES OF THE RAMP WITH 12" HAND RAIL EXTENSIONS PAST THE TOP AND BOTTOM OF THE RAMP.
2. VARIATIONS IN HAND RAIL HEIGHT SHALL NOT BE ALLOWED.
3. THE RAMP SHALL HAVE A MINIMUM WIDTH OF 60".
4. HAND RAIL SHALL BE SMOOTH-FINISH. ALL WELDED SURFACES SHALL BE PAINTED WITH TWO COATS OF ENAMEL, COLOR TO BE SELECTED BY THE ARCHITECT.
5. PROVIDE HAND RAIL/GUARD RAIL AT ALL RETAINING WALLS GREATER THAN 30" IN HEIGHT.
6. RAMP CONSTRUCTION SHALL BE SIMILAR TO CONCRETE SIDEWALKS.

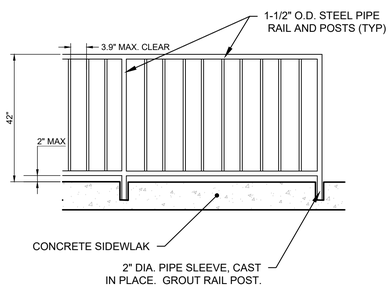


SECTION



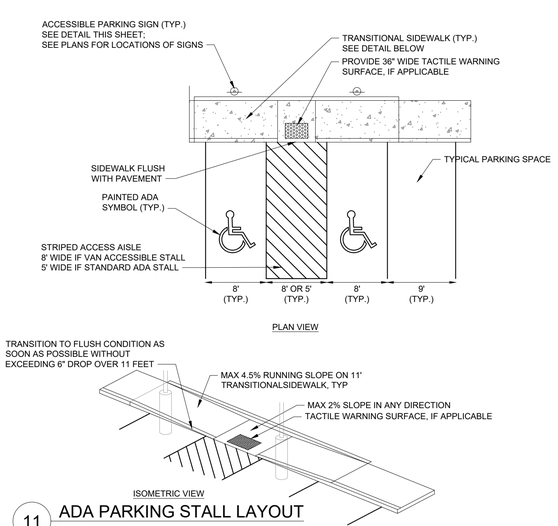
SECTION

9 ACESSIBLE RAMP WITH HANDRAIL
NOT TO SCALE

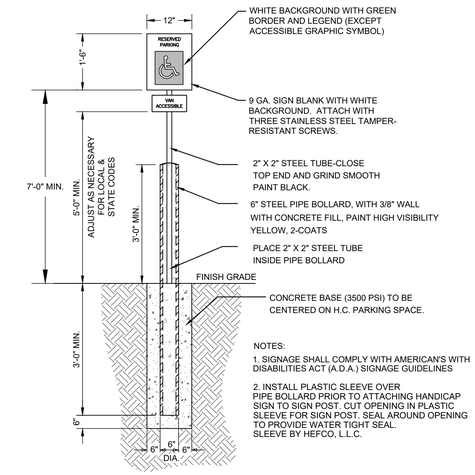


NOTES:
1. VARIATIONS IN GUARD RAIL HEIGHT SHALL NOT BE ALLOWED.
2. MAXIMUM CLEARANCE BETWEEN BOTTOM RAIL AND CONCRETE SHALL BE 2". GUARD RAIL SHALL BE SMOOTH-FINISHED, ALL WELDED SURFACES PRIMED AND PAINTED WITH TWO COATS OF ENAMEL. COLOR TO BE SELECTED BY ARCHITECT.

10 GUARD RAIL
NOT TO SCALE



11 ADA PARKING STALL LAYOUT
NOT TO SCALE



NOTES:
1. SIGNAGE SHALL COMPLY WITH AMERICAN'S WITH DISABILITIES ACT (A.D.A.) SIGNAGE GUIDELINES
2. INSTALL PLASTIC SLEEVE OVER PIPE BOLLARD PRIOR TO ATTACHING HANDICAP SIGN TO SIGN POST. CUT OPENING IN PLASTIC SLEEVE FOR SIGN POST. SEAL AROUND OPENING TO PROVIDE WATER TIGHT SEAL. SLEEVE BY HEFCO, L.L.C.

12 ACCESSIBLE PARKING SIGNAGE
NOT TO SCALE

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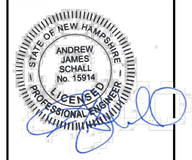
PORTSMOUTH, NEW HAMPSHIRE



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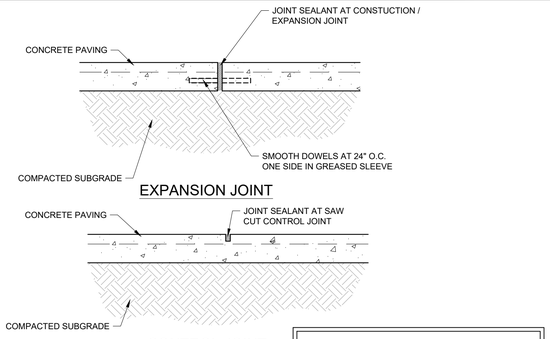
DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

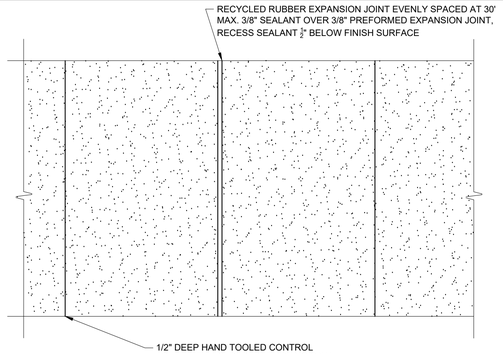
SITE DETAILS

C7.00



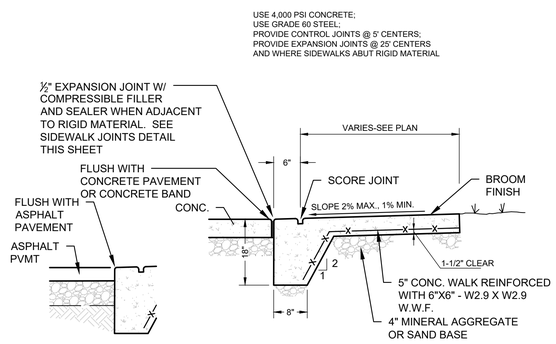
NOTE:
1. CONTROL JOINTS TO BE SPACED EVERY 5' MAX HORIZONTALLY.
2. EXPANSION JOINTS TO BE SPACED EVERY 20' MAX HORIZONTALLY.
3. EXPANSION JOINTS SHALL BE PLACED AT ANY TIE-IN POINT TO EXISTING CONCRETE AND AT ALL VERTICAL INTERFACES WITH BUILDINGS AND WALLS.

1 SIDEWALK JOINT DETAIL
NOT TO SCALE



NOTE:
EXPANSION JOINTS SHALL BE PLACED AT ANY TIE-IN POINT TO EXISTING CONCRETE AND AT ALL VERTICAL INTERFACES WITH BUILDINGS AND WALLS.

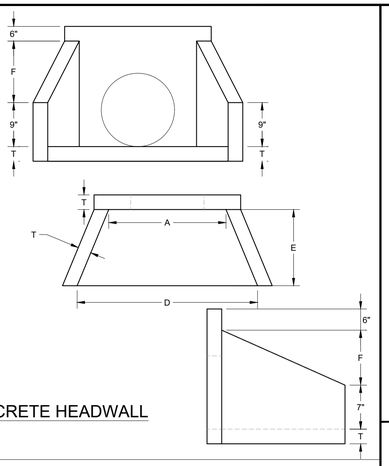
2 CONCRETE JOINT
NOT TO SCALE



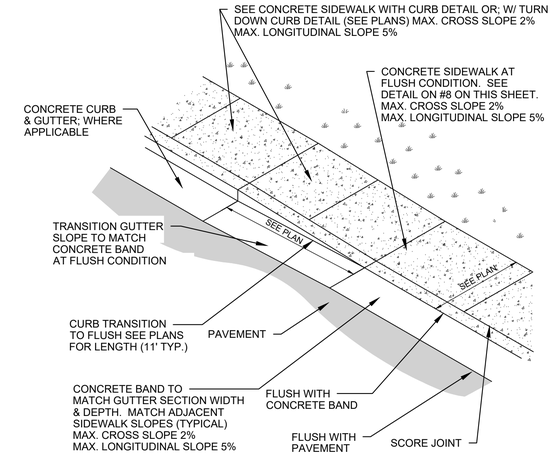
3 SIDEWALK AT FLUSH CONDITION
NOT TO SCALE

TABLE OF DIMENSIONS

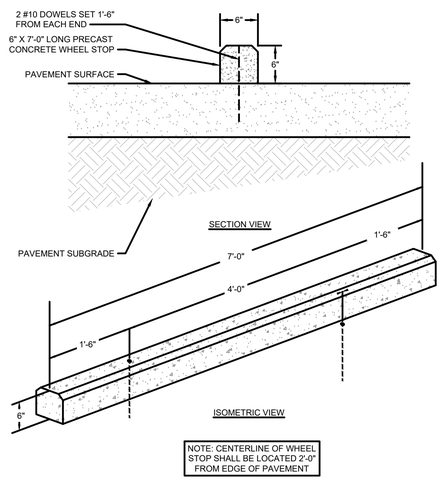
PIPE SIZE	A	D	E	F	T (MIN)
15"	2'-6"	5'-0"	2'-6"	1'-9"	6"
18"	2'-6"	5'-0"	2'-6"	1'-9"	6"
21"	2'-6"	5'-0"	2'-6"	1'-9"	6"
24"	4'-0"	6'-6"	3'-0"	3'-3"	6"
30"	4'-0"	6'-6"	3'-0"	3'-3"	6"
36"	5'-6"	8'-0"	3'-6"	4'-5"	6"
42"	5'-6"	8'-0"	3'-6"	4'-5"	6"
48"	5'-6"	8'-0"	3'-6"	4'-5"	6"
54"	7'-0"	9'-5"	4'-6"	5'-9"	6"
60"	7'-0"	9'-5"	4'-6"	5'-9"	6"
66"	8'-6"	11'-0"	5'-6"	6'-11"	6"
72"	8'-6"	11'-0"	5'-6"	6'-11"	6"



4 PRECAST CONCRETE HEADWALL
NOT TO SCALE

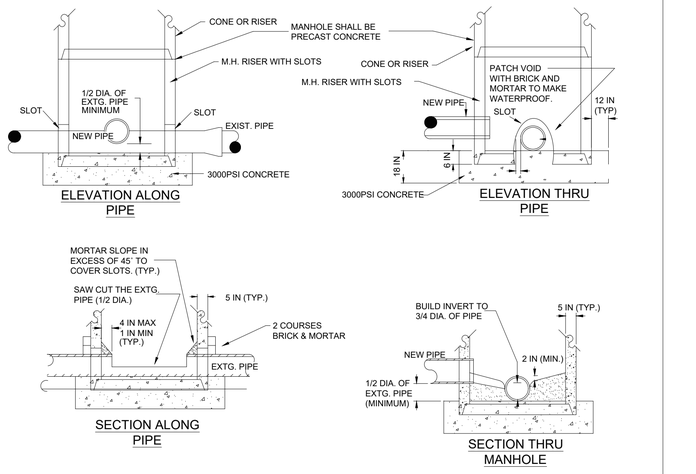


5 SIDEWALK TRANSITION TO FLUSH
NOT TO SCALE

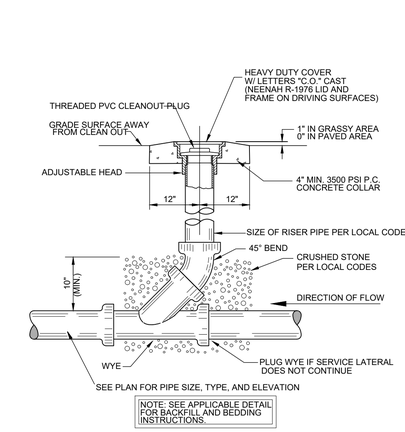


NOTE: CENTERLINE OF WHEEL STOP SHALL BE LOCATED 2'-0" FROM EDGE OF PAVEMENT

6 CONCRETE WHEEL STOP
NOT TO SCALE

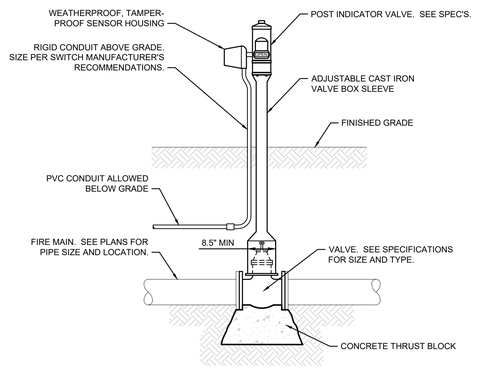


7 DOGHOUSE MANHOLE
NOT TO SCALE

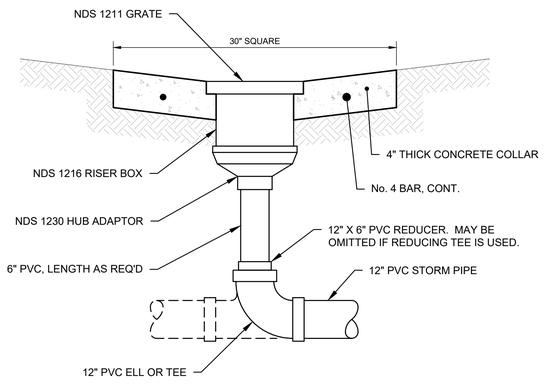


NOTE: SEE APPLICABLE DETAIL FOR BACKFILL AND BEDDING INSTRUCTIONS.

8 STORM / SANITARY SEWER CLEANOUT
NOT TO SCALE

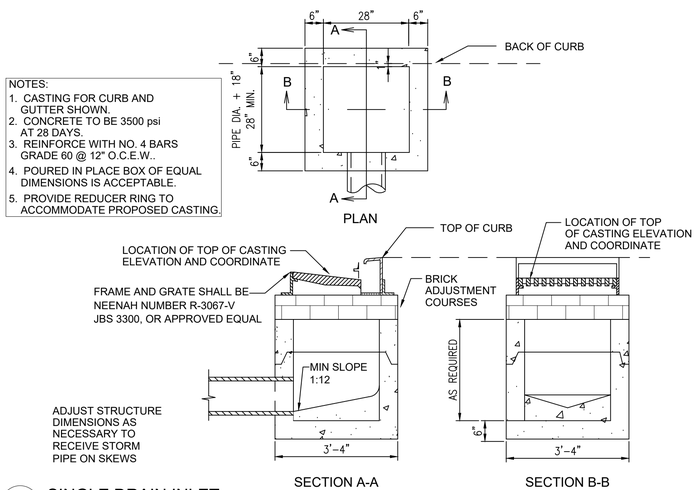


9 POST INDICATOR VAVLE (PIV)
NOT TO SCALE



NDS IS BASIS FOR DESIGN. APPROVED EQUAL MAY BE SUBMITTED TO ENGINEER FOR APPROVAL.

10 12" AREA DRAIN INLET
NOT TO SCALE



11 SINGLE DRAIN INLET
NOT TO SCALE

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE – ANDREW JAMES SCHALL No. 15914 – LICENSED PROFESSIONAL ENGINEER

No.	REVISIONS	DATE	BY
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DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

SITE DETAILS

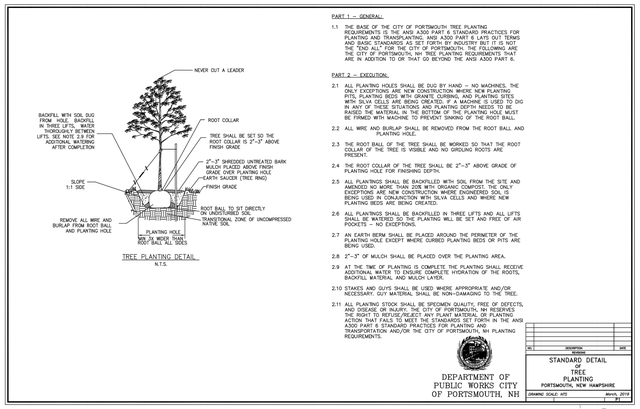
C7.01

PLANT_SCHEDULE

CANOPY TREES	CODE	QTY	BOTANICAL / COMMON NAME	CONT.	CALIPER	HEIGHT
	AF	6	CORYLUS AMERICANA / AUTUMN BLAZE MAPLE	B&B	3" MIN.	14'-16' HT.

SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	CONT.	SPACING	HEIGHT
	AM	11	ARONIA MELANOCARPA / BLACK CHOKEBERRY	5 GAL	9-FT O.C.	3-FT MIN.
	PV	50	PANICUM VIRGATUM / SWITCHGRASS	1 GAL	2-FT O.C.	18" MIN.

GROUND COVERS	CODE	QTY	BOTANICAL / COMMON NAME
	SOD	4,030 SF	SOD
	VARIES	7,600 SF	CONSERVATION SEED MIX / NEW ENGLAND WETMIX (WETLAND SEED MIX)



TREE PLANTING DETAIL
N.T.S.

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT SPECIFIC ENOUGH FOR MUNICIPAL USE. THE FOLLOWING ARE SPECIFICS THE CITY OF PORTSMOUTH HAS IN THE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING BEDS ARE BEING CREATED, OR WHERE SOIL CELLS ARE BEING INSTALLED WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE ADJUSTED, MATERIAL ON THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

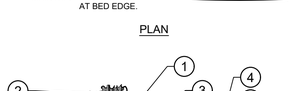
2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-GIMMICKING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING THAT DOES NOT MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

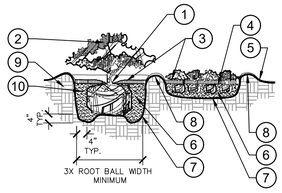
DEPARTMENT OF PUBLIC WORKS CITY OF PORTSMOUTH, NH

NO.	DESCRIPTION	DATE
	REVISED	

STANDARD DETAIL OF TREE PLANTING
PORTSMOUTH, NEW HAMPSHIRE
DRAWING SCALE: NTS — March, 2019 — P1



PLAN



SECTION

1. TOP OF SHRUB ROOTBALLS TO BE PLANTED 1" - 2" HIGH WITH SOIL MOUNDING UP TO THE TOP OF ROOTBALL.
2. PRUNE ALL SHRUBS TO ACHIEVE A UNIFORM MASS/HEIGHT.
3. 3" MULCH LAYER AS SPECIFIED.
4. EXCAVATE ENTIRE BED SPECIFIED FOR GROUNDCOVER BED.
5. FINISHED GRADE (SEE GRADING PLAN).
6. PREPARED PLANTING SOIL AS SPECIFIED. (SEE LANDSCAPE NOTES) NOTE: WHEN GROUND-COVERS AND SHRUBS USED IN MASSES, ENTIRE BED TO BE AMENDED WITH PLANTING SOIL MIX AS SPECIFIED.
7. SCARIFY OF PLANTING PIT SIDES AND BOTTOM.
8. 4" HIGH BERM FIRMLY COMPACTED.
9. UNDISTURBED NATIVE SOIL.
10. FERTILIZER TABLETS (MAX 3" DEEP)

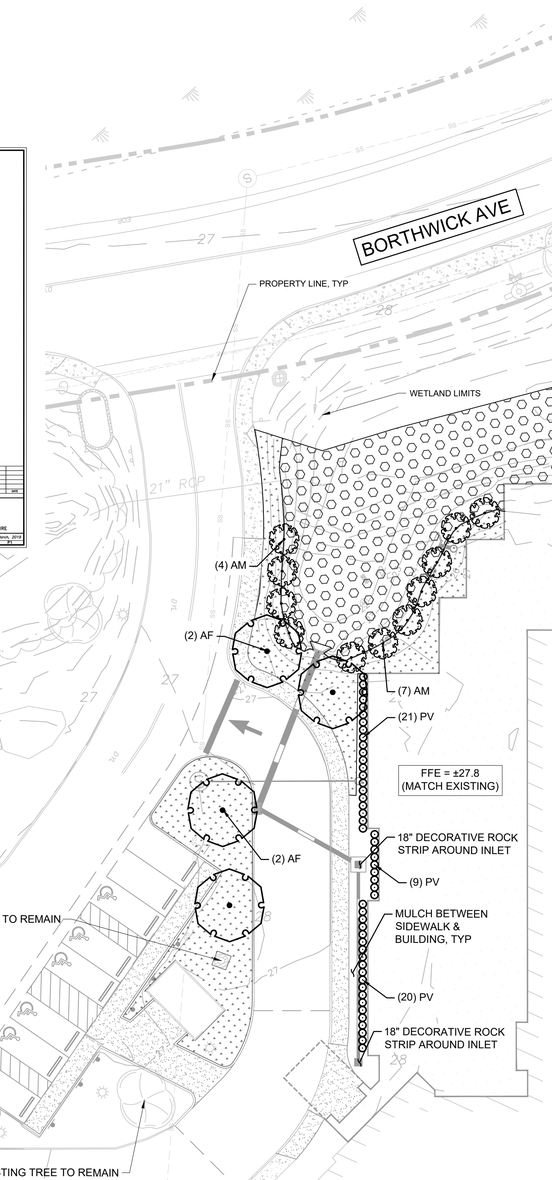
NOTES:

A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS PRIOR TO INSTALLATION.

B. WHEN SHRUBS ARE PRUNED IN MASSES, PRUNE ALL SHRUBS TO ACHIEVE UNIFORM MASS / HEIGHT.

C. ALL SHRUBS AND GROUNDCOVERS SHALL BE PLUMB VERTICALLY, UNLESS OTHERWISE DIRECTED BY OWNERS REPRESENTATIVE.

1 / L101 — SHRUB/GROUNDCOVER PLANTING
SECTION / PLAN — NTS



GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

Kimley»Horn
404 WYMAN STREET, SUITE 385 WALTHAM, MA 02451
MAIN:781.328.0676 | WWW.KIMLEY-HORN.COM

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

STATE OF NEW HAMPSHIRE – ANDREW JAMES SCHALL No. 15914 – LICENSED PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	BY
1			
2			
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DESIGNED BY: ZCN
DRAWN BY: ZCN
CHECKED BY: MEH
DATE: 05/23/2022
KIMLEY-HORN PROJECT NO. 118252004

LANDSCAPE PLAN

L1.00

Drawing name: K:\NSH_LDEV\118252004 - portsmouth - cancer center - 2021\4-CADD\plansheets\L1.00 LANDSCAPE PLAN.dwg L1.00 LANDSCAPE PLAN May 23, 2022 1:51pm by: Zack.Newman

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SHERWOOD DATA - Timothy Cimino
VIDEO - Crew Anderson & Kirk
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REVISIONS:
CONSTRUCTION DOCUMENTS - PRICING SET
DATE: 04 / 25 / 2022

Architects • Planners • Interiors

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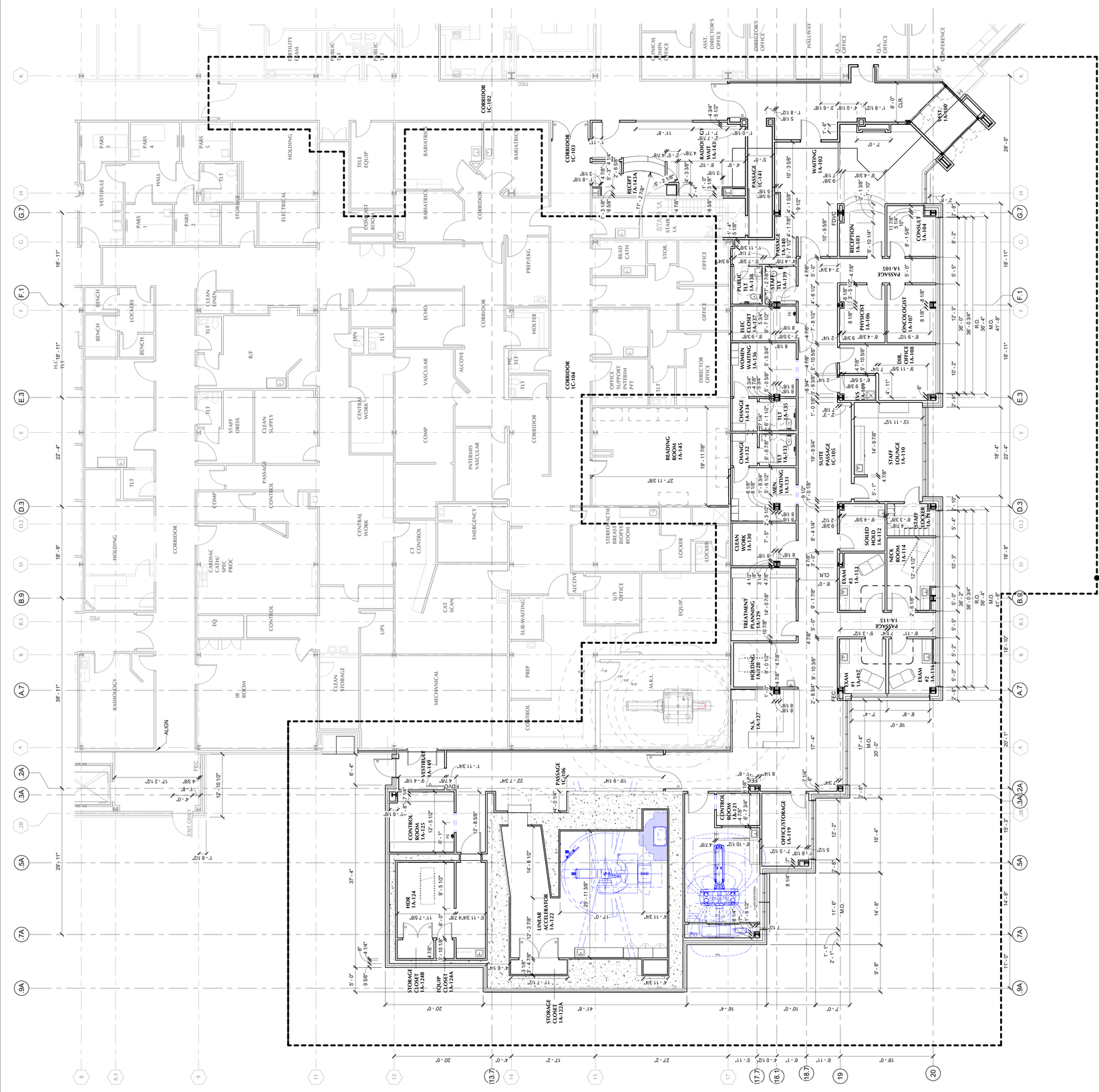
DIMENSION NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. WHERE THERE IS A QUESTION REGARDING DIMENSIONS, CONSULT THE ARCHITECT BEFORE PROCEEDING. DO NOT SCALE DRAWINGS.
2. REFER TO LARGE SCALE PLANS FOR ADDITIONAL DIMENSIONS.
3. ALL INTERIOR WALL DIMENSIONS ARE FROM OUTSIDE FACE OF GYPSUM BOARD TO OUTSIDE FACE OF GYPSUM BOARD OR TO CENTERLINE OF COLUMN UNLESS NOTED OTHERWISE.
4. UNLESS INDICATED OTHERWISE, ALL INTERIOR WALLS ARE 4 7/8" THICK AND ARE CONSTRUCTED OF 5/8" GYPSUM BOARD ON EACH SIDE OF 3 5/8" METAL STUDS.
5. CORRIDOR WIDTHS GIVEN ARE THE MINIMUM CLEAR DIMENSIONS.
6. REFER TO ANSI/ADA DETAILS FOR ACCESSIBLE DOOR CLEARANCE REQUIREMENTS. DOORS SHALL BE MOUNTED 6 INCHES FROM FINISH FACE OF WALL TO HINGE SIDE OF FRAME, UNLESS NOTED OTHERWISE.REFER TO DETAIL 1/6.01.
7. THE DIMENSIONS PROVIDED REFLECT INFORMATION INDICATED IN THE ORIGINAL CONTRACT DOCUMENTS FURNISHED BY THE OWNER AND HAVE NOT BEEN FIELD COORDINATED OTHERWISE NOTED. IT IS INTENDED THAT THE NEW CONSTRUCTION BE ALIGN WITH THE EXISTING BUILDING AS SHOWN. NEW WINDOWS SHALL ALIGN WITHEXISTING WINDOWS BELOW. NEW ARCHITECTURAL ELEMENTS SHALL ALIGN WITH EXISTING ELEMENTS AS SHOWN. IF THE CONTRACTOR SHALL DETERMINE THAT ACTUAL CONDITIONS AS SHOWN AT THE PROJECT SITE ARE DIFFERENT THAN INDICATED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY AND ADJUSTMENTS ARE NECESSARY.
8. CONTRACTOR SHALL "3D LASER SCAN" THE PORTION OF THE EXISTING HOSPITAL WHERE NEW CONSTRUCTION WILL BE ATTACHED TO THE EXISTING FACILITY. THE BUILDING WITH THE LEVEL OF ACCURACY REQUIRED FOR THE PROPER FABRICATION OF THE WALL PANELS AND ALIGNMENT OF WINDOWS AND OTHER ELEMENTS.

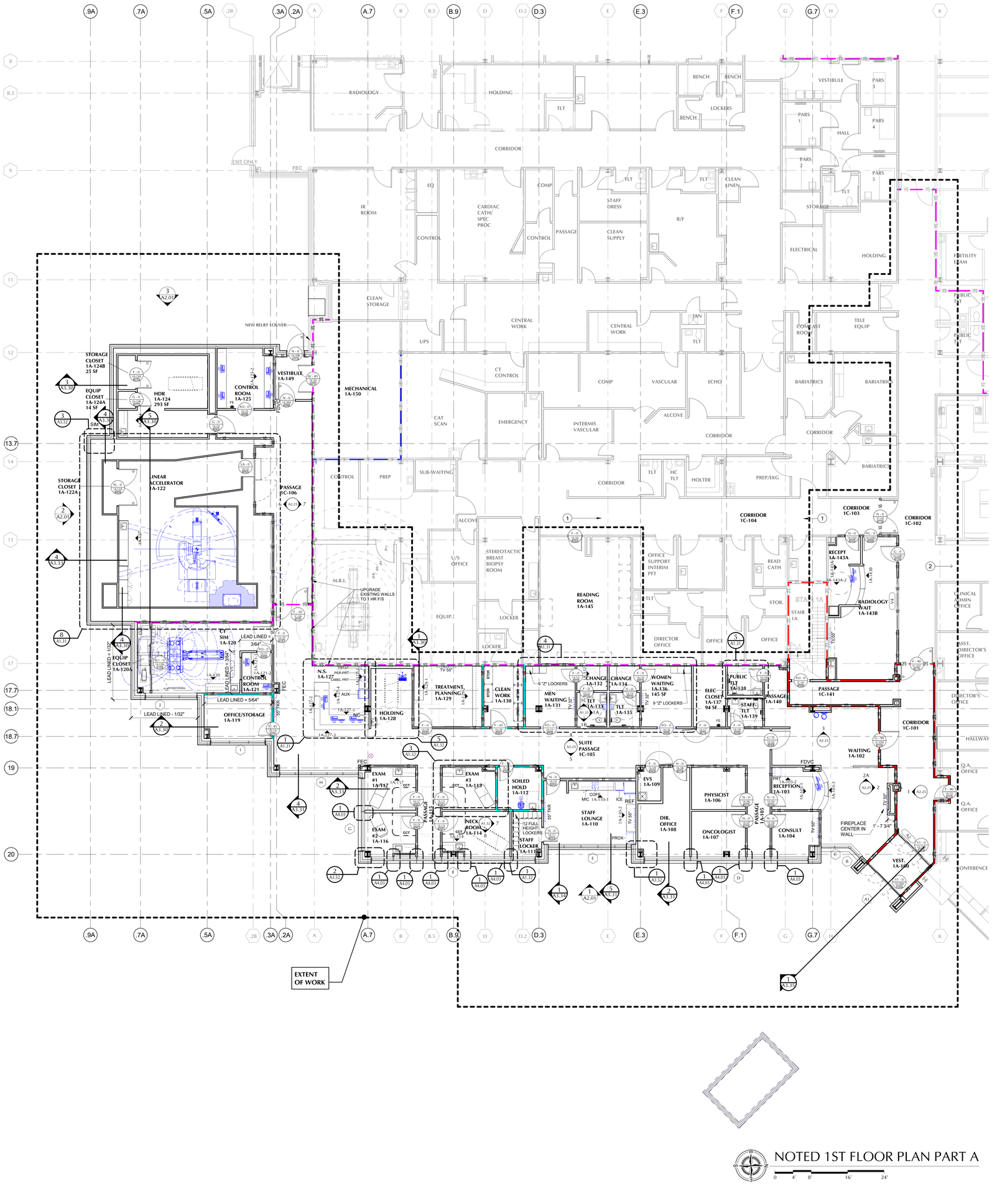


DIMENSIONED 1st FLOOR - PART A

0 4" 8" 16" 24"

RESPONSIBILITY: Author
CHECKED BY: NAME DATE

DRAWING FILE: BIM 3603\376305 - Portsmouth Radiation Oncology\376305 Portsmouth Once .R20.rvt
PLOTTED ON: 4/24/2022 11:58:12 AM



KEYNOTES:

1. REMOVE AND SALVAGE ACT AND/OR SUSPENSION GRID TO SUPPORT MEP SCOPE OF WORK SEE MEP DRAWINGS FOR ADDITIONAL INFORMATION
2. REMOVE AND SALVAGE ACOUSTICAL CEILING TILE AND/OR SUSPENSION GRID FOR APPROXIMATELY 80-FEET TO SUPPORT ELECTRICAL SCOPE OF WORK. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.

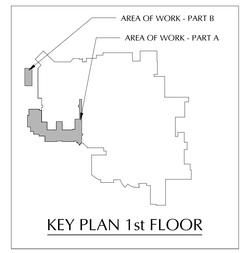
GENERAL FLOOR PLAN NOTES

1. REFER TO A0.00 FOR ADDITIONAL GENERAL NOTES.
2. SEE SHEET A4.01 FOR PARTITION TYPES AND DETAILS.
3. MECHANICAL AND/OR ELECTRICAL PORTIONS OF THE WORK MAY REQUIRE WORK ON THE FLOOR BELOW OR IN SPACES ADJACENT TO THE WORK. THE SCOPE OF PROJECT INCLUDES WORK NECESSARY TO ACCESS THESE AREAS AND TO REPAIR OR REPLACE ANY FINISHES, FLOORS, WALLS, CEILINGS OR OTHER ITEMS DAMAGED OBTAINING SUCH ACCESS.
4. WHEN PENETRATING FLOOR SLAB OR REMOVING MECHANICAL, PLUMBING, ELECTRICAL, AND LOW VOLTAGE FROM FLOOR, SEAL PENETRATION WITH A TESTED FIRE PROTECTION ASSEMBLY WITH A RATING EQUAL TO THE SURROUNDING CONSTRUCTION.
5. REFER TO SOUND TRANSMISSION PLANS FOR SOUND BATT LOCATIONS AND REQUIRED STC RATINGS REQUIRED.
6. REFER TO FINISH AND FURNITURE PLANS FOR TACK BOARD/MARKER BOARD/CLOCK LOCATIONS. PROVIDE NECESSARY BLOCKING FOR THESE ITEMS, WHICH SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR, & FOR ITEMS PROVIDED BY OTHERS.
7. SEE FINISH PLANS FOR CORNER GUARD, HANDRAIL AND DOOR GUARD LOCATIONS.
8. PROVIDE FIRE RETARDANT WOOD BLOCKING AS REQUIRED BY PROJECT CONDITIONS.
9. O.F.E. - OWNER FURNISHED EQUIPMENT INSTALLED BY THE CONTRACTOR, VENDOR OR OWNER. REFER TO THE O.F.E. BROCHURE TO DETERMINE THE PARTY RESPONSIBLE FOR INSTALLATION. OWNER TO PURCHASE AND DELIVER ALL NEW EQUIPMENT TO THE SITE. CONTRACTOR SHALL COORDINATE DELIVERY SCHEDULE WITH OWNER. CONTRACTOR SHALL PROVIDE MECHANICAL, PLUMBING AND ELECTRICAL CONNECTIONS REQUIRED FOR ALL EQUIPMENT IN THE O.F.E BROCHURE.
10. SEE SPECIFICATIONS FOR SPECIFIC LEVEL OF FINISH AND PREPARATION REQUIREMENTS FOR EACH SURFACE.
11. THE OWNER SHALL FURNISH AND THE CONTRACTOR SHALL COORDINATE AND PROPERLY INSTALL THE FOLLOWING:

    A. AT EACH SINK/LAVATORY LOCATION, ONE SOAP DISPENSER UNLESS NOTED OTHERWISE. VERIFY LOCATIONS WITH OWNER'S REPRESENTATIVE.
    B. AT EACH PATIENT CARE, UTILITY AND WORK AREA ONE SHARPS DISPOSAL UNIT, GLOVES DISPENSER AND HAND GEL DISPENSER, AS DIRECTED BY THE OWNER'S REPRESENTATIVE
12. WALL MOUNTED SINKS AND LAVATORIES SHALL BE MOUNTED SO THAT THE CENTERLINE OF THE SINK IS 1'-3" MIN. TO FACE OF ADJACENT FIXED EQUIPMENT, SIDE WALL, CASEWORK, ETC.
13. CLINICAL SINKS SHALL BE MOUNTED SO THAT THE CENTERLINE OF THE SINK IS 1'-6" MIN. TO THE FACE OF THE ADJACENT FIXED EQUIPMENT, SIDE WALL, CASEWORK, ETC.

PARTITION LEGEND - SEE SHEET A4.01

HIGHEST PRIORITY	1	TWO HOUR RATED FIRE & SMOKE BARRIER - SHAFTWALL	2S 2S 2S
	2	TWO HOUR RATED FIRE & SMOKE BARRIER	2FS 2FS 2FS
	3	TWO HOUR RATED FIRE BARRIER	2F 2F 2F
	4	ONE HOUR RATED FIRE & SMOKE BARRIER - SHAFTWALL	1S 1S 1S
	5	ONE HOUR RATED FIRE & SMOKE BARRIER	1FS 1FS 1FS
	6	ONE HOUR RATED FIRE BARRIER	1F 1F 1F
	7	ONE HOUR RATED FIRE BARRIER - (INCIDENTAL USE/HAZARDOUS AREA)	1HR 1HR 1HR
	8	SMOKE PARTITION	NS NS NS
LOWEST PRIORITY	9	PARTITION TO CEILING - STUDS TO DECK, STOP GYPSUM BOARD 4" ABOVE CEILING.	



KEY PLAN 1st FLOOR

NOTED 1ST FLOOR PLAN PART A

0 4' 8' 16' 24'

GENERAL CONTRACTORS

REVISIONS:

DATE: 04 / 25 / 2022

CONSTRUCTION DOCUMENTS - PRICING SET

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RESPONSIBILITY: Author
CHECKED BY: Verif Date

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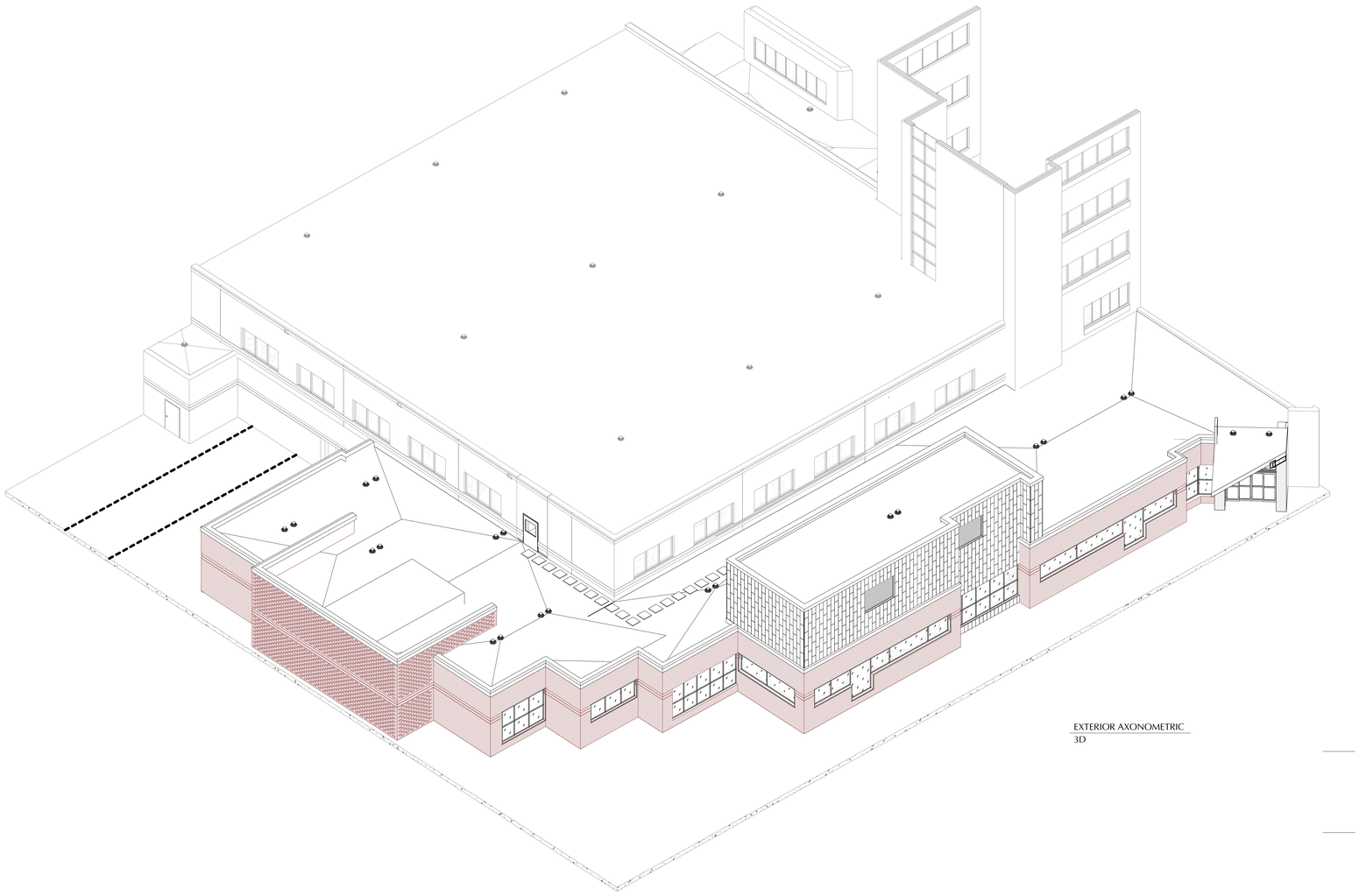
PLOTTED DATE: 4/26/2022 11:53:34 PM

NOTED 1st FLOOR PLAN - PART A

A1.01B



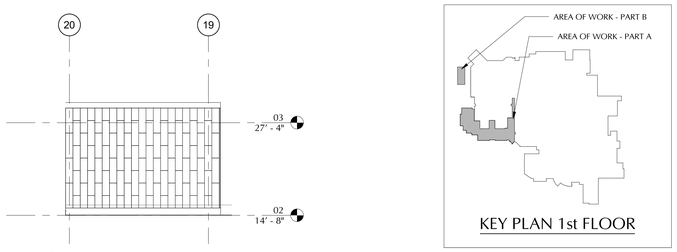
EXTERIOR AXONOMETRIC
3D

EXTERIOR ELEVATION NOTES

1. ALL BRICK CONTROL JOINTS SHALL ALIGN WITH EXISTING JOINTS.
2. ALL EXTERIOR FINISHES (INCLUDING EIFS, BRICK, CAST STONE, MORTAR, CAULK, ETC.) SHALL MATCH EXISTING IN FINISH, SIZE, COLOR AND TEXTURE.
3. REFER TO SHEET A6.01 FOR EXTERIOR WINDOW ELEVATIONS
4. ALL EXTERIOR LOUVERS SHALL HAVE DARK BRONZE FINISH TO MATCH EXISTING
5. ALL ALUMINUM STOREFRONT SYSTEMS SHALL HAVE DARK BRONZE FINISH TO MATCH EXISTING

EXTERIOR MATERIALS LEGEND

- BRICK - MATCH EXISTING
- BRICK SOLDIER COURSE - MATCH EXISTING
- NEW WINDOWS SHALL MATCH APPEARANCE OF EXISTING GLASS UNITS *ALL GLAZING SHALL BE VISION GLASS
- *INDICATES SPANDREL PANEL



KEY PLAN 1st FLOOR

5 A1.02A ELEVATION E
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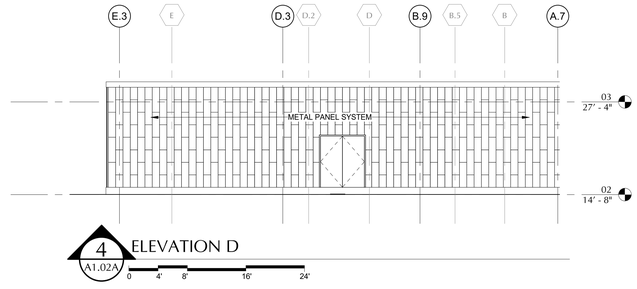

4 A1.02A ELEVATION D
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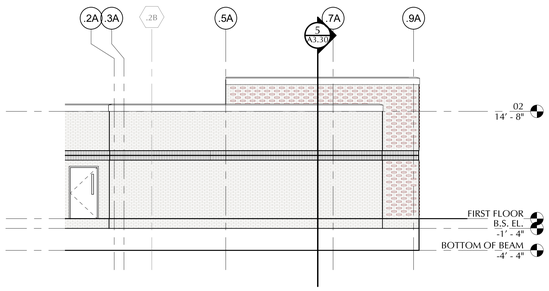

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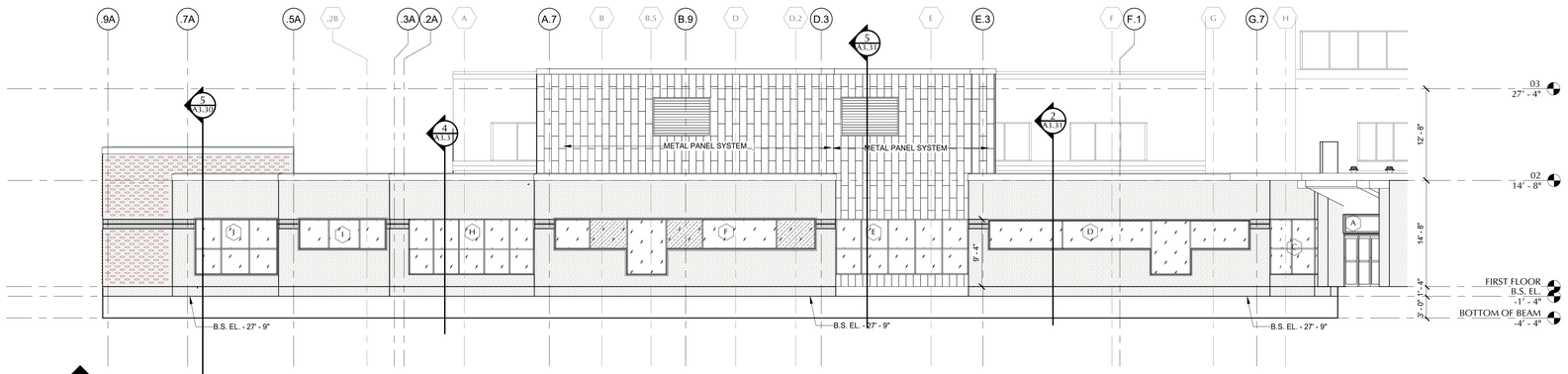

1 A1.01B ELEVATION A
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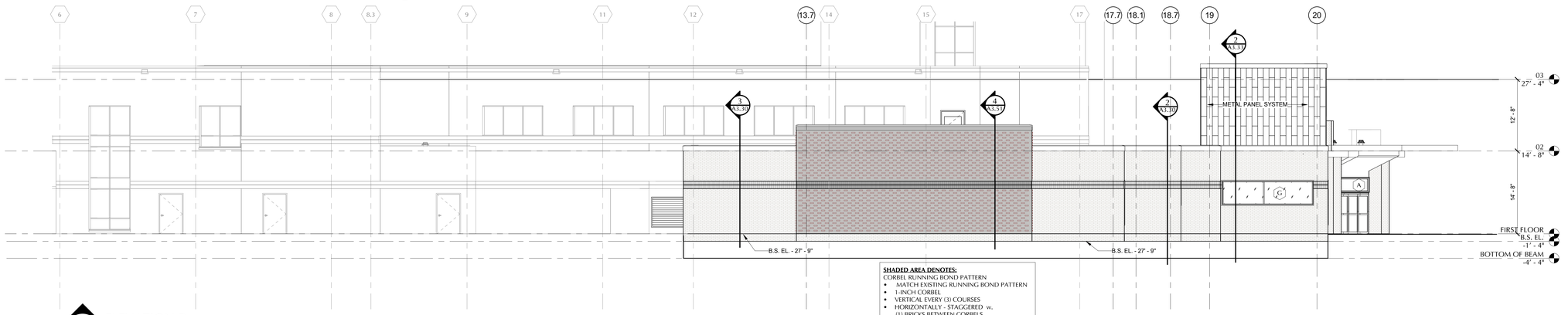

SHADED AREA DENOTES:
CORBEL RUNNING BOND PATTERN
- MATCH EXISTING RUNNING BOND PATTERN
- 1-INCH CORBEL
- VERTICAL EVERY (3) COURSES
- HORIZONTALLY - STAGGERED w. (1) BRICKS BETWEEN CORBELS

2 A1.01B ELEVATION B
0 4' 8' 16' 24'

RESPONSIBILITY: Author 08/20/19
CHECKED BY: Issue date

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GENERAL CONTRACTORS

REVISIONS:

DATE:
04 / 25 / 2022

CONSTRUCTION DOCUMENTS - PRICING SET

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GE HEALTHCARE - CT Sim
Terry Mell - terry.s.mell@ge.com

EXTERIOR ELEVATIONS
A2.01

GOVE ENVIRONMENTAL SERVICES, INC.

October 15, 2019

Portsmouth Regional Hospital

Subject: Wetland Delineation Report
Portsmouth Regional Hospital
333 Borthwick Ave, Portsmouth, NH

Dear Chris Akers,

Per your request, this letter is to verify that Gove Environmental Services, Inc., performed a site inspection to identify wetlands at Portsmouth Regional Hospital, 333 Borthwick Ave, Portsmouth, NH. Wetlands were evaluated utilizing the following standards:

1. *US Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Technical Report ERDC/EL TR-12-1 (January 2012).
2. *Field Indicators for Identifying Hydric Soils in New England – Version 4, April 2019.* New England Hydric Soils Technical Committee.
3. *US Army Corps of Engineers National Wetland Plant List, 2018.*
4. *Classification of Wetlands and Deepwater Habitats of the United States.* USFW Manual FWS/OBS–79/31 (1979).

Brenden Walden performed the site inspection on 9/17/19. During the site inspection, two areas of wetland were identified on the Site. The wetland areas were demarcated with a series of pink "Wetland Delineation" flagging consecutively labeled:

1 Start – 15 Stop & A1-A22

The attached sketch plan depicts the general location of the flag series, which were used to identify the resource areas in the field. A general description of the wetlands is also provided

The wetland demarcated by the **1 Start – 15 Stop** series of flags, delineated a drainage area dominated by emergent vegetation, hydric soils on the wetland border consisted of NE-S1 & HTM-S hydric soil classifications, soil saturation and water staining were also observed. Bordering upland area consisted developed area and impervious surface.

The wetland demarcated by the **A1-A22** series of flags, delineated the wetland boundary for a detention basin vegetated with emergent vegetation. The wetland boundary consisted of NE-S with areas of HTM-S. Bordering upland areas consist of maintained lawn areas and impervious surface from surrounding development.

This concludes the wetland delineation report. If I can be of further assistance, please feel free to contact me at (603) 778-0644.

Sincerely,

Brenden Walden
Business Manager & Wetland Scientist
Gove Environmental Services, Inc.

Enc. Wetland Delineation Sketch

STATE OF NEW HAMPSHIRE
BRENDEN M. WALDEN
10/15/19
No. 297
CERTIFIED WETLAND SCIENTIST

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

15 Start
Al-Aza
15 Stop

GRADING PLAN LEGEND

28.60 SPOT ELEVATION

HP	HIGH POINT	LP	LOW POINT
TC	TOP OF CURB	BC	BOTTOM OF CURB / GUTTER LINE
TW	GRADE AT TOPSIDE OF WALL	BW	GRADE AT BOTTOM SIDE OF WALL
INV	INVERT	RIM	TOP OF GRATE / COVER
ME	MATCH EXISTING		

FFE 28.60 FINISH FLOOR ELEVATION

27 EXISTING CONTOUR

27 PROPOSED CONTOUR

POND IMPACT LEGEND

	DESCRIPTION	AREA	VOLUME
	PRE-DEVELOPMENT POND	± 17,325 SF	± 54,190 CF
	POND REDUCTION	± 1,475 SF	± 2,451 CF
	PROPOSED POND ADDITION	± 1,250 SF	± 4,526 CF
	PROPOSED POND	± 17,100 SF	± 56,265 CF

POND SUMMARY

EXISTING POND VOLUME:	± 54,190 CF
NET POND GAIN:	± 2,075 CF
NEW POND VOLUME:	± 56,265 CF

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

POND 1

POND 2

EXISTING 24" RCP POND OUTFALL

PROPERTY LINE, TYP

EXISTING POND

WETLAND LIMITS

EXISTING 21" RCP DRAINING INTO MODIFIED POND

NEW POND LIMITS

POND REDUCTION

PROPOSED BUILDING EXPANSION

MOB POND REDUCTION

PROPOSED POND EXPANSION

EXPANDED POND

FFE = ±27.8
(MATCH EXISTING)

Kimley»Horn
404 WYMAN STREET, SUITE 385 WALTHAM, MA 02451
MAIN:781.328.0676 | WWW.KIMLEY-HORN.COM

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

No.	REVISIONS	DATE	BY
1			
2			
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10			

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 05/05/2022
KIMLEY-HORN PROJECT NO. 118252004

POND MODIFICATION

EX. B

Drawing name: K:\NSH_LDEV\118252004 - Portsmouth - Cancer Center - 2021\4-CADD\Exhibits\POND MODIFICATIONS.dwg POND EXHIBIT May 05, 2022 2:08pm by: Zack.Newman

GRADING PLAN LEGEND

28.60 SPOT ELEVATION

HP	HIGH POINT	LP	LOW POINT
TC	TOP OF CURB	BC	BOTTOM OF CURB / GUTTER LINE
TW	GRADE AT TOPSIDE OF WALL	BW	GRADE AT BOTTOM SIDE OF WALL
INV	INVERT	RIM	TOP OF GRATE / COVER
ME	MATCH EXISTING		

FFE 28.60 FINISH FLOOR ELEVATION

27 EXISTING CONTOUR

27 PROPOSED CONTOUR

WETLAND IMPACT LEGEND

	DESCRIPTION	AREA
	TEMPORARY WETLAND DISTURBANCE	± 4,400 SF
	PERMANENT WETLAND DISTURBANCE	± 200 SF
	PROPOSED WETLANDS	± 1,150 SF

WETLAND SUMMARY

EXISTING WETLAND AREA:	± 10,300 SF
PERMANENT WETLAND DISTURBANCE:	± 200 SF
PROPOSED WETLAND ADDED:	± 1,150 SF
NEW WETLAND AREA:	± 11,250 SF

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

PROPERTY LINE, TYP

WETLAND LIMITS

EXISTING 21" RCP

EXISTING 24" RCP POND OUTFALL

TEMPORARY WETLAND DISTURBANCE

PERMANENT WETLAND DISTURBANCE

PERMANENT WETLAND DISTURBANCE

NEW WETLAND AREA

PROPOSED POND EXPANSION

PROPOSED BUILDING EXPANSION

MOBILE UNIT

FFE = ±27.8
(MATCH EXISTING)

BW: 22.51
BW: 22.93
BW: 22.31
BW: 23.47
BW: 23.51
BW: 24.36
BW: 25.79
BW: 26.32
BW: 26.93
BW: 22.02
BW: 26.03
BW: 26.01
BW: 27.34
BW: 27.02

8.66%
0.67%
0.29%
14.2%
5.04%
0.02%

Kimley»Horn
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MAIN:781.328.0676 | WWW.KIMLEY-HORN.COM

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

No.	REVISIONS	DATE	BY
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DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 05/05/2022
KIMLEY-HORN PROJECT NO. 118252004

WETLAND DISTURBANCE

EX. A

Drawing name: K:\NSH_LDEV\118252004 - Portsmouth - Cancer Center - 2021\4-CADD\Exhibits\Wetland disturbance_C5.00.dwg WETLAND EXHIBIT May 04, 2022 2:21pm by: Zack.Newman

Stormwater Management

Long-Term Maintenance & Operation Plan

Portsmouth Regional Medical Center
South Stormwater Wetland Pond

333 Borthwick Avenue
Portsmouth, NH

May 23, 2022

Prepared by:
Kimley-Horn and Associates, Inc.
404 Wyman St, Ste 385
Waltham, MA 02451

Kimley»Horn

Summary

This document describes the stormwater system components of the development and outlines the inspection and maintenance required to ensure the efficacy of the on-site stormwater system.

Description of Stormwater System Components

There is an existing stormwater wetland pond along the south side of the existing hospital facility that detains stormwater runoff from pavement areas and building roof that is captured in a system of pipes and routed to the stormwater wetland pond. The existing stormwater wetland pond is denoted in Exhibit A.

Maintenance Inspections of Stormwater Sensitive Areas

The owner is responsible for the maintenance of the property and adhering to the maintenance guidelines of this agreement as noted below. A major storm event is defined as any storm event which causes local flooding or where there are fallen trees or large tree limbs, debris, or road obstructions as a result of the event.

Maintenance Operations for Stormwater Wetland Pond

- Spot Reseeding. Inspectors should look for bare or eroding areas in the contributing drainage area or around the wetland stormwater pond and make sure they are immediately stabilized with conservation seed mix.
- Remove and replace dead plants. Since up to 10% of the plant stock may die off in the first year, construction contracts should include a care and replacement warranty to ensure that vegetation is properly established and survives during the first growing season following construction. The typical thresholds below which replacement is required are 85% survival of plant material and 100% survival of trees.
- Check for sediment buildup at curb cuts, gravel diaphragms or pavement edges that prevents flow from getting into the bed, and check for other signs of bypassing.
- Check for any winter- or salt-killed vegetation, and replace it with hardier native wetland species.
- Note presence of accumulated sand, sediment and/ or trash and remove it.
- Inspect stormwater wetland pond side slopes for evidence of any rill or gully erosion, and repair it.
- Check the stormwater wetland pond for evidence of excessive ponding, dead plants or concentrated flows, and take appropriate remedial action.
- Check inflow points for clogging, and remove any sediment.
- Look for any bare soil or sediment sources in the contributing drainage area, and stabilize them immediately.
- Check for clogged or slow-draining soil, a crust formed on the top layer, or other causes of insufficient filtering time, and restore proper filtration characteristics

Checklists, which further indicate what should be evaluated during inspections, are included with this document.

Routine and Non-Routine Maintenance Tasks

Maintenance of the stormwater wetland pond should be integrated into routine landscape maintenance tasks. If landscaping contractors will be expected to perform maintenance, their contracts should contain specifics on unique stormwater wetland pond landscaping needs, such as maintaining elevation differences needed for ponding, sediment and trash removal, and no use of fertilizers and pesticides.

Pollutant Disposal

All trash and pollutants should be removed from the site and deposited in a permitted landfill. Deposited sediment can be used in gardens or landscaped areas but should be applied in thin layers and not stock piled in a location where it could erode any further. Leaves and other organic materials can be deposited or composted.

Responsible Party

The responsible party for the inspection and maintenance of the stormwater wetland pond:

Portsmouth Regional Hospital
333 Borthwick Avenue
Portsmouth, New Hampshire 03801

South Stormwater Wetland Pond Area					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
General Inspection					
Access to the site is adequately maintained for inspection and maintenance.					
Area is clean (trash, debris, grass clippings, etc. removed).					
Inlet/ Outlet Structures					
Drainage ways (overland flow or pipes) to the practice are free of trash, debris, large branches, etc.					
Area around the inlet structure is maintained and trimmings are removed.					
No evidence of gullies, rills, or excessive erosion around the inlet structure.					
Main Treatment					
Wetland area is free of trash, debris, and sediment.					
Vegetation within and around practice is maintained per landscaping plan. Any trimmings are removed.					
Plants seem to be healthy and in good condition. Comment on condition of plants.					
Results					
Overall condition of Wetland Area					
Additional Comments					

Notes: *If a specific maintenance item was not checked, please check N/A and explain why in the appropriate comment box.

CITY OF PORTSMOUTH

Planning Department
1 Junkins Avenue
Portsmouth, New
Hampshire 03801
(603) 610-7216

ZONING BOARD OF ADJUSTMENT

April 28, 2022

HCA Health Services of NH, Inc. dba Portsmouth Regional Hospital
PO BOX 80610
Indianapolis, IN 46280

RE: **Board of Adjustment Request for Property Located at 333 Borthwick Avenue (LU-22-35)**

Dear Owner:

The Zoning Board of Adjustment, at its regularly scheduled meeting of **Tuesday, April 26, 2022**, considered your application for building an addition on the existing hospital which requires the following: 1) A Variance from Section 10.531 to allow a 40' front yard where 50' is required. Said property is shown on Assessor Map 240, Lot 2-1 and lies within the Office Research District. As a result of said consideration, the Board voted to **grant** the request as presented and advertised.

The Board's decision may be appealed up to thirty (30) days after the vote. Any action taken by the applicant pursuant to the Board's decision during this appeal period shall be at the applicant's risk. Please contact the Planning Department for more details about the appeals process.

Approvals may also be required from other City Commissions or Boards. Once all required approvals have been received, applicant is responsible for applying for and securing a building permit from the Inspection Department prior to starting any project work.

This approval shall expire unless a building permit is issued within a period of two (2) years from the date granted unless an extension is granted in accordance with Section 10.236 of the Zoning Ordinance.

The minutes and audio recording of this meeting are available by contacting the Planning Department.

Very truly yours,

Arthur Parrott, Chairman of the Zoning Board of Adjustment

cc: Shanti Wolph, Chief Building Inspector

Rosann Maurice-Lentz, City Assessor

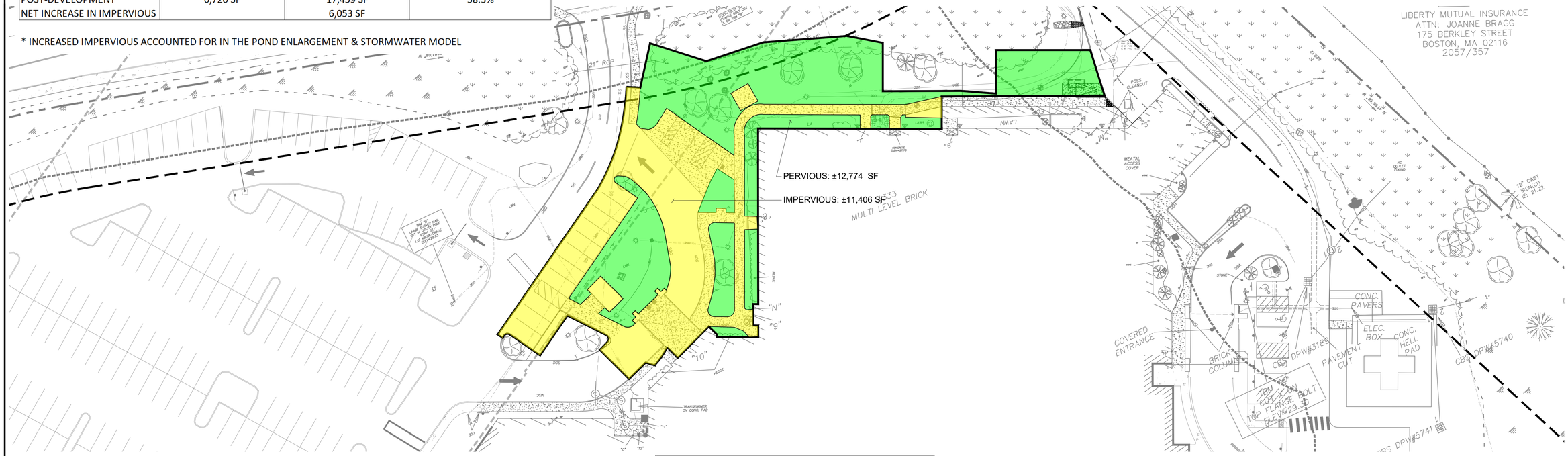
Chris Akers, Project Manager, Kimley-Horn

LAND COVER DATA TABLE			
	PERVIOUS AREA	IMPERVIOUS AREA	OVERALL CAMPUS OPENSPACE
PRE-DEVELOPMENT	12,774 SF	11,406 SF	39.0%
POST-DEVELOPMENT	6,720 SF	17,459 SF	38.3%
NET INCREASE IN IMPERVIOUS		6,053 SF	

* INCREASED IMPERVIOUS ACCOUNTED FOR IN THE POND ENLARGEMENT & STORMWATER MODEL

GRAPHIC SCALE IN FEET
0 15 30 60

NORTH



PRE-DEVELOPMENT LAND COVERAGE
1" = 30'

POST-DEVELOPMENT LAND COVERAGE
1" = 30'

Kimley»Horn
404 WYMAN STREET, SUITE 385 WALTHAM, MA 02451
MAIN:781.328.0676 | WWW.KIMLEY-HORN.COM

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PORTSMOUTH REGIONAL HOSPITAL
RADIATION ONCOLOGY ADDITION
PORTSMOUTH, NEW HAMPSHIRE

No.	REVISIONS	DATE	BY
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9			
10			

DESIGNED BY:	CRA
DRAWN BY:	MEH
CHECKED BY:	BB
DATE:	04/25/2022
KIMLEY-HORN PROJECT NO.	118252004

PRE & POST DEVELOPMENT LAND COVERAGE

D1.00

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	16.61	-------	23.20	28.61	36.05	41.44	47.34	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	------	-------	16.61	-------	23.20	28.61	36.05	41.44	47.34	POST-DEVELOPMENT RUNOFF
3	Reservoir	1	-------	9.051	-------	10.72	14.18	17.71	19.92	21.93	PRE-DEVELOPMENT
4	Reservoir	2	-------	8.827	-------	10.59	13.57	17.12	19.33	21.45	POST-DEVELOPMENT

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	16.61	2	716	35,198	------	------	------	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	16.61	2	716	35,198	------	------	------	POST-DEVELOPMENT RUNOFF
3	Reservoir	9.051	2	722	33,767	1	22.45	9,429	PRE-DEVELOPMENT
4	Reservoir	8.827	2	722	33,767	2	22.41	9,733	POST-DEVELOPMENT

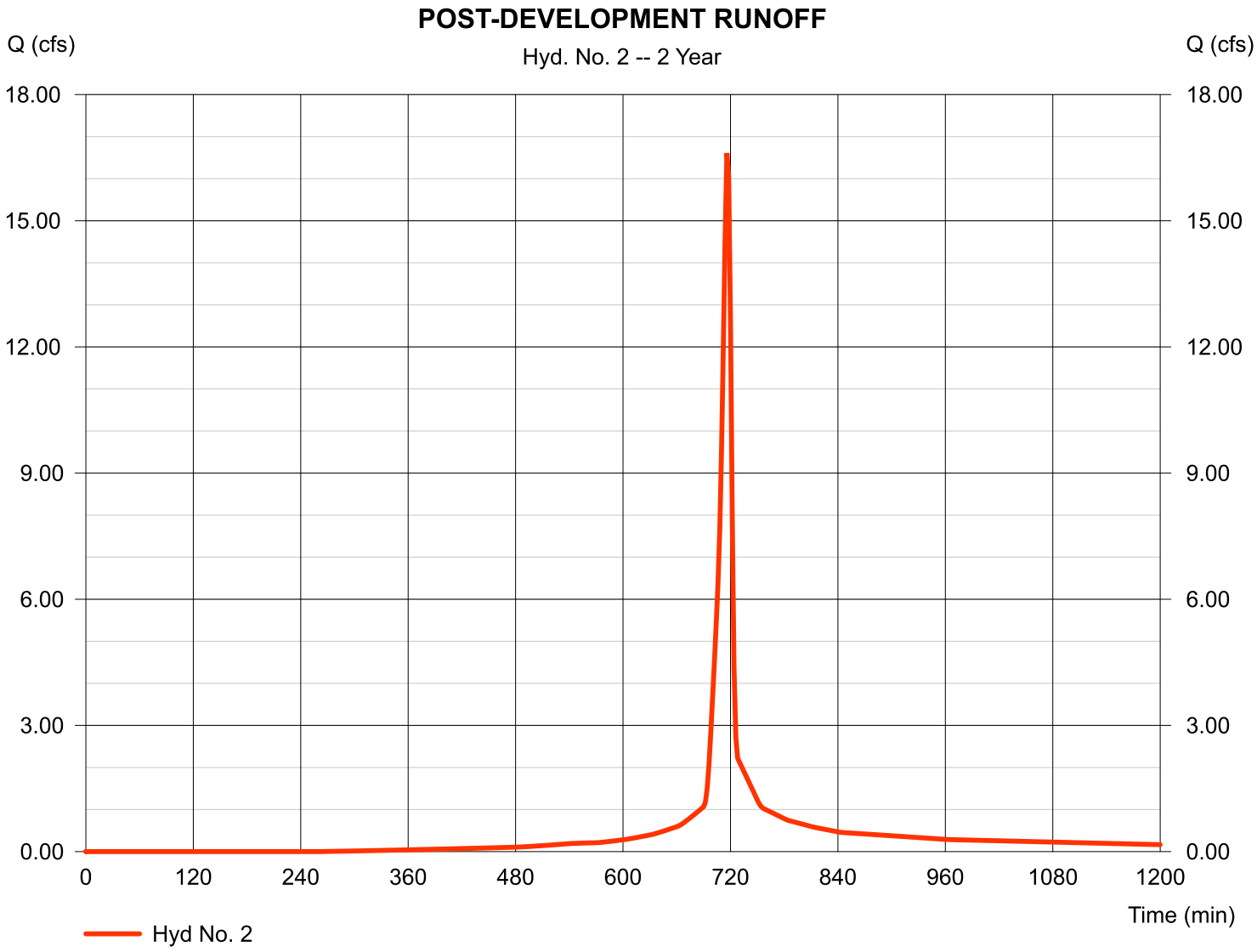
Hydrograph Report

Hyd. No. 2

POST-DEVELOPMENT RUNOFF

Hydrograph type	= SCS Runoff	Peak discharge	= 16.61 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 35,198 cuft
Drainage area	= 4.180 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.33 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.910 x 98) + (1.320 x 79) + (1.950 x 98)] / 4.180



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	23.20	2	716	50,272	------	------	------	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	23.20	2	716	50,272	------	------	------	POST-DEVELOPMENT RUNOFF
3	Reservoir	10.72	2	722	48,841	1	22.91	13,320	PRE-DEVELOPMENT
4	Reservoir	10.59	2	724	48,841	2	22.80	13,648	POST-DEVELOPMENT

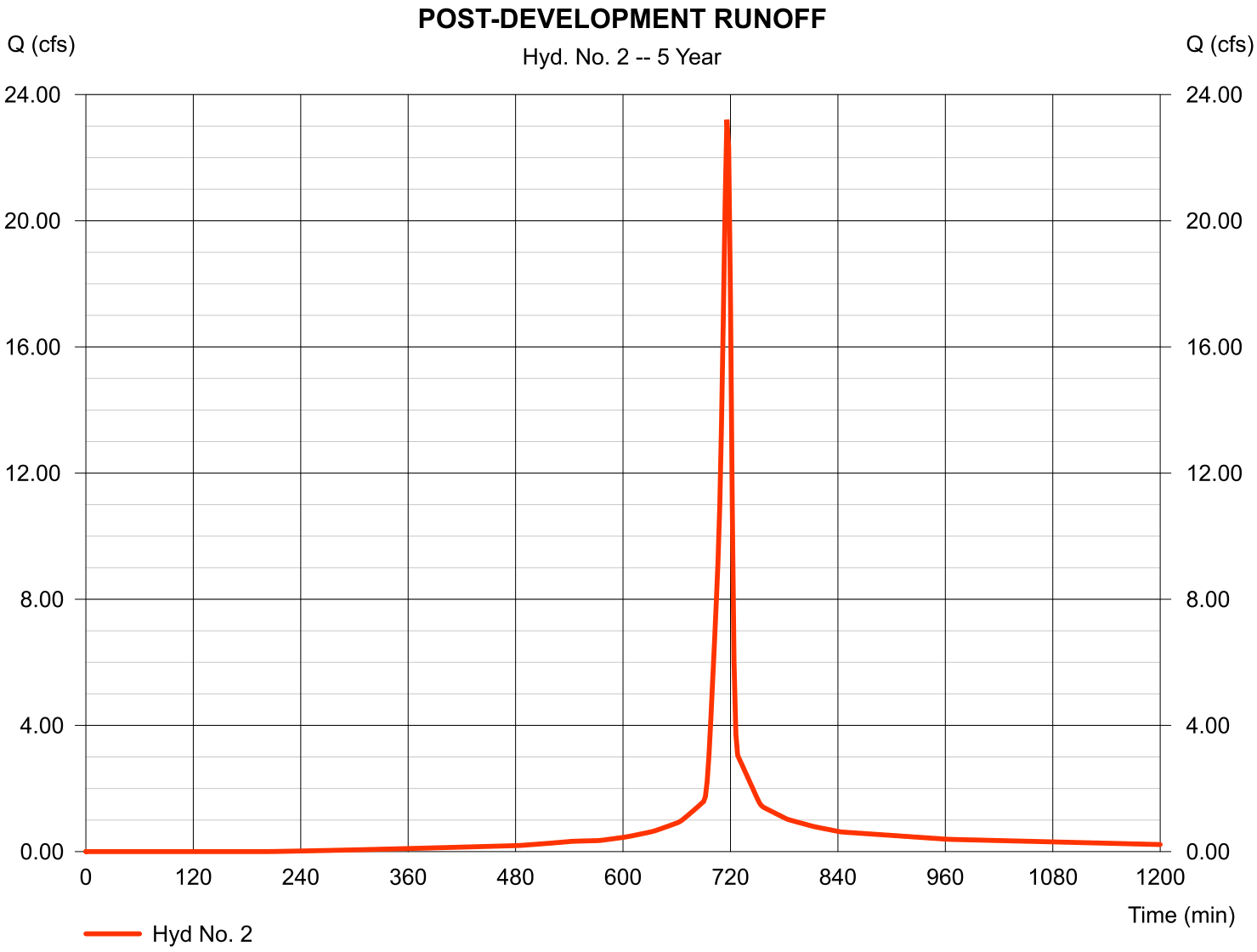
Hydrograph Report

Hyd. No. 2

POST-DEVELOPMENT RUNOFF

Hydrograph type	= SCS Runoff	Peak discharge	= 23.20 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 50,272 cuft
Drainage area	= 4.180 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.43 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.910 x 98) + (1.320 x 79) + (1.950 x 98)] / 4.180



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	28.61	2	716	62,900	------	------	------	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	28.61	2	716	62,900	------	------	------	POST-DEVELOPMENT RUNOFF
3	Reservoir	14.18	2	722	61,470	1	23.21	16,336	PRE-DEVELOPMENT
4	Reservoir	13.57	2	722	61,469	2	23.15	16,866	POST-DEVELOPMENT

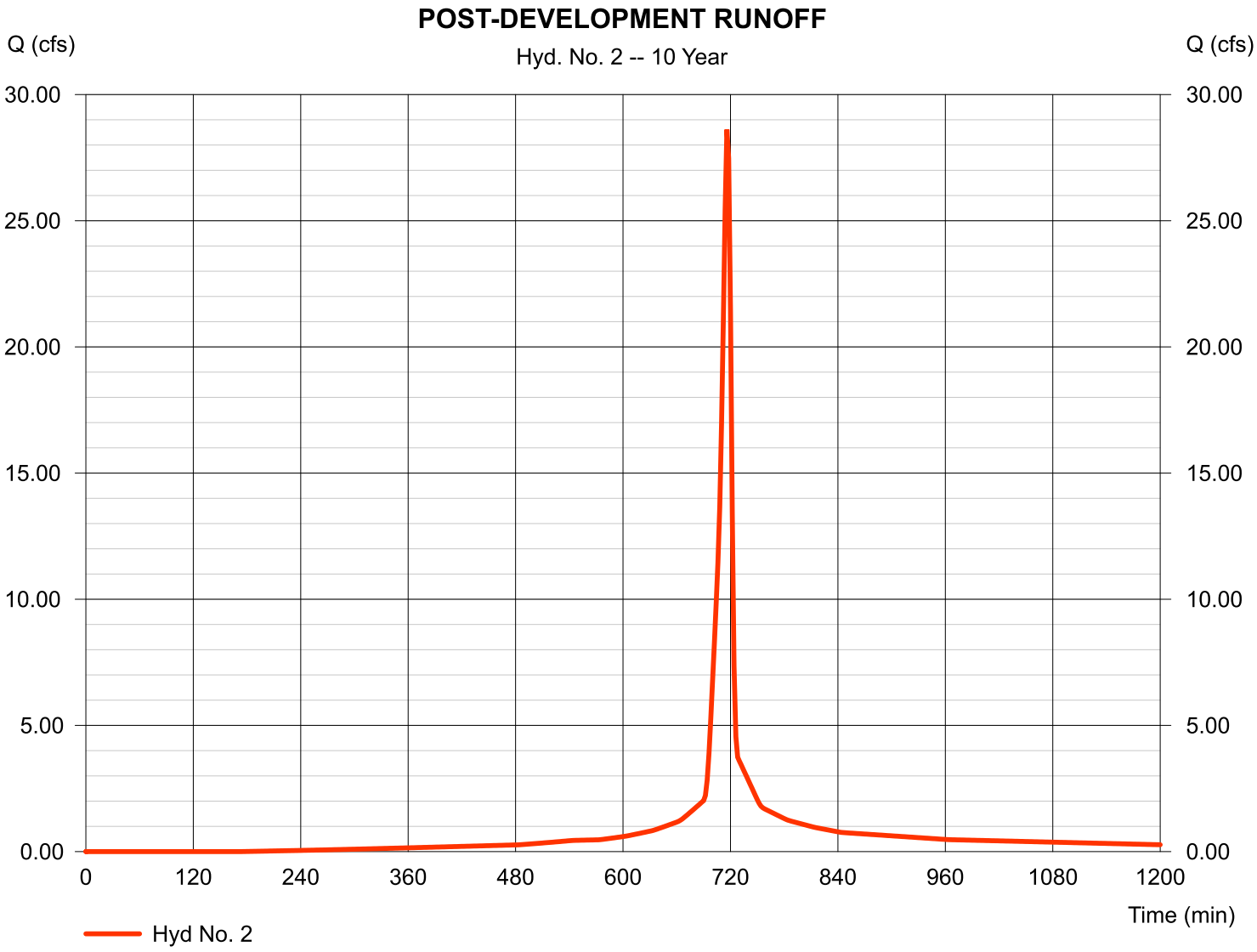
Hydrograph Report

Hyd. No. 2

POST-DEVELOPMENT RUNOFF

Hydrograph type	= SCS Runoff	Peak discharge	= 28.61 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 62,900 cuft
Drainage area	= 4.180 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.34 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.910 x 98) + (1.320 x 79) + (1.950 x 98)] / 4.180



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	36.05	2	716	80,516	------	------	------	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	36.05	2	716	80,516	------	------	------	POST-DEVELOPMENT RUNOFF
3	Reservoir	17.71	2	722	79,085	1	23.60	20,589	PRE-DEVELOPMENT
4	Reservoir	17.12	2	722	79,085	2	23.53	21,204	POST-DEVELOPMENT

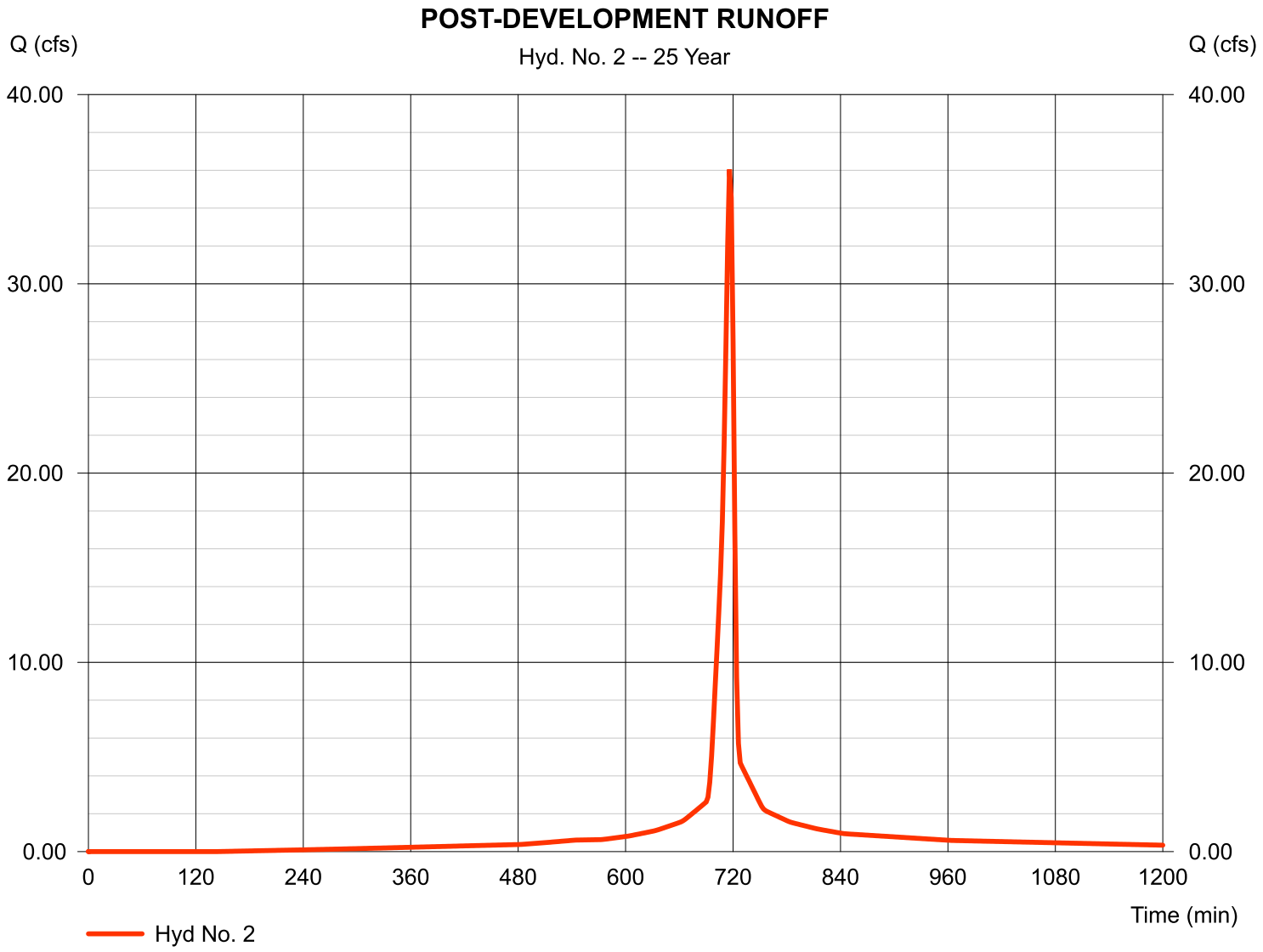
Hydrograph Report

Hyd. No. 2

POST-DEVELOPMENT RUNOFF

Hydrograph type	= SCS Runoff	Peak discharge	= 36.05 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 80,516 cuft
Drainage area	= 4.180 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.910 x 98) + (1.320 x 79) + (1.950 x 98)] / 4.180



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	41.44	2	716	93,438	------	------	------	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	41.44	2	716	93,438	------	------	------	POST-DEVELOPMENT RUNOFF
3	Reservoir	19.92	2	722	92,008	1	23.88	23,729	PRE-DEVELOPMENT
4	Reservoir	19.33	2	722	92,007	2	23.80	24,417	POST-DEVELOPMENT

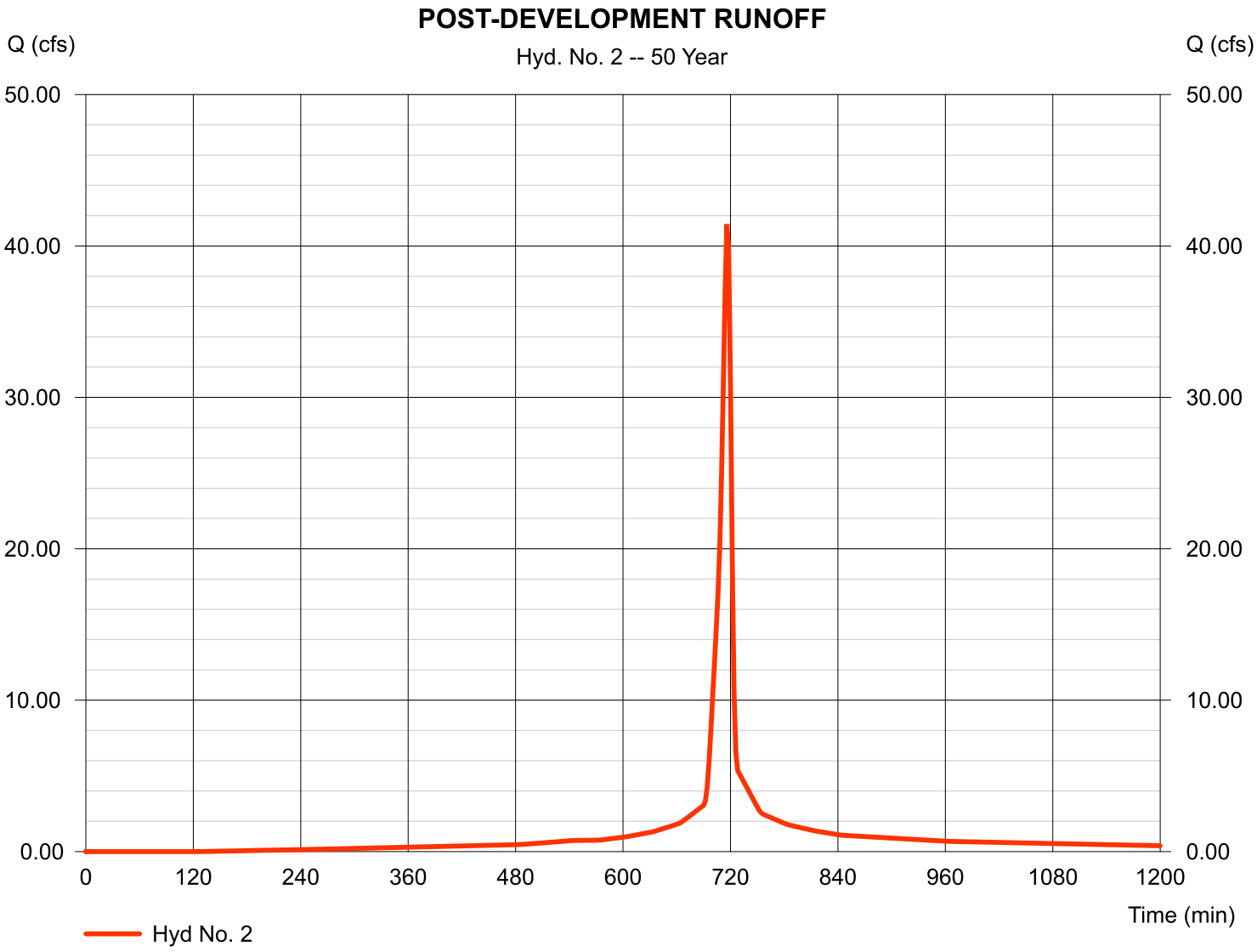
Hydrograph Report

Hyd. No. 2

POST-DEVELOPMENT RUNOFF

Hydrograph type	= SCS Runoff	Peak discharge	= 41.44 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 93,438 cuft
Drainage area	= 4.180 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.52 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.910 x 98) + (1.320 x 79) + (1.950 x 98)] / 4.180



Hydrograph Summary Report

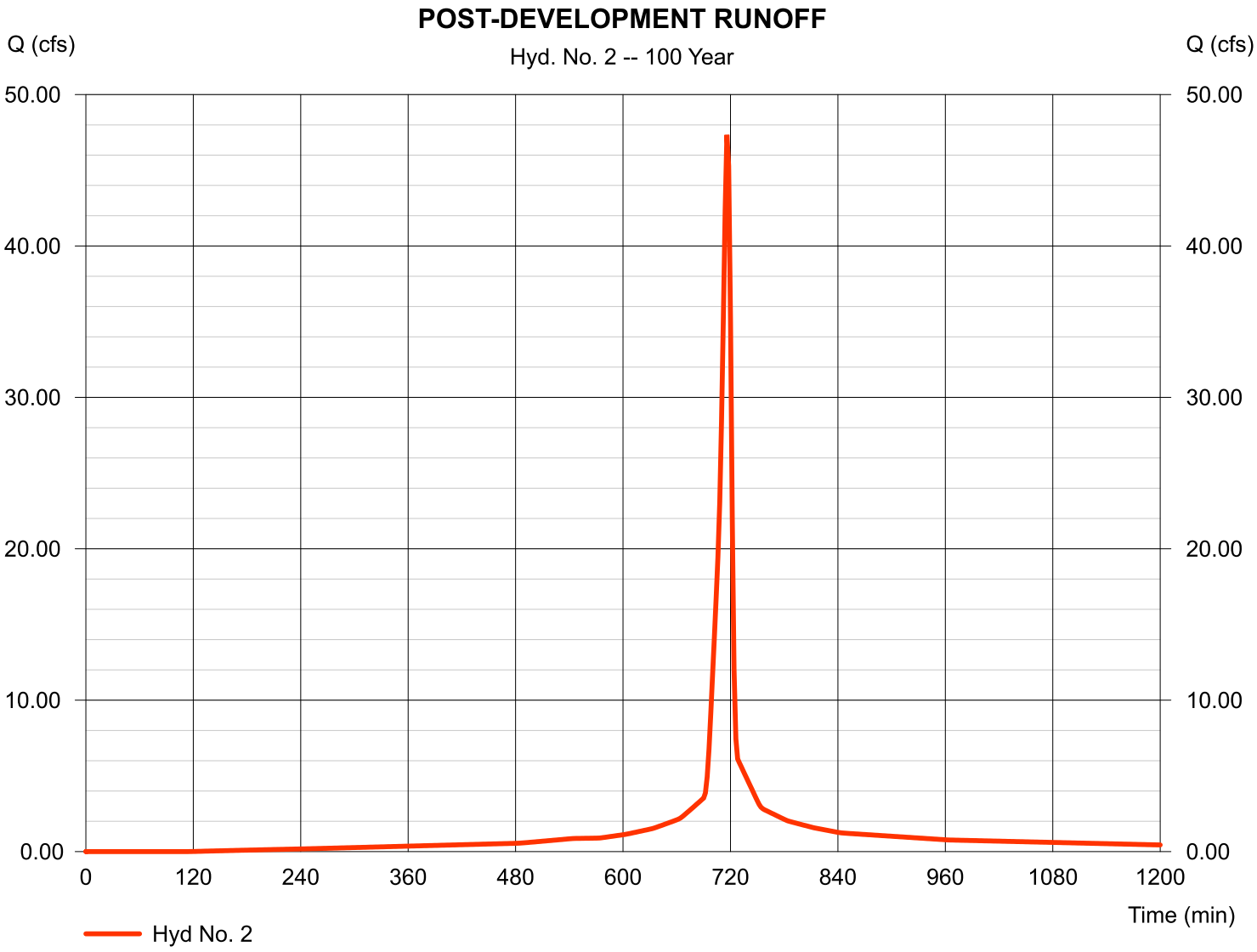
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	47.34	2	716	107,662	------	------	------	PRE-DEVELOPMENT RUNOFF
2	SCS Runoff	47.34	2	716	107,662	------	------	------	POST-DEVELOPMENT RUNOFF
3	Reservoir	21.93	2	722	106,232	1	24.17	27,298	PRE-DEVELOPMENT
4	Reservoir	21.45	2	722	106,231	2	24.10	28,058	POST-DEVELOPMENT

Hydrograph Report

Hyd. No. 2

POST-DEVELOPMENT RUNOFF

Hydrograph type	= SCS Runoff	Peak discharge	= 47.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 107,662 cuft
Drainage area	= 4.180 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.910 x 98) + (1.320 x 79) + (1.950 x 98)] / 4.180