

T5037-002  
July 21, 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, last revised July 21, 2022;
- TAC Comment Response Report, dated July 21, 2022;
- Drainage Peer Review Response Letter, dated July 21, 2022;
- Drainage Analysis, last revised July 21, 2022;
- Operations and Maintenance Manual, dated May 24, 2022;
- Grade Plane Exhibit, last revised July 21, 2022;
- Community Space Exhibit, last revised July 21, 2022;
- Landscape Presentation Plan Set, last revised July 21, 2022;
- Fire Truck Turning Exhibit, last revised July 21, 2022;
- Passenger Vehicle Turning Exhibit, dated July 21, 2022
- Traffic Impact Study, dated May 24, 2022;
- Eversource Will Service Letter, dated May 23, 2022;
- Unutil Will Service Letter, dated February 22, 2021;
- Green Building Statement, dated May 23, 2022;

## **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 1-1A, 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 1-1A & 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 ways via stormwater filtration treatment units. In addition, underground detention systems have 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 seven (7) 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
- June 7, 2022 – Technical Advisory Committee Meeting

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 and regular meeting.

### **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 area 2 is proposed from Map 119, Lot 1-1C to the City of Portsmouth. Lastly land transfer area 3 is proposed from Map 119 Lot 1-1A 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.

<b>City of Portsmouth Downtown Overlay Parking Requirement</b>	
<b>North End Development, Portsmouth, NH</b>	
Proposed Commercial Use Parking Requirements	No requirements 75,000 SF <b>0 Spaces</b>
Proposed Residential Use Parking Requirements	1.3 Spaces / Dwelling Unit 84 Dwelling Units <b>110 Spaces</b>
Proposed Residential Visitor Parking Requirements	1 Spaces / 5 Dwelling Unit 84 Dwelling Units <b>17 Spaces</b>
Sheraton Hotel Parking Requirements	0.75 Spaces / Hotel Room 181 Rooms <b>136 Spaces</b>
Sheraton Condo Parking Requirements	Deeded Easement for 24 Spaces 12 Dwelling Units <b>24 Spaces</b>
Deer Street Condo Parking Requirements	Deeded Easement for 58 Spaces 3-story mixed use Condos on Deer Street <b>58 Spaces</b>
Subtotal Required	<b>345 Spaces</b>
DOD Parking	<b>-4 Spaces</b>
<b>Total Spaces Required</b>	<b>341 Spaces</b>

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.**

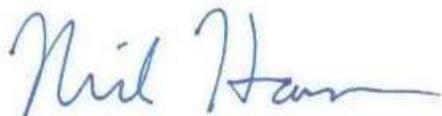
The development complies with all applicable standards of the ordinance and the City's land use regulations.

The enclosed revised plans and supplemental materials have been provided to address comments received from the Technical Advisory Committee (TAC) in correspondence dated June 6, 2022 and at their meeting held on June 7, 2022.

We respectfully request to be placed on the TAC meeting agenda for August 2, 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](mailto: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

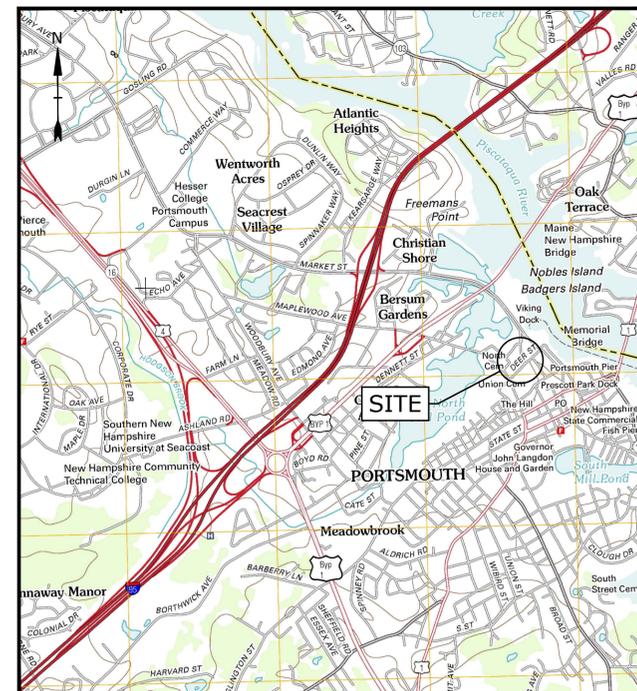
## RUSSELL STREET & DEER STREET PORTSMOUTH, NEW HAMPSHIRE

MAY 24, 2022

LAST REVISED JULY 21, 2022

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	7/21/2022
G-100	GENERAL NOTES AND LEGEND	7/21/2022
C-101	EXISTING CONDITIONS & DEMOLITION PLAN	7/21/2022
C-102	OVERALL SITE PLAN	7/21/2022
C-102.1	SITE PLAN	7/21/2022
C-103	GRADING & DRAINAGE PLAN	7/21/2022
C-104	UTILITIES PLAN	7/21/2022
C-200	ACCESS EASEMENT PLAN	7/21/2022
C-201	DRAINAGE EASEMENT PLAN	7/21/2022
C-202	UTILITIES EASEMENT PLAN	7/21/2022
C-203	COMMUNITY SPACE EASEMENT PLAN	7/21/2022
C-204	LOT LINE REVISION PLAN	7/21/2022
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	7/21/2022
C-502	DETAILS SHEET	7/21/2022
C-503	DETAILS SHEET	7/21/2022
C-504	DETAILS SHEET	7/21/2022
C-505	DETAILS SHEET	7/21/2022
C-506	DETAILS SHEET	7/21/2022
C-507	DETAILS SHEET	7/21/2022
C-508	DETAILS SHEET	7/21/2022
C-509	DETAILS SHEET	7/21/2022
L-100	LANDSCAPE MATERIAL PLAN, LEGEND AND NOTES	7/21/2022
L-101	LANDSCAPE SITE PLAN	7/21/2022
L-102	LANDSCAPE DETAILS	7/21/2022
E-001	LIGHTING COVER SHEET	7/15/2022
E-100	EXTERIOR LIGHTING PLAN AND CALCULATIONS	7/15/2022
E-101	EXTERIOR LIGHTING CUTSHEETS	7/15/2022
E-102	EXTERIOR LIGHTING CUTSHEETS	7/15/2022
E-103	EXTERIOR LIGHTING CUTSHEETS	7/15/2022
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

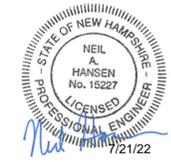
ARCHITECT:  
SGA ARCHITECTURE  
200 HIGH STREET, FLOOR 2  
BOSTON MA, 02110  
857-300-2610

OWNER/APPLICANT:  
TAX MAP 118, LOT 28  
TAX MAP 119, LOT 1-1A  
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



**TAC RESUBMISSION  
COMPLETE SET 40 SHEETS**



- 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 PTP 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 PTPAR DATA SUBMITTAL.
  14. A VIDEO INSPECTION OF THE EXISTING SEWER AND DRAIN LINES ON MAPLEWOOD AVENUE, DEER STREET AND RUSSELL STREET SHALL BE COMPLETE AND PROVIDED TO PORTSMOUTH DPW PRIOR TO CONSTRUCTION.

- 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 SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
  9. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
  10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
  11. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
  12. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
  13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
  14. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
  15. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
  16. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.

- SITE NOTES:**
1. PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
  2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
  3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
  4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
  5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
  6. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
  7. 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 BUILDINGS 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 - UNTIL
    - 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 SURVEYORS, 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 EXIST
- 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
- PROPOSED MINOR CONTOUR LINE
- PROPOSED DRAIN LINE (TYP)
- INLET PROTECTION SILT SACK
- PROPOSED CATCHBASIN
- PROPOSED DRAIN MANHOLE
- PROPOSED YARD DRAIN
- EXISTING STORM DRAIN
- EXISTING SANITARY SEWER
- EXISTING SANITARY SEWER TO BE REMOVED
- EXISTING UNDERGROUND TELECOMMUNICATION
- EXISTING WATER
- EXISTING GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD UTILITY
- PROPOSED SANITARY SEWER
- PROPOSED WATER
- PROPOSED GAS
- PROPOSED UNDERGROUND ELECTRIC
- PROPOSED UNDERGROUND TELECOMMUNICATION
- 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

Last Saved: 7/20/2022 10:02:02 AM  
Plotted On: Jun 21, 2022 9:54:44 AM By: Ckrzucik  
Tighe & Bond 121115027 Two International Group\002 Russell Street Development\Drawings - Figures AutoCAD\15037-002-C-DSGN.dwg

**North End Mixed Use Development**

**Two International Group**

Russell Street & Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
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



**SITE DATA:**  
 LOCATION: TAX MAP 118 LOT 28 OWNER: PORT HARBOR LAND LLC  
 TAX MAP 119 LOT 1-1A 1000 MARKET ST  
 TAX MAP 119 LOT 1-1C BUILDING ONE  
 TAX MAP 119 LOT 4 PORTSMOUTH, NH 03801  
 TAX MAP 124 LOT 12  
 TAX MAP 125 LOT 21

ZONING DISTRICT: CHARACTER DISTRICT 5 (CD5)  
 DOWNTOWN OVERLAY DISTRICT  
 NORTH END INCENTIVE OVERLAY DISTRICT  
 HISTORIC DISTRICT

PROPOSED USE: MIXED USE, RESIDENTIAL, RETAIL

**OFF-STREET PARKING REQUIREMENTS**

**PARKING SPACES REQUIRED:**

<b>COMMERCIAL:</b> NO REQUIREMENT IN DOD	0 SPACES
<b>DWELLING UNITS:</b> OVER 750 SF, 1.3 SPACES PER UNIT	84 UNITS 110 SPACES
<b>VISITOR SPACES:</b> 1 SPACE PER 5 DWELLING UNITS	84 UNITS 17 SPACES
<b>EXISTING HOTEL:</b> 0.75 SPACES PER GUEST ROOM	181 ROOMS 136 SPACES
<b>EXISTING DEEDED CONDO SPACES:</b> SHERATON CONDOS DEER STREET CONDOS	24 SPACES 58 SPACES
<b>DOWNTOWN OVERLAY DISTRICT</b>	-4 SPACES
<b>TOTAL MINIMUM PARKING SPACES REQUIRED =</b>	<b>341 SPACES</b>

**COMMUNITY SPACE:**

	REQUIRED	PROPOSED
MAP 125 LOT 21 DEVELOPMENT LOT AREA: 18,237 SF	3,647 SF, 20%	6,136 SF, 33.6%
MAP 118 LOT 28 DEVELOPMENT LOT AREA: 52,389 SF	15,717 SF, 30%	
OFFSITE COMMUNITY SPACE AREA (MAP 119 LOT 4): 7,092 SF	2,128 SF, 30%	
MAP 118 LOT 28 TOTAL	17,844 SF, 30%	25,089 SF, 35.3%
MAP 124 LOT 12 DEVELOPMENT LOT AREA: 19,404 SF	3,881 SF, 20%	7,496 SF, 38.6%
<b>TOTALS</b>	<b>25,373 SF</b>	<b>38,721 SF, 39.9%</b>

**DEVELOPMENT STANDARDS**

**BUILDING PLACEMENT (PRINCIPAL BUILDING):**

REQUIRED	PROPOSED	MAP 124 LOT 12	MAP 118 LOT 28	MAP 124 LOT 12
MAXIMUM PRINCIPAL FRONT YARD:	5 FT	MAP 125 LOT 21 6 FT <sup>(1)</sup>	MAP 118 LOT 28 9 FT <sup>(1)</sup>	MAP 124 LOT 12 10 FT <sup>(1)</sup>
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 <sup>(2)</sup>	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 <sup>(1)</sup>	5 STORIES <sup>(1)</sup>
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:	70% MIN.	75%	73%	71%
ALLOWED ROOF TYPES	FLAT, GABLE, HIP, GAMBREL, MANSARD	FLAT	FLAT	FLAT

**TOTAL PARKING SPACES PROVIDED**

EXISTING SHERATON HOTEL PARKING	154 SPACES
ON SITE SURFACE PARKING	189 SPACES
<b>TOTAL SPACES PROVIDED</b>	<b>343 SPACES</b>

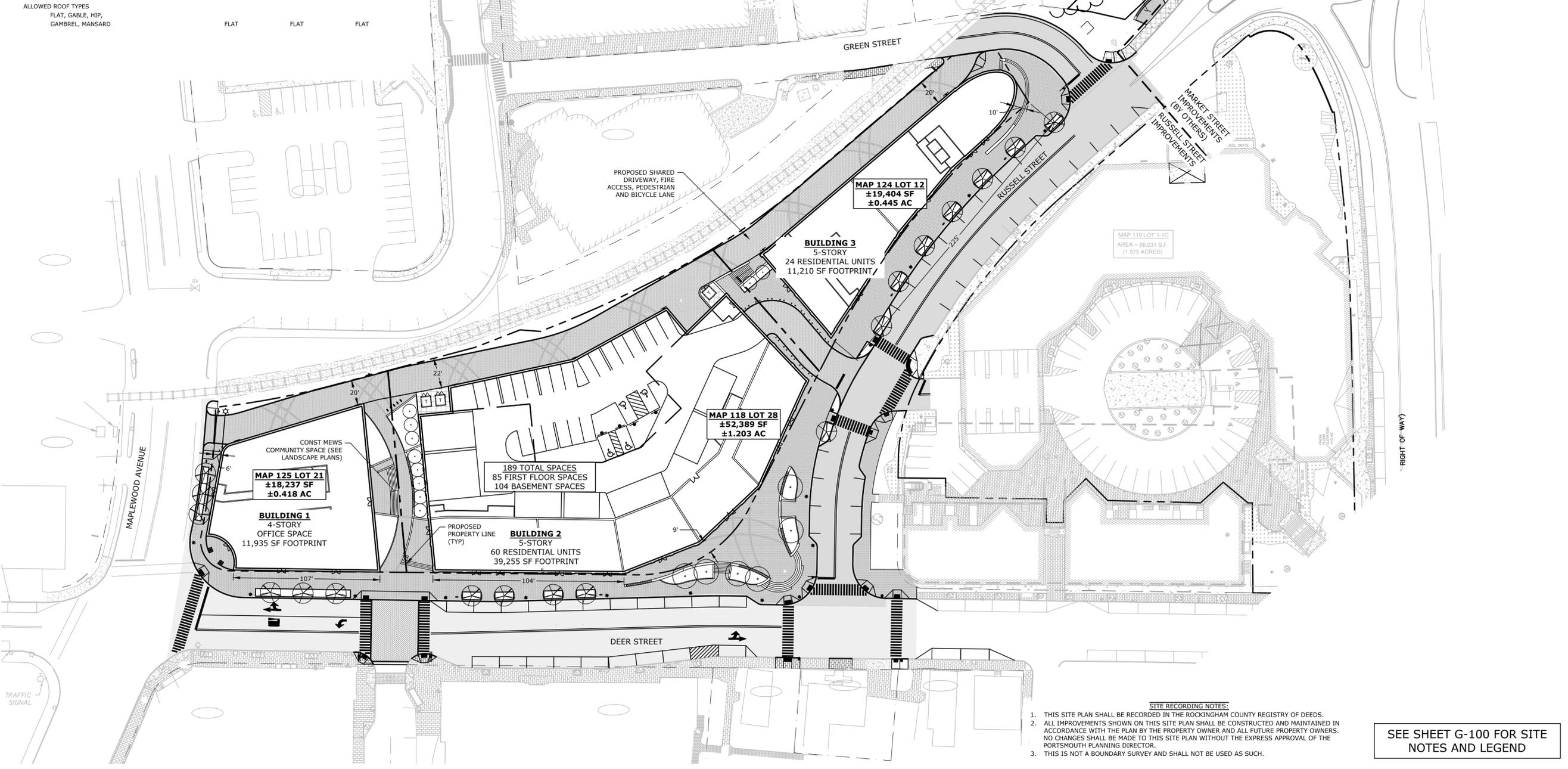
**ADA PARKING SPACES**

REQUIRED	PROPOSED
9 SPACES	9 SPACES
(2 VAN SPACES)	(2 VAN SPACES)

**BICYCLE SPACES**

REQUIRED	PROPOSED
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 BICYCLE CONDITIONAL USE PERMIT PER 10.5A43.43  
 (3) - PER NORTH END INCENTIVE OVERLAY DISTRICT, THE MAXIMUM BUILDING HEIGHT CAN BE INCREASED BY 1 STORY PER 10.5A46



**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
 Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CJK	
CHECKED:	NAH	
APPROVED:	PMC	

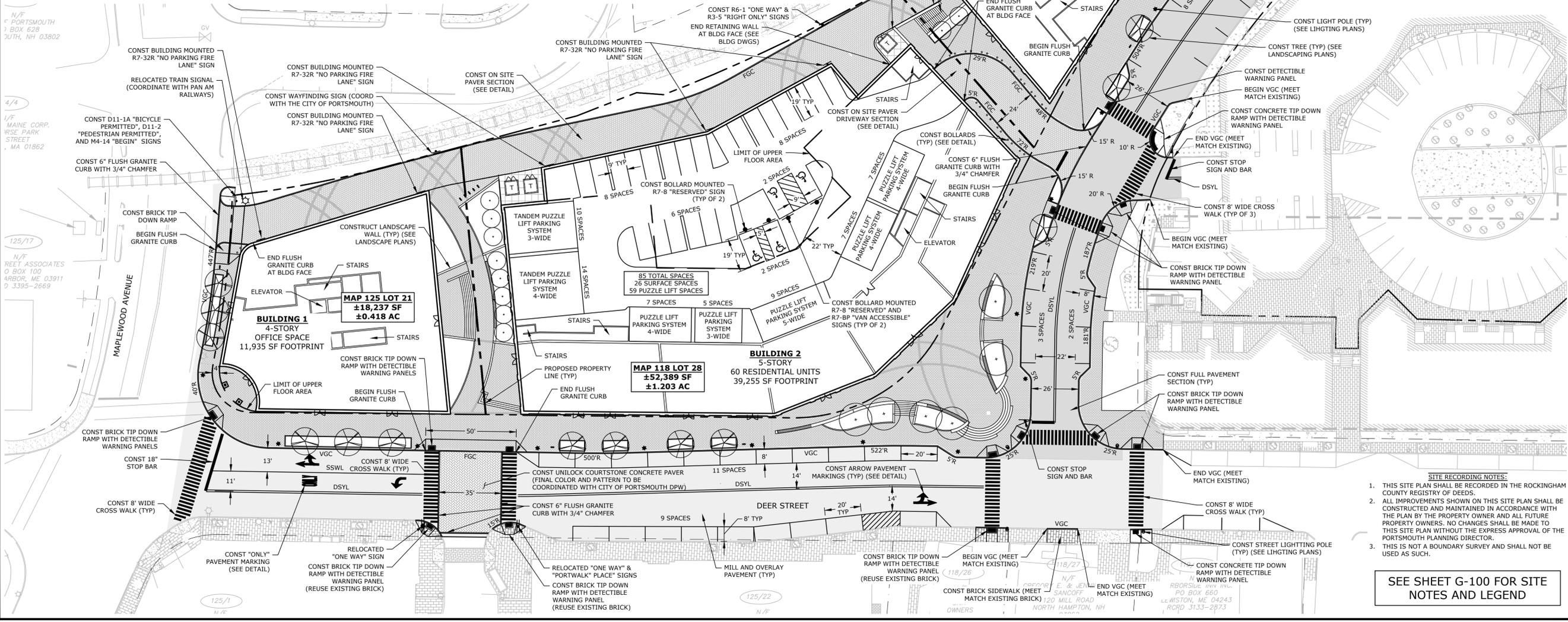
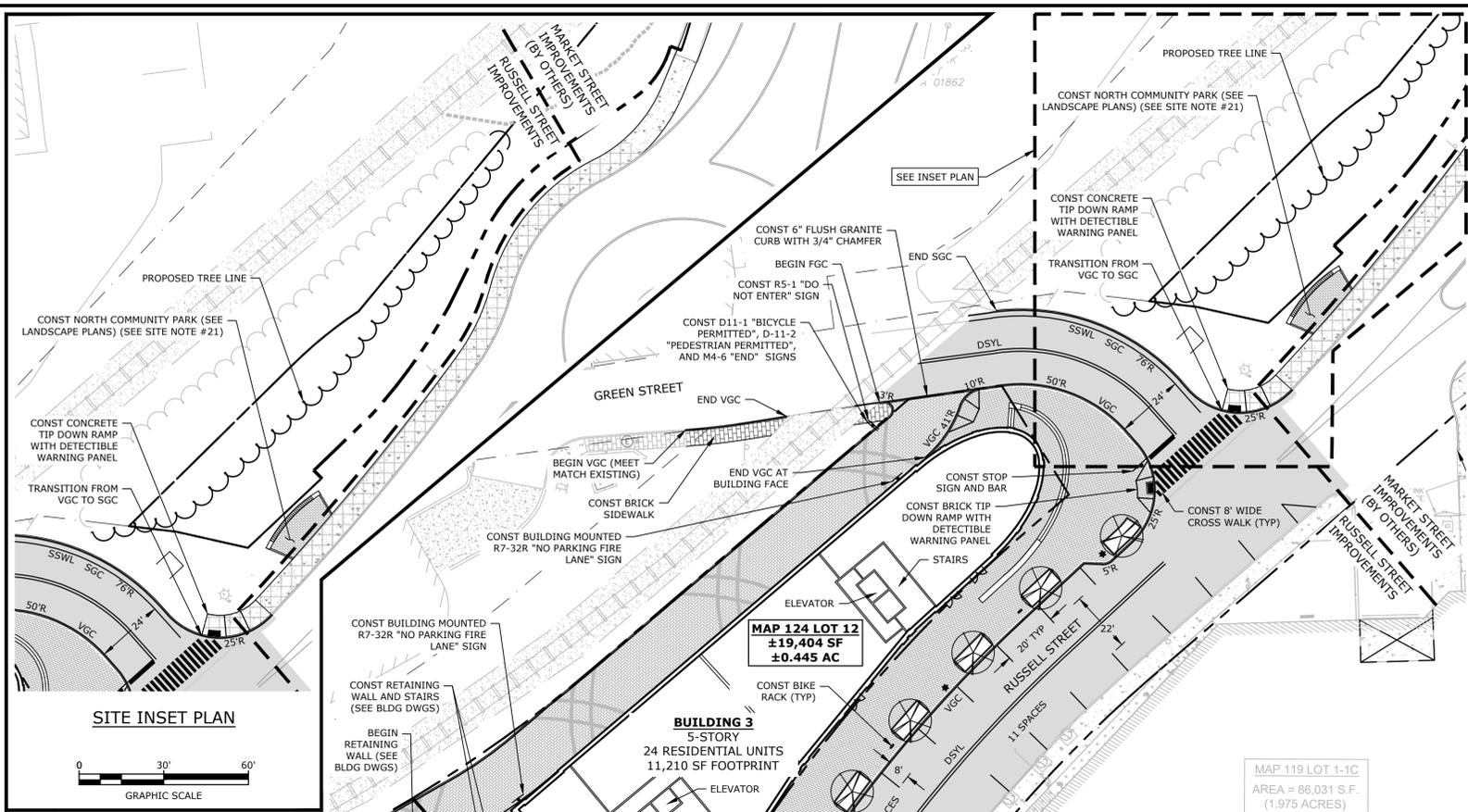
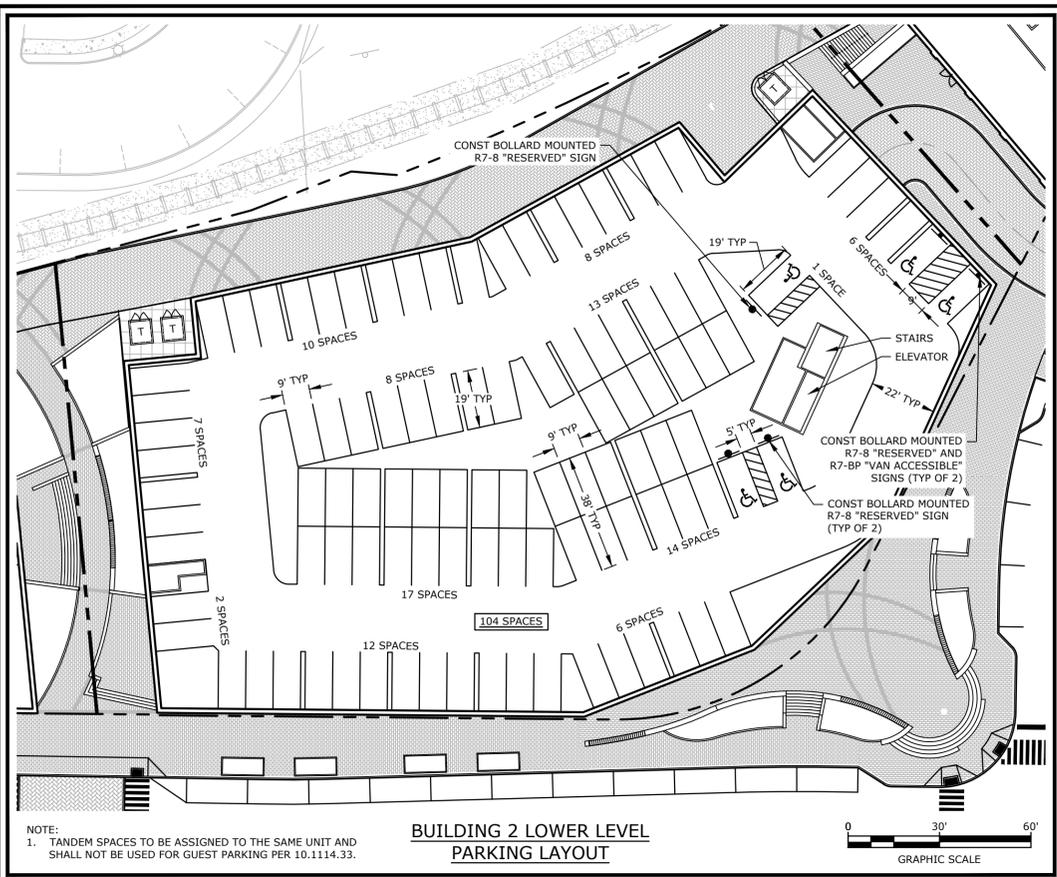
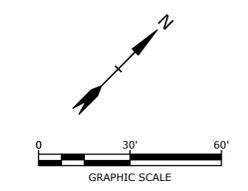
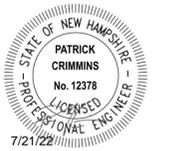
**OVERALL SITE PLAN**

SCALE: AS SHOWN

**C-102**

- SITE RECORDING NOTES:**
- 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.
  - THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND



**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

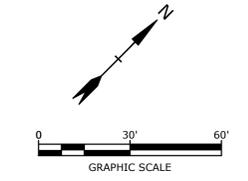
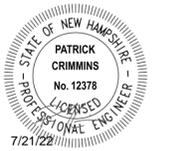
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CJG	
CHECKED BY:	NAH	
APPROVED:	PMC	

- SITE RECORDING NOTES:**
- 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.
  - THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET G-100 FOR SITE NOTES AND LEGEND

**SITE PLAN**  
SCALE: AS SHOWN  
C-102.1

Last Saved: 7/20/2022  
 Plotted On: Jun 21, 2022 7:17am By: Ckrucik  
 Tighe & Bond\T5037-Two International Group\002 - Russell Street Development\Drawings\Figures\AutoCAD\T5037-002-C-DSGN.dwg



**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CJK	
CHECKED:	NAH	
APPROVED:	PMC	

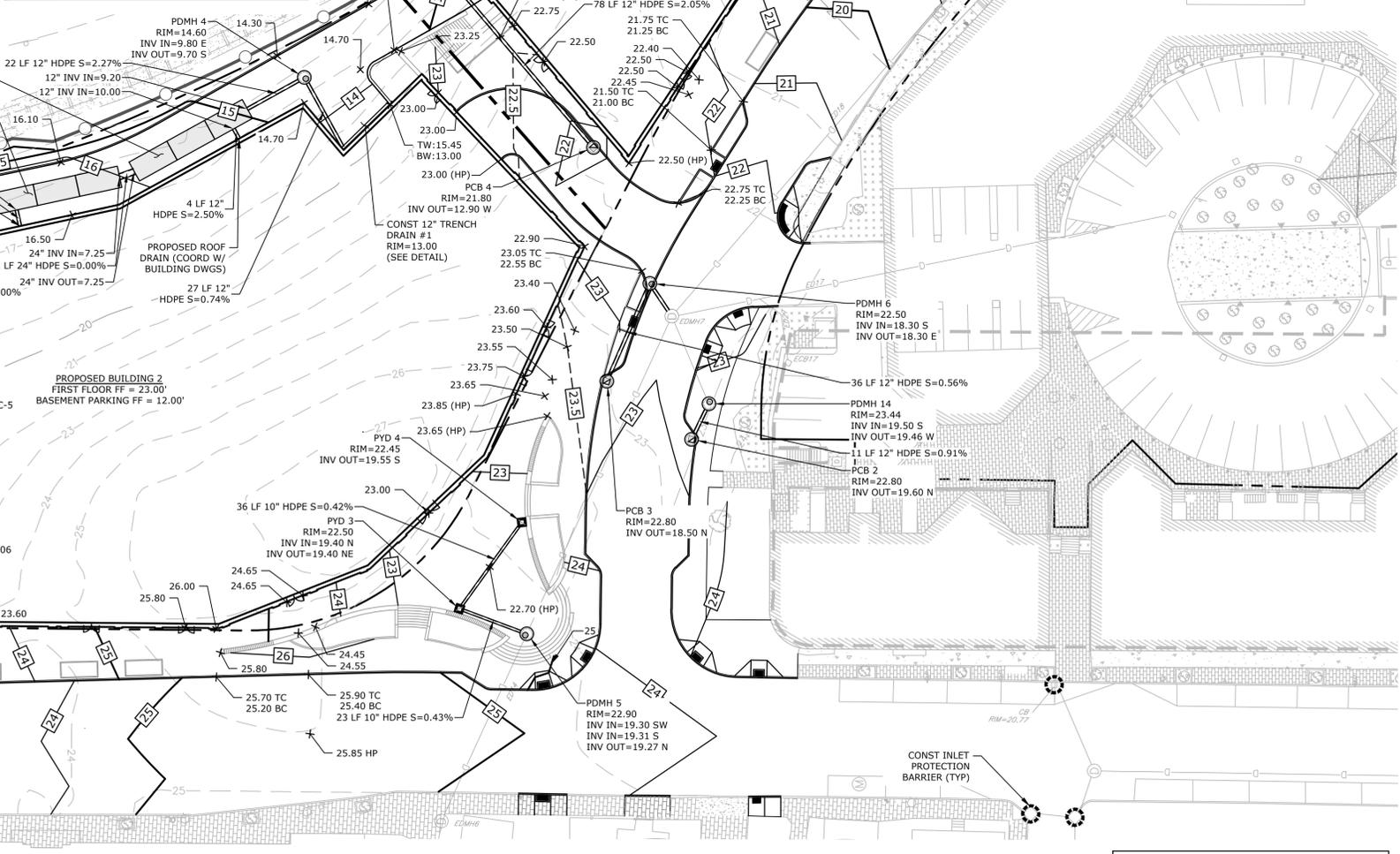
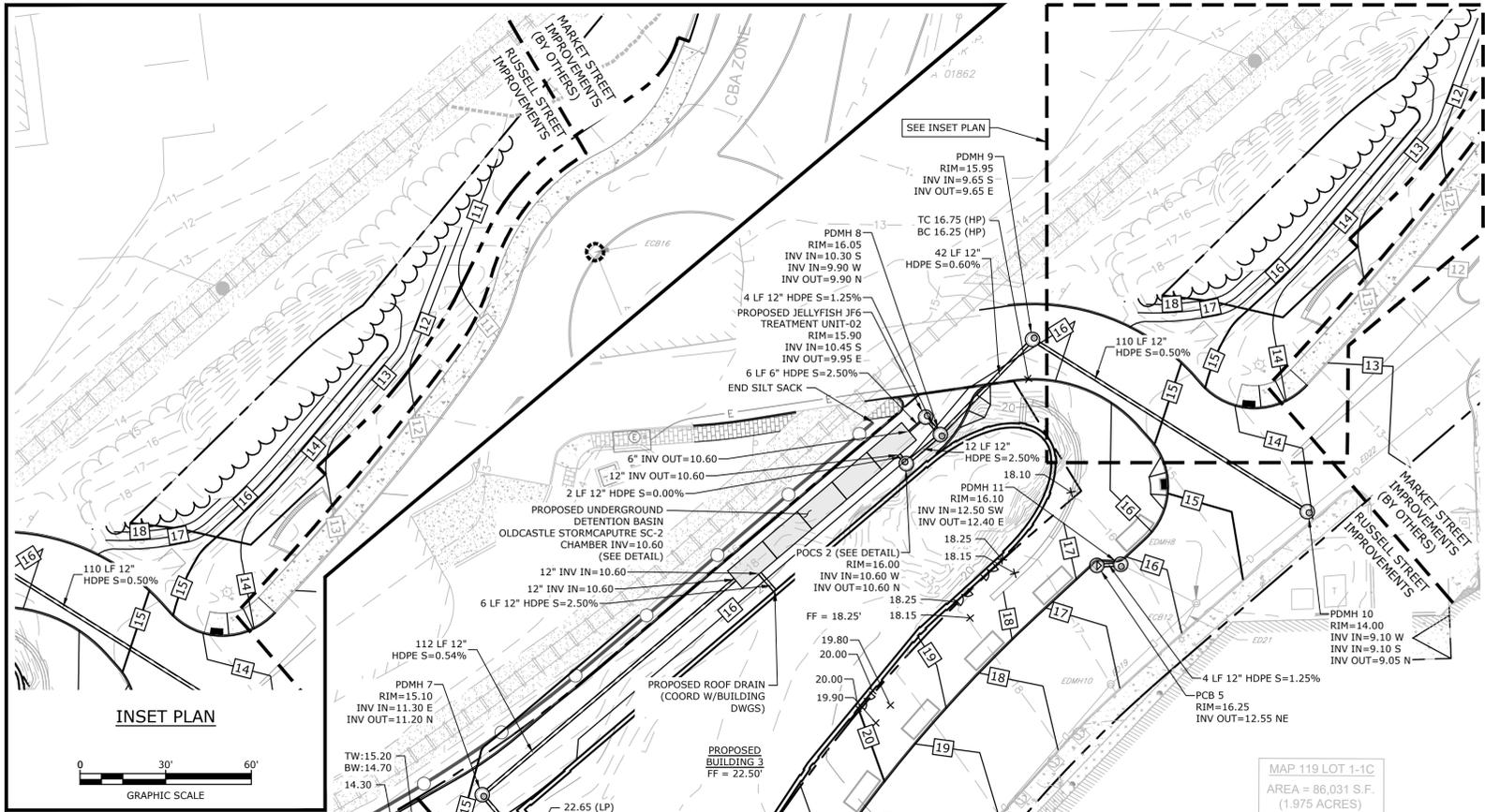
**GRADING & DRAINAGE PLAN**

SCALE: AS SHOWN

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=-0.0111
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=-0.0028
ED13	30'	12" CONC	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

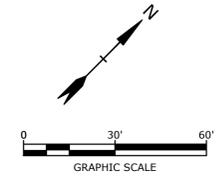
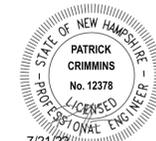
**EXISTING DRAINAGE SCHEDULE**

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)
EDM1	RIM=15.59	INV. IN=11.17 (ED1)
EDM2	RIM=14.00	INV. IN=6.67 (ED3)
EDM3	RIM=13.91	INV. IN=6.41 (ED6)
EDM4	RIM=14.12	INV. IN=6.26 (ED8)
EDM5	RIM=16.60	INV. IN=12.98 (ED12)
EDM6	RIM=25.21	INV. IN(SE)=19.93
EDM7	RIM=22.94	INV. IN=19.49 (ED16)
EDM8	RIM=15.58	INV. IN=12.26 (ED20)
EDM9	RIM=11.06	INV. IN=6.50 (ED26)
EDM10	RIM=16.89	INV. IN=10.43 (ED18)
EDM11	RIM=10.14	INV. IN=6.96 (ED23)
EDM12	RIM=11.55	INV. IN=3.81 (ED27)
EDM13	RIM=11.45	INV. IN=2.37 (ED29)
EDM14	RIM=10.14	INV. IN=6.74 (ED24)
EDM15	RIM=11.55	INV. IN=3.71 (ED28)
EDM16	RIM=11.45	INV. IN=2.27 (ED30)
EDM17	RIM=15.58	INV. IN=12.28 (ED21)
EDM18	RIM=15.58	INV. IN=9.80 (ED19)
EDM19	RIM=11.06	INV. IN=5.54 (ED25)
EDM20	RIM=11.06	INV. IN=3.70 (ED22)
EDM21	RIM=16.89	INV. IN=10.43 (ED18)
EDM22	RIM=16.89	INV. IN=10.51 (ED19)
EDM23	RIM=16.89	INV. IN=10.43 (ED18)
EDM24	RIM=16.89	INV. IN=10.51 (ED19)
EDM25	RIM=16.89	INV. IN=10.43 (ED18)
EDM26	RIM=16.89	INV. IN=10.51 (ED19)
EDM27	RIM=16.89	INV. IN=10.43 (ED18)
EDM28	RIM=16.89	INV. IN=10.51 (ED19)
EDM29	RIM=16.89	INV. IN=10.43 (ED18)
EDM30	RIM=16.89	INV. IN=10.51 (ED19)



SEE SHEET G-100 FOR GRADING & DRAINAGE NOTES AND LEGEND

Last Saved: 7/20/2022  
 Plotted On: Jun 21, 2022 6:55am By: Ckrucik  
 Tighe & Bond: T:\11\T5037 - Two International Group\002 - Russell Street Development\Drawings\Figures\AutoCAD\T5037-002-C-DSGN.dwg

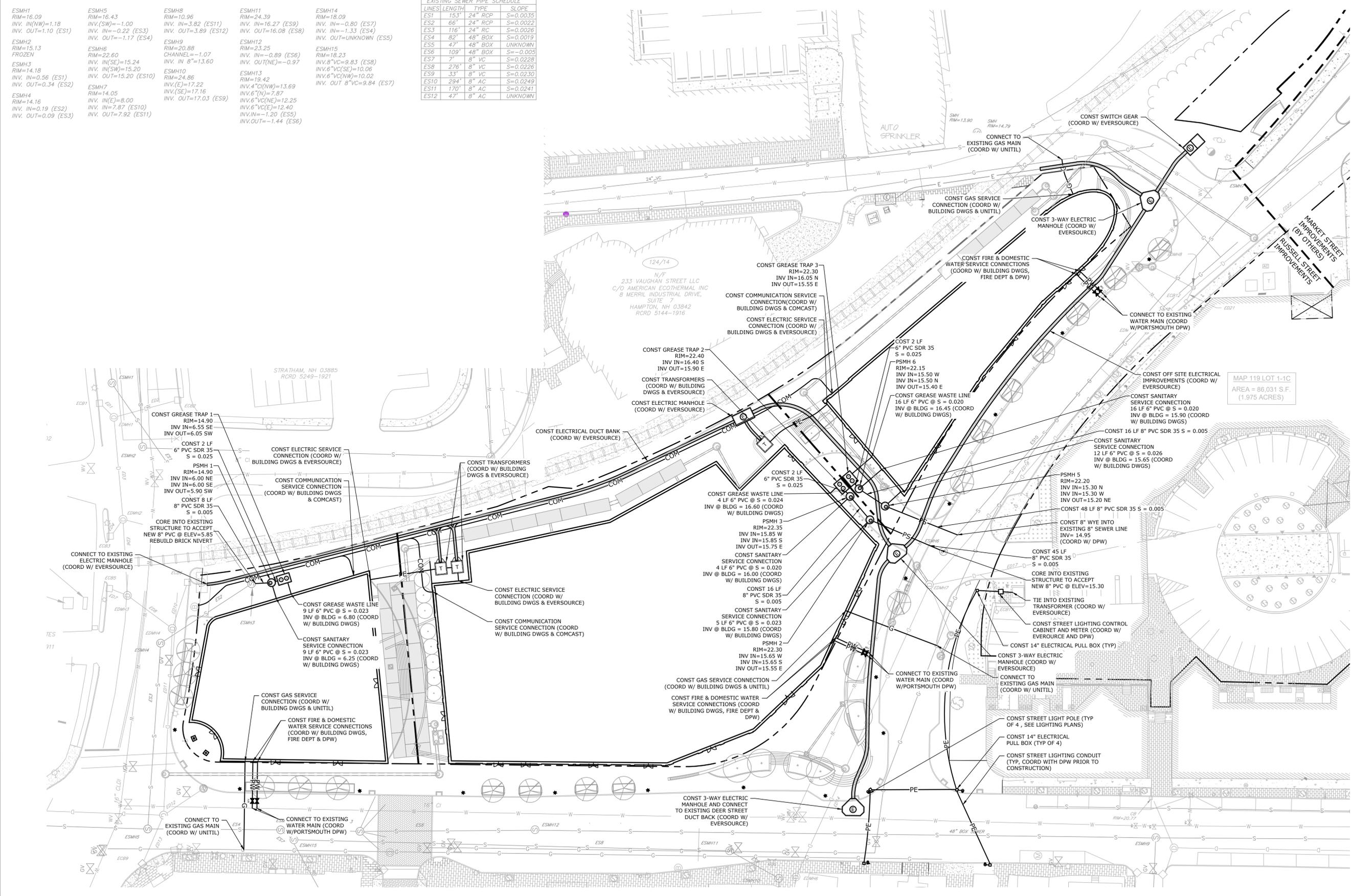


LINES	LENGTH	TYPE	SLOPE
ES1	153'	24" RCP	S=0.0035
ES2	66'	24" RCP	S=0.0022
ES3	116'	24" RC	S=0.0026
ES4	82'	48" BOX	S=0.0019
ES5	47'	48" BOX	UNKNOWN
ES6	109'	48" BOX	S=-0.005
ES7	7'	8" VC	S=0.0228
ES8	276'	8" VC	S=0.0226
ES9	33'	8" VC	S=0.0230
ES10	294'	8" AC	S=0.0249
ES11	170'	8" AC	S=0.0241
ES12	47'	8" AC	UNKNOWN

EXISTING SEWER SCHEDULE

ESMH1 RIM=16.09 INV. IN(NW)=1.18 INV. OUT=1.10 (ES1)	ESMH5 RIM=16.43 INV.(SW)=-1.00 INV. IN=-0.22 (ES3) INV. OUT=-1.17 (ES4)	ESMH8 RIM=10.96 INV. IN=3.82 (ES11) INV. OUT=3.89 (ES12)	ESMH11 RIM=24.39 INV. IN=16.27 (ES9) INV. OUT=16.08 (ES8)	ESMH14 RIM=18.09 INV. IN=-0.80 (ES7) INV. IN=-1.33 (ES4) INV. OUT=UNKNOWN (ES5)
ESMH2 RIM=15.13 FROZEN	ESMH6 RIM=22.60 CHANNEL=-1.07 INV. IN(SE)=15.24 INV. IN(SW)=15.20 INV. OUT=15.20 (ES10)	ESMH9 RIM=20.89 CHANNEL=-1.07 INV. IN 8"=13.60	ESMH12 RIM=23.25 INV. IN=-0.89 (ES6) INV. OUT(NE)=-0.97	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)
ESMH3 RIM=14.18 INV. IN=0.96 (ES1) INV. OUT=0.34 (ES2)	ESMH7 RIM=14.05 INV. IN(E)=8.00 INV. IN=7.87 (ES10) INV. OUT=7.92 (ES11)	ESMH10 RIM=24.86 INV.(E)=17.22 INV. OUT=17.03 (ES9)	ESMH13 RIM=19.42 INV.4"VC(NW)=13.69 INV.6"VC(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)	

Last Saved: 7/20/2022  
 Plotted On: Jun 21, 2022 6:56am By: Ckrucik  
 Tighe & Bond: E:\11\15037 - Two International Group\002 - Russell Street Development\Drawings\002 - Russell Street Development\002-C-DSGN.dwg



**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH

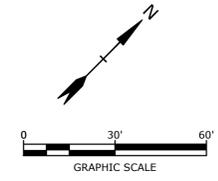
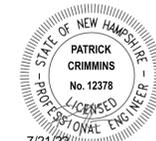
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CIK	
CHECKED:	NAH	
APPROVED:	PMC	

UTILITIES PLAN

SCALE: AS SHOWN

C-104

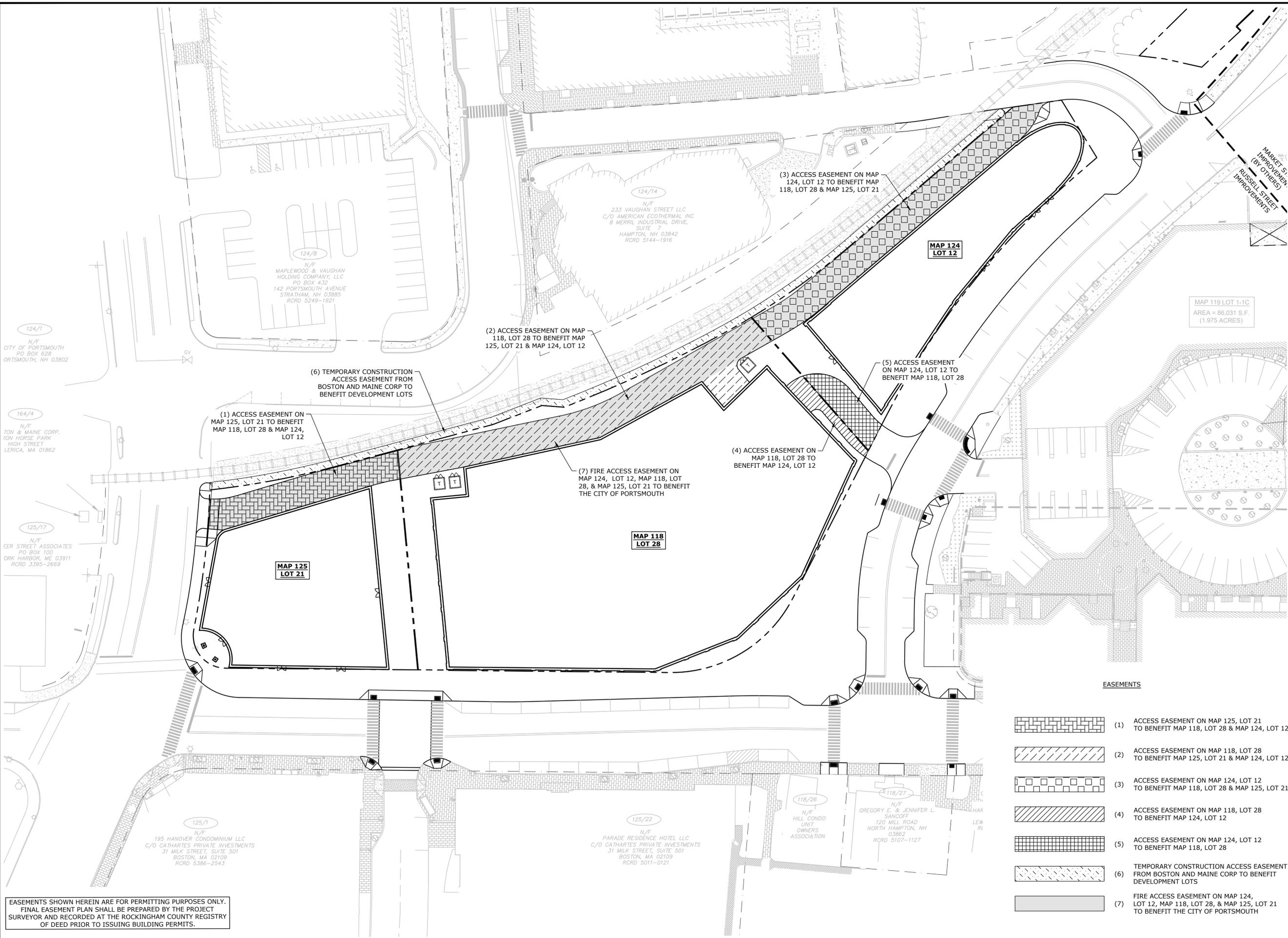
SEE SHEET G-100 FOR  
UTILITIES NOTES AND LEGEND



**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH



**EASEMENTS**

	(1) ACCESS EASEMENT ON MAP 125, LOT 21 TO BENEFIT MAP 118, LOT 28 & MAP 124, LOT 12
	(2) ACCESS EASEMENT ON MAP 118, LOT 28 TO BENEFIT MAP 125, LOT 21 & MAP 124, LOT 12
	(3) ACCESS EASEMENT ON MAP 124, LOT 12 TO BENEFIT MAP 118, LOT 28 & MAP 125, LOT 21
	(4) ACCESS EASEMENT ON MAP 118, LOT 28 TO BENEFIT MAP 124, LOT 12
	(5) ACCESS EASEMENT ON MAP 124, LOT 12 TO BENEFIT MAP 118, LOT 28
	(6) TEMPORARY CONSTRUCTION ACCESS EASEMENT FROM BOSTON AND MAINE CORP TO BENEFIT DEVELOPMENT LOTS
	(7) FIRE ACCESS EASEMENT ON MAP 124, LOT 12, MAP 118, LOT 28, & MAP 125, LOT 21 TO BENEFIT THE CITY OF PORTSMOUTH

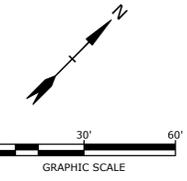
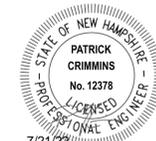
EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEED PRIOR TO ISSUING BUILDING PERMITS.

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CIK	
CHECKED:	NAH	
APPROVED:	PMC	

**ACCESS EASEMENT PLAN**

SCALE: AS SHOWN

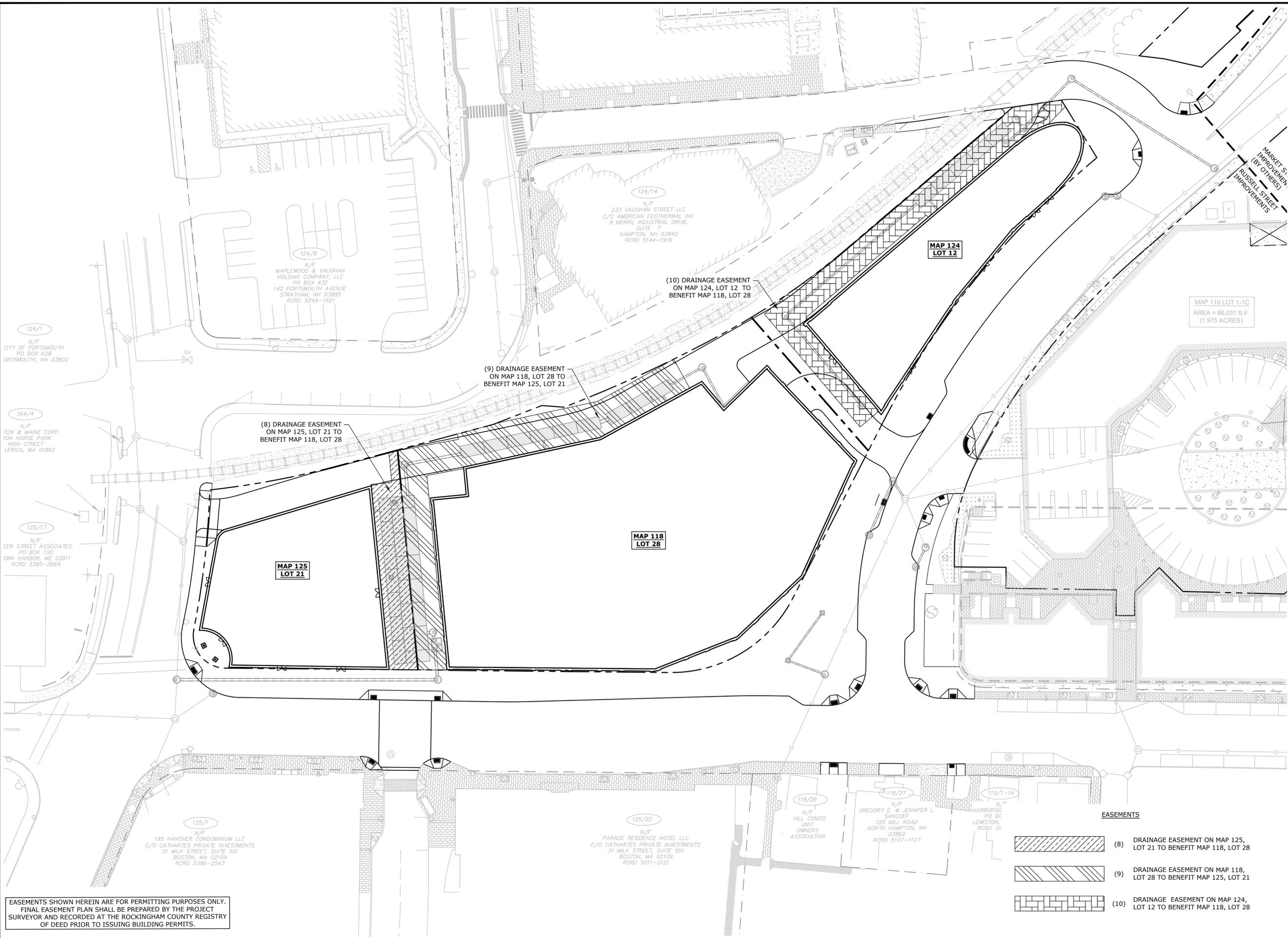
Last Saved: 7/20/2022 11:56am By: Ckrulik  
 Plotted On: Jun 21, 2022 6:56am By: Ckrulik  
 Tighe & Bond: T:\11\T5037 - Two International Group\002 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DSGN.dwg

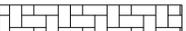


**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH



- EASEMENTS**
-  (8) DRAINAGE EASEMENT ON MAP 125, LOT 21 TO BENEFIT MAP 118, LOT 28
  -  (9) DRAINAGE EASEMENT ON MAP 118, LOT 28 TO BENEFIT MAP 125, LOT 21
  -  (10) DRAINAGE EASEMENT ON MAP 124, LOT 12 TO BENEFIT MAP 118, LOT 28

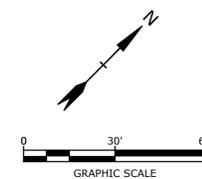
EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY.  
FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT  
SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY  
OF DEED PRIOR TO ISSUING BUILDING PERMITS.

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CJK	
CHECKED:	NAH	
APPROVED:	PMC	

**DRAINAGE  
EASEMENT PLAN**

SCALE: AS SHOWN

Last Saved: 7/20/2022 7:19am By: Ckrucik  
 Plotted On: Jun 21, 2022 7:19am By: Ckrucik  
 Tighe & Bond File: T5037 - Two International Group\002 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DSGN.dwg



**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	7/21/2022	TAC Resubmission

PROJECT NO: T5037-002

DATE: May 24, 2022

FILE: T5037-002-C-DSGN.DWG

DRAWN BY: CIK

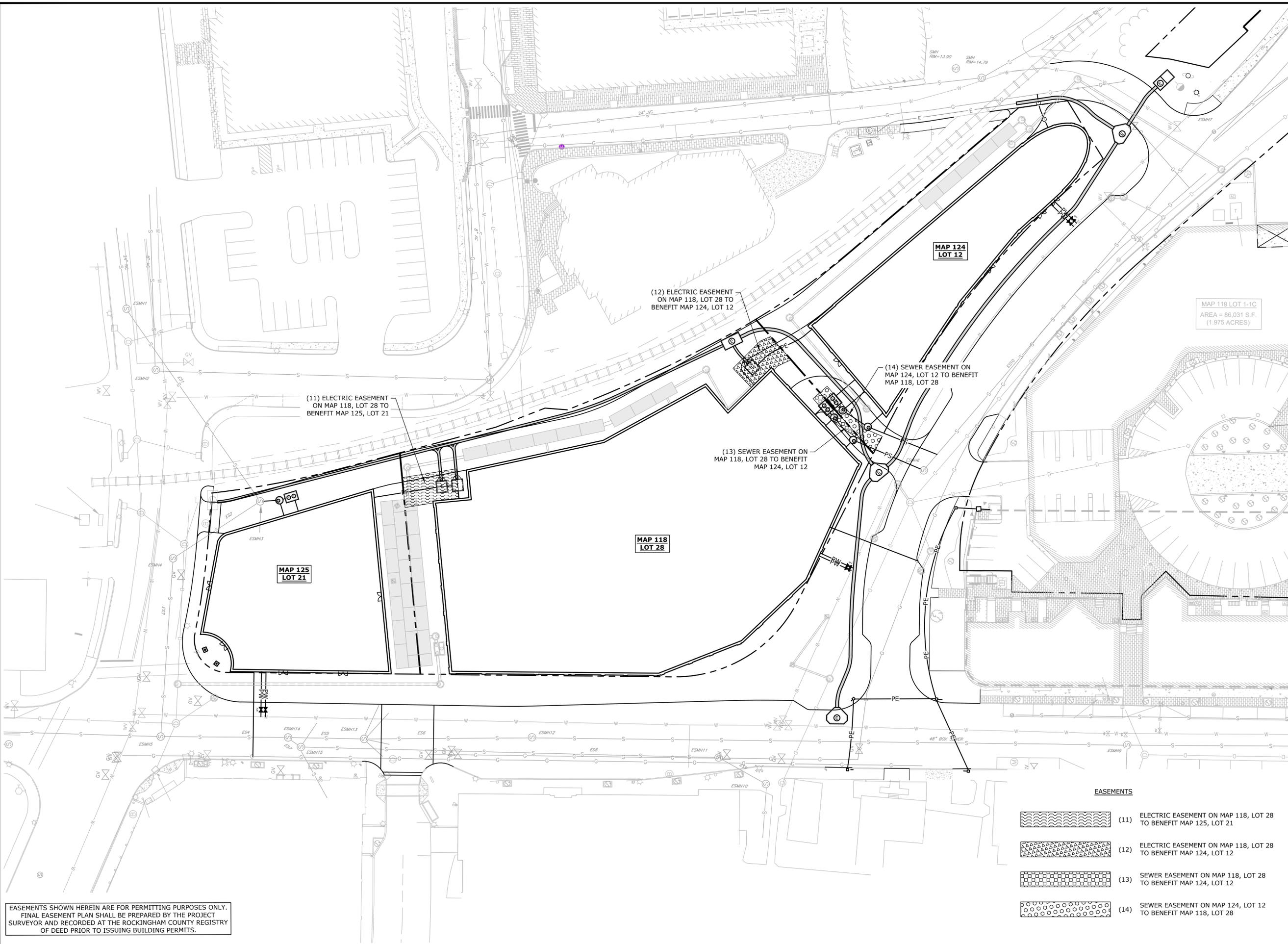
CHECKED: NAH

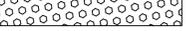
APPROVED: PMC

**UTILITIES  
EASEMENT PLAN**

SCALE: AS SHOWN

**C-202**

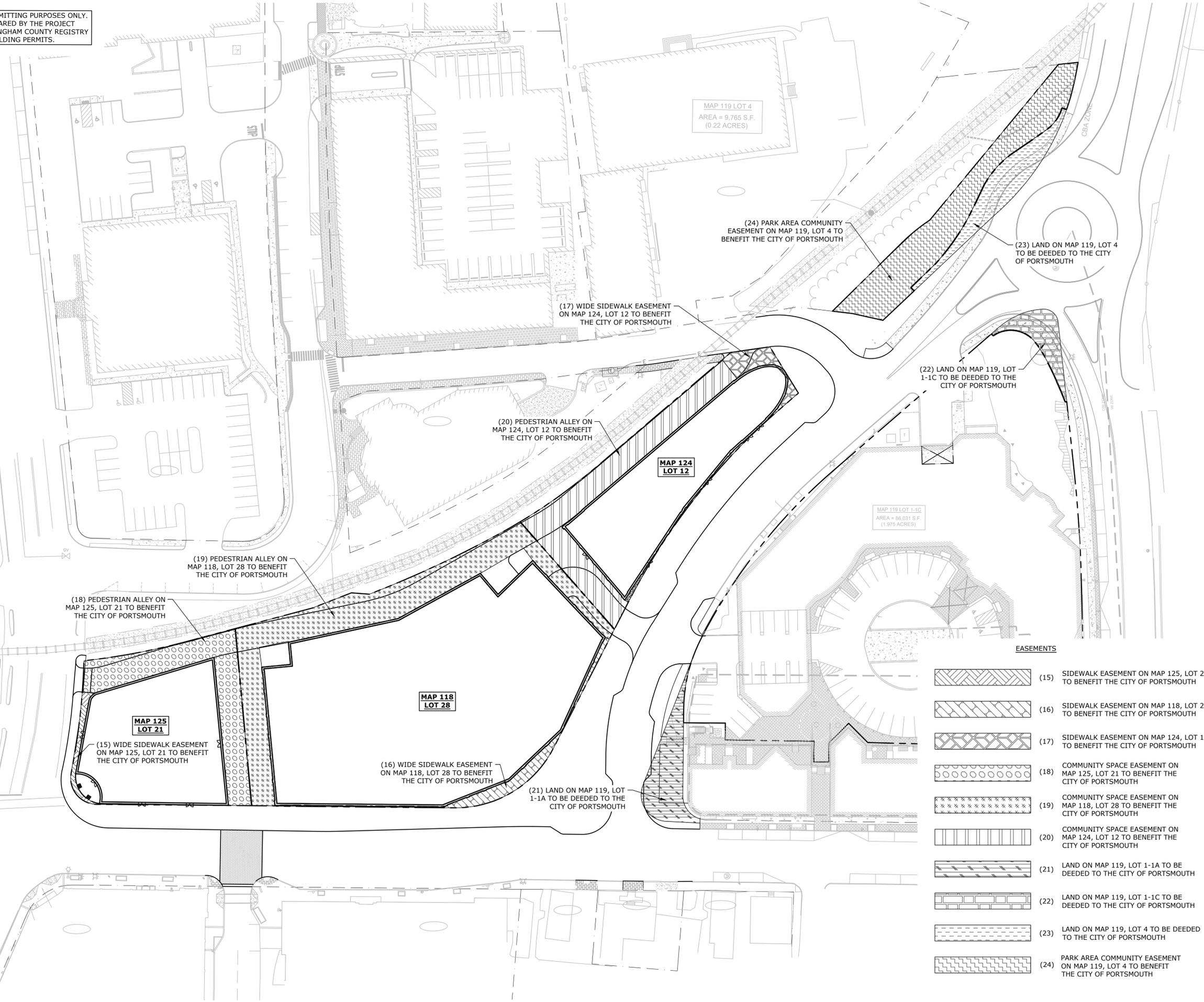
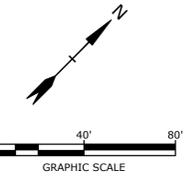
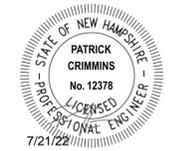


- EASEMENTS**
-  (11) ELECTRIC EASEMENT ON MAP 118, LOT 28 TO BENEFIT MAP 125, LOT 21
  -  (12) ELECTRIC EASEMENT ON MAP 118, LOT 28 TO BENEFIT MAP 124, LOT 12
  -  (13) SEWER EASEMENT ON MAP 118, LOT 28 TO BENEFIT MAP 124, LOT 12
  -  (14) SEWER EASEMENT ON MAP 124, LOT 12 TO BENEFIT MAP 118, LOT 28

EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY.  
FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT  
SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY  
OF DEED PRIOR TO ISSUING BUILDING PERMITS.

Last Saved: 7/20/2022 11:22:06 AM By: CKraulik  
 Plotted On: Jun 21, 2022 6:56 AM By: CKraulik  
 Tighe & Bond File: T5037 - Two International Group\002 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DSGN.dwg

EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY.  
FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT  
SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY  
OF DEED PRIOR TO ISSUING BUILDING PERMITS.



- EASEMENTS**
- (15) SIDEWALK EASEMENT ON MAP 125, LOT 21 TO BENEFIT THE CITY OF PORTSMOUTH
  - (16) SIDEWALK EASEMENT ON MAP 118, LOT 28 TO BENEFIT THE CITY OF PORTSMOUTH
  - (17) SIDEWALK EASEMENT ON MAP 124, LOT 12 TO BENEFIT THE CITY OF PORTSMOUTH
  - (18) COMMUNITY SPACE EASEMENT ON MAP 125, LOT 21 TO BENEFIT THE CITY OF PORTSMOUTH
  - (19) COMMUNITY SPACE EASEMENT ON MAP 118, LOT 28 TO BENEFIT THE CITY OF PORTSMOUTH
  - (20) COMMUNITY SPACE EASEMENT ON MAP 124, LOT 12 TO BENEFIT THE CITY OF PORTSMOUTH
  - (21) LAND ON MAP 119, LOT 1-1A TO BE DEEDED TO THE CITY OF PORTSMOUTH
  - (22) LAND ON MAP 119, LOT 1-1C TO BE DEEDED TO THE CITY OF PORTSMOUTH
  - (23) LAND ON MAP 119, LOT 4 TO BE DEEDED TO THE CITY OF PORTSMOUTH
  - (24) PARK AREA COMMUNITY EASEMENT ON MAP 119, LOT 4 TO BENEFIT THE CITY OF PORTSMOUTH

**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH

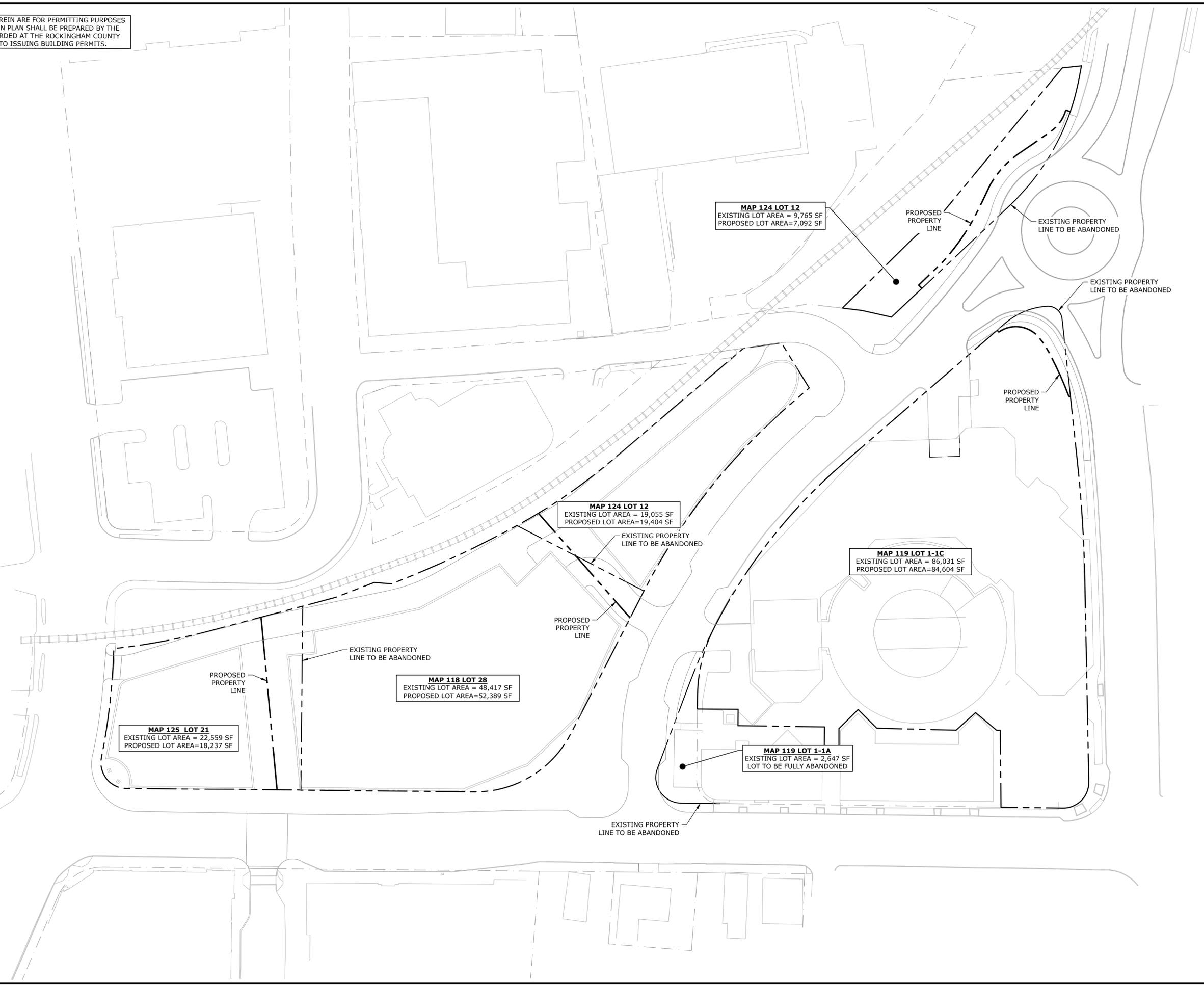
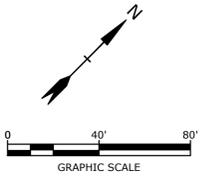
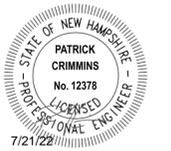
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DSGN.DWG	
DRAWN BY:	CJK	
CHECKED:	NAH	
APPROVED:	PMC	

**COMMUNITY SPACE  
EASEMENT PLAN**

SCALE: AS SHOWN

Last Saved: 7/20/2022  
 Plotted On: Jul 21, 2022 7:23am By: Ckrulik  
 Tighe & Bond: T:\11\15037 - Two International Group\002 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DSGN.dwg

LOT LINE REVISIONS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL LOT LINE REVISION PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEED PRIOR TO ISSUING BUILDING PERMITS.



**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DSGN.DWG
DRAWN BY:	CJK
CHECKED:	NAH
APPROVED:	PMC

**LOT LINE  
REVISION PLAN**

SCALE: AS SHOWN

Last Saved: 7/20/2022 11:03:03 AM By: CKraulik  
 Plotted On: Jul 21, 2022 2:07:00 PM  
 Tighe & Bond 2111 V5037 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 MAP / LOT: MAP 118 / LOT 28  
PROJECT ADDRESS: RUSSELL STREET & DEER STREET MAP 119 / LOT 1-1A  
MAP 119 / LOT 1-1C  
MAP 119 / LOT 4  
MAP 124 / LOT 12  
MAP 125 / LOT 21  
PORTSMOUTH, NH 03801  
PROJECT LATITUDE: 43°-04'-43" N  
PROJECT LONGITUDE: 70°-45'-41" W

**PROJECT DESCRIPTION**

THE PROJECT CONSISTS OF THE CONSTRUCTION OF AN 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 OR DIRECTLY TO THE PISQUATAQUA 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 ADJACENT 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, CYCLOM 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 RESEED, 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.
  - B. 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:**

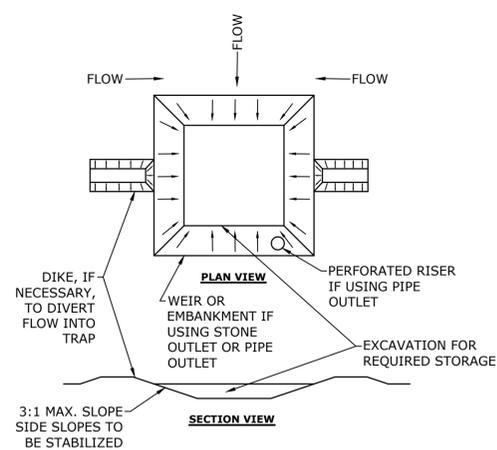
- 1. WASTE MATERIAL:
  - A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEP TACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
  - B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
  - C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING 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**

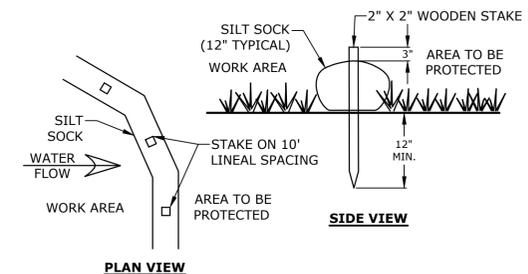
- 1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THIS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ON SITE AT ALL TIMES.
- 2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING 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.

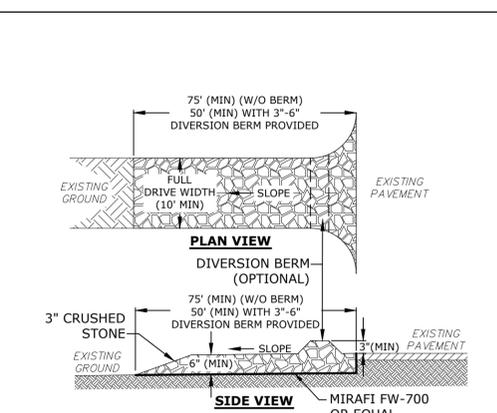
**SEDIMENT TRAP**  
NO SCALE



**NOTES:**

- 1. SILT SOCK SHALL BE SILT SOCK BY FILTREXX OR APPROVED EQUAL
- 2. INSTALL SILT SOCK IN ACCORDANCE WITH...

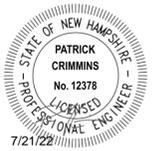
**SILT SOCK**  
NO SCALE



**NOTE:**

- 1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

**STABILIZED CONSTRUCTION EXIT**  
NO SCALE



**North End Mixed Use Development**

**Two International Group**

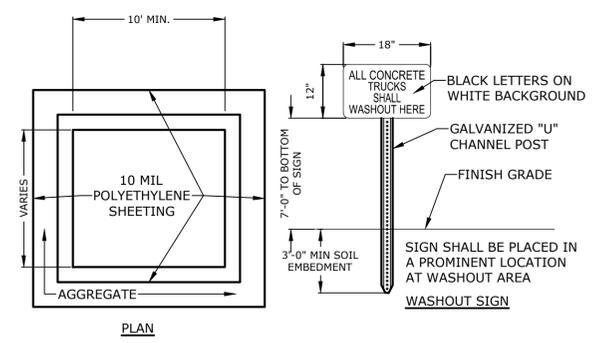
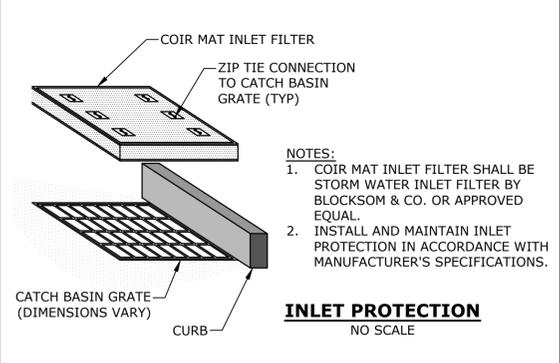
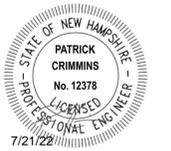
Russell Street & Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DTLS.DWG	
DRAWN BY:	CJX	
CHECKED:	NAH	
APPROVED:	PMC	

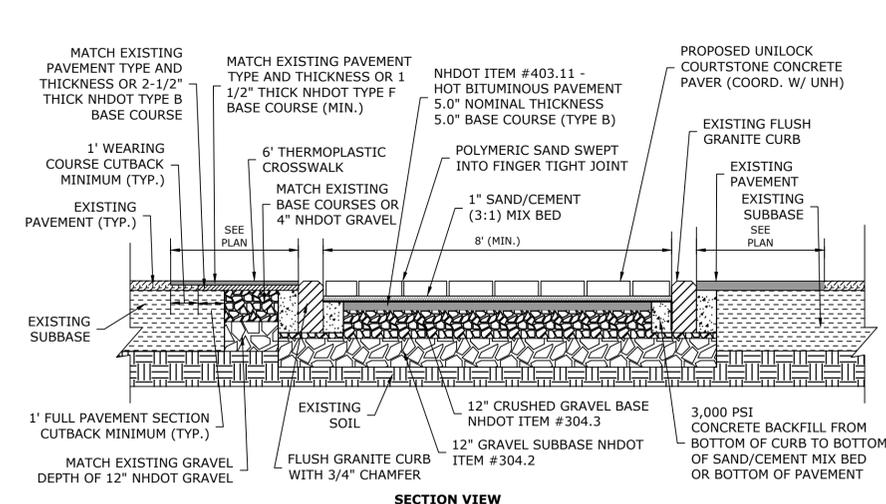
**EROSION CONTROL NOTES AND DETAILS SHEET**

SCALE: AS SHOWN

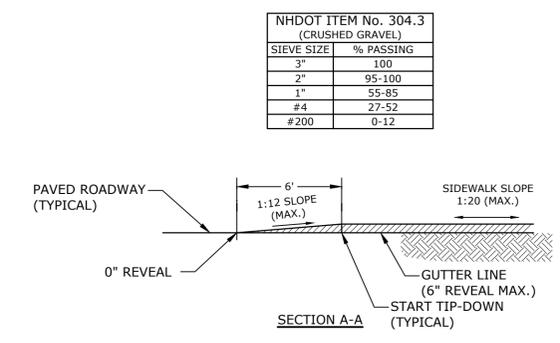
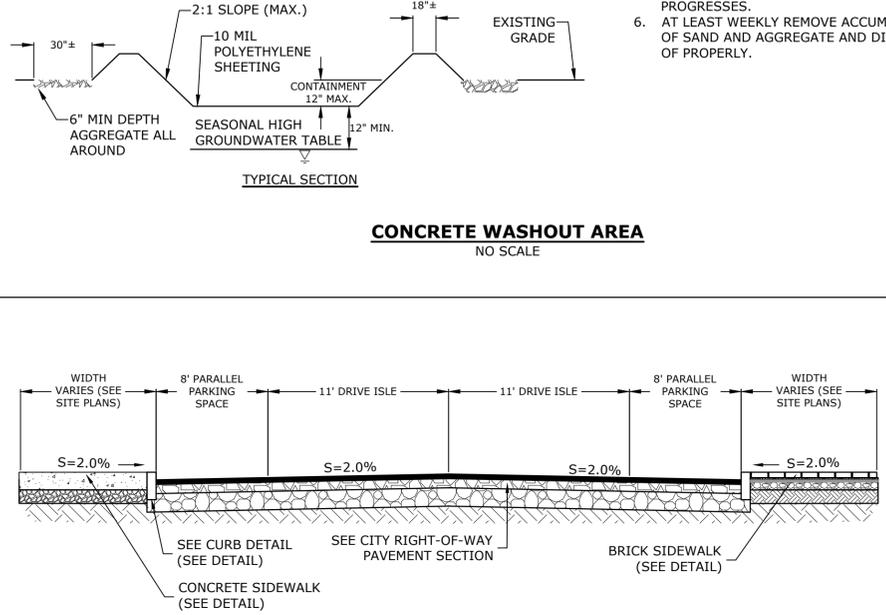
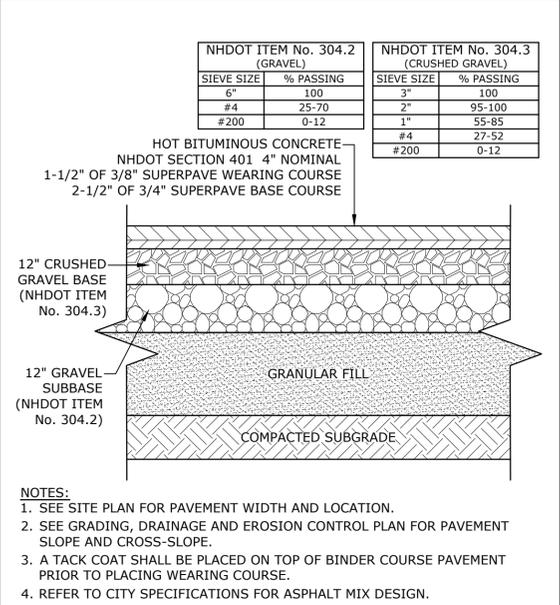
Last Saved: 7/20/2022  
Plotted On: Jul 21, 2022 7:00am By: Ckrucik  
Tighe & Bond\EA115027 - Two International Group\03 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002 - C-DTLS.dwg



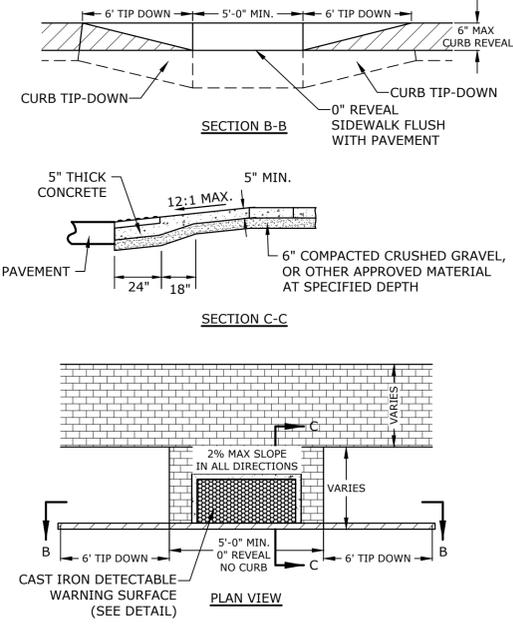
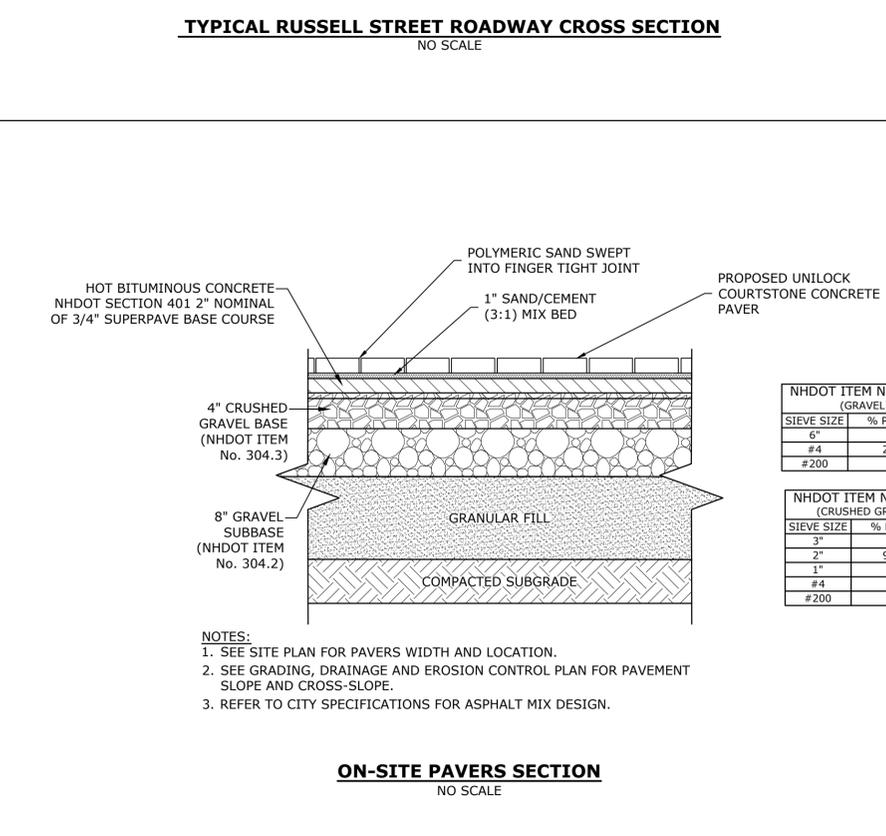
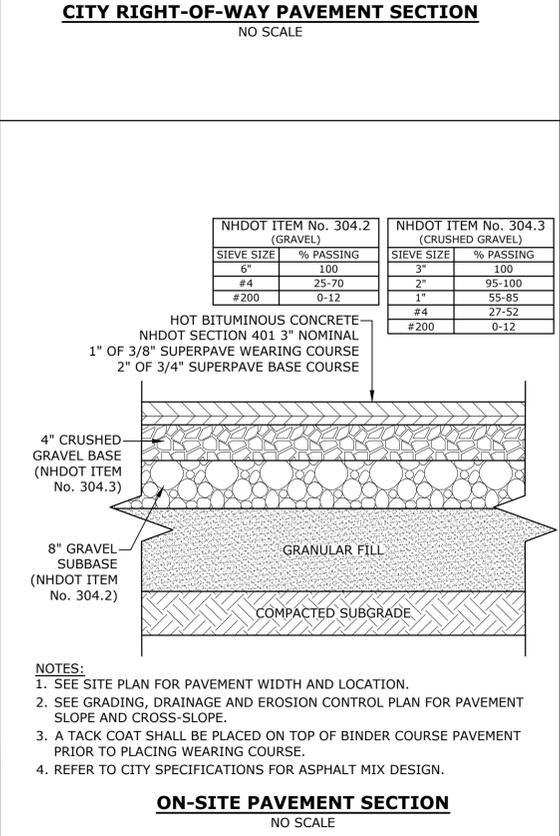
- NOTES:**
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
  2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
  3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT 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.



- 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.



- 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).



**North End Mixed Use Development**

**Two International Group**

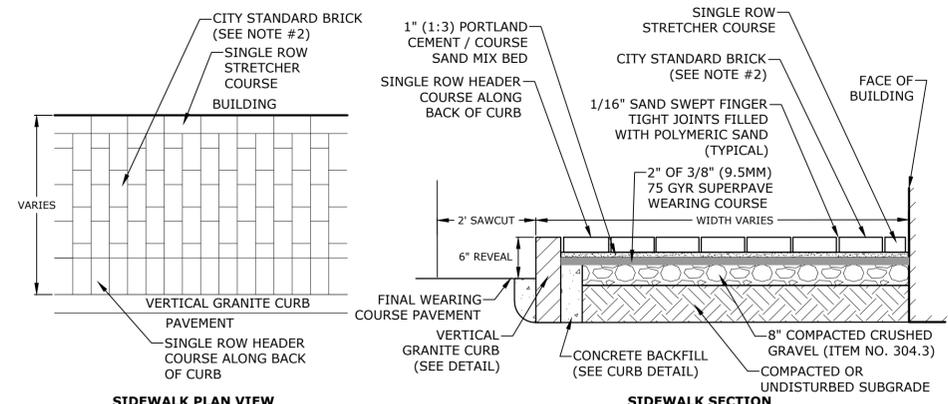
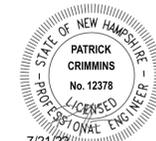
**Russell Street & Deer Street Portsmouth, NH**

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DTLS.DWG	
DRAWN BY:	CJX	
CHECKED:	NAH	
APPROVED:	PMC	

DETAILS SHEET

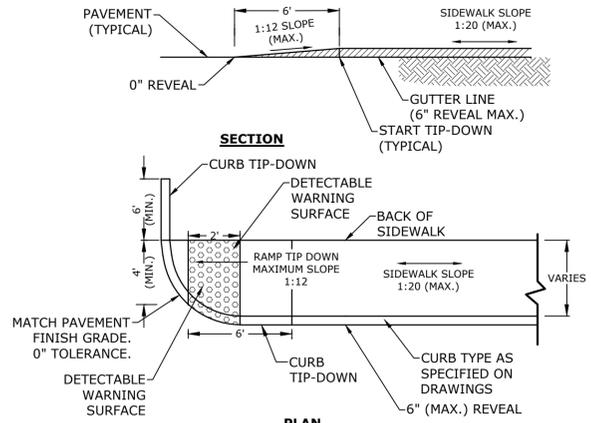
SCALE: AS SHOWN

C-502



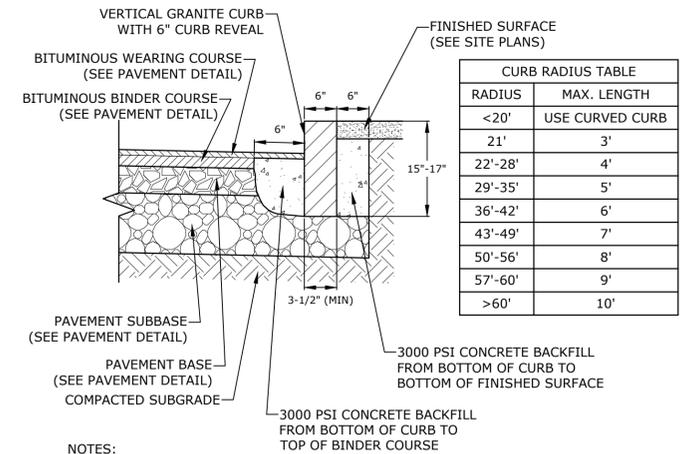
- NOTES:**
- BRICK SIDEWALK SHALL BE INSTALLED AS DETAILED AND PER CITY OF PORTSMOUTH REQUIREMENTS/SPECIFICATIONS AND SHALL INCLUDE A CONTINUOUS APPROVED PAVER EDGE RESTRAINT SYSTEM AT ALL LOCATIONS NOT ADJACENT TO CURB OR BUILDINGS.
  - CITY STANDARD BRICK SHALL BE TRADITIONAL EDGE, PATHWAY, FULL RANGE 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.
  - 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 1/TYPE II.

**BRICK SIDEWALK**  
NO SCALE



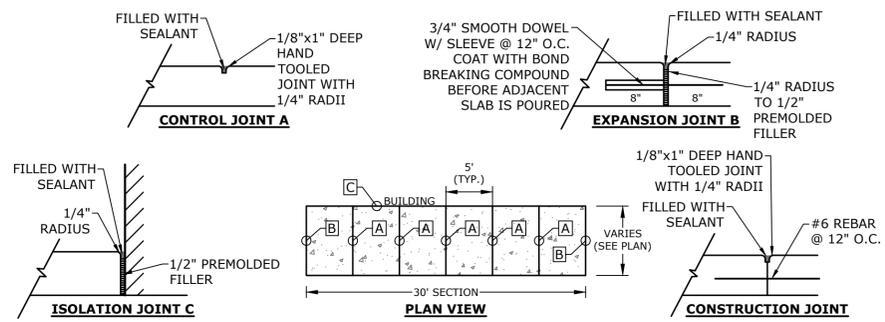
- NOTES:**
- RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
  - PROVIDE 8" COMPACTED CRUSHED GRAVEL BASE BENEATH INCS.
  - DETECTABLE WARNING STRIP SHALL BE ADA SOLUTIONS, INC. CAST IN PLACE RAMP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

**CONCRETE SIDEWALK TIP-DOWN RAMP WITH DETECTABLE WARNING PANEL**  
NO SCALE



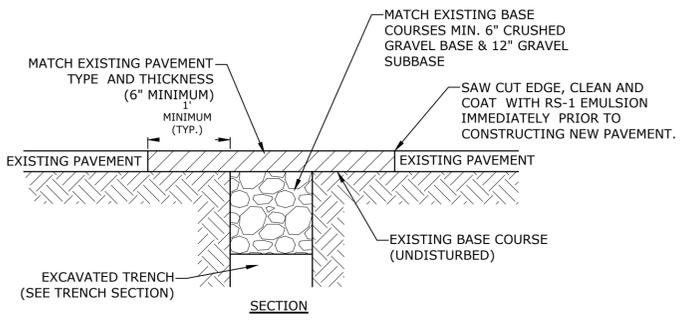
- NOTES:**
- SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
  - ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
  - MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
  - MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
  - MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
  - ALL RADIUS 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
  - JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

**VERTICAL GRANITE CURB**  
NO SCALE



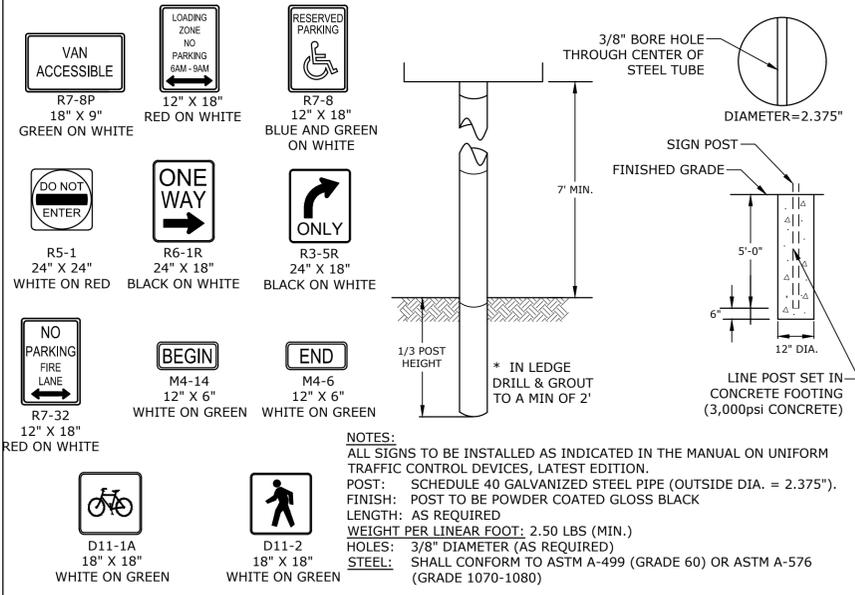
- NOTES:**
- SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
  - SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
  - ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.

**CONCRETE SIDEWALK WITH GRANITE CURB**  
NO SCALE



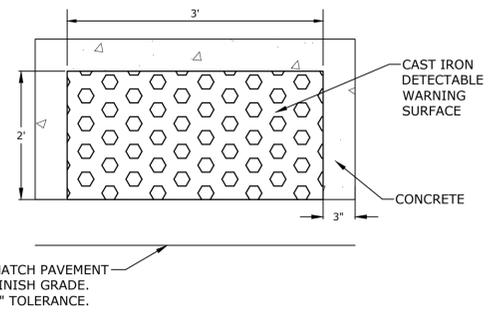
- NOTE:**
- COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.

**ROADWAY TRENCH PATCH**  
NO SCALE



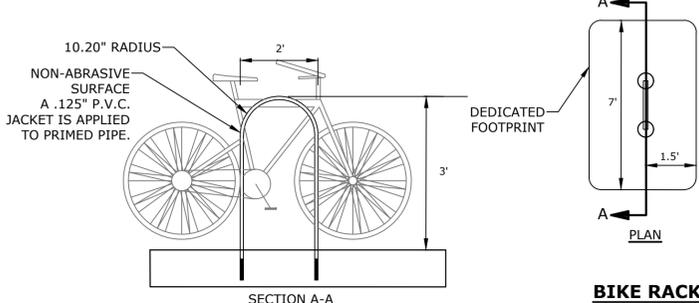
- NOTES:**
- ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
  - POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
  - FINISH: POST TO BE POWDER COATED GLOSS BLACK
  - LENGTH: AS REQUIRED
  - WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
  - 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

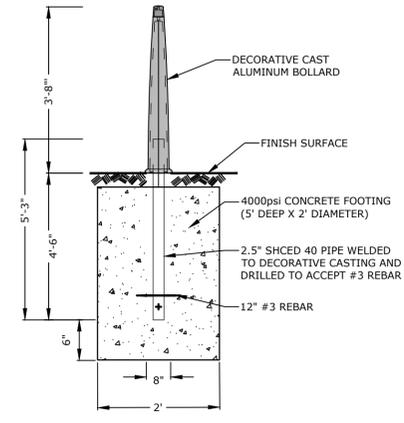


- NOTES:**
- DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
  - DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

**CAST IRON DETECTABLE WARNING SURFACE**  
NO SCALE



**BIKE RACK**  
NO SCALE



- NOTES:**
- DECORATIVE CAST BOLLARD TO BE DG4 BY URBAN ACCESSORIES OR APPROVED EQUAL

**BOLLARD DETAIL**  
NO SCALE

**North End Mixed Use Development**

**Two International Group**

Russell Street & Deer Street  
Portsmouth, NH

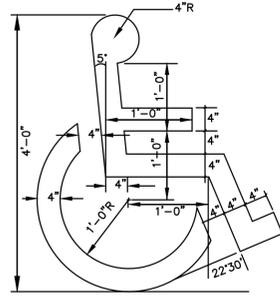
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DTLS.DWG	
DRAWN BY:	CJK	
CHECKED:	NAH	
APPROVED:	PMC	

**DETAILS SHEET**

SCALE: AS SHOWN

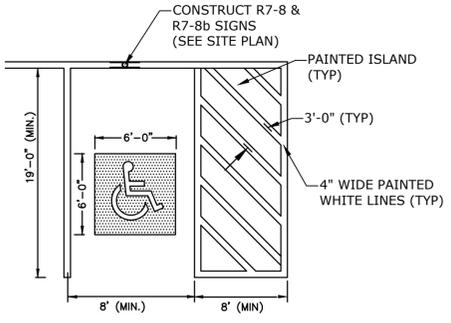
**C-503**

Last Saved: 7/20/2022 10:00am By: CKrczuk  
Plotted On: Jul 21, 2022 7:00am By: CKrczuk  
Tighe & Bond 2111/5037 Two International Group 002 Russell Street Development Drawings - Figures AutoCAD T5037-002-C-DTLS.dwg



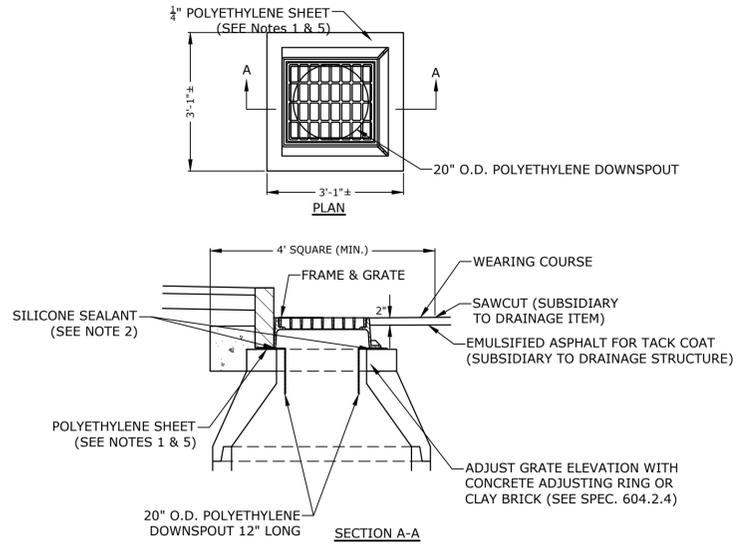
- NOTES:**
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING WHITE THERMOPLASTIC, REFLECTORIZED PAVEMENT PARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505.
  2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

**ACCESSIBLE SYMBOL**  
NO SCALE



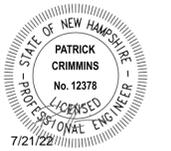
- NOTES:**
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
  2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN W/DISABILITIES ACT.

**ACCESSIBLE PARKING STALL**  
NO SCALE

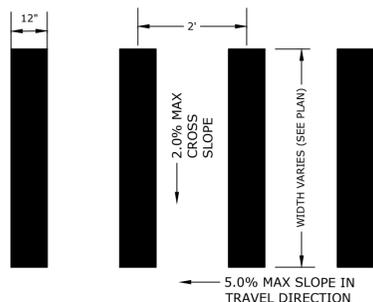


- NOTES:**
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
  2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
  3. PLACE CLASS AA 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



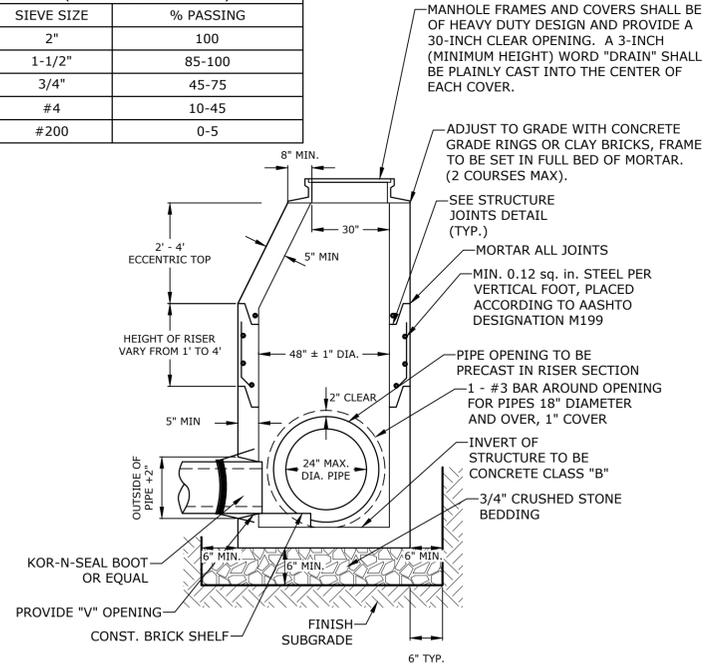
**ONLY LEGEND**



- NOTE:**
1. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTORIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

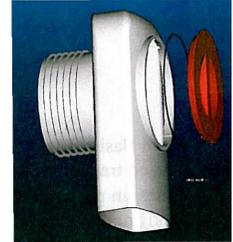
**CROSSWALK STRIPING**  
NO SCALE

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



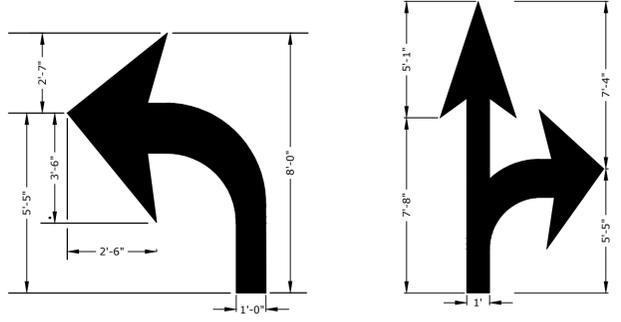
- NOTES:**
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
  2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
  3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL 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 HORIZONTAL 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**

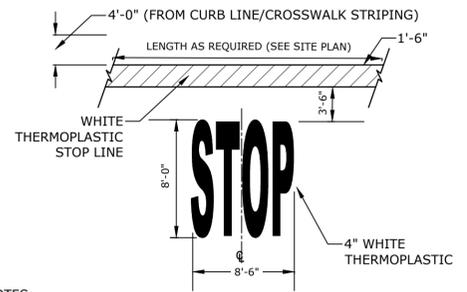


**TURN ARROW**

**COMBINATION ARROW**

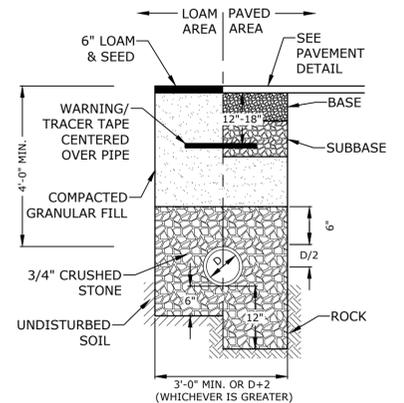
- NOTES:**
1. ALL WORDS AND SYMBOLS SHALL BE RETROREFLECTIVE WHITE AND SHALL CONFORM TO THE LATEST VERSION OF THE MUTCD.
  2. MULTI-WORD MESSAGES SHALL READ "UP"; THAT IS, THE FIRST WORD SHALL BE NEAREST THE APPROACHING DRIVER.
  3. THE WORD "ONLY" SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS, 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



- NOTES:**
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
  2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTORIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

**STOP BAR AND LEGEND**  
NO SCALE



- NOTES:**
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
  2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

**STORM DRAIN TRENCH**  
NO SCALE

**North End Mixed Use Development**

**Two International Group**

Russell Street & Deer Street  
Portsmouth, NH

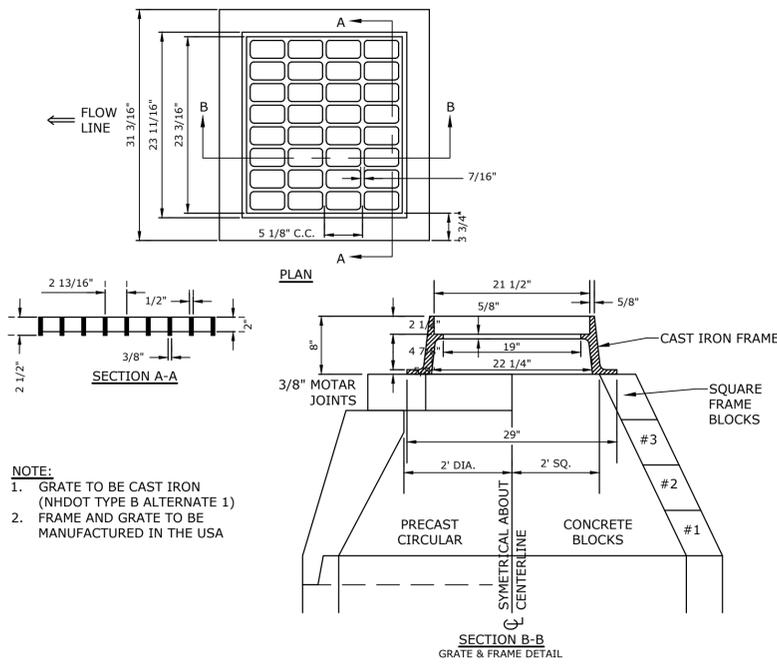
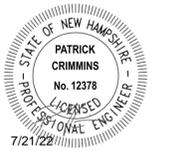
MARK	DATE	DESCRIPTION
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CIK
CHECKED:	NAH
APPROVED:	PMC

**DETAILS SHEET**

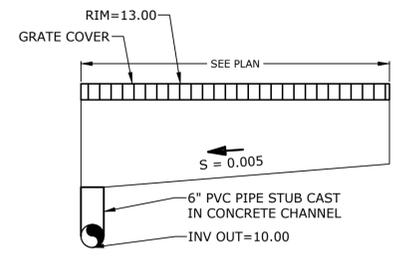
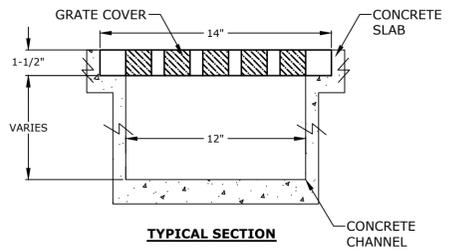
SCALE: AS SHOWN

**C-504**



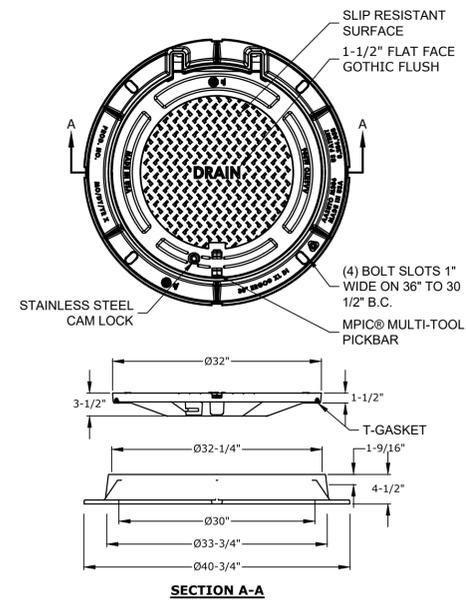
**NOTE:**  
 1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)  
 2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

**CATCH BASIN FRAME & GRATE**  
NO SCALE



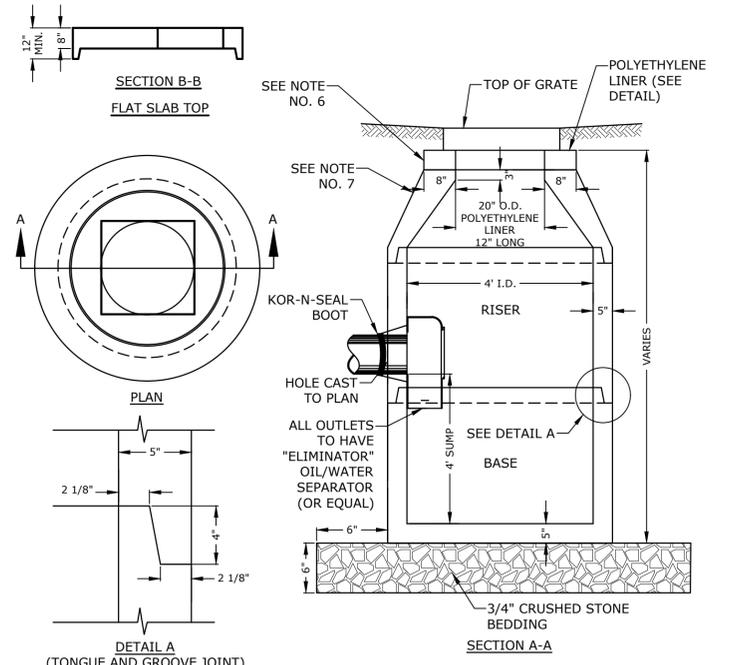
**NOTES:**  
 1. TRENCH DRAIN FRAME AND GRATE SHALL BE MULTIDRAIN ECONODRAIN SERIES #12 OR EQUAL.

**TRENCH DRAIN**  
NO SCALE



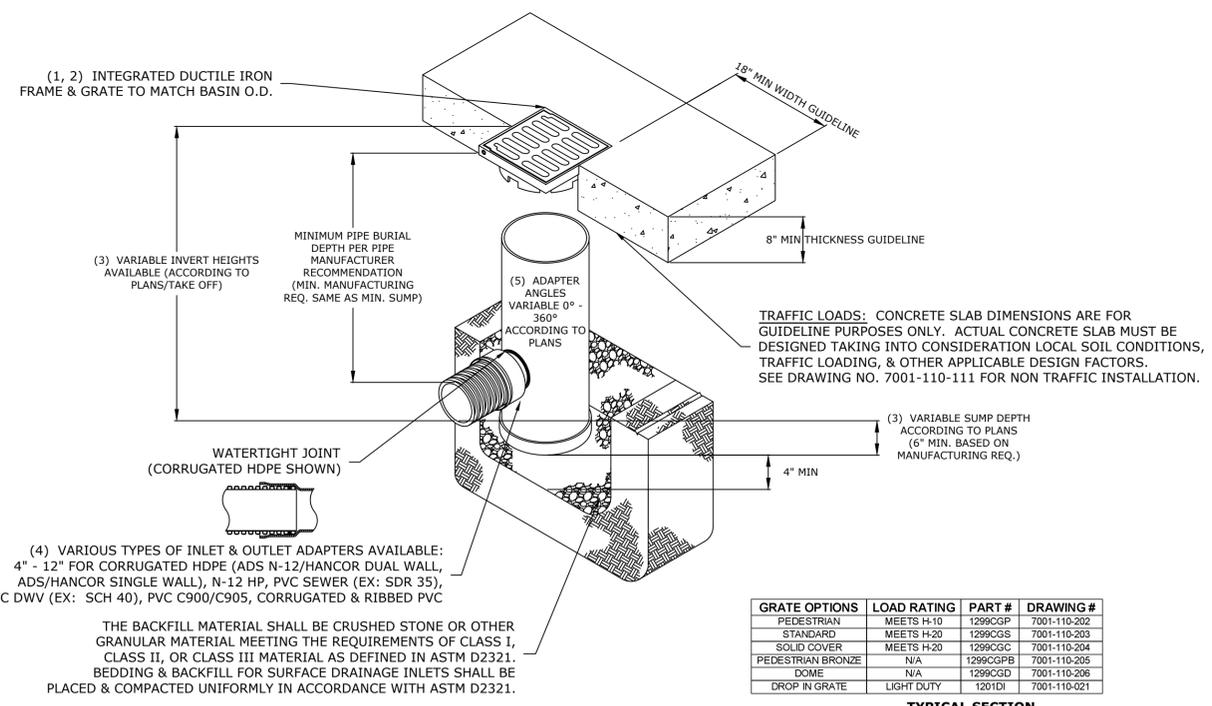
**NOTES:**  
 1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.  
 2. ALL DIMENSIONS ARE NOMINAL.  
 3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:  
 A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.  
 B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF 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 THE 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 H2O 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

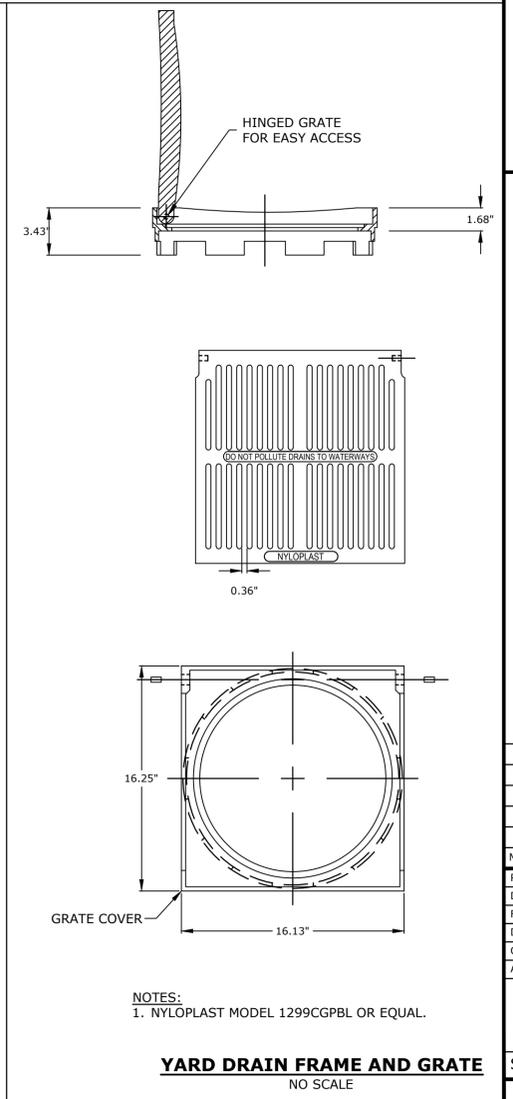


(4) VARIOUS TYPES OF INLET & OUTLET ADAPTERS AVAILABLE:  
 4" - 12" FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL, ADS/HANCOR SINGLE WALL), N-12 HP, PVC SEWER (EX: SDR 35), PVC DWV (EX: SCH 40), PVC C900/C905, CORRUGATED & RIBBED PVC

THE BACKFILL MATERIAL SHALL BE CRUSHED STONE OR OTHER GRANULAR MATERIAL MEETING THE REQUIREMENTS OF CLASS I, CLASS II, OR CLASS III MATERIAL AS DEFINED IN ASTM D2321. BEDDING & BACKFILL FOR SURFACE DRAINAGE INLETS SHALL BE PLACED & COMPACTED UNIFORMLY IN ACCORDANCE WITH ASTM D2321.

**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



**YARD DRAIN FRAME AND GRATE**  
NO SCALE

**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

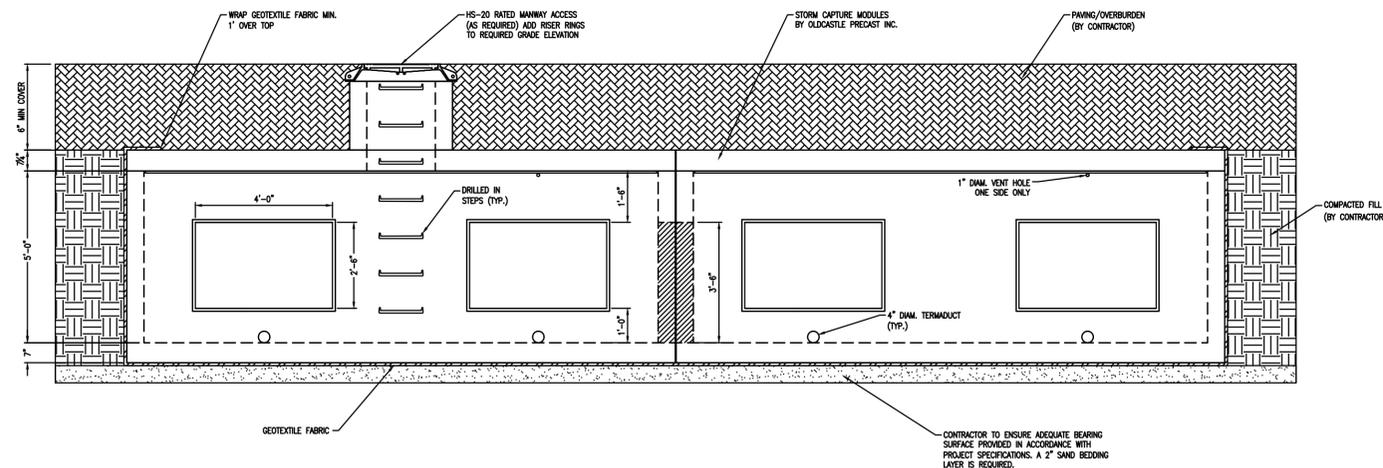
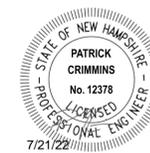
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-C-DTLS.DWG	
DRAWN BY:	CJK	
CHECKED:	NAH	
APPROVED:	PMC	

**DETAILS SHEET**

SCALE: AS SHOWN

**C-505**

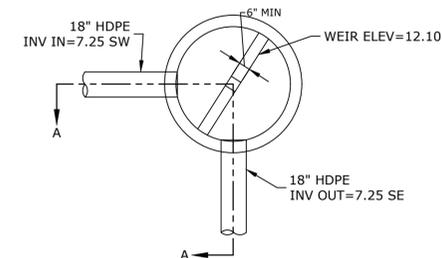
Last Saved: 7/20/2022  
 Plotted On: Jun 21, 2022 7:01am By: Ckrzulk  
 Tighe & Bond: E:\11\15037 - Two International Group\002 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DTLS.dwg



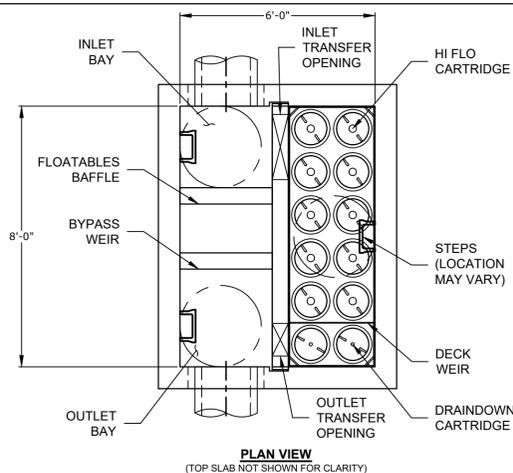
**TYPICAL SECTION**

- NOTES:**
1. UNDERGROUND DETENTION SYSTEM TO BE OLDCASTLE STORMCAPTURE SC-5 DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT BASIN SPECIFICATIONS AND FINAL MANUFACTURED 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.

**OLDCASTLE SC-5 DETAIL**  
NO SCALE

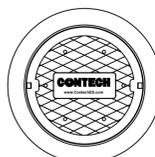


**PLAN VIEW**



**PLAN VIEW**  
(TOP SLAB NOT SHOWN FOR CLARITY)

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

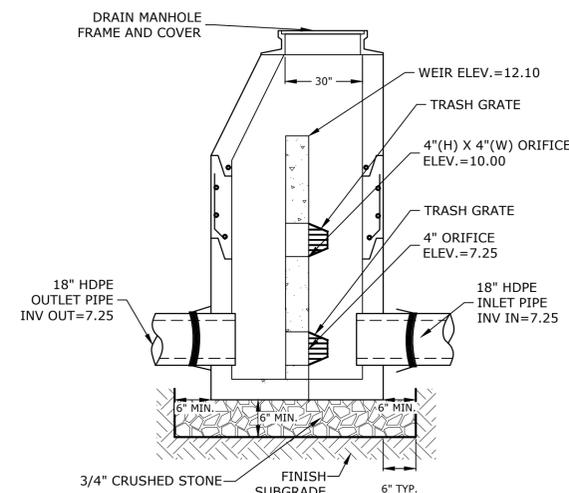


SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	JF-1
MODEL SIZE	JFPD0806
WATER QUALITY FLOW RATE (cfs)	0.59
PEAK FLOW RATE (cfs)	1.44
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	3/1
CARTRIDGE SIZE	54"

- 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](http://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.

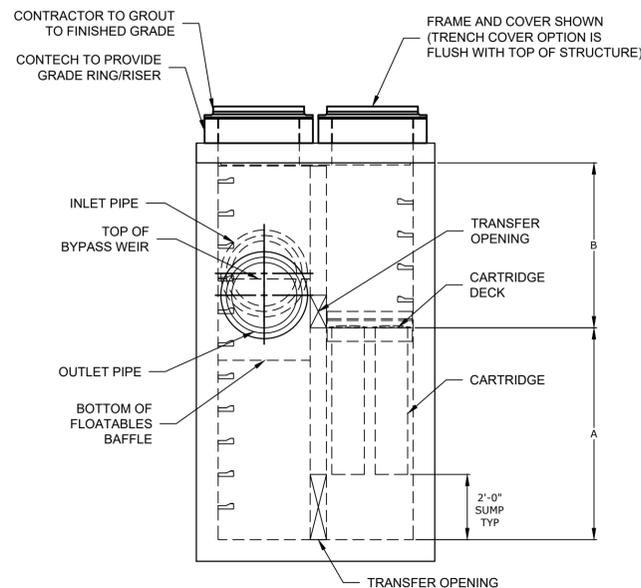
- INSTALLATION NOTES**
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
  - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES 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.

**CONTECH ENGINEERED SOLUTIONS LLC**  
 www.conteches.com  
 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45099  
 US 9 123 830, OTHER INTERNATIONAL PATENTS PENDING  
 800-338-1122 513-645-7000 513-645-7993 FAX



**POS-01**  
NO SCALE

- NOTES:**
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
  2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER 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.



**ELEVATION VIEW**

**CONTECH JELLYFISH STORMWATER FILTER (JFPD0806)**  
NO SCALE

**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

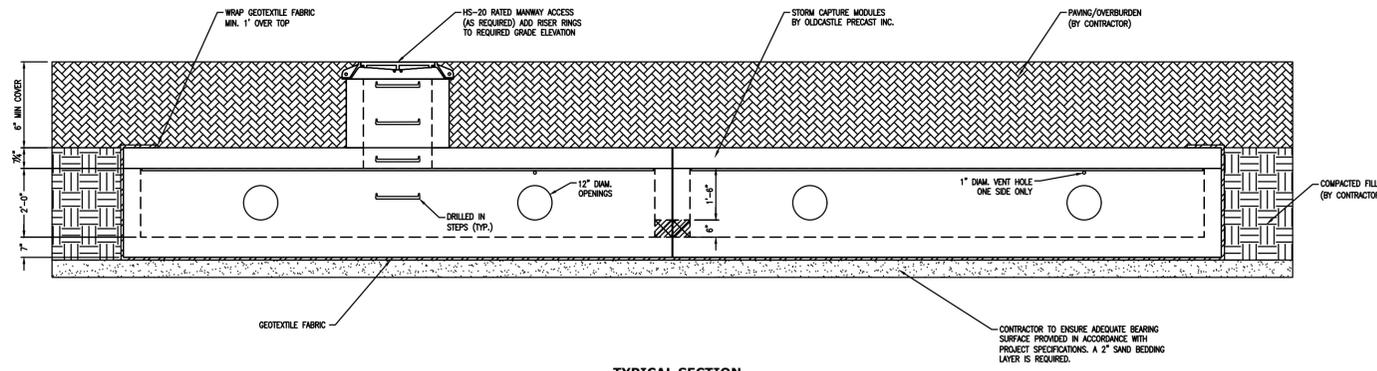
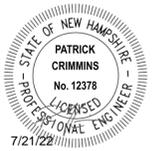
MARK	DATE	DESCRIPTION
A	7/21/2022	TAC Resubmission

PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-C-DTLS.DWG
DRAWN BY:	CIK
CHECKED:	NAH
APPROVED:	PMC

**DETAILS SHEET**

SCALE: AS SHOWN

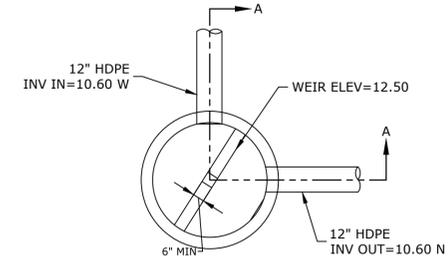
**C-506**



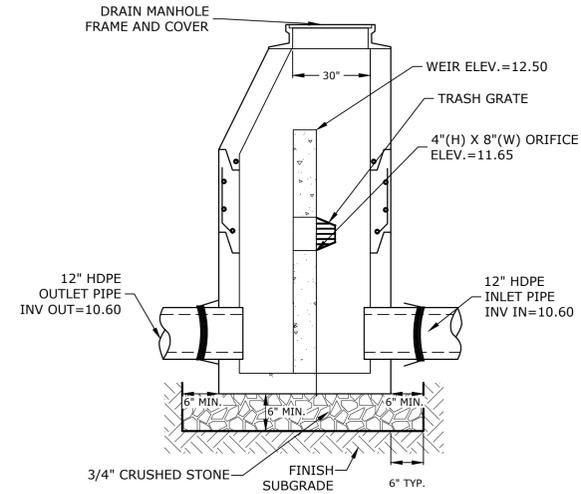
**TYPICAL SECTION**

- NOTES:**
1. UNDERGROUND DETENTION SYSTEM TO BE OLDCASTLE STORMCAPTURE SC-2 DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT BASIN 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.

**OLDCASTLE SC-2 DETAIL**  
NO SCALE

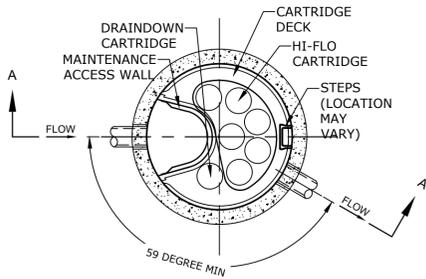


**PLAN VIEW**



- 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-02**  
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. Ø72" MANHOLE. JELLYFISH PEAK TREATMENT CAPACITY IS 1.16 CFS. IF THE SITE CONDITIONS EXCEED 1.16 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

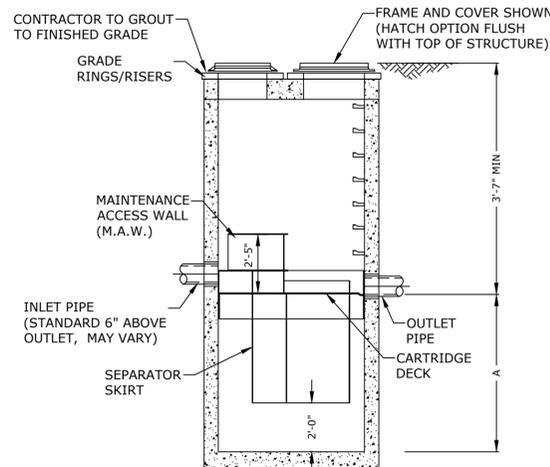
CARTRIDGE SELECTION				
CARTRIDGE DEPTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-5"	5'-3"	4'-2"	3'-2"
FLOW RATE HIGH-FLO / DRAINDOWN (cfs) (per cart)	0.19 / 0.09	0.13 / 0.065	0.09 / 0.045	0.05 / 0.025
MAX. CARTS HIGH-FLO / DRAINDOWN	6 / 1			

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	2
WATER QUALITY FLOW RATE (cfs)	0.83
PEAK FLOW RATE (cfs)	1.15
RETURN PERIOD OF PEAK FLOW (yrs)	25
# OF CARTRIDGES REQUIRED (HF / DD)	5/1
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](http://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 OR 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 RATINGS 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 WATERSSTOP 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.

**CONTECH JELLYFISH STORMWATER FILTER (JF6)**  
NO SCALE



**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

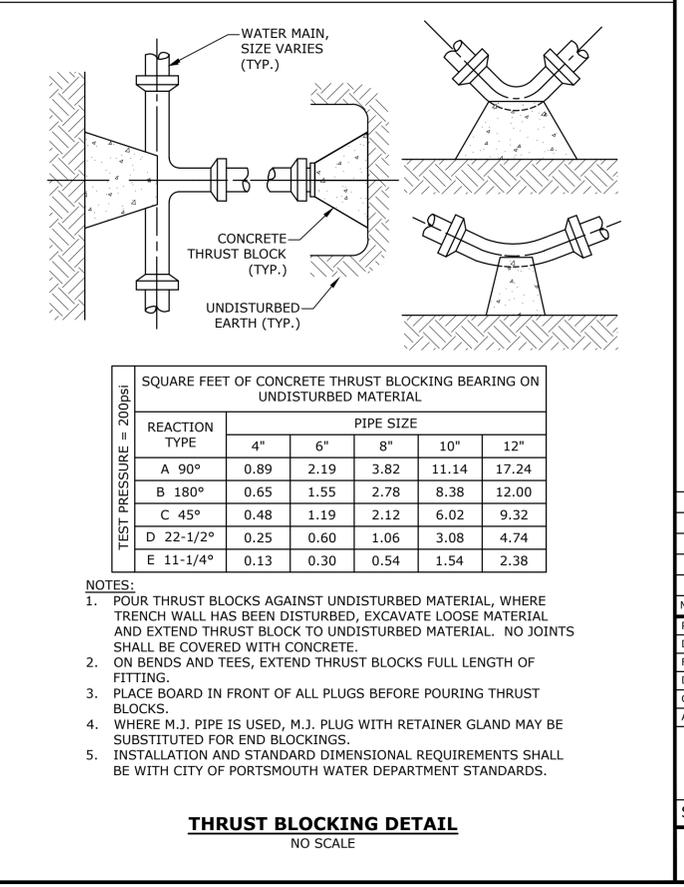
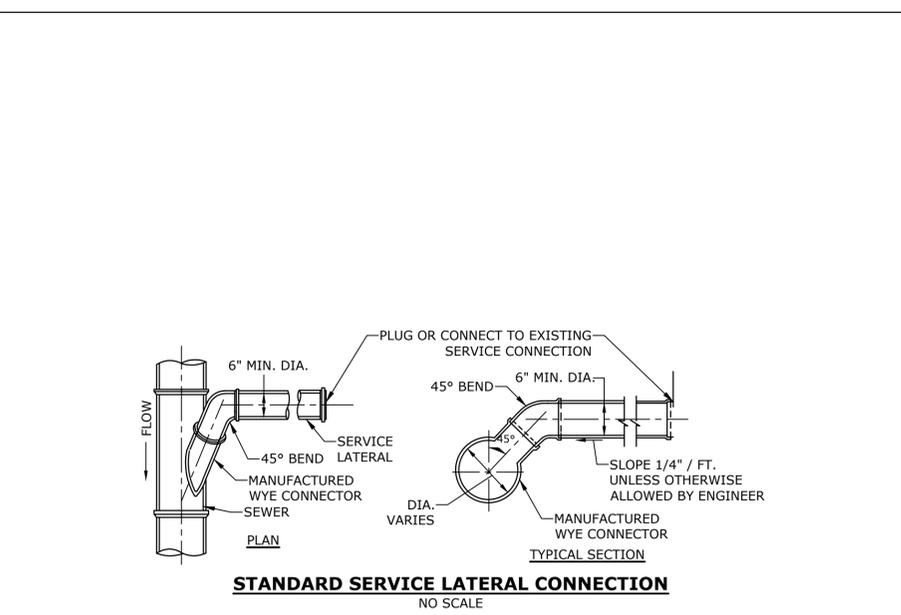
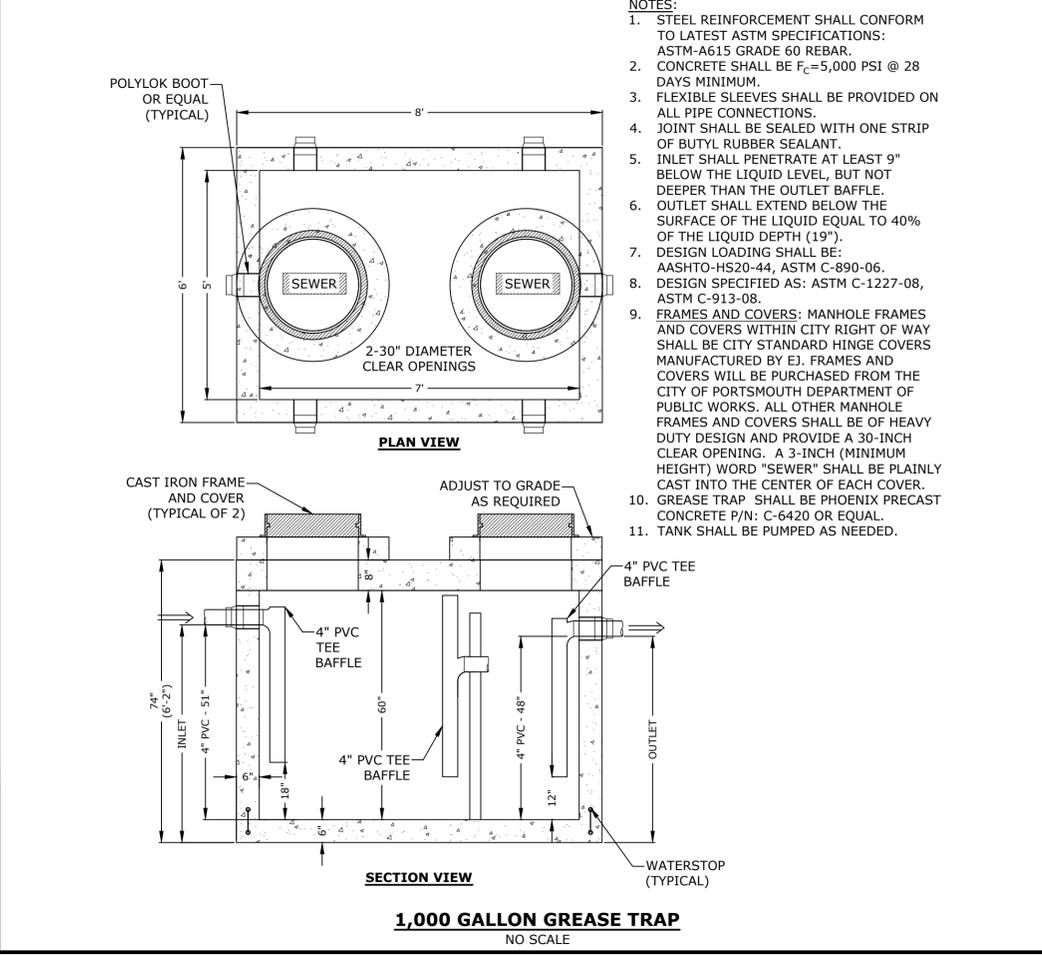
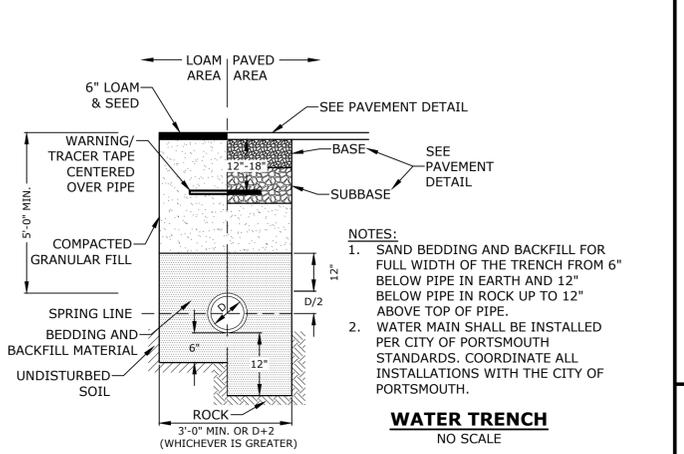
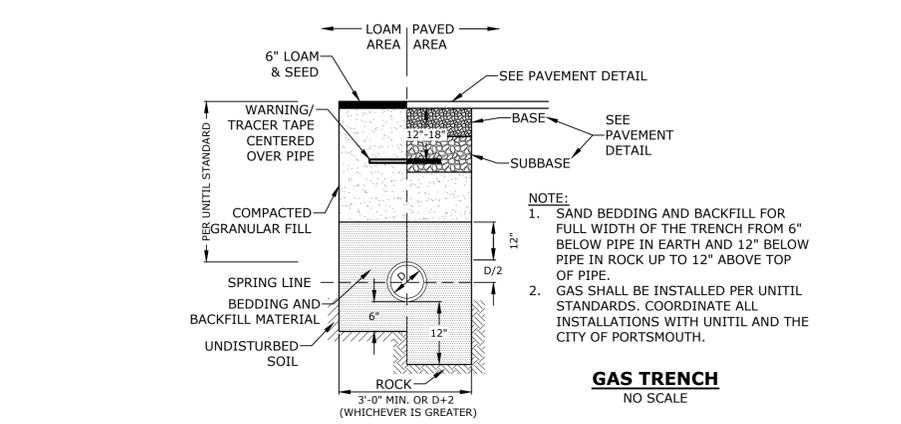
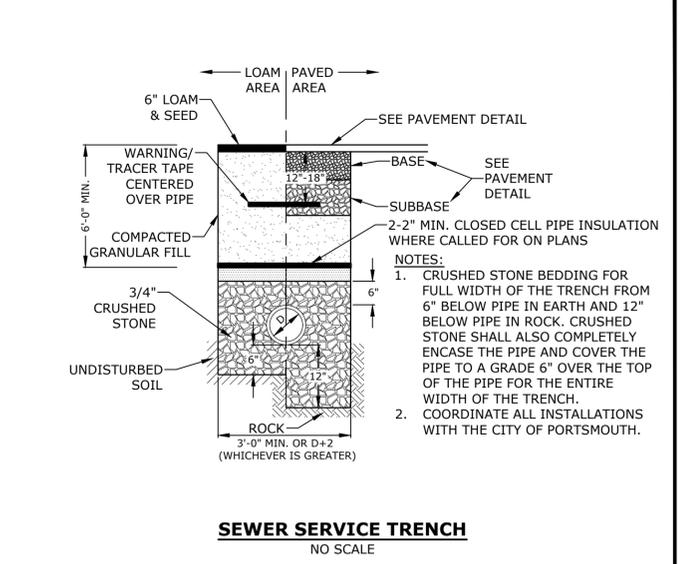
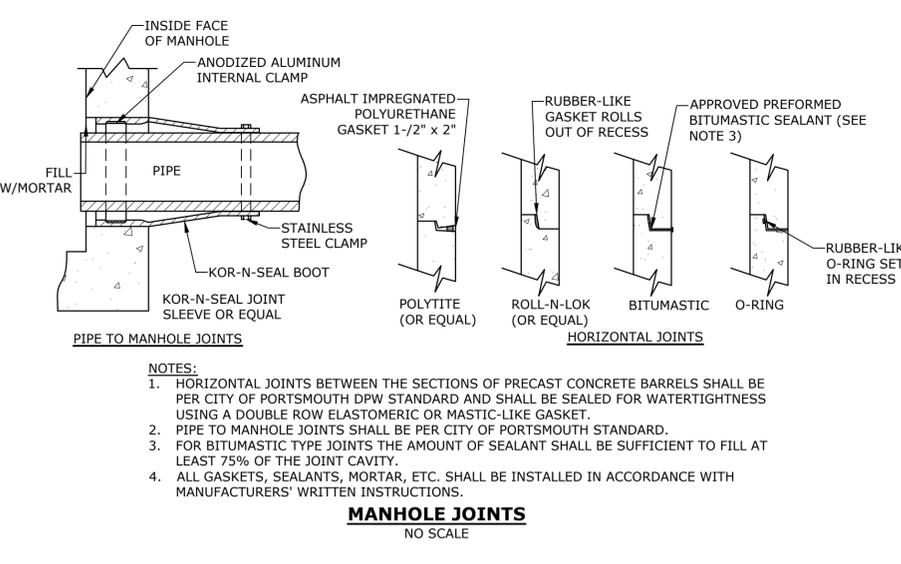
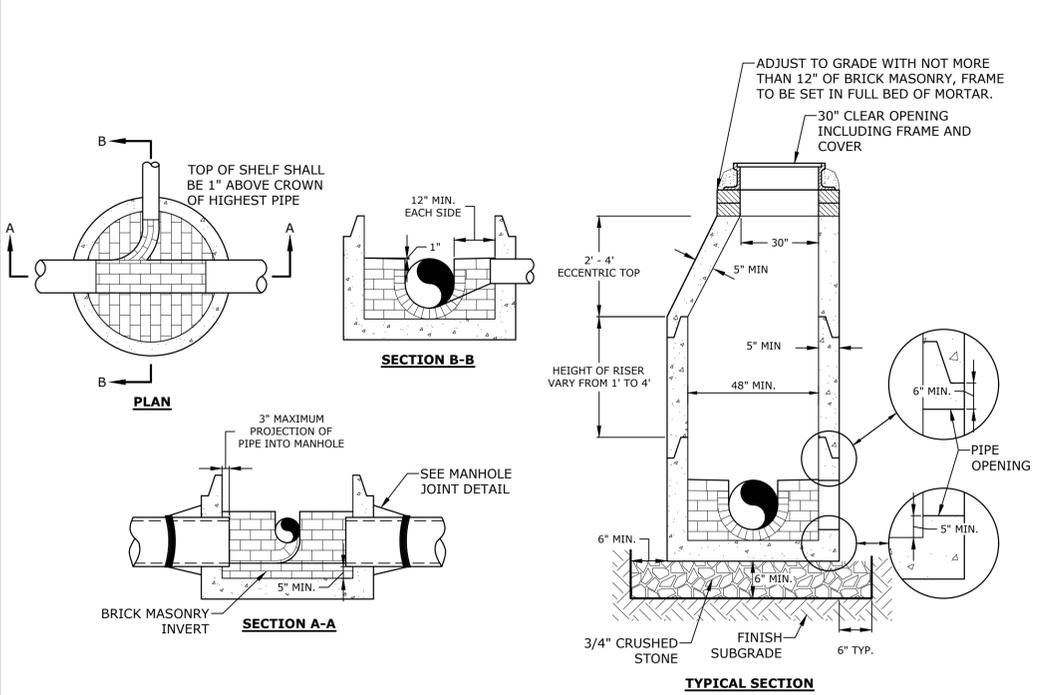
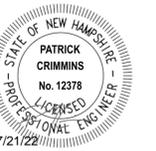
E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION

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



**North End Mixed Use Development**

**Two International Group**

Russell Street & Deer Street  
Portsmouth, NH

MARK	DATE	DESCRIPTION
A	7/21/2022	TAC Resubmission

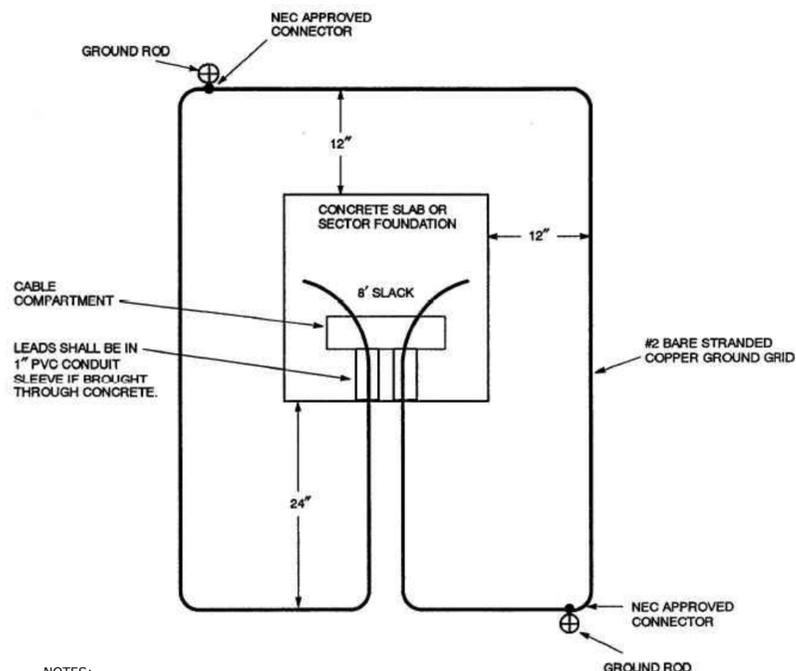
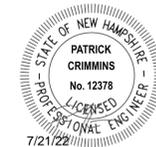
PROJECT NO: T5037-002  
 DATE: May 24, 2022  
 FILE: T5037-002-C-DTLS.DWG  
 DRAWN BY: CLK  
 CHECKED: NAH  
 APPROVED: PMC

DETAILS SHEET

SCALE: AS SHOWN

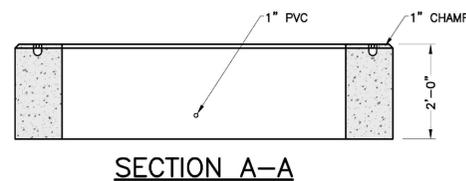
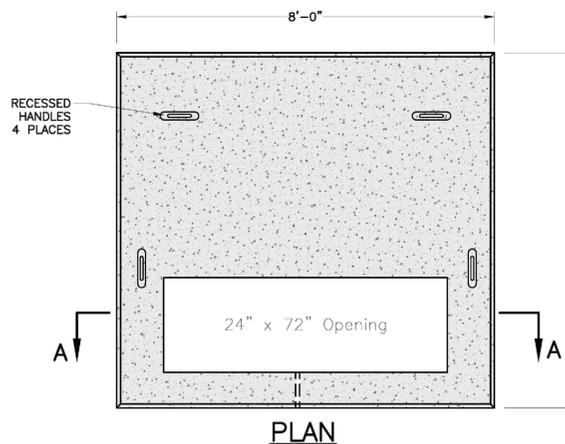
C-508

Last Saved: 7/20/2022 10:01:01 AM By: CKR/CLK  
 Plotted On: Jul 21, 2022 7:01 AM By: CKR/CLK  
 Tighe & Bond: E:\11\15037 - Two International Group\002 - Russell Street Development\Drawings - Figures\AutoCAD\T5037-002-C-DTLS.dwg



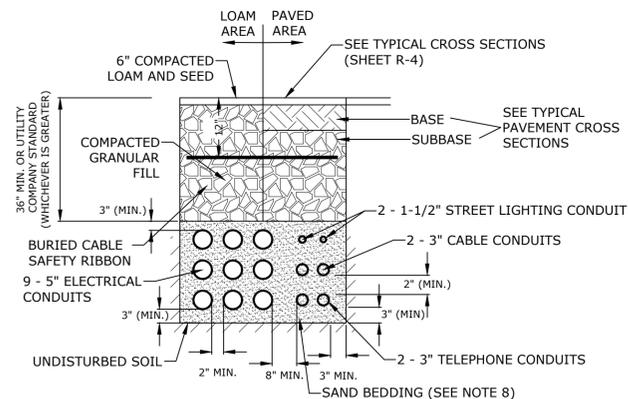
**NOTES:**  
 THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12 INCHES BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFORMER. THE TWO 8-FOOT GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.

**PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL**  
 NO SCALE



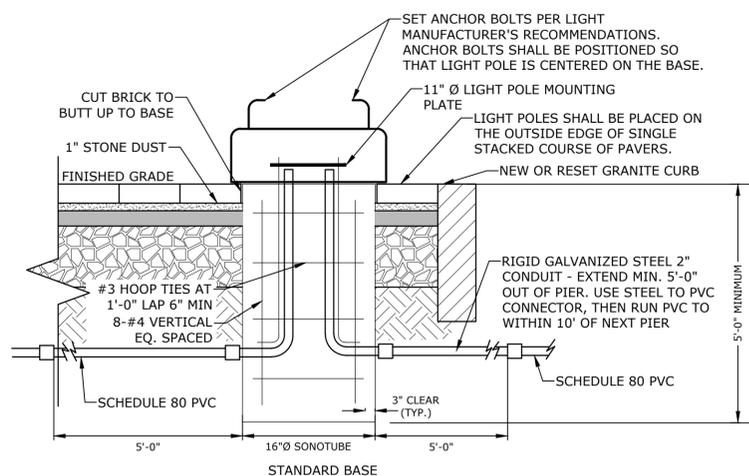
**NOTES:**  
 1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION.  
 2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS  
 3. STEEL REINFORCEMENT - ASTM A615, GRADE 60  
 4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

**3-PHASE TRANSFORMER PAD**  
 NO SCALE



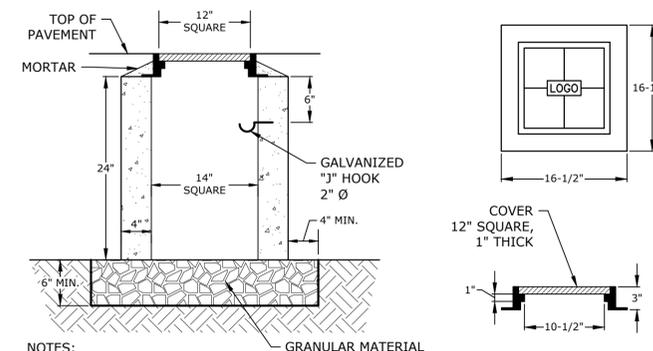
**NOTES:**  
 1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.  
 2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.  
 3. 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.  
 4. 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.  
 5. 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.  
 6. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.  
 7. 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



**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



**NOTES:**  
 1. 14" X 14" CONCRETE PULL BOX, NHDOT ITEM 614.511

**CONCRETE PULL BOX**  
 NO SCALE

**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
 Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION

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-509

PLANT SCHEDULE

Symbol	Quantity	Botanical Name	Common Name	Size	Spacing	Notes
<b>TREES</b>						
AC BO	7	<i>Acer rubrum</i> 'Bowhall'	Bowhall Maple	4-5" Cal.		Single-stem, matched
CA CA	5	<i>Carpinus caroliniana</i>	American Hornbeam	4-5" Cal.		Single-stem, matched
CO SP	2	<i>Cornus</i> 'Rutgan' Stellar Pink	Stellar Pink Dogwood	3-4" Cal.		B&B; matched
GI BI	6	<i>Ginkgo biloba</i> 'Magyar'	Magyar Ginkgo	5-6" Cal.		B&B; matched
LI WO	5	<i>Liquidambar styraciflua</i> 'Worplesdon'	Worplesdon Sweetgum	4-5" Cal.		B&B; matched
MA SO	3	<i>Magnolia x soulangiana</i>	Saucer Magnolia	3-4" Cal.		B&B; matched
QU RP	6	<i>Quercus x warei</i> 'Long' Regal Prince	Regal Prince Oak	4-5" Cal.		B&B; matched
<b>SHRUBS</b>						
Co Pe		<i>Comptonia peregrina</i>	Sweet Fern	#3 Container	36" O.C.	
Co Ra		<i>Cornus sericea</i> 'Cardinal'	Cardinal Red Twig Dogwood	#5 Container	36" O.C.	
De Gr		<i>Deutzia gracilis</i> 'Nikko'	Nikko Deutzia	#3 Container	30" O.C.	
Fo Ga		<i>Fothergilla gardenii</i> 'Mount Airy'	Mount Airy Fothergilla	#5 Container	36" O.C.	
Hy Qu		<i>Hydrangea quercifolia</i> 'Pee Wee'	Oakleaf Hydrangea	#5 Container	48" O.C.	
Li Be		<i>Lindera Benzoin</i>	Spice Bush	#5 Container	36" O.C.	
Ix Gl		<i>Ilex glabra</i> 'Shamrock'	Shamrock Inkberry	#5 Container	36" O.C.	
Il Ji		<i>Ilex verticillata</i> 'Jim Dandy'	Jim Dandy Winterberry	#5 Container	48" O.C.	
Il Ve		<i>Ilex verticillata</i> 'Red Sprite'	Red Sprite Winterberry	#5 Container	48" O.C.	
My Pe		<i>Myrica pensylvanica</i>	Northern Bayberry	#5 Container	48" O.C.	
Rh Gl		<i>Rhus aromatica</i> 'Gro-Low'	Fro-Low Fragrant Sumac	#3 Container	30" O.C.	
Rh Mh		<i>Rhododendron x 'Marie Hoffman'</i>	Mare Hoffman Azalea	#5 Container	48" O.C.	
Sp To		<i>Spiraea tomentosa</i>	Steeplebush	#3 Container	30" O.C.	
<b>PERENNIALS</b>						
am hu		<i>Amsonia x 'Blue Ice'</i>	Blue Star Flower	#2 Container	18" O.C.	
as ob		<i>Aster oblongifolius</i> 'Raydon's Favorite'	Raydon's Favorite Aster	#2 Container	24" O.C.	
ba bi		<i>Baptisia australis</i>	Blue False Indigo	#3 Container	30" O.C.	
ga od		<i>Galium odoratum</i>	Sweet Woodruff	#2 Container	12" O.C.	
ge ro		<i>Geranium x 'Rozanne'</i>	Rozanna Cranesbill	#2 Container	18" O.C.	
he vi		<i>Heuchera villosa</i> 'Autumn Bride'	Autumn Bride Coral Bells	#2 Container	18" O.C.	
he hr		<i>Hemerocallis</i> 'Happy Returns'	Happy Returns Daylily	#2 Container	24" O.C.	
li sp		<i>Liriope spicata</i>	Lilyturf	4" Container	10" O.C.	
os ci		<i>Osmundastrum cinnamomeum</i>	Cinnamon Fern	#2 Container	30" O.C.	
po od		<i>Polygonatum odoratum</i> var. <i>pluriflorum</i> 'Variegatum'	Variegated Solomon's Seal	#2 Container	15" O.C.	
ti co		<i>Tiarella cordifolia</i>	Foamflower	#2 Container	15" O.C.	
va an		<i>Vaccinium angustifolium</i>	Lowbush Blueberry	#2 Container	15" O.C.	
<b>ORNAMENTAL GRASSES</b>						
bo cu		<i>Bouteloua curtipendula</i>	Side Oats Grama	#2 Container	30" O.C.	
ca pe		<i>Carex pennsylvanica</i>	Pennsylvania Sedge	#2 Container	30" O.C.	
ca ac		<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather Reed Grass	#3 Container	30" O.C.	
de ce		<i>Deschampsia cespitosa</i> 'Pixie Fountain'	Tufted Hair Grass	#2 Container	30" O.C.	
mi si		<i>Miscanthus sinensis</i> 'Adagio'	Dwarf Silver Grass	#2 Container	30" O.C.	
pe al		<i>Pennisetum alopecuroides</i> 'Hamelin'	Hameln Dwarf Fountain Grass	#2 Container	24" O.C.	
<b>SEED MIXES</b>						
Buffer Seed Mix		<i>Ernst Seed Fescue Mix composed of 45% Creeping Red Fescue/ 27.5% Hard Fescue 'Minimus' / 27.5% Hard Fescue 'Beacon'</i>				

PLANTING NOTES

- LANDSCAPE ARCHITECT TO APPROVE PLANT MATERIAL PRIOR TO DELIVERY TO SITE.
- PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
- NO SUBSTITUTIONS OF PLANT SPECIES WITHOUT LANDSCAPE ARCHITECT'S WRITTEN APPROVAL.
- 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.
- LOCATE AND VERIFY UTILITY LINE LOCATIONS PRIOR TO STAKING AND REPORT CONFLICTS TO LANDSCAPE ARCHITECT.
- 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.
- NO PLANTING TO BE INSTALLED BEFORE ACCEPTANCE OF ROUGH GRADING.
- 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.
- INSTALL PLANTS WITH ROOT FLARES FLUSH WITH FINISHED GRADE. IMMEDIATELY REPLANT PLANTS THAT SETTLE OUT OF PLUMB OR BELOW FINISHED GRADE.
- 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.
- WATER PLANTS THOROUGHLY AFTER INSTALLATION, A MINIMUM OF TWICE WITHIN THE FIRST 24 HOURS.
- REPAIR DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF LIMIT OF WORK
- SOAK ALL PERENNIALS FOR 24 HOURS PRIOR TO INSTALLATION
- BUFFER SEED MIX AREA TO BE WATERED AND MONITORED DURING ESTABLISHMENT TO ENSURE SEED COVERAGE AND ESTABLISHMENT IS UNIFORM AND HEALTHY AND UNTIL ACCEPTANCE.
- 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.
- MOWING HEIGHT TO BE NOT LESS THAN 3".

**North End  
Mixed Use  
Development**

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION

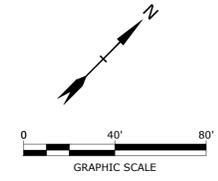
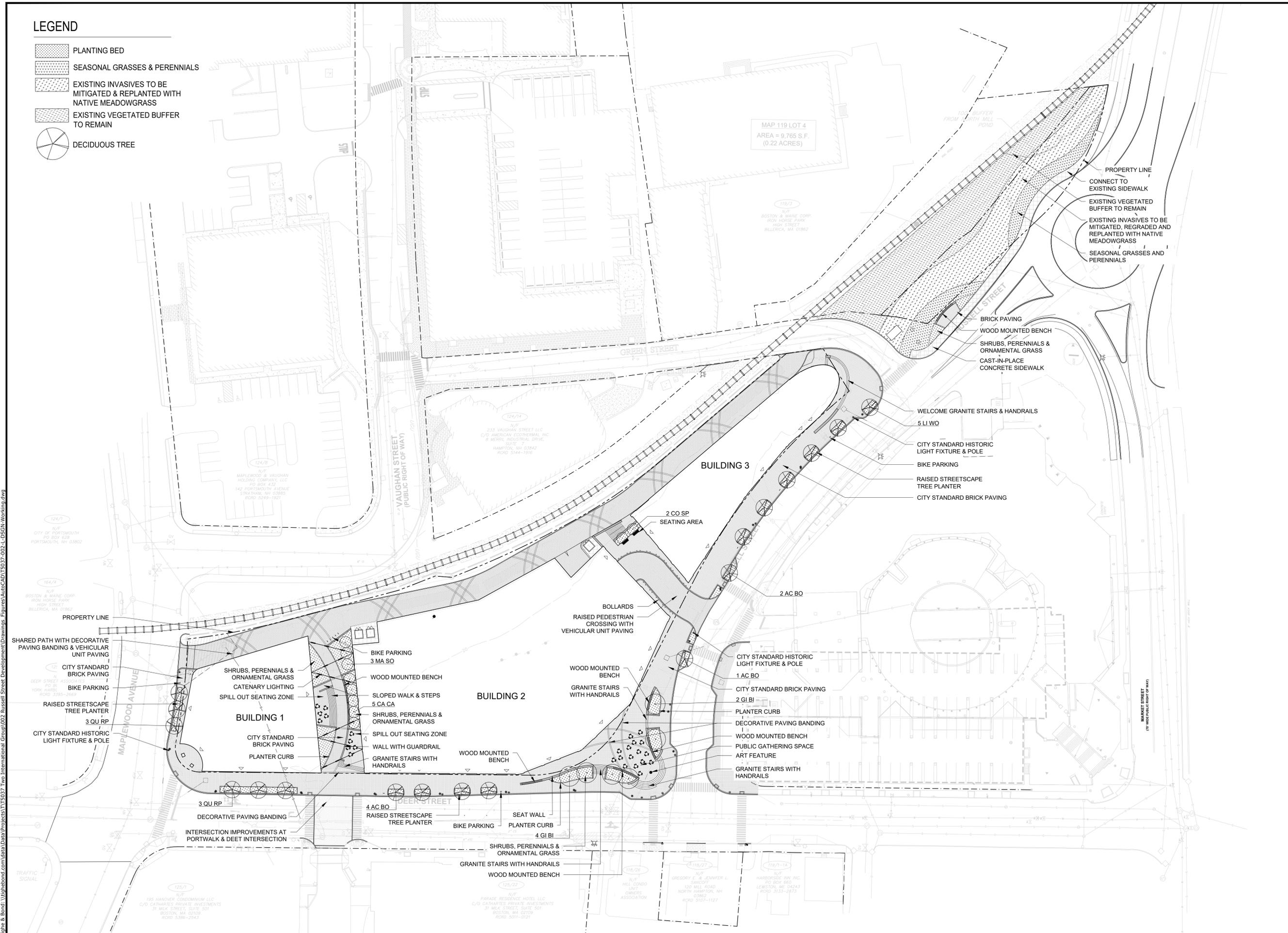
PROJECT NO:	T5037-002
DATE:	May 24, 2022
FILE:	T5037-002-L-DSGN-WORKING.DWG
DRAWN BY:	OS
CHECKED:	RU
APPROVED:	RU

LANDSCAPE MATERIAL PLAN,  
LEGEND AND NOTES

SCALE: AS SHOWN

LEGEND

-  PLANTING BED
-  SEASONAL GRASSES & PERENNIALS
-  EXISTING INVASIVES TO BE MITIGATED & REPLANTED WITH NATIVE MEADOWGRASS
-  EXISTING VEGETATED BUFFER TO REMAIN
-  DECIDUOUS TREE



North End  
Mixed Use  
Development

Two  
International  
Group

Russell Street &  
Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
PROJECT NO:	T5037-002	
DATE:	May 24, 2022	
FILE:	T5037-002-L-DSGN-WORKING.DWG	
DRAWN BY:	OS	
CHECKED:	RU	
APPROVED:	RU	

LANDSCAPE SITE PLAN

SCALE: AS SHOWN

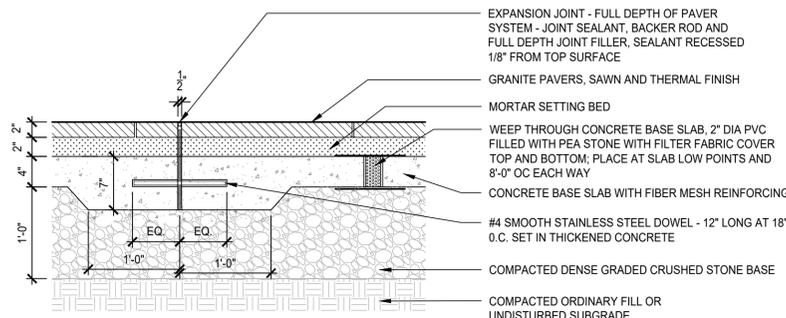
Last Saved: 7/21/2022 9:38am By: O'Strain  
 Plotted On: Jul 21, 2022 9:38am By: O'Strain  
 Tighe & Bond | W:\projects\2022\North End Mixed Use Development\Drawings\Figures\AutoCAD\T5037-002-L-DSGN-Working.dwg

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.

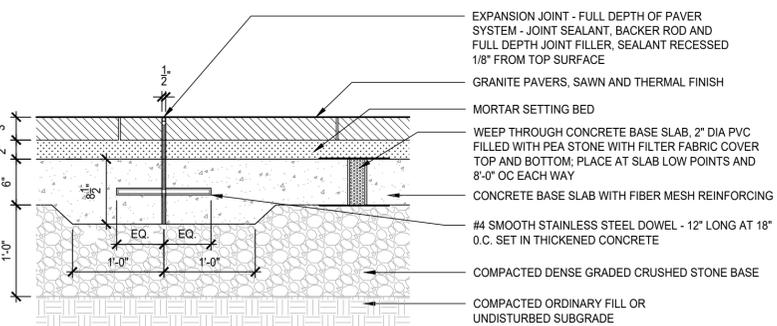
1. ALL PLANTING HOLES SHALL BE DUG BY HAND- NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINES USED TO DIG ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED 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.

NOTE:  
 1. ALIGN EXPANSION JOINT WITH PAVER JOINT.  
 2. PROVIDE EXPANSION JOINTS AT 20' ON CENTER OR AS SHOWN ON DRAWINGS.  
 3. PROVIDE CAULKED CONSTRUCTION JOINT WHERE PAVING ABUTS VERTICAL SURFACE.  
 4. THE JOINTS BETWEEN GRANITE PAVER PIECES TO BE 1/4" MORTAR JOINTS.

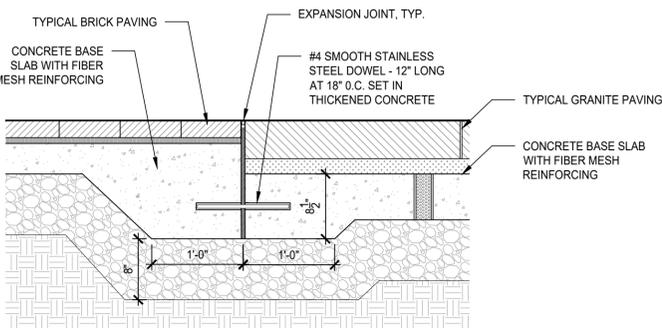


1 GRANITE PAVERS ON CONCRETE BASE - PEDESTRIAN  
 SCALE: 1"=1'-0"

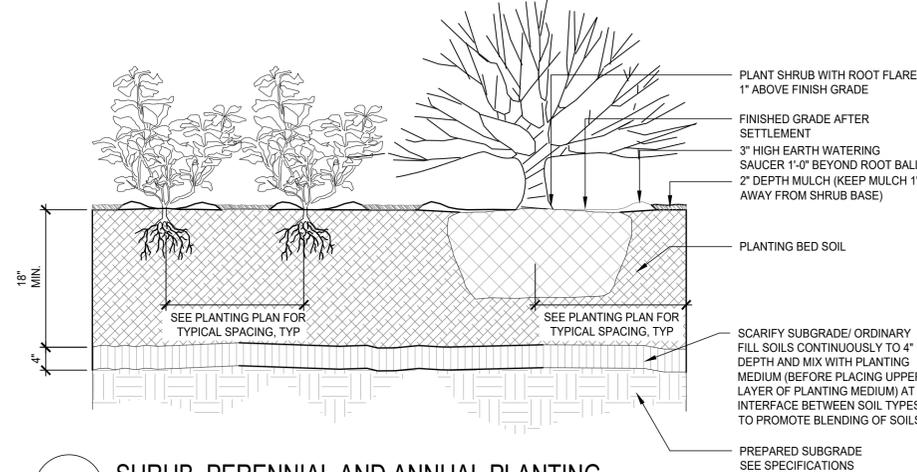
NOTE:  
 1. ALIGN EXPANSION JOINT WITH PAVER JOINT.  
 2. PROVIDE EXPANSION JOINTS AT 20' ON CENTER OR AS SHOWN ON DRAWINGS.  
 3. PROVIDE CAULKED CONSTRUCTION JOINT WHERE PAVING ABUTS VERTICAL SURFACE.  
 4. THE JOINTS BETWEEN GRANITE PAVER PIECES TO BE 1/4" MORTAR JOINTS.



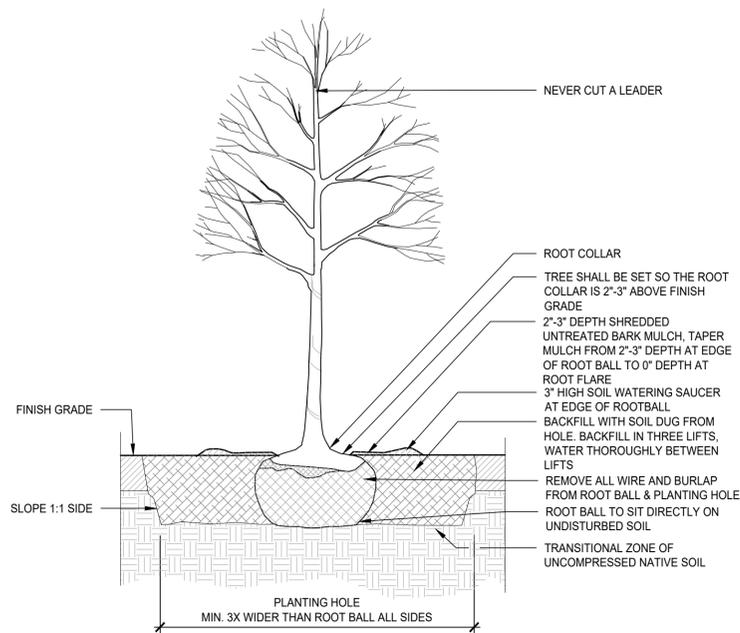
2 GRANITE PAVERS ON CONCRETE BASE - VEHICULAR  
 SCALE: 1"=1'-0"



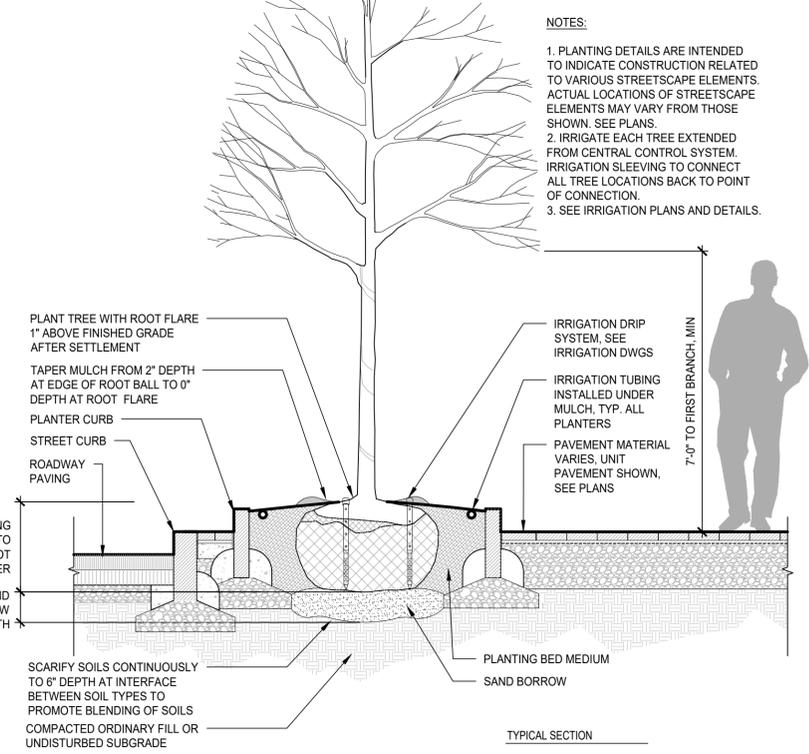
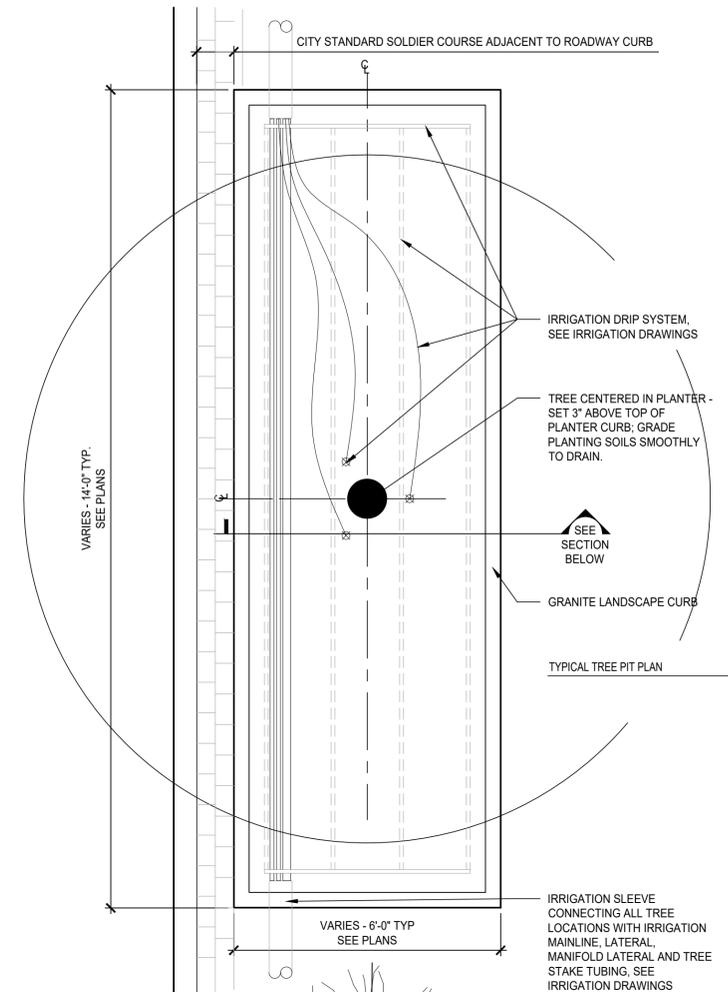
3 GRANITE TO BRICK PAVING TRANSITION  
 SCALE: 1"=1'-0"



4 SHRUB, PERENNIAL AND ANNUAL PLANTING  
 SCALE: 3/4"=1'-0"



5 TREE PLANTING DETAIL  
 SCALE: 3/8"=1'-0"



6 TREE PLANTING IN RAISED LANDSCAPE CURB PLANTER  
 SCALE: 1/2" = 1'-0"

North End Mixed Use Development

Two International Group

Russell Street & Deer Street  
 Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
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

Last Saved: 7/19/2022 5:10pm By: O'Brien  
 Plotted On: Jul 19, 2022 5:10pm  
 Tighe & Bond | W:\p\landsc\02\_Russell Street Development\Drawings\02\_Russell Street Development\02\_Russell Street Development\02\_L-DSGN-Working.dwg



54 W 21st Street, Suite 1201  
NEW YORK, NY 10010  
857.300.2610 | SGA-ARCH.COM

**PROJECT TEAM:**

**CLIENT**  
**TWO INTERNATIONAL GROUP**  
1 NEW HAMPSHIRE AVENUE, SUITE 101  
PORTSMOUTH, NH 03801  
(603) 436-8686  
**ARCHITECT OF RECORD**  
**MARKET SQUARE ARCHITECTS**

104 CONGRESS STREET  
PORTSMOUTH, NH 03801  
(603) 501-0202

**CIVIL ENGINEER**  
**TIGHE & BOND**

177 Corporate Drive  
PORTSMOUTH, NH 03801  
(603) 433-8818

**LANDSCAPE DESIGN**  
**HALVORSON**

25 KINGSTON STREET  
BOSTON, MA 02111  
(617) 536-0380

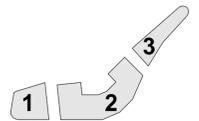
**STRUCTURE DESIGN**  
**DESIMONE CONSULTING ENGINEERS**  
31 MILK STREET  
BOSTON, MA 02109  
(617) 936-4492

**MEP ENGINEER**  
**JB&B**

80 PINE STREET  
NEW YORK, NY 10005  
(212) 530-9300

**LIGHTING DESIGN**  
**LIGHTBOX STUDIOS**

80 PINE STREET  
NEW YORK, NY 10005  
(646) 810-2600



DRAWING INDEX				
SHEET NUMBER	DRAWING NUMBER	SHEET TITLE	ISSUE DATE	
			TAC SUBMISSION	07/15/22
1	L-001	LIGHTING COVER SHEET, FIXTURE SCHEDULE, AND DRAWING INDEX	•	
2	L-100	EXTERIOR LIGHTING PLAN AND CALCULATIONS		
3	L-101	EXTERIOR LIGHTING CUTSHEETS NO. 1	•	
4	L-102	EXTERIOR LIGHTING CUTSHEETS NO. 2	•	
5	L-103	EXTERIOR LIGHTING CUTSHEETS NO. 3	•	

LIGHTING FIXTURE SCHEDULE													
FIXTURE TYPE DESIGNATION	SYMBOL	FIXTURE DESCRIPTION	FIXTURE DISTRIBUTION	LOCATION	QUANTITY	LAMPS			DRIVER/BALLAST		MAX TOTAL SYSTEM WATTS	SPECIFIED BY	MANUFACTURER/CATALOG NUMBER
						QTY. PER FIXTURE	TYPE	WATTS	VOLTS	PHI TYPE			
P1		PORTSMOUTH STANDARD HISTORIC LED STREET POLES		STREET LIGHTING	18	2	EA	12.2 W	120V	NON DIM	25 W	LBX STUDIOS	POLE: NEW STAMP LIGHTING "RS-TUR" #RS-TUR-177 #PSHNC-16-10-17-2-883.50-CB LAMP: PHILIPS SIGNIFY #12.2A19LED927FRP/E26ND120 61FB
P2		PORTSMOUTH STANDARD COBRA HEAD LED STREET POLES		CROSSWALK	3	1	EA	180 W	120-277V	0-10V DIM	180 W	LBX STUDIOS	LEOTEK GREENCOBRA LED STREET LIGHT GC1 F-Series #GC1-80F-MV-WW-2-GY-700-HSS
X1		2 DIAMETER DOMED DECORATIVE SCONCE		BUILDING FACADE	81	1	EA	30 W	120-277V	0-10V	30 W	LBX STUDIOS	ACUTY H-OLOPHANE GLASWERKS LUMINESCENT LED BERN #GBLF3-P10-30K-ANVOLT-ASY-ARM-BK
X2		LINEAR LED FIXTURE RECESSED IN CANOPY		ENTRY CANOPIES	140LF	1	LF	4.9 W/ FT	120-277V	0-10V	4.9 W/ FT	LBX STUDIOS	SELUX I60 #L60W-1C20-930-LW-F-04-XX-WH-U-DIM
X3		SURFACE MOUNTED LINEAR LED GRAZER		GARAGE SCREEN	166LF	1	LF	18.5 W/FT	120-277V	DMX	18.5 W/FT	LBX STUDIOS	PHILIPS COLORGRAZE INTELLIHUE POWERCORE. 15" x 30" #423-00016-02
X4		3 DIAMETER VERTICAL LED CATENARY RING		THE MEWS	21	1	EA	18 W	24 VDC	0-10V	18 W	LBX STUDIOS	LUMINII PLEXINEON CATENARY #PX-36-VR-2X35-SO-F-CAT-GC #PS010V-96-24-LIN
X5		BUILDING MOUNTED FLOOD LIGHT		GENERAL EXTERIOR	8	1	EA	26 W	120-277V	0-10V	26 W	LBX STUDIOS	ERCO BEAMER NEW WIDE FLOOD #A4000778

CONTROL TYPE LEGEND	
ND:	NON - DIM
0-10V:	0-10V
DMX:	DMX

**SEAL / SIGNATURE**

© Spagnolo Group Architecture, PC  
06/10/22

**PROJECT:**

**Russell Street Mixed Development**

2 Russell Street, Portsmouth NH

Two International Group

**REVISIONS:**

No.	Date	Description

**SUBMISSIONS:**

Date	Issued For:
07/15/2022	TAC SUBMISSION

SCALE **NONE**  
DATE ISSUED **07/15/22**  
PROJECT NO **27009.N.001**  
DRAWN BY **JR**  
CHECKED BY **MM**

**SHEET TITLE:**

**LIGHTING COVER SHEET, FIXTURE SCHEDULE, AND DRAWING INDEX E-001**



54 W 21st Street, Suite 1201  
 NEW YORK, NY 10010  
 857.300.2610 | SGA-ARCH.COM

**PROJECT TEAM:**

**CLIENT**  
**TWO INTERNATIONAL GROUP**  
 1 NEW HAMPSHIRE AVENUE, SUITE 101  
 PORTSMOUTH, NH 03801  
 (603) 436-8686  
**ARCHITECT OF RECORD**  
**MARKET SQUARE ARCHITECTS**

104 CONGRESS STREET  
 PORTSMOUTH, NH 03801  
 (603) 501-0202

**CIVIL ENGINEER**  
**TIGHE & BOND**

177 Corporate Drive  
 PORTSMOUTH, NH 03801  
 (603) 433-8818

**LANDSCAPE DESIGN**  
**HALVORSON**

25 KINGSTON STREET  
 BOSTON, MA 02111  
 (617) 536-0380

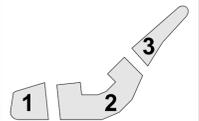
**STRUCTURE DESIGN**  
**DESIMONE CONSULTING ENGINEERS**  
 31 MILK STREET  
 BOSTON, MA 02109  
 (617) 936-4492

**MEP ENGINEER**  
**JB&B**

80 PINE STREET  
 NEW YORK, NY 10005  
 (212) 530-9300

**LIGHTING DESIGN**  
**LIGHTBOX STUDIOS**

80 PINE STREET  
 NEW YORK, NY 10005  
 (646) 810-2600



**SEAL / SIGNATURE**

© Spagnolo Group Architecture, PC  
 06/10/22

**PROJECT:**

**Russell Street Mixed Development**

2 Russell Street, Portsmouth NH

Two International Group

**REVISIONS:**

No.	Date	Description

**SUBMISSIONS:**

Date	Issued For:
07/15/2022	TAC SUBMISSION

SCALE 1" = 20'-0"

DATE ISSUED 07/15/22

PROJECT NO 27009.N.001

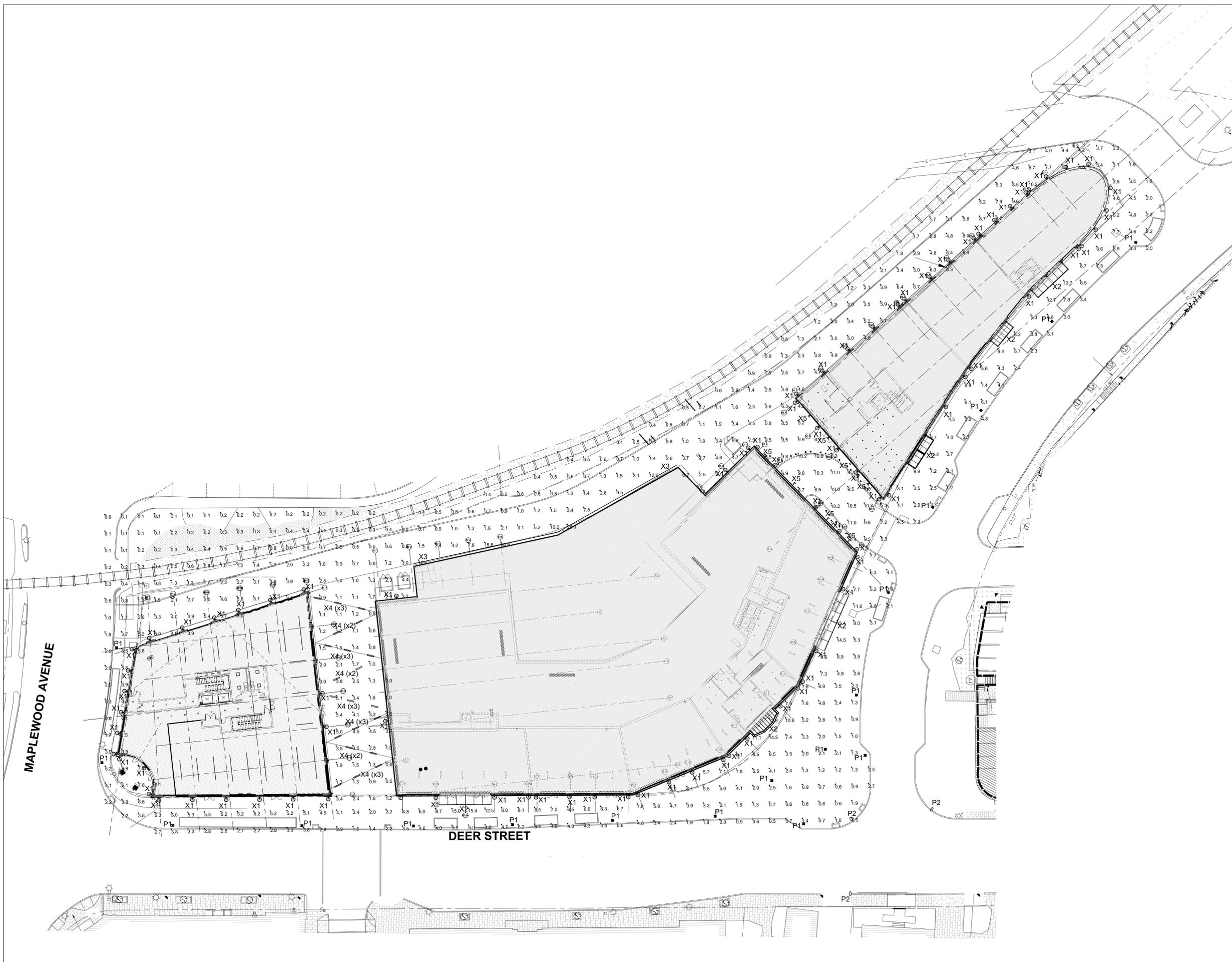
DRAWN BY JR

CHECKED BY MM

**SHEET TITLE:**

**EXTERIOR LIGHTING PLAN AND CALCULATIONS**

**E-100**





54 W 21st Street, Suite 1201  
NEW YORK, NY 10010  
857.300.2610 | SGA-ARCH.COM

PROJECT TEAM:

CLIENT  
TWO INTERNATIONAL GROUP

1 NEW HAMPSHIRE AVENUE, SUITE 101  
PORTSMOUTH, NH 03801  
(603) 436-8686  
ARCHITECT OF RECORD  
MARKET SQUARE ARCHITECTS  
104 CONGRESS STREET  
PORTSMOUTH, NH 03801  
(603) 501-0202

CIVIL ENGINEER  
TIGHE & BOND

177 Corporate Drive  
PORTSMOUTH, NH 03801  
(603) 433-8818

LANDSCAPE DESIGN  
HALVORSON

25 KINGSTON STREET  
BOSTON, MA 02111  
(617) 536-0380

STRUCTURE DESIGN  
DESIMONE CONSULTING ENGINEERS  
31 MILK STREET  
BOSTON, MA 02109  
(617) 936-4492

MEP ENGINEER  
JB&B

80 PINE STREET  
NEW YORK, NY 10005  
(212) 530-9300

LIGHTING DESIGN  
LIGHTBOX STUDIOS

80 PINE STREET  
NEW YORK, NY 10005  
(646) 910-2600

SEAL / SIGNATURE

© Spagnolo Group Architecture, PC  
06/10/22

Russell Street Mixed  
Development

2 Russell Street, Portsmouth  
NH

Two International Group

REVISIONS:

No.	Date	Description

SUBMISSIONS:

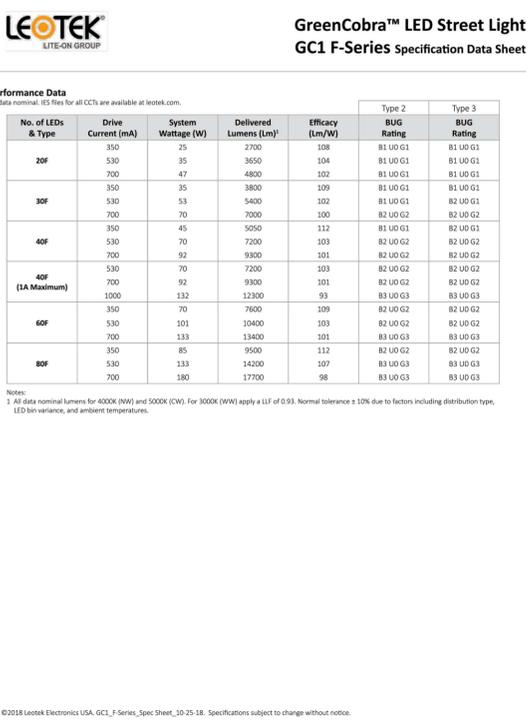
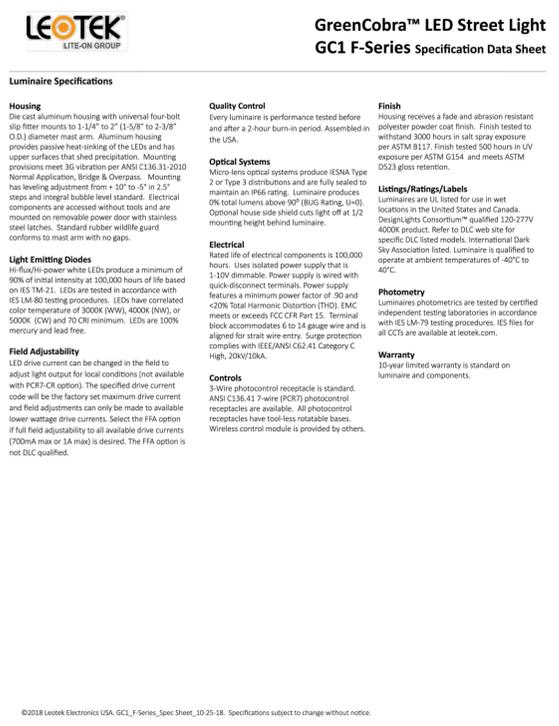
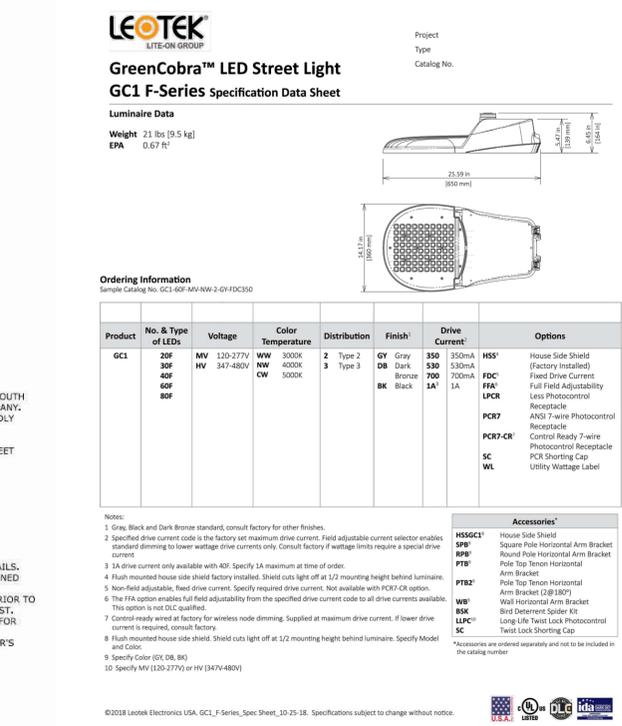
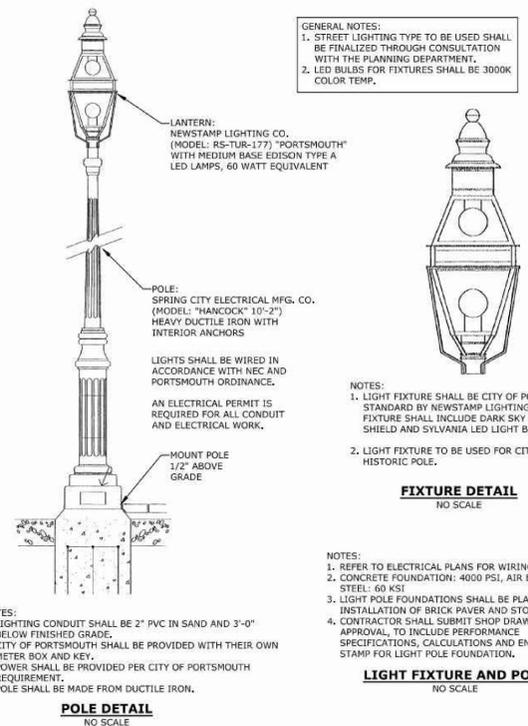
Date Issued For:  
07/15/2022 TAC SUBMISSION

SCALE NONE  
DATE ISSUED 07/15/22  
PROJECT NO 27009.N.001  
DRAWN BY JR  
CHECKED BY MM

SHEET TITLE:

EXTERIOR  
LIGHTING  
CUTSHEETS  
NO. 1

E-101



FIXTURE TYPE 'P1'  
STREET LIGHT ON 10FT POLE

FIXTURE TYPE 'P2'  
STREET LIGHT ON 20FT POLE

GBLF3  
GlasWorks® Luminescent LED Beam®  
HOLOPHANE  
LEADER IN LIGHTING SOLUTIONS  
GBLF3  
GlasWorks® Luminescent LED Beam®  
HOLOPHANE  
LEADER IN LIGHTING SOLUTIONS  
DIMENSIONAL DATA  
Maximum Height: 17'6\"/>  
Acuity Brands | Holophane | Buy American

GBLF3  
GlasWorks® Luminescent LED Beam®  
HOLOPHANE  
LEADER IN LIGHTING SOLUTIONS  
ORDERING INFORMATION  
Example: GBLF3 P30 40K MVOLT ASY OSM BK  
Color Type LED Lumens Package Color Temperature Voltage Optics Mounting Style Finish Color  
Options  
Acuity Brands | Holophane | Buy American

GBLF3  
GlasWorks® Luminescent LED Beam®  
HOLOPHANE  
LEADER IN LIGHTING SOLUTIONS  
PERFORMANCE DATA  
Lumen and Wattage Data  
Options Matrix  
Acuity Brands | Holophane | Buy American

GBLF3  
GlasWorks® Luminescent LED Beam®  
HOLOPHANE  
LEADER IN LIGHTING SOLUTIONS  
PERFORMANCE DATA  
LED Lumen Maintenance  
Adjustable Output (AO) Response  
Ambient Ambient Temperature Factor  
Acuity Brands | Holophane | Buy American

FIXTURE TYPE 'X1'  
BUILDING MOUNTED LIGHT FIXTURE



ERCO

Beamer New Floodlight



**AC000778** Spotlight in LED module: 2.8W/114lm 3000K warm white  
 Ø 30mm diameter  
 Version 1  
 Size M  
 Dry Light lens wide flood

**Product description**  
 Housing and hinge corrosion-resistant polymer, coated. Optimized surface for reduced accumulation of dirt. Sealed joint with internal wiring, 90° tilt. Scale die. Corrosion-resistant aluminum.  
 Mounting plate: Polymer, coated. Rotatable through 360°.  
 2 cable entries. Through-wiring possible.  
 5-right terminal block  
 Control gear 120V/277V, 60Hz, dimmable.  
 LED module: high-power LEDs. Call-meeting lens made of optical polymer. Luminaire head with non-reflective protective glass, corrosion-resistant cast aluminum, no-vibr surface treatment. Double powder-coated internal lens.

**Technical data**

Luminous flux of the luminaire	1250lm
Connected load	25.0W
Luminaire efficiency	48lm/W
Color rendition	15.5 CRI
Dimmer resolution index	CR10
Lumen maintenance LED manufacturer specifications	L80 > 100000h
LED lifetime (L70)	150,000 hours
LED lifetime (L90)	100,000 hours
LMF	E

For your regional contact in the ERCO Sales network click here [www.ercos.com/contact](http://www.ercos.com/contact)

Technical region: 120/60Hz, 277V/60Hz  
 We reserve the right to make technical and design changes.  
 Edition: 1/16/2022  
 Current version under: [www.ercos.com/AC000778](http://www.ercos.com/AC000778)

ERCO

Beamer New Floodlight

**Planning data**

Clearing (all)	1	2	3	4	5	6	7	8	9	10		
Ambient conditions	P	C	N	D	P	C	N	D	P	C	N	D
LMF	0.96	0.94	0.90	0.86	0.93	0.91	0.86	0.81	0.92	0.90	0.84	0.79
OSAF	0.99	0.97	0.95	0.92	0.98	0.97	0.95	0.92	0.98	0.97	0.95	0.92
Hour of operation (h)	1000	5000	10000	20000	30000	40000	50000					
LMF	1.00	0.99	0.99	0.96	0.94	0.92	0.90					
LSF	1	1	1	1	1	1	1					

LMF LMF050M5LMFC5F  
 MF Maintenance Factor  
 LMF Luminaires Maintenance Factor  
 RSMF Room Surface Maintenance Factor  
 LMF Lumens Maintenance Factor  
 LMF Lamp Lumen Maintenance Factor  
 CSF Lamp Sine Wave Factor  
 C Room pure  
 N Room clean  
 D Room dirty

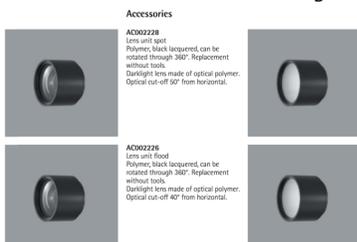
**Technical data based on international standards and directives**  
 IEC 60588 Luminaires - Parts 1 + 2: Optical requirements, particular requirements and tests.  
 IEC 62031 LED modules for general lighting - Safety specifications  
 IEC 62471 Photobiological safety of lamps and lamp systems  
 Luminaires  
 UL 1588 Standard for Track Lighting Systems  
 UL 1574 Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products  
 IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products  
 IES LM-80-08 Measuring Lumen Maintenance of LED Light Sources  
 CIE 13 Method of measuring and specifying color rendering properties of light sources



All technical data are subject to industry standard tolerances. See also [www.ercos.com/ercos-led](http://www.ercos.com/ercos-led)

ERCO

Beamer New Floodlight



**Accessories**

**AC002228** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Darklight lens made of optical polymer. Optical cut-off 90° from horizontal.

**AC002226** Lens unit oval  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Darklight lens made of optical polymer. Optical cut-off 40° from horizontal.

**AC002225** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Darklight lens made of optical polymer. Optical cut-off 40° from horizontal.

**AC002227** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Darklight lens made of optical polymer.

**AC002013** Lens unit oval flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Anti-reflective SpheroLit lens made of optical polymer.

**AC002019** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Anti-reflective SpheroLit lens made of optical polymer.

**AC002017** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Anti-reflective SpheroLit lens made of optical polymer.

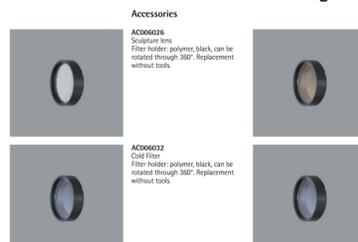
**AC002119** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Anti-reflective room lens made of optical polymer, infinitely focusable.

**AC002121** Lens unit oval wide flood  
 Polymer, black lacquered, can be rotated through 360°. Replacement without tools.  
 Anti-reflective room lens made of optical polymer, infinitely focusable.

**AC006001** Softening lens  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.  
 Anti-reflective SpheroLit lens made of optical polymer.

ERCO

Beamer New Floodlight



**Accessories**

**AC006026** Sculpture lens  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006032** Cold Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006030** Cold Filter Plus  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006028** Warm Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006012** Warm Filter Plus  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006029** Starline Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006011** Fish Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006033** Market Mast Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006031** Broad and Factory Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

**AC006023** Blue Light Filter  
 Filter holder: polymer, black, can be rotated through 360°. Replacement without tools.

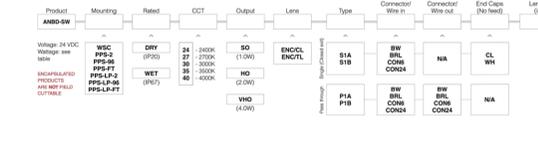
FIXTURE TYPE 'X5' BUILDING FLOODLIGHT

**ANYBEND-SW** Q-CAP Flexible Fixtures - MICRO 5 SERIES

ANYBEND-SW is a fully encapsulated flexible linear LED fixture suitable for use in a variety of applications. Because of its dry and wet rating, it is perfect for not only indoor use but also as outdoor accent lighting where the fixture is visible. ANYBEND-SW encapsulates our 24-volt static white LED strips in polycarbonate. Offered in three different outputs: standard output (1.0W/ft), high output (2.0W/ft), and very high output (4.0W/ft). ANYBEND-SW has a unique up/down and side bend with a 9° bending radius and it is compatible with three different mounting hardware options to ensure our product fits any design need. Utilize clear endcaps for continuous runs with no light loss.

**Output** (calculated LED = 4000 hours)

CCT	SO Standard Output 1 W/ft			HO High Output 2 W/ft			VHO Very High Output 4 W/ft					
	LM	CM	CM	LM	CM	CM	LM	CM	CM			
2800K	44	93	43	92	135	93	131	92	300	93	203	93
2700K	48	96	33	96	133	97	85	96	283	97	166	96
3000K	52	95	47	96	140	95	127	97	300	96	217	97
3500K	51	98	41	98	137	98	109	98	296	97	247	98
4000K	46	97	53	98	132	97	138	98	275	98	304	97



**Flexibility**

- Field modifications are not covered under Q-Tran warranty
- 5 year warranty
- Up/Down, Side Bend
- Data subject to change, all data has +/- 5% tolerance
- PPS-FT and PPS-LP-FT is to be cut at Q-Tran to requested length

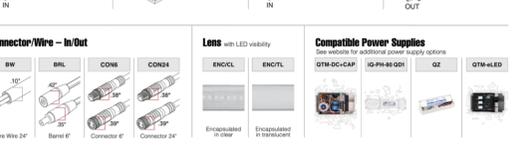
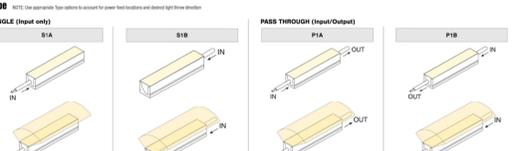
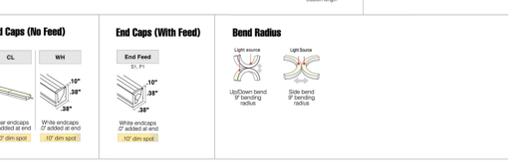
**ANYBEND-SW** Q-CAP Flexible Fixtures - MICRO 5 SERIES

**Mounting** NOTE: 2 white anode clips provided per foot 12". 1 for each additional 12". Other mounting styles incur additional charge, see price guide for details.

**WSC** White anode clip  
**PPS-2** PVC mounting clip  
**PPS-16** PVC channel  
**PPS-FT** PVC channel  
**PPS-LP-2** Low profile PVC mounting clip  
**PPS-LP-16** Low profile PVC channel  
**PPS-LP-FT** Low profile PVC channel Custom length

**Ambient Temperature Limits**

ANYBEND	Mounting	Min	Max
48"	Micro	-4	77
24"	Micro	-4	96
24"	Surface	-4	113
18"	Micro	-4	102
18"	Surface	-4	102



**LUMENLINEAR**

Lumenlinear lighting provides ample illumination for life safety and ambiance without the glare or harshness of overhead pole lighting. The diminutive profile and variable length provide seamless runs of projected light with full IES cutoff when installed in our Lumenrail™ system.

For information on Lumenlinear low-voltage LED lighting, scan this QR code.

**LUMENPOST** INTEGRATED LED DRIVER ENCLOSURE

Lumenpost is a cast stainless steel enclosure designed to house an LED driver for any Lumenrail™ post mounted application. It provides easy installation, service convenience and the durability to withstand harsh environments and vandal abuse. The enclosure integrates into a standard 1.90" diameter post for aesthetic uniformity throughout the handrail system.

- Use with Lumenpost™, Bantam™ or Lumenrail™ luminaires
- Tamper proof 316 stainless steel hardware
- Industry leading 100W, 24VDC output
- Code-compliant structural integrity
- High-quality craftsmanship and appearance

For information on Lumenpost, scan this QR code.

1600 SEVENTH BUILDING  
 SEATTLE CENTRAL BUSINESS DISTRICT  
 SEATTLE, WA  
 DESIGN: HBB LANDSCAPE ARCHITECTURE

BENCH LIGHTING

HANDRAIL LIGHTING



54 W 21st Street, Suite 1201  
 NEW YORK, NY 10010  
 857.300.2610 | [SGA-ARCH.COM](http://SGA-ARCH.COM)

PROJECT TEAM:

CLIENT  
**TWO INTERNATIONAL GROUP**

1 NEW HAMPSHIRE AVENUE, SUITE 101  
 PORTSMOUTH, NH 03801  
 (603) 436-8686  
 ARCHITECT OF RECORD  
**MARKET SQUARE ARCHITECTS**

104 CONGRESS STREET  
 PORTSMOUTH, NH 03801  
 (603) 501-0202

CIVIL ENGINEER  
**TIGHE & BOND**

177 Corporate Drive  
 PORTSMOUTH, NH 03801  
 (603) 433-8818

LANDSCAPE DESIGN  
**HALVORSON**

25 KINGSTON STREET  
 BOSTON, MA 02111  
 (617) 536-0380

STRUCTURE DESIGN  
**DESIMONE CONSULTING ENGINEERS**

31 MILK STREET  
 BOSTON, MA 02109  
 (617) 936-4492

MEP ENGINEER  
**JB&B**

80 PINE STREET  
 NEW YORK, NY 10005  
 (212) 530-9300

LIGHTING DESIGN  
**LIGHTBOX STUDIOS**

80 PINE STREET  
 NEW YORK, NY 10005  
 (646) 610-2600

SEAL / SIGNATURE

© Spagnolo Group Architecture, PC  
 06/10/22

**PROJECT:**  
**Russell Street Mixed Development**

2 Russell Street, Portsmouth NH

Two International Group

REVISIONS:

No.	Date	Description

SUBMISSIONS:

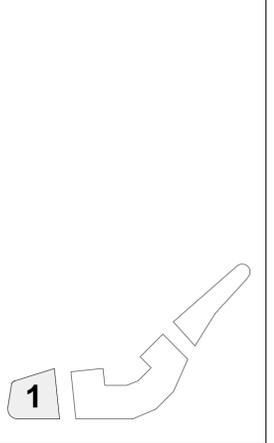
Date	Issued For:
07/15/2022	TAC SUBMISSION

SCALE NONE  
 DATE ISSUED 07/15/22  
 PROJECT NO 27009.N.001  
 DRAWN BY JR  
 CHECKED BY MM

SHEET TITLE:  
**EXTERIOR LIGHTING CUTSHEETS NO. 3**

**E-103**

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
05/23/22

**PROJECT:**

**Russell Street Mixed Use Scheme**

Russell Street, Portsmouth NH

**REVISIONS:**

No.	Date	Description

**SUBMISSIONS:**

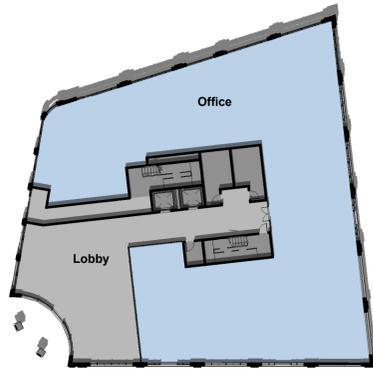
Date	Issued For:
05/23/22	TAC Work Session

SCALE **As indicated**  
DATE ISSUED **05/23/22**  
PROJECT NO **4979.00**  
DRAWN BY **Author**  
CHECKED BY **Checker**

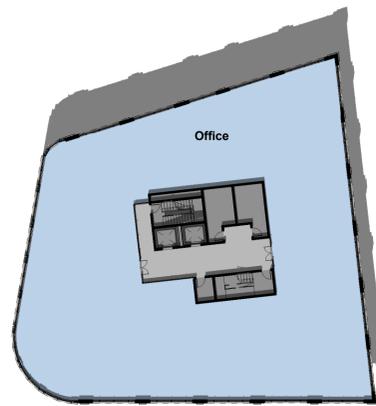
**SHEET TITLE:**

**BUILDING 1  
AREA PLANS**

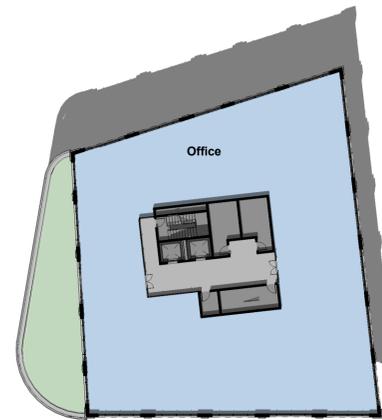
**A - 101**



1 **B1 - LEVEL 1**  
1/32" = 1'-0"



2 **B1 - LEVEL 3**  
1/32" = 1'-0"



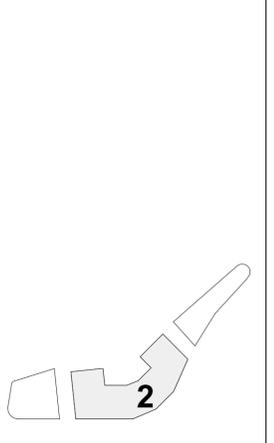
3 **B1 - LEVEL 4**  
1/32" = 1'-0"

**GROSS AREA CALCULATIONS**

<b>B1 - LEVEL 1</b>	
Back of House	1,061 SF
Lobby	2,574 SF
Office	7,974 SF
	11,609 SF
<b>B1 - LEVEL 2</b>	
Back of House	956 SF
Lobby	663 SF
Office	10,312 SF
	11,932 SF
<b>B1 - LEVEL 3</b>	
Back of House	956 SF
Lobby	663 SF
Office	10,313 SF
	11,932 SF
<b>B1 - LEVEL 4</b>	
Back of House	956 SF
Lobby	663 SF
Office	8,851 SF
	10,471 SF
<b>GRAND TOTAL</b>	<b>45,944 SF</b>

AREA LEGEND	
	OFFICE
	CONDO
	RETAIL
	PARKING
	LOBBY
	OUTDOOR SPACE
	BACK OF HOUSE

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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:**

**BUILDING 2  
AREA PLANS**

**A - 102**

**GROSS AREA CALCULATIONS**

B2 - LEVEL 0	
Back of House	625 SF
Lobby	253 SF
Parking	38,270 SF
<b>TOTAL</b>	<b>39,148 SF</b>

B2 - LEVEL 1	
Back of House	1,263 SF
Lobby	2,441 SF
Parking	25,590 SF
Retail	10,440 SF
<b>TOTAL</b>	<b>39,735 SF</b>

B2 - LEVEL 2	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,109 SF
Lobby	2,619 SF
<b>TOTAL</b>	<b>29,754 SF</b>

B2 - LEVEL 3	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,395 SF
Lobby	2,391 SF
<b>TOTAL</b>	<b>29,810 SF</b>

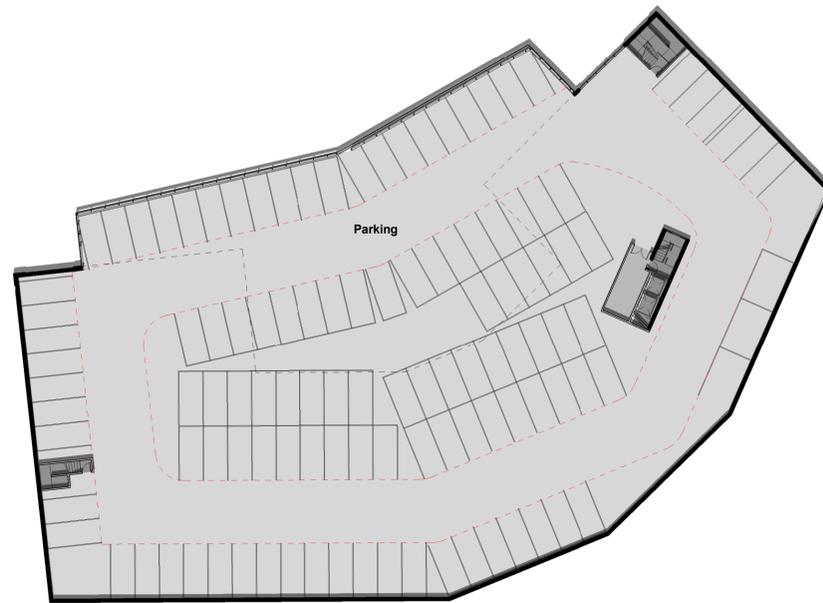
B2 - LEVEL 4	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,395 SF
Lobby	2,391 SF
<b>TOTAL</b>	<b>29,810 SF</b>

B2 - LEVEL 5	
Back of House	1,082 SF
Balcony	944 SF
Condo	25,395 SF
Lobby	2,391 SF
<b>TOTAL</b>	<b>29,810 SF</b>

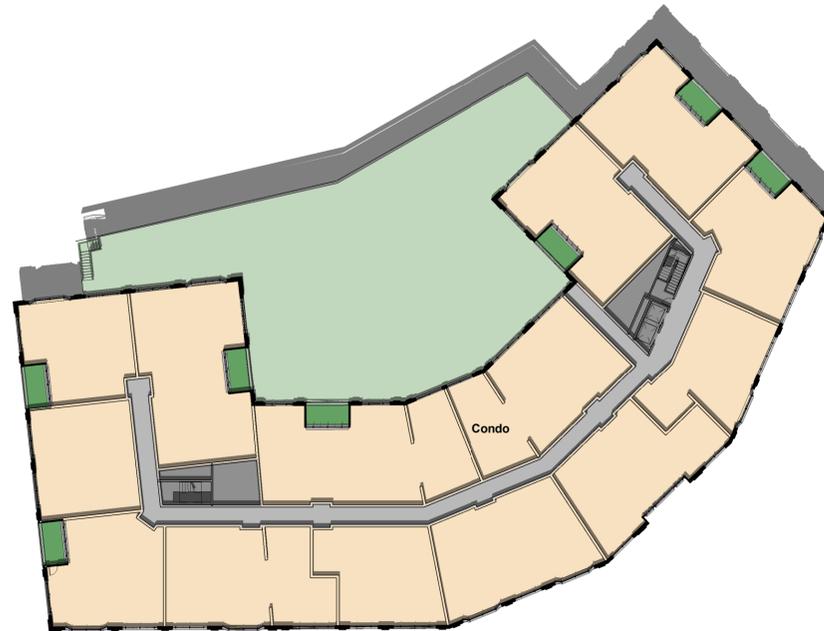
<b>GRAND TOTAL</b>	<b>198,068 SF</b>
--------------------	-------------------

**AREA LEGEND**

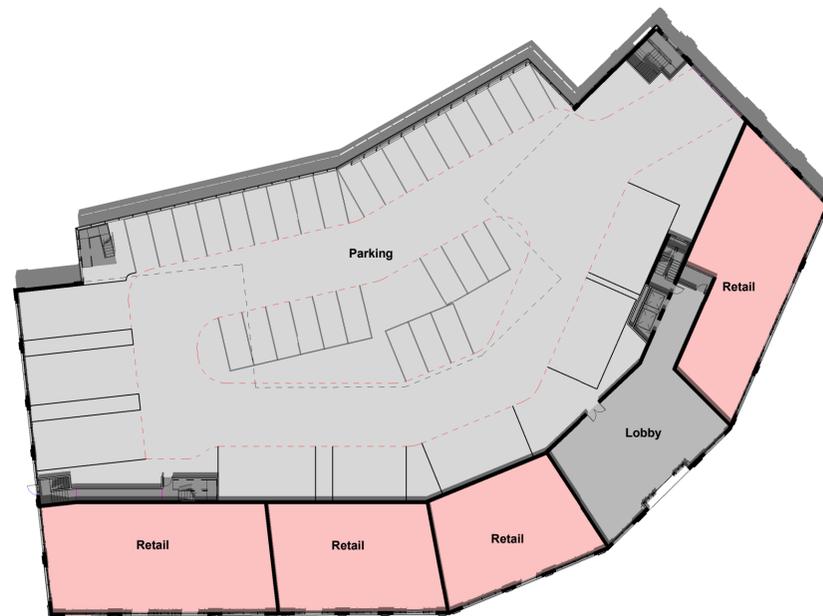
	OFFICE
	CONDO
	RETAIL
	PARKING
	LOBBY
	OUTDOOR SPACE
	BACK OF HOUSE



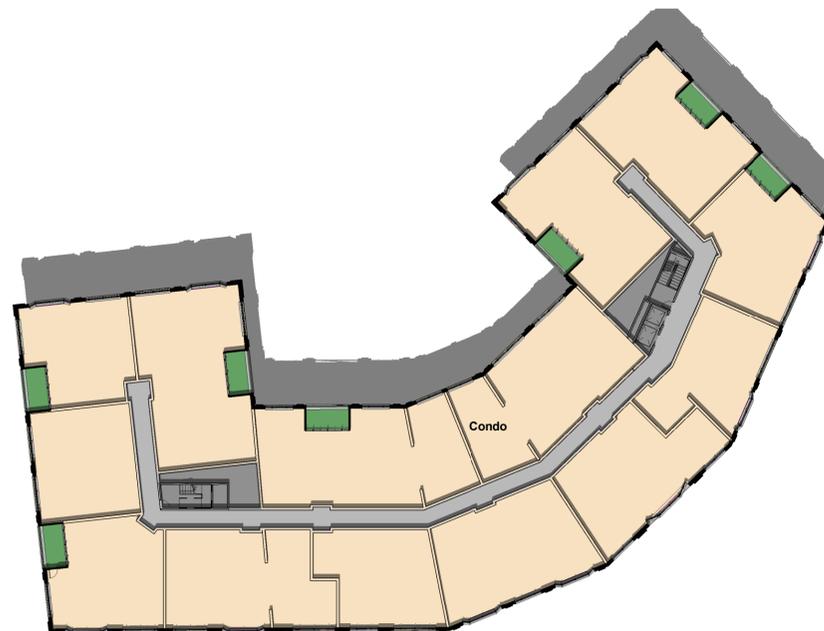
1 **B2 - LEVEL 0**  
1/32" = 1'-0"



3 **B2 - LEVEL 2**  
1/32" = 1'-0"

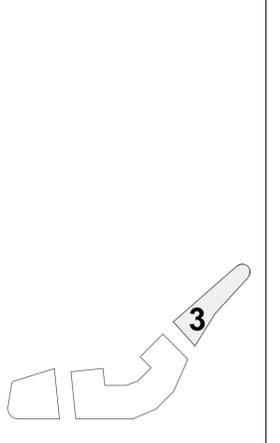


2 **B2 - LEVEL 1**  
1/32" = 1'-0"



4 **B2 - LEVEL 3-5**  
1/32" = 1'-0"

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
05/23/22

**PROJECT:**

**Russell Street Mixed Use Scheme**

Russell Street, Portsmouth NH

**REVISIONS:**

No.	Date	Description

**SUBMISSIONS:**

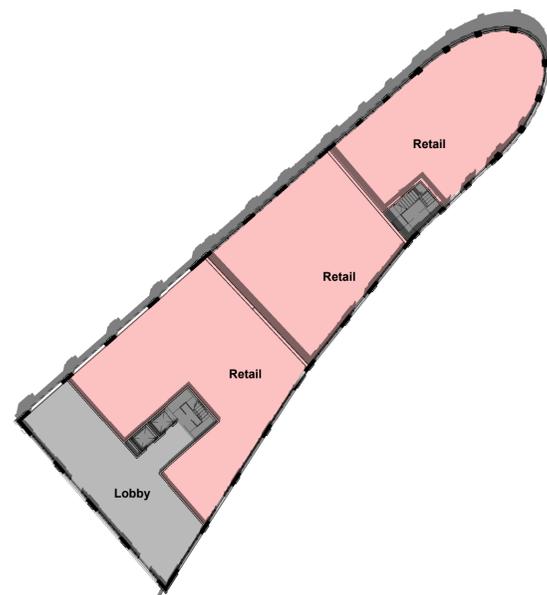
Date	Issued For:
05/23/22	TAC Work Session

SCALE **As indicated**  
DATE ISSUED **05/23/22**  
PROJECT NO **4979.00**  
DRAWN BY **Author**  
CHECKED BY **Checker**

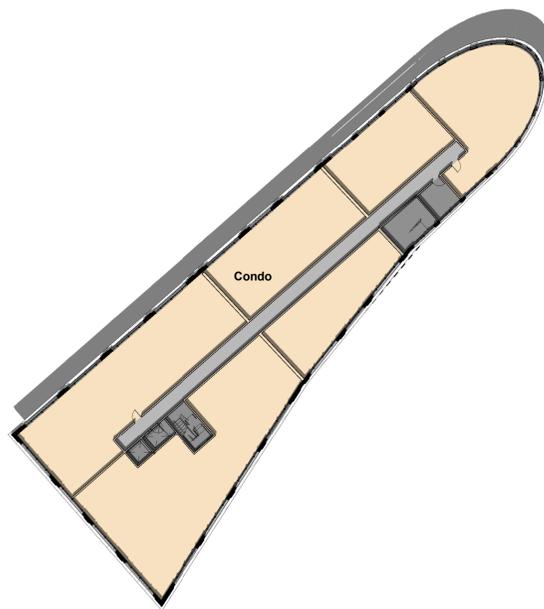
**SHEET TITLE:**

**BUILDING 3  
AREA PLANS**

**A - 103**



1 **B3 - LEVEL 1**  
1/32" = 1'-0"



2 **B3 - LEVEL 2-5**  
1/32" = 1'-0"

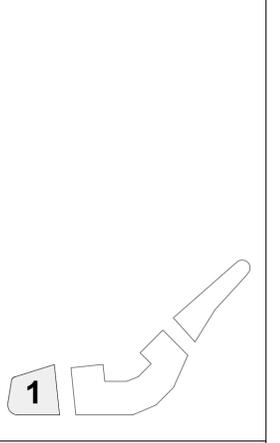
**GROSS AREA CALCULATIONS**

<b>B3 - LEVEL 1</b>	
Back of House	514 SF
Lobby	1,861 SF
Retail	8,829 SF
	11,203 SF
<b>B3 - LEVEL 2</b>	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
<b>B3 - LEVEL 3</b>	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
<b>B3 - LEVEL 4</b>	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
<b>B3 - LEVEL 5</b>	
Back of House	624 SF
Condo	9,675 SF
Lobby	904 SF
	11,203 SF
<b>GRAND TOTAL</b>	<b>56,017 SF</b>

AREA LEGEND	
	OFFICE
	CONDO
	RETAIL
	PARKING
	LOBBY
	OUTDOOR SPACE
	BACK OF HOUSE

MATERIAL LEGEND	
	BRICK
	LIMESTONE
	GRANITE
	METAL

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
 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:**

**BUILDING 1 ELEVATION**

**A - 201**



**1 B1 - East Elevation**  
 3/32" = 1'-0"

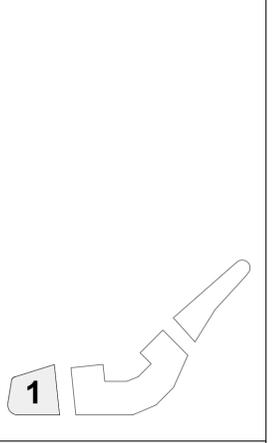


**2 B1- South Elevation**  
 3/32" = 1'-0"



200 HIGH ST, BOSTON, MA 02110  
857.300.2610 | SGA-ARCH.COM

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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:**

**BUILDING 1 ELEVATION**

**A - 202**

MATERIAL LEGEND	
	BRICK
	LIMESTONE
	GRANITE
	METAL

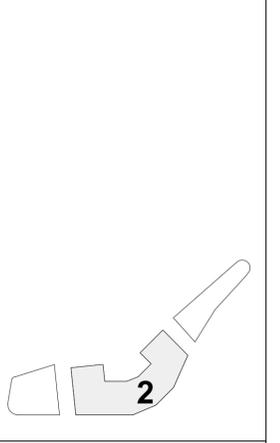


**1 B1- West Elevation**  
3/32" = 1'-0"



**2 B1- North Elevation**  
3/32" = 1'-0"

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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:**

**BUILDING 2 ELEVATION**

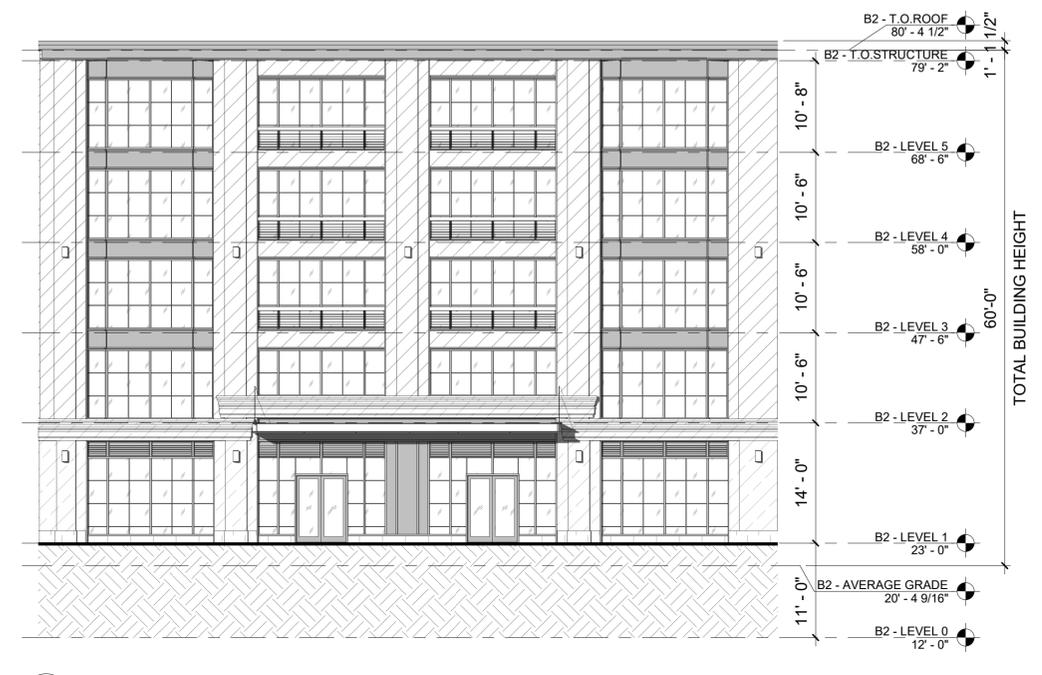
**A - 203**

**MATERIAL LEGEND**

	BRICK
	LIMESTONE
	GRANITE
	METAL



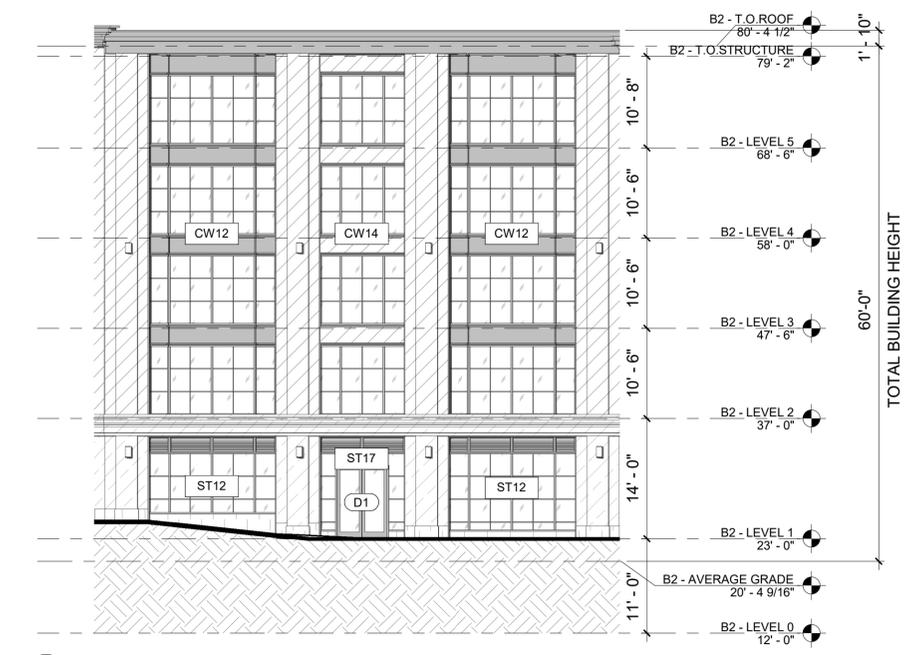
1 B2 - North Elevation  
3/32" = 1'-0"



2 B2 - East Elevation 1  
3/32" = 1'-0"

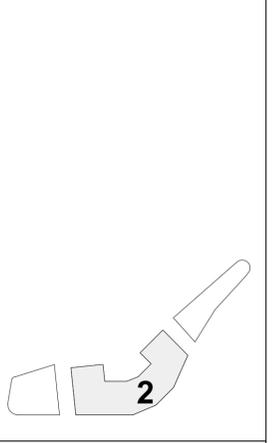


3 B2 - East Elevation 2  
3/32" = 1'-0"



4 B2 - South-East Elevation 1  
3/32" = 1'-0"

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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**

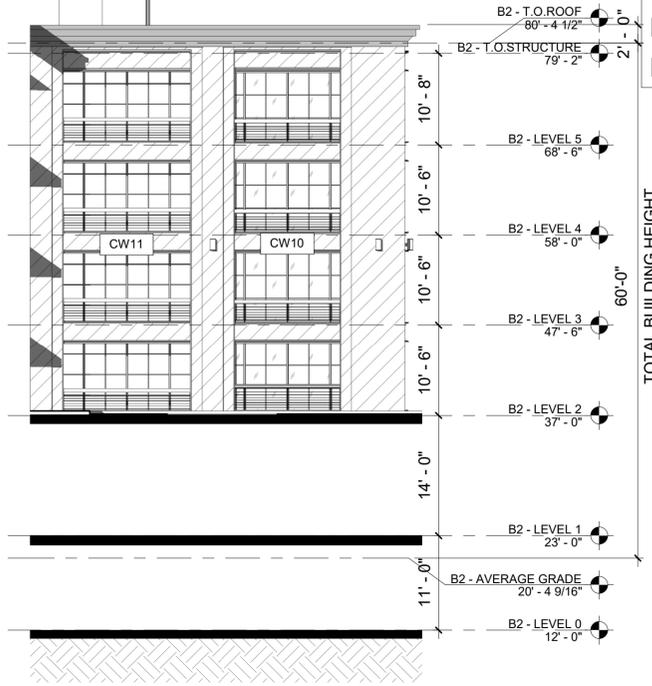
**SHEET TITLE:**

**BUILDING 2 ELEVATION**

**A - 204**



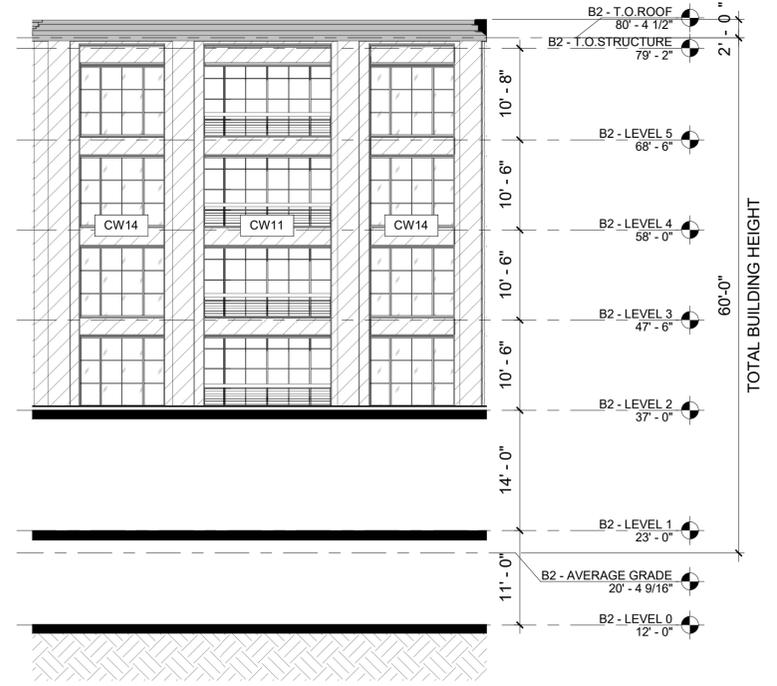
**1 B2 - South-East Elevation 2**  
3/32" = 1'-0"



**3 B2 - North Elevation 2**  
3/32" = 1'-0"



**2 B2 - South Elevation**  
3/32" = 1'-0"

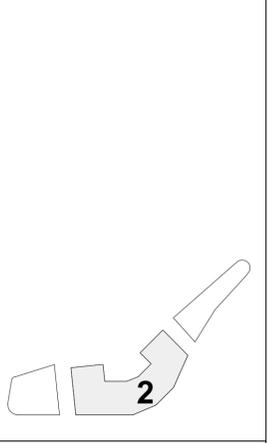


**4 B2 - South-West Elevation 2**  
3/32" = 1'-0"

**MATERIAL LEGEND**

	BRICK
	LIMESTONE
	GRANITE
	METAL

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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:**

**BUILDING 2 ELEVATION**

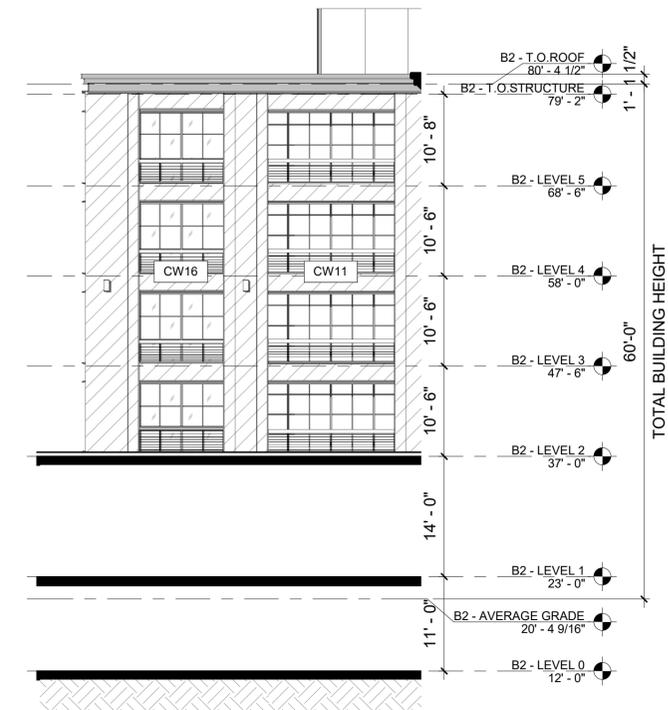
**A - 205**

**MATERIAL LEGEND**

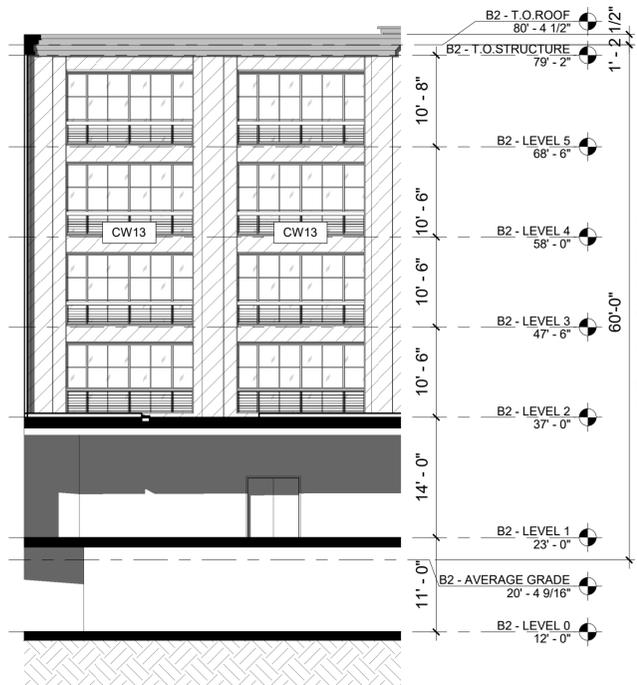
	BRICK
	LIMESTONE
	GRANITE
	METAL



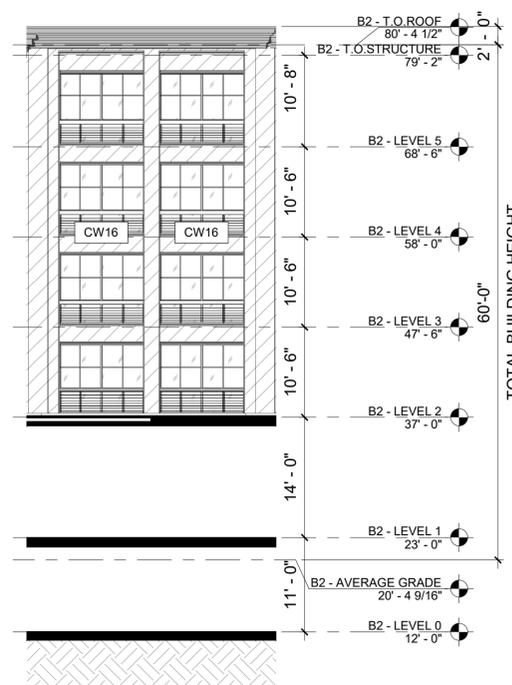
1 B2 - West Elevation 1  
3/32" = 1'-0"



2 B2 - South Elevation 2  
3/32" = 1'-0"



3 B2 - West Elevation 2  
3/32" = 1'-0"

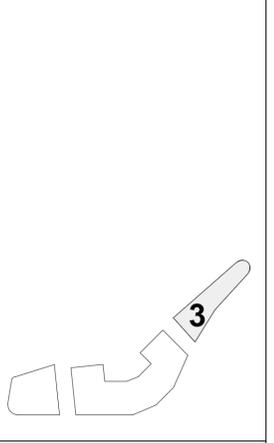


4 B2 - South West Elevation 1  
3/32" = 1'-0"



5 B2 - North-West Elevation  
3/32" = 1'-0"

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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:**

**BUILDING 3 ELEVATION**

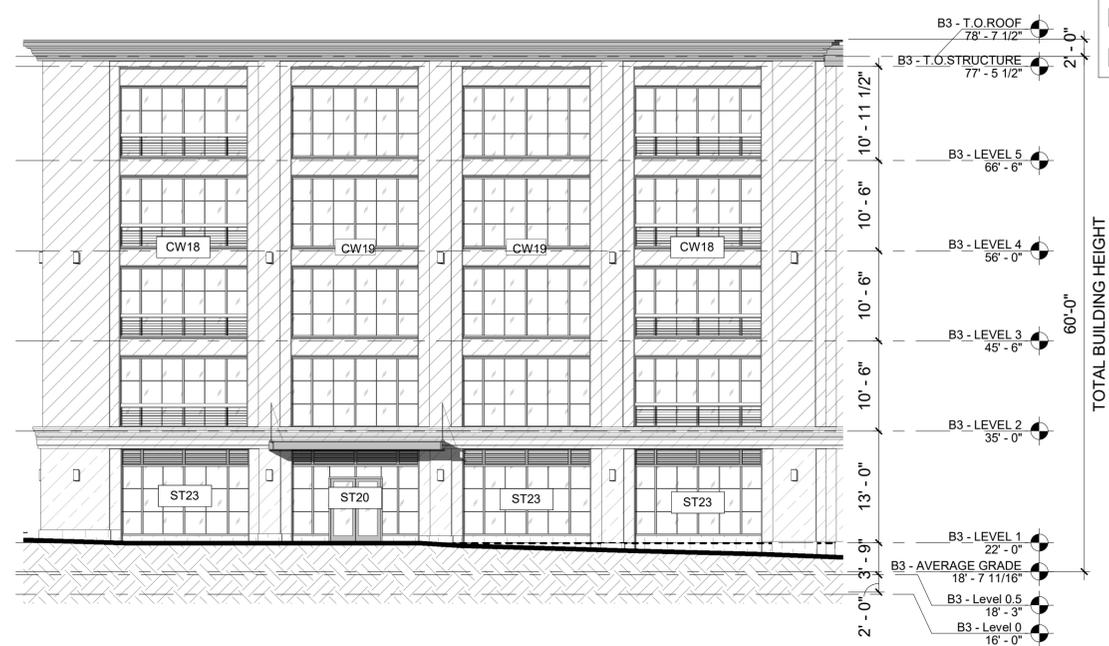
**A - 206**

**MATERIAL LEGEND**

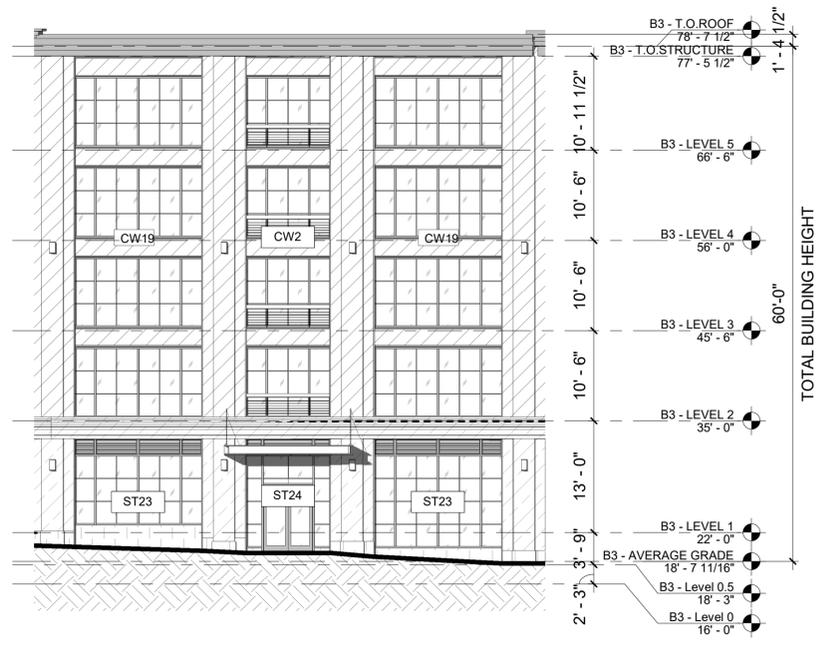
	BRICK
	LIMESTONE
	GRANITE
	METAL



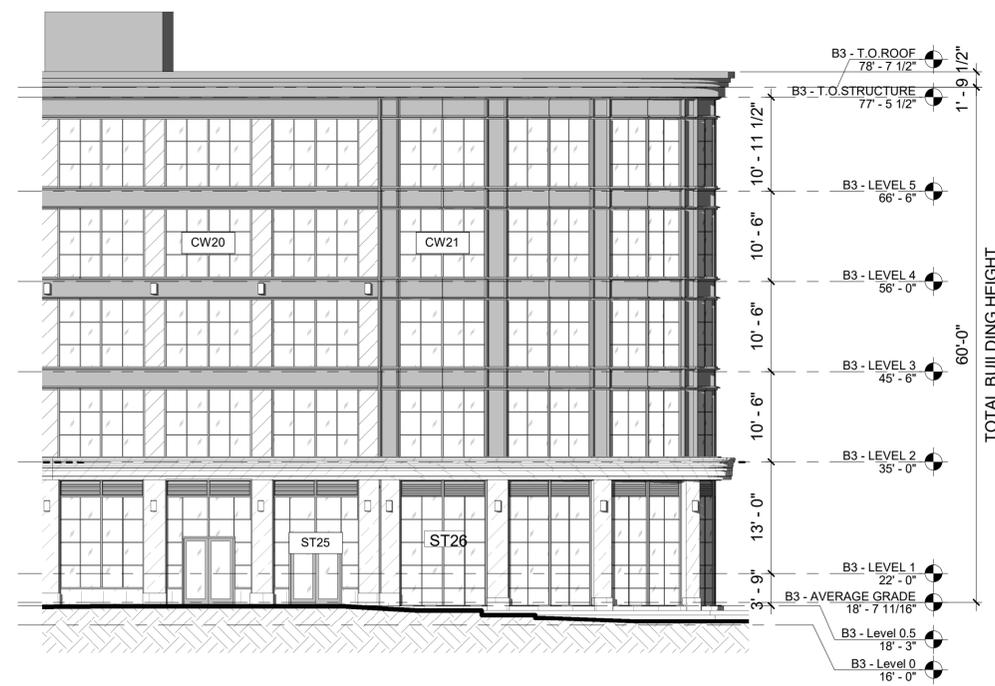
1 B3 - South Elevation  
3/32" = 1'-0"



2 B3 - East Elevation 1  
3/32" = 1'-0"

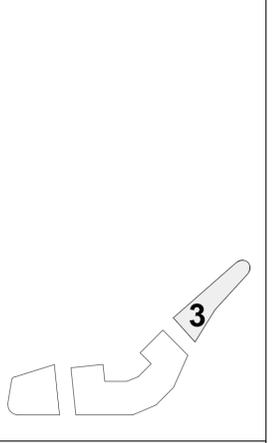


3 B3 - East Elevation 2  
3/32" = 1'-0"



4 B3 - East Elevation 3  
3/32" = 1'-0"

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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

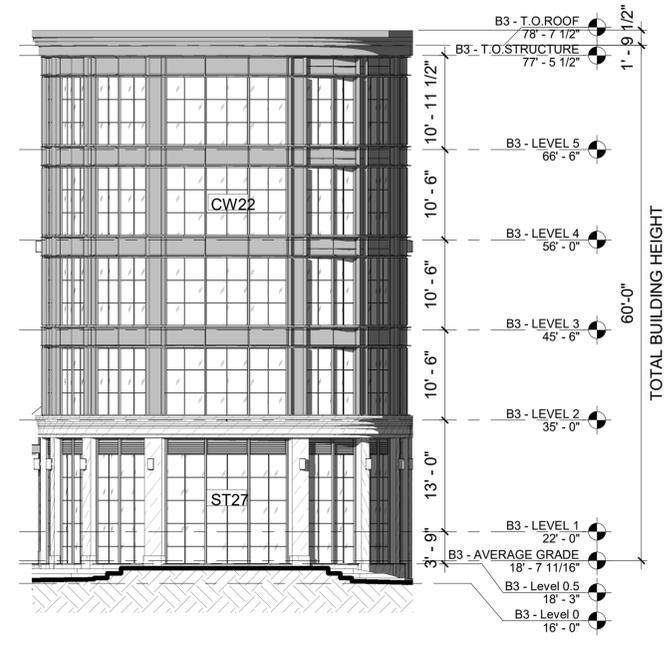
SCALE **As indicated**  
DATE ISSUED **05/23/22**  
PROJECT NO **4979.00**  
DRAWN BY **Author**  
CHECKED BY **Checker**

**SHEET TITLE:**

**BUILDING 3  
ELEVATION**

**A - 207**

MATERIAL LEGEND	
	BRICK
	LIMESTONE
	GRANITE
	METAL

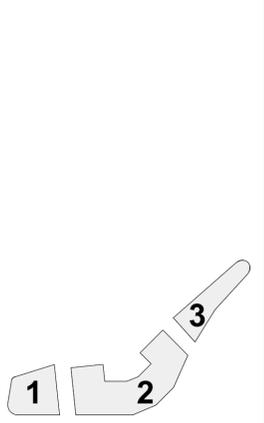


**1 B3 - North Elevation**  
3/32" = 1'-0"



**2 B3 -West Elevation**  
3/32" = 1'-0"

**PROJECT TEAM:**



**SEAL / SIGNATURE**

© Spagnolo Gisness & Associates, Inc.  
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**



**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%

City of Portsmouth TAC, June 7, 2022:			
	TAC Comment	Applicant Response	Sheet
<b>TAC Comments from 6/6 Correspondence:</b>			
1	3rd party review for stormwater management and 3rd party review for traffic impacts is required. A full review will be forthcoming after traffic and drainage studies are completed.	A third-party review of the drainage analysis and traffic impacts study have been completed. Revisions based on the drainage analysis review have been completed and are included in the revised plans, drainage report, and operations and maintenance manual, and a response to comments has been included in the submission package. A response to the traffic impact study review is being prepared and we anticipate submitting that response prior to the TAC meeting.	
2	Are there any offsite improvements proposed for the City owned land located between the Railroad and Vaughan St?	There are not any offsite improvements proposed for the city owned land in between the railroad and Vaughan Street.	
3	Pre-video inspect sewer and drain pipes on Deer Street, Maplewood Ave, and Russell Street.	Note 14 has been added to the General Notes requiring the contractor to perform video inspection of the drainage and sewer lines on Deer Street, Maplewood Avenue, and Russell Street prior to construction.	G-100
4	Correct the alignment of the "Proposed North Mill Pond Greenway".	The North Mill Pond Greenway alignment has been corrected.	
5	Drivable area along the railroad must be signed as pedestrian and bike path. Add pedestrian crossing over railroad between Map 125 Lot 21 and Map 118 Lot 28.	The Access road behind the buildings has been signed with both pedestrian and bike signs. Due to the liability of having a pedestrian crossing over the railroad, a crossing has not been added. However, a wayfinding sign has been added to the site plan at the end of the mews community space to direct pedestrians to Maplewood Avenue and Green Street.	C-102.1
<b>Prior to Planning Board Approval:</b>			
6	Applicant must agree to contribute to the Maplewood Ave drainage improvements.	Acknowledged	
7	Applicant must agree to contribute to the Russell and Market Street intersection traffic improvements.	Acknowledged	

T-5037-002  
July 21, 2022

Mr. Philip A. Corbett, PE, Project Manager  
CMA Engineers, Inc.  
35 Bow Street  
Portsmouth, New Hampshire 03801

Re: **Review of North End Mixed-Use Development Stormwater and Drainage  
Developer: Port Harbor Land LLC  
Design Engineer: Tighe & Bond  
CMA #1134.4**

Dear Philip:

On behalf of Port Harbor Land, LLC (applicant), we are pleased to submit the following revised items for the above referenced project. The enclosed items have been revised in response to the five (5) drainage review comments and two (2) general comments received from CMA in a letter dated June 24<sup>th</sup>, 2022.

- One (1) copy of the Site Plan Set, last revised July 21, 2022;
- One (1) copy of the Drainage Analysis, last revised July 21, 2022;
- One (1) copy of the Operations & Maintenance Plan, last revised July 21, 2022;

Please find **in bold** below specific responses to each comment stated in the June 24<sup>th</sup> letter.

### **Site Plan Review Regulations**

1. *Section 7.1: Applicants shall incorporate Low Impact Development (LID) design practices and techniques in all aspects of the site's development.*

The only proposed LID for the site is the structural BMP (Contech Jellyfish Filter). Most of the site flows to the Contech Jellyfish for treatment; however, there are portions of the driveways that discharge untreated onto the Greene Street ROW, and into the closed drainage system in Russell Street.

**The runoff from the proposed driveway in between buildings 2 & 3 has been redirected to discharge to an underground detention basin and jellyfish filter rather than discharging to Russell Street without being treated. The fire access road high point near Green Street has been shifted closer to Green Street to maximize the amount of runoff that is captured, detained, and treated.**

2. *Section 7.4.2.6: Efforts shall be made to utilize methods that intercept, treat, and infiltrate runoff throughout the site including, but not limited to, infiltration trenches, drainfields, dry wells, bioretention areas, level spreaders, filter strips, wetlands, vegetated swales, gravel wetlands, rain gardens, and tree boxes.*

The plan includes no infiltration of groundwater recharge features. Instead, the project includes a closed underground detention system with an outlet structure to mitigate the peak runoff flow. The report mentions there are excessively draining (Hydrologic Soil Group Type A) soils on site. No test pit report or boring logs were included; the applicant should demonstrate why on-site infiltration is not achievable.



**The proposed site is comprised of urban land with shallow bedrock. Due to these site constrictions, infiltration is not feasible. Hydrologic Soil Group A soils were determined from the Web Soil Survey Report generated for this project, which does not take into account the shallow bedrock. Peak flows have been mitigated for the development site through the use of underground detention chambers, and treatment standards are being met through the use of stormwater filtration units.**

3. *Section 7.4.2.7: Applicants shall demonstrate why on-site infiltration approaches are not possible or adequate before proposing the use of conventional systems that rely on collection and conveyance to remove runoff from the site.*

See comments 1 and 2.

**See response to comment # 2.**

4. *Section 7.4.3.1: All applications shall minimize the area of impervious surfaces and address the potential negative impact of impervious surfaces on surface and groundwater resources.*

The proposed site is 92% impervious and adds 11% more impervious surfaces than the pre-development conditions. No pervious drive, parking or walkway areas are proposed.

**The proposed project has utilized alternative options to traditional site design to reduce the amount of impervious surfaces. These alternative options include having the parking for the development under building 2 and combining the use of the site driveway access as a pedestrian and bike connection and fire lane. Additionally, the proposed project site has shallow bedrock preventing the use of pervious drives, parking, or sidewalks, as previously mentioned in comment response # 2.**

5. *Section 7.4.4.1: The applicant shall submit a Stormwater Management Plan and Erosion Control Plan.*

No Stormwater Management Plan or Erosion Control Plan were submitted.

**Per City of Portsmouth Site Plan Review Regulations Section 7.4, there are 16 items required to be included as part of the Stormwater Management Plan. For ease of review, we have indicated where each of the 16 items are located on the submitted documents.**

- 1. Section 1 of the drainage report and Sheet C-501.**
- 2. No on-site or adjacent wetlands, streams, or water bodies.**
- 3. Section 3 of the Drainage Report.**
- 4. Sheet C-103.**
- 5. Section 2 of the Drainage Report.**
- 6. Section 1.3 of the Drainage Report.**
- 7. Sheets G-100 and C-501.**
- 8. N/A**
- 9. Sections 4, 5, & 6 of the Drainage Report and the Operations & Maintenance Plan.**
- 10.No on-site infiltration**

11.N/A

12.Plan Set and Drainage Report have been completed by a licensed professional engineer certified in the State of New Hampshire.

13.Operations & Maintenance Plan

14.Operations & Maintenance Plan

15.Sheet C-501 and Operations & Maintenance Plan

16.Operations & Maintenance Plan

### **General Comments**

1. The applicant should strive for greater treatment and infiltration of the sites' stormwater runoff or describe why such treatments are not viable. This redevelopment presents an opportunity to improve treatment and potentially infiltrate on site, utilizing tree box filters, rain gardens, or underground infiltration systems. However, it appears that limited means are proposed to achieve this improvement.

**The proposed project has treated all but a small portion of impervious surfaces that are unable to be captured due to their proximity to the railroad and existing roadways. Per the City of Portsmouth's Site Plan regulations, Section 7.6.2.2, the proposed project qualifies as a redevelopment project being that greater than 40% of the developable land is existing impervious surface. The project is required to treat at least 30% of the existing impervious surface and 100% of the additional impervious surfaces. Or at least 60% of the entire developed area using filtration and/or infiltration practices. The existing lot is comprised of 72,833 SF (80.90%) of impervious area. The proposed redevelopment lot contains 88,455 SF of impervious surface and is proposed to treat 69,757 SF of this impervious surface. The proposed stormwater management system treats 100% (15,622 SF) of the additional impervious surface and 74% (54,135 SF) of the existing impervious surface using a filtration system. As noted in comment response # 2, on-site infiltration is not feasible due to shallow bedrock conditions. As previously noted, the existing condition of the site is 80.90% impervious and has no existing stormwater treatment practices. The proposed treatment system for the site will provide a significant improvement to the quality of stormwater runoff leaving the site.**

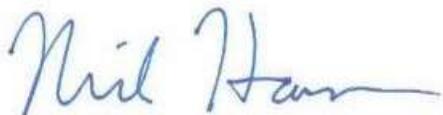
2. The applicant should confirm the downstream existing stormwater drainage system has adequate capacity (functions well under existing conditions).

**Per discussions with the City of Portsmouth DPW it is our understanding that the existing stormwater drainage system functions well in the existing conditions for both Russell Street and Maplewood Avenue. It is also our understanding that the City is currently in the design process to upgrade the drainage system and outfall to the Maplewood Avenue drainage system. The existing condition of the site was looked at closely to ensure that the pre-development condition was modelled accurately so that the proposed development would not have an adverse impact to the City's closed drainage system. The proposed project results in reduced peak flow to the existing closed drainage systems therefore the proposed project would not have an adverse impact on the city's drainage system.**

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](mailto:nahansen@tighebond.com).

Sincerely,

**TIGHE & BOND, INC.**



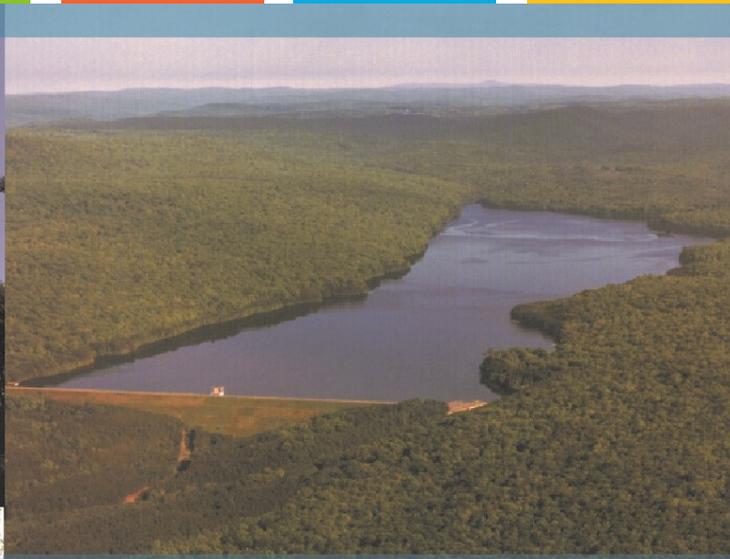
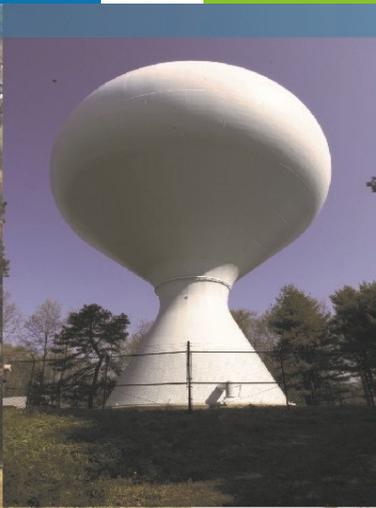
Neil A. Hansen, PE  
Project Manager



Patrick M. Crimmins, PE  
Vice President

Enclosures

Copy: Port Harbor Land, LLC (via email)  
City of Portsmouth Planning Department



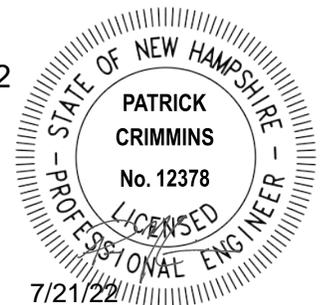
North End Mixed Use Development  
Russell & Deer Street  
Portsmouth, NH

## Drainage Analysis

Port Harbor Land, LLC

May 24, 2022

Last Revised July 21, 2022



**Tighe & Bond**



**Tighe&Bond**

**CONTENTS**



**Section 1 Project Description**

1.1 On-Site Soil Description .....1-1  
1.2 Pre- and Post-Development Comparison .....1-2  
1.3 Calculation Methods.....1-2

**Section 2 Pre-Development Conditions**

2.1 Pre-Development Calculations.....2-1  
2.2 Pre-Development Watershed Plans .....2-1

**Section 3 Post-Development Conditions**

3.1 Post-Development Calculations .....3-2  
3.2 Post-Development Watershed Plans.....3-2

**Section 4 Peak Rate Comparison**

**Section 5 Mitigation Description**

5.1 Pre-Treatment Methods for Protecting Water Quality .....5-2  
5.2 Treatment Methods for Protecting Water Quality. ....5-2

**Section 6 BMP Worksheet**

**Appendices**

A Web Soil Survey Report  
B Extreme Precipitation Tables



**Tighe&Bond**

**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 three (3) 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 evaluates the flow the discharges surface water toward the existing railroad tracks to the west of the project. PA-3 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 were 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(I).

## 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 were obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(I).

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.

**Tighe&Bond**

**SECTION 2**



## 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, & PA-3). These points of analysis and watersheds are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-801.

The point of analysis and its contributing watershed areas are described below:

### **Point of Analysis (PA-1)**

Pre-development Watershed 1.0 (PRE 1.0) is comprised of mostly impervious surfaces from portions of the existing paved parking area, Deer Street, and concrete sidewalks, with pockets of grass. Runoff from this watershed area sheets via overland flow to either Deer Street or Maplewood Avenue and carried along the gutter line at the edge of the road to various catch basins connecting to a closed drainage system. This closed drainage system along Maplewood Avenue discharging 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 mainly impervious surfaces from the existing paved parking area with pockets of grass and gravel. Runoff from this watershed area sheets via overland flow to a gravel swale along the railroad tracks. Runoff directed toward the railroad tracks travels where it infiltrates.

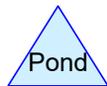
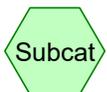
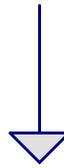
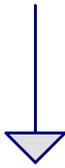
### **Point of Analysis (PA-3)**

Pre-development Watershed 3.0 (PRE 3.0) 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**





**T-5037-002 PRE**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Printed 7/20/2022

Page 2

**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
12,636	39	>75% Grass cover, Good, HSG A (PRE 2.0, PRE 3.0)
10,382	80	>75% Grass cover, Good, HSG D (PRE 1.0, PRE 2.0, PRE 3.0)
2,104	96	Gravel surface, HSG A (PRE 2.0)
5,270	96	Gravel surface, HSG D (PRE 2.0)
3,120	98	Ledge, HSG A (PRE 2.0, PRE 3.0)
62,458	98	Unconnected pavement, HSG A (PRE 2.0, PRE 3.0)
63,417	98	Unconnected pavement, HSG D (PRE 1.0, PRE 2.0, PRE 3.0)
6,029	30	Woods, Good, HSG A (PRE 3.0)
<b>165,416</b>	<b>90</b>	<b>TOTAL AREA</b>

**T-5037-002 PRE**

Prepared by Tighe & Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Printed 7/20/2022

Page 3

**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
86,347	HSG A	PRE 2.0, PRE 3.0
0	HSG B	
0	HSG C	
79,069	HSG D	PRE 1.0, PRE 2.0, PRE 3.0
0	Other	
<b>165,416</b>		<b>TOTAL AREA</b>

**T-5037-002 PRE**

Prepared by Tighe & Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 2-Yr Rainfall=3.68"

Printed 7/20/2022

Page 4

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=14,937 sf 79.04% Impervious Runoff Depth>3.01"  
Flow Length=290' Tc=5.0 min CN=94 Runoff=1.16 cfs 3,746 cf

**Subcatchment PRE 2.0:** Runoff Area=78,192 sf 76.16% Impervious Runoff Depth>2.91"  
Flow Length=444' Tc=5.0 min CN=93 Runoff=5.91 cfs 18,945 cf

**Subcatchment PRE 3.0:** Runoff Area=72,287 sf 79.73% Impervious Runoff Depth>2.26"  
Flow Length=470' Tc=5.0 min CN=86 Runoff=4.38 cfs 13,596 cf

**Link PA1:** Inflow=1.16 cfs 3,746 cf  
Primary=1.16 cfs 3,746 cf

**Link PA2:** Inflow=5.91 cfs 18,945 cf  
Primary=5.91 cfs 18,945 cf

**Link PA3:** Inflow=4.38 cfs 13,596 cf  
Primary=4.38 cfs 13,596 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 36,287 cf Average Runoff Depth = 2.63"**  
**22.02% Pervious = 36,421 sf 77.98% Impervious = 128,995 sf**

**T-5037-002 PRE**

Prepared by Tighe & Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 10-Yr Rainfall=5.59"

Printed 7/20/2022

Page 5

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=14,937 sf 79.04% Impervious Runoff Depth>4.89"  
Flow Length=290' Tc=5.0 min CN=94 Runoff=1.83 cfs 6,085 cf

**Subcatchment PRE 2.0:** Runoff Area=78,192 sf 76.16% Impervious Runoff Depth>4.78"  
Flow Length=444' Tc=5.0 min CN=93 Runoff=9.44 cfs 31,119 cf

**Subcatchment PRE 3.0:** Runoff Area=72,287 sf 79.73% Impervious Runoff Depth>4.02"  
Flow Length=470' Tc=5.0 min CN=86 Runoff=7.71 cfs 24,208 cf

**Link PA1:** Inflow=1.83 cfs 6,085 cf  
Primary=1.83 cfs 6,085 cf

**Link PA2:** Inflow=9.44 cfs 31,119 cf  
Primary=9.44 cfs 31,119 cf

**Link PA3:** Inflow=7.71 cfs 24,208 cf  
Primary=7.71 cfs 24,208 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 61,412 cf Average Runoff Depth = 4.46"**  
**22.02% Pervious = 36,421 sf 77.98% Impervious = 128,995 sf**

**Summary for Subcatchment PRE 1.0:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.83 cfs @ 12.07 hrs, Volume= 6,085 cf, Depth> 4.89"

Runoff 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
3,131	80	>75% Grass cover, Good, HSG D
11,806	98	Unconnected pavement, HSG D
14,937	94	Weighted Average
3,131		20.96% Pervious Area
11,806		79.04% Impervious Area
11,806		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.50		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
0.2	47	0.0310	3.57		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.7	143	0.0053	3.30	2.59	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
1.6	290	Total, Increased to minimum Tc = 5.0 min			

**Summary for Subcatchment PRE 2.0:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 9.44 cfs @ 12.07 hrs, Volume= 31,119 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
6,315	80	>75% Grass cover, Good, HSG D
5,270	96	Gravel surface, HSG D
45,632	98	Unconnected pavement, HSG D
78,192	93	Weighted Average
18,640		23.84% Pervious Area
59,552		76.16% Impervious Area
58,048		97.47% Unconnected

**T-5037-002 PRE**

Type III 24-hr 10-Yr Rainfall=5.59"

Prepared by Tighe & Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 7

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0750	2.50		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
2.5	344	0.0129	2.31		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
3.2	444	Total, Increased to minimum Tc = 5.0 min			

**Summary for Subcatchment PRE 3.0:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 7.71 cfs @ 12.07 hrs, Volume= 24,208 cf, Depth> 4.02"

Runoff 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
7,685	39	>75% Grass cover, Good, HSG A
6,029	30	Woods, Good, HSG A
50,042	98	Unconnected pavement, HSG A
936	80	>75% Grass cover, Good, HSG D
5,979	98	Unconnected pavement, HSG D
72,287	86	Weighted Average
14,650		20.27% Pervious Area
57,637		79.73% Impervious Area
56,021		97.20% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	25	0.0140	0.97		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
0.1	15	0.1670	2.86		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.1	140	0.0110	2.13		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.6	290	0.0300	7.86	6.17	<b>Pipe Channel,</b> 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 = 14,937 sf, 79.04% Impervious, Inflow Depth > 4.89" for 10-Yr event

Inflow = 1.83 cfs @ 12.07 hrs, Volume= 6,085 cf

Primary = 1.83 cfs @ 12.07 hrs, Volume= 6,085 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 = 78,192 sf, 76.16% Impervious, Inflow Depth > 4.78" for 10-Yr event  
Inflow = 9.44 cfs @ 12.07 hrs, Volume= 31,119 cf  
Primary = 9.44 cfs @ 12.07 hrs, Volume= 31,119 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**Summary for Link PA3:**

Inflow Area = 72,287 sf, 79.73% Impervious, Inflow Depth > 4.02" for 10-Yr event  
Inflow = 7.71 cfs @ 12.07 hrs, Volume= 24,208 cf  
Primary = 7.71 cfs @ 12.07 hrs, Volume= 24,208 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**T-5037-002 PRE**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 25-Yr Rainfall=7.08"

Printed 7/20/2022

Page 9

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=14,937 sf 79.04% Impervious Runoff Depth>6.36"  
Flow Length=290' Tc=5.0 min CN=94 Runoff=2.34 cfs 7,922 cf

**Subcatchment PRE 2.0:** Runoff Area=78,192 sf 76.16% Impervious Runoff Depth>6.25"  
Flow Length=444' Tc=5.0 min CN=93 Runoff=12.16 cfs 40,708 cf

**Subcatchment PRE 3.0:** Runoff Area=72,287 sf 79.73% Impervious Runoff Depth>5.44"  
Flow Length=470' Tc=5.0 min CN=86 Runoff=10.30 cfs 32,768 cf

**Link PA1:** Inflow=2.34 cfs 7,922 cf  
Primary=2.34 cfs 7,922 cf

**Link PA2:** Inflow=12.16 cfs 40,708 cf  
Primary=12.16 cfs 40,708 cf

**Link PA3:** Inflow=10.30 cfs 32,768 cf  
Primary=10.30 cfs 32,768 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 81,398 cf Average Runoff Depth = 5.90"**  
**22.02% Pervious = 36,421 sf 77.98% Impervious = 128,995 sf**

**T-5037-002 PRE**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 50-Yr Rainfall=8.48"

Printed 7/20/2022

Page 10

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=14,937 sf 79.04% Impervious Runoff Depth>7.76"  
Flow Length=290' Tc=5.0 min CN=94 Runoff=2.83 cfs 9,654 cf

**Subcatchment PRE 2.0:** Runoff Area=78,192 sf 76.16% Impervious Runoff Depth>7.64"  
Flow Length=444' Tc=5.0 min CN=93 Runoff=14.70 cfs 49,752 cf

**Subcatchment PRE 3.0:** Runoff Area=72,287 sf 79.73% Impervious Runoff Depth>6.79"  
Flow Length=470' Tc=5.0 min CN=86 Runoff=12.71 cfs 40,925 cf

**Link PA1:** Inflow=2.83 cfs 9,654 cf  
Primary=2.83 cfs 9,654 cf

**Link PA2:** Inflow=14.70 cfs 49,752 cf  
Primary=14.70 cfs 49,752 cf

**Link PA3:** Inflow=12.71 cfs 40,925 cf  
Primary=12.71 cfs 40,925 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 100,331 cf Average Runoff Depth = 7.28"**  
**22.02% Pervious = 36,421 sf 77.98% Impervious = 128,995 sf**

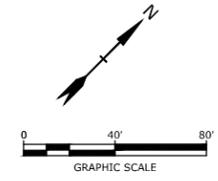
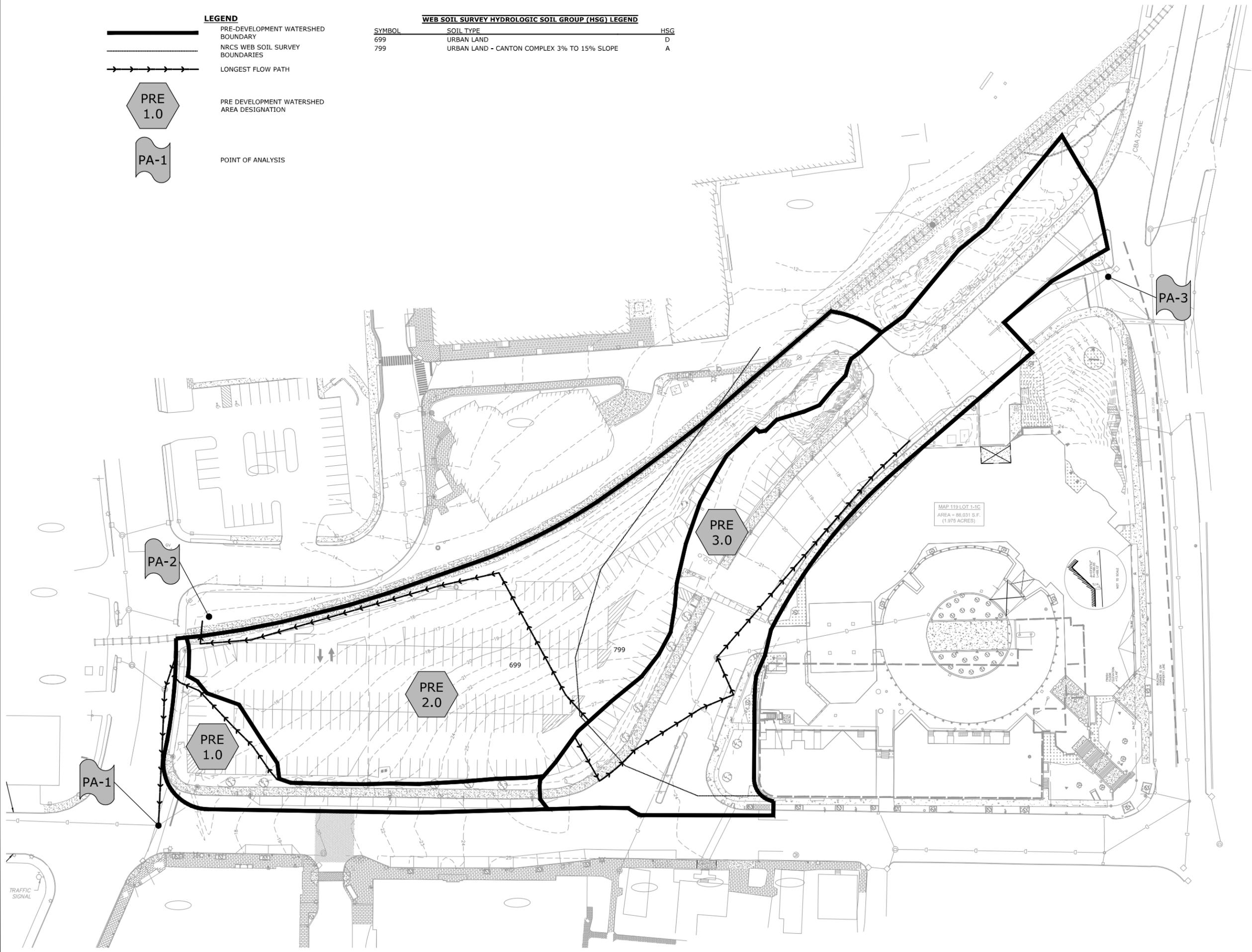
**LEGEND**

 PRE-DEVELOPMENT WATERSHED BOUNDARY  
 NRCS WEB SOIL SURVEY BOUNDARIES  
 LONGEST FLOW PATH  
 PRE 1.0  
 PA-1

PRE DEVELOPMENT WATERSHED AREA DESIGNATION  
 POINT OF ANALYSIS

**WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND**

SYMBOL	SOIL TYPE	HSG
699	URBAN LAND	D
799	URBAN LAND - CANTON COMPLEX 3% TO 15% SLOPE	A



**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
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: 7/20/2022 8:03am By: Ckrzouik  
 Plotted On: Jul 21, 2022 8:03am By: Ckrzouik  
 Tighe & Bond: P1115037 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 five (5) 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 three point of analysis (PA-1, PA-2 & PA-3).

Two underground detention systems are included on the development site for the purpose of mitigating peak flowrates. Additionally, two Jellyfish Filter units are proposed for treatment purposes and are designed that flows greater than the 2-year storm event bypass these units.

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 brick sidewalks and seating areas along Deer Street and Maplewood Avenue. 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 proposed buildings 1 and 2 as well as portions of the mews community space. Runoff from this watershed is captured by various 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 PJFF 1). Flows exiting the Jellyfish Filter discharge to the closed drainage system along Maplewood Avenue (PA-1).

### **Point of Analysis (PA-2)**

Post-development Watershed 2.0 (POST 2.0) is comprised mostly of the brick fire, pedestrian, and bicycle access drive. Additionally, this watershed has portions of gravel adjacent to the railroad tracks. Like the pre-development conditions, runoff from this watershed travels parallel to the railroad tracks prior to infiltrating into the ground.

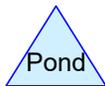
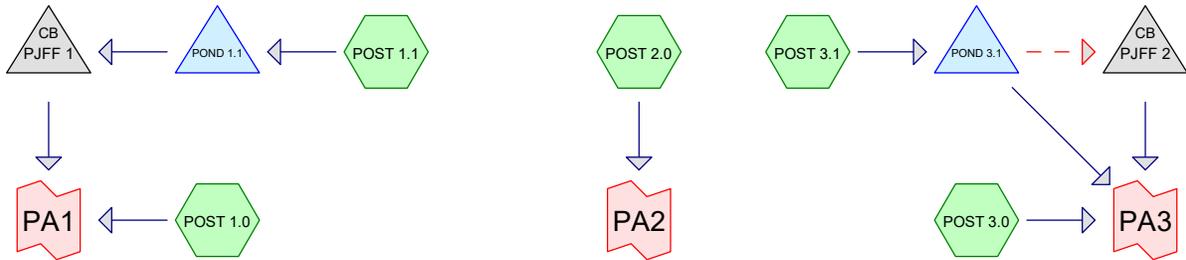
### **Point of Analysis (PA-3)**

Post-development Watershed 3.0 (POST 3.0) 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.

Post-development Watershed 3.1 (POST 3.1) is comprised of the proposed building 3 and the shared access driveway between buildings 2 and 3. Runoff from this watershed is captured by a catch basin and roof leader connecting to a proposed underground detention system (Pond 3.1). The detention system discharges to the treatment unit, a Contech Jellyfish Stormwater Filter (Pond PJFF 2). Flows exiting the Jellyfish Filter discharge to the closed drainage system along Russell Street (PA-3).

### **3.1 Post-Development Calculations**

### **3.2 Post-Development Watershed Plans**



**Routing Diagram for T-5037-002 POST**  
 Prepared by Tighe & Bond, Printed 7/20/2022  
 HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

**T-5037-002 POST**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Printed 7/20/2022

Page 2

**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
11,690	39	>75% Grass cover, Good, HSG A (POST 2.0, POST 3.0, POST 3.1)
2,460	80	>75% Grass cover, Good, HSG D (POST 1.0, POST 1.1, POST 3.0)
1,125	96	Gravel surface, HSG A (POST 2.0)
6,672	96	Gravel surface, HSG D (POST 2.0)
50,755	98	Paved parking, HSG A (POST 2.0, POST 3.0, POST 3.1)
26,589	98	Paved parking, HSG D (POST 1.0, POST 1.1, POST 2.0, POST 3.0, POST 3.1)
20,986	98	Roofs, HSG A (POST 1.1, POST 3.1)
43,348	98	Unconnected roofs, HSG D (POST 1.1)
1,791	30	Woods, Good, HSG A (POST 3.0)
<b>165,416</b>	<b>93</b>	<b>TOTAL AREA</b>

**T-5037-002 POST**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Printed 7/20/2022

Page 3

**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
86,347	HSG A	POST 1.1, POST 2.0, POST 3.0, POST 3.1
0	HSG B	
0	HSG C	
79,069	HSG D	POST 1.0, POST 1.1, POST 2.0, POST 3.0, POST 3.1
0	Other	
<b>165,416</b>		<b>TOTAL AREA</b>

**T-5037-002 POST**

Type III 24-hr 2-Yr Rainfall=3.68"

Prepared by Tighe &amp; Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 4

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=8,504 sf 88.63% Impervious Runoff Depth>3.22"  
 Flow Length=336' Tc=5.0 min CN=96 Runoff=0.68 cfs 2,283 cf

**Subcatchment POST 1.1:** Runoff Area=56,100 sf 98.25% Impervious Runoff Depth>3.44"  
 Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=4.64 cfs 16,102 cf

**Subcatchment POST 2.0:** Runoff Area=25,065 sf 68.10% Impervious Runoff Depth>3.33"  
 Flow Length=420' Slope=0.0193 '/' Tc=5.0 min CN=97 Runoff=2.05 cfs 6,959 cf

**Subcatchment POST 3.0:** Runoff Area=60,974 sf 77.60% Impervious Runoff Depth>2.17"  
 Flow Length=726' Tc=5.0 min CN=85 Runoff=3.56 cfs 11,039 cf

**Subcatchment POST 3.1:** Runoff Area=14,773 sf 99.09% Impervious Runoff Depth>3.33"  
 Flow Length=139' Slope=0.0050 '/' Tc=5.0 min CN=97 Runoff=1.21 cfs 4,101 cf

**Pond PJFF 1:** Peak Elev=7.11' Inflow=0.59 cfs 15,602 cf  
 18.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.59 cfs 15,602 cf

**Pond PJFF 2:** Peak Elev=9.95' Inflow=0.00 cfs 0 cf  
 12.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=0.00 cfs 0 cf

**Pond POND 1.1:** Peak Elev=9.39' Storage=6,990 cf Inflow=4.64 cfs 16,102 cf  
 Outflow=0.59 cfs 15,602 cf

**Pond POND 3.1:** Peak Elev=11.61' Storage=631 cf Inflow=1.21 cfs 4,101 cf  
 Primary=0.83 cfs 3,871 cf Secondary=0.00 cfs 0 cf Outflow=0.83 cfs 3,871 cf

**Link PA1:** Inflow=1.15 cfs 17,885 cf  
 Primary=1.15 cfs 17,885 cf

**Link PA2:** Inflow=2.05 cfs 6,959 cf  
 Primary=2.05 cfs 6,959 cf

**Link PA3:** Inflow=4.31 cfs 14,910 cf  
 Primary=4.31 cfs 14,910 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 40,484 cf Average Runoff Depth = 2.94"**  
**14.35% Pervious = 23,738 sf 85.65% Impervious = 141,678 sf**

**T-5037-002 POST**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 10-Yr Rainfall=5.59"

Printed 7/20/2022

Page 5

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=8,504 sf 88.63% Impervious Runoff Depth>5.12"  
 Flow Length=336' Tc=5.0 min CN=96 Runoff=1.06 cfs 3,626 cf

**Subcatchment POST 1.1:** Runoff Area=56,100 sf 98.25% Impervious Runoff Depth>5.35"  
 Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=7.10 cfs 25,011 cf

**Subcatchment POST 2.0:** Runoff Area=25,065 sf 68.10% Impervious Runoff Depth>5.23"  
 Flow Length=420' Slope=0.0193 '/' Tc=5.0 min CN=97 Runoff=3.15 cfs 10,930 cf

**Subcatchment POST 3.0:** Runoff Area=60,974 sf 77.60% Impervious Runoff Depth>3.91"  
 Flow Length=726' Tc=5.0 min CN=85 Runoff=6.37 cfs 19,892 cf

**Subcatchment POST 3.1:** Runoff Area=14,773 sf 99.09% Impervious Runoff Depth>5.23"  
 Flow Length=139' Slope=0.0050 '/' Tc=5.0 min CN=97 Runoff=1.86 cfs 6,442 cf

**Pond PJFF 1:** Peak Elev=7.26' Inflow=1.08 cfs 24,318 cf  
 18.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=1.08 cfs 24,318 cf

**Pond PJFF 2:** Peak Elev=10.36' Inflow=0.49 cfs 258 cf  
 12.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=0.49 cfs 258 cf

**Pond POND 1.1:** Peak Elev=10.57' Storage=10,845 cf Inflow=7.10 cfs 25,011 cf  
 Outflow=1.08 cfs 24,318 cf

**Pond POND 3.1:** Peak Elev=12.03' Storage=807 cf Inflow=1.86 cfs 6,442 cf  
 Primary=1.03 cfs 5,948 cf Secondary=0.49 cfs 258 cf Outflow=1.52 cfs 6,206 cf

**Link PA1:** Inflow=1.65 cfs 27,944 cf  
 Primary=1.65 cfs 27,944 cf

**Link PA2:** Inflow=3.15 cfs 10,930 cf  
 Primary=3.15 cfs 10,930 cf

**Link PA3:** Inflow=7.65 cfs 26,098 cf  
 Primary=7.65 cfs 26,098 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 65,900 cf Average Runoff Depth = 4.78"**  
**14.35% Pervious = 23,738 sf 85.65% Impervious = 141,678 sf**

**T-5037-002 POST**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 10-Yr Rainfall=5.59"

Printed 7/20/2022

Page 6

**Summary for Subcatchment POST 1.0:**

[49] Hint: Tc&lt;2dt may require smaller dt

Runoff = 1.06 cfs @ 12.07 hrs, Volume= 3,626 cf, Depth&gt; 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	Paved parking, HSG A
967	80	>75% Grass cover, Good, HSG D
7,537	98	Paved parking, HSG D
8,504	96	Weighted Average
967		11.37% Pervious Area
7,537		88.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	100	0.0038	0.76		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
1.0	206	0.0310	3.57		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.2	30	0.0053	3.30	2.59	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
3.4	336	Total, Increased to minimum Tc = 5.0 min			

**Summary for Subcatchment POST 1.1:**

[49] Hint: Tc&lt;2dt may require smaller dt

Runoff = 7.10 cfs @ 12.07 hrs, Volume= 25,011 cf, Depth&gt; 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
9,087	98	Roofs, HSG A
0	39	>75% Grass cover, Good, HSG A
*	0	Gravel surface, HSG A
0	98	Paved parking, HSG A
43,348	98	Unconnected roofs, HSG D
980	80	>75% Grass cover, Good, HSG D
*	0	Gravel surface, HSG D
2,685	98	Paved parking, HSG D
56,100	98	Weighted Average
980		1.75% Pervious Area
55,120		98.25% Impervious Area
43,348		78.64% Unconnected

**T-5037-002 POST**

Type III 24-hr 10-Yr Rainfall=5.59"

Prepared by Tighe &amp; Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 7

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
0.8	58	0.0050	1.14		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
2.8	158	Total, Increased to minimum Tc = 5.0 min			

**Summary for Subcatchment POST 2.0:**

[49] Hint: Tc&lt;2dt may require smaller dt

Runoff = 3.15 cfs @ 12.07 hrs, Volume= 10,930 cf, Depth&gt; 5.23"

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 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
0	98	Roofs, HSG A
199	39	>75% Grass cover, Good, HSG A
* 1,125	96	Gravel surface, HSG A
5,809	98	Paved parking, HSG A
0	98	Unconnected roofs, HSG D
0	80	>75% Grass cover, Good, HSG D
* 6,672	96	Gravel surface, HSG D
11,260	98	Paved parking, HSG D
25,065	97	Weighted Average
7,996		31.90% Pervious Area
17,069		68.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0193	1.45		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
1.9	320	0.0193	2.82		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
3.0	420	Total, Increased to minimum Tc = 5.0 min			

**Summary for Subcatchment POST 3.0:**

[49] Hint: Tc&lt;2dt may require smaller dt

Runoff = 6.37 cfs @ 12.07 hrs, Volume= 19,892 cf, Depth&gt; 3.91"

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 10-Yr Rainfall=5.59"

**T-5037-002 POST**

Prepared by Tighe & Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 10-Yr Rainfall=5.59"

Printed 7/20/2022

Page 8

Area (sf)	CN	Description
1,791	30	Woods, Good, HSG A
11,357	39	>75% Grass cover, Good, HSG A
* 0	96	Gravel surface, HSG A
42,234	98	Paved parking, HSG A
0	98	Unconnected roofs, HSG D
513	80	>75% Grass cover, Good, HSG D
* 0	96	Gravel surface, HSG D
5,079	98	Paved parking, HSG D
60,974	85	Weighted Average
13,661		22.40% Pervious Area
47,313		77.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	89	0.0398	1.90		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
1.2	637	0.0387	8.92	7.01	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.0	726	Total, Increased to minimum Tc = 5.0 min			

**Summary for Subcatchment POST 3.1:**

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.86 cfs @ 12.07 hrs, Volume= 6,442 cf, Depth> 5.23"

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 10-Yr Rainfall=5.59"

Area (sf)	CN	Description
11,899	98	Roofs, HSG A
134	39	>75% Grass cover, Good, HSG A
* 0	96	Gravel surface, HSG A
2,712	98	Paved parking, HSG A
0	98	Unconnected roofs, HSG D
28	98	Paved parking, HSG D
* 0	96	Gravel surface, HSG D
14,773	97	Weighted Average
134		0.91% Pervious Area
14,639		99.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.0050	0.85		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
0.6	39	0.0050	1.14		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
2.6	139	Total, Increased to minimum Tc = 5.0 min			

**T-5037-002 POST**

Prepared by Tighe &amp; Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 10-Yr Rainfall=5.59"

Printed 7/20/2022

Page 9

**Summary for Pond PJFF 1:**

Inflow Area = 56,100 sf, 98.25% Impervious, Inflow Depth > 5.20" for 10-Yr event  
 Inflow = 1.08 cfs @ 12.55 hrs, Volume= 24,318 cf  
 Outflow = 1.08 cfs @ 12.55 hrs, Volume= 24,318 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.08 cfs @ 12.55 hrs, Volume= 24,318 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 7.26' @ 12.55 hrs  
 Flood Elev= 20.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	6.70'	<b>18.0" Round Culvert</b> L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 6.70' / 6.60' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

**Primary OutFlow** Max=1.08 cfs @ 12.55 hrs HW=7.26' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 1.08 cfs @ 2.68 fps)

**Summary for Pond PJFF 2:**

Inflow = 0.49 cfs @ 12.13 hrs, Volume= 258 cf  
 Outflow = 0.49 cfs @ 12.13 hrs, Volume= 258 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 0.49 cfs @ 12.13 hrs, Volume= 258 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 10.36' @ 12.13 hrs  
 Flood Elev= 20.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	9.95'	<b>12.0" Round Culvert</b> L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 9.95' / 9.90' S= 0.0125 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.46 cfs @ 12.13 hrs HW=10.35' TW=0.00' (Dynamic Tailwater)  
 ↑1=Culvert (Barrel Controls 0.46 cfs @ 2.37 fps)

**Summary for Pond POND 1.1:**

Inflow Area = 56,100 sf, 98.25% Impervious, Inflow Depth > 5.35" for 10-Yr event  
 Inflow = 7.10 cfs @ 12.07 hrs, Volume= 25,011 cf  
 Outflow = 1.08 cfs @ 12.55 hrs, Volume= 24,318 cf, Atten= 85%, Lag= 28.9 min  
 Primary = 1.08 cfs @ 12.55 hrs, Volume= 24,318 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 10.57' @ 12.55 hrs Surf.Area= 3,840 sf Storage= 10,845 cf  
 Flood Elev= 12.25' Surf.Area= 3,840 sf Storage= 16,330 cf

Plug-Flow detention time= 162.0 min calculated for 24,318 cf (97% of inflow)  
 Center-of-Mass det. time= 144.6 min ( 889.6 - 745.0 )

**T-5037-002 POST**

Prepared by Tighe & Bond

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 10-Yr Rainfall=5.59"

Printed 7/20/2022

Page 10

Volume	Invert	Avail.Storage	Storage Description
#1E	6.25'	0 cf	<b>24.00'W x 128.00'L x 6.58'H Field E</b> 20,224 cf Overall - 17,152 cf Embedded = 3,072 cf x 0.0% Voids
#2E	7.25'	13,130 cf	<b>Oldcastle Storm Capture SC1 5' x 24</b> Inside #1 Inside= 84.0"W x 60.0"H => 34.69 sf x 16.00'L = 555.0 cf Outside= 96.0"W x 67.0"H => 44.67 sf x 16.00'L = 714.7 cf 3 Rows adjusted for 190.0 cf perimeter wall
#3F	6.25'	0 cf	<b>8.00'W x 96.00'L x 6.58'H Field F</b> 5,056 cf Overall - 4,288 cf Embedded = 768 cf x 0.0% Voids
#4F	7.25'	3,200 cf	<b>Oldcastle Storm Capture SC1 5' x 6</b> Inside #3 Inside= 84.0"W x 60.0"H => 34.69 sf x 16.00'L = 555.0 cf Outside= 96.0"W x 67.0"H => 44.67 sf x 16.00'L = 714.7 cf 1 Rows adjusted for 130.0 cf perimeter wall
		16,330 cf	Total Available Storage

Storage Group E created with Chamber Wizard  
Storage Group F created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	7.25'	<b>18.0" Round Culvert</b> L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 7.25' / 7.20' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	7.25'	<b>4.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	10.00'	<b>4.0" W x 4.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Primary	12.10'	<b>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</b> Head (feet) 0.00 1.00 Width (feet) 4.00 4.00

**Primary OutFlow** Max=1.08 cfs @ 12.55 hrs HW=10.57' TW=7.26' (Dynamic Tailwater)

- 1=Culvert (Passes 1.08 cfs of 13.64 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.75 cfs @ 8.55 fps)
- 3=Orifice/Grate (Orifice Controls 0.34 cfs @ 3.04 fps)
- 4=Custom Weir/Orifice ( Controls 0.00 cfs)

**Summary for Pond POND 3.1:**

Inflow Area = 14,773 sf, 99.09% Impervious, Inflow Depth > 5.23" for 10-Yr event  
 Inflow = 1.86 cfs @ 12.07 hrs, Volume= 6,442 cf  
 Outflow = 1.52 cfs @ 12.13 hrs, Volume= 6,206 cf, Atten= 18%, Lag= 3.6 min  
 Primary = 1.03 cfs @ 12.13 hrs, Volume= 5,948 cf  
 Secondary = 0.49 cfs @ 12.13 hrs, Volume= 258 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
 Peak Elev= 12.03' @ 12.13 hrs Surf.Area= 512 sf Storage= 807 cf  
 Flood Elev= 12.60' Surf.Area= 512 sf Storage= 1,045 cf

Plug-Flow detention time= 46.9 min calculated for 6,193 cf (96% of inflow)  
 Center-of-Mass det. time= 25.3 min ( 777.6 - 752.3 )

**T-5037-002 POST**

Type III 24-hr 10-Yr Rainfall=5.59"

Prepared by Tighe &amp; Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 11

Volume	Invert	Avail.Storage	Storage Description
#1A	9.60'	205 cf	<b>8.00'W x 64.00'L x 3.58'H Field A</b> 1,835 cf Overall - 1,323 cf Embedded = 512 cf x 40.0% Voids
#2A	10.60'	840 cf	<b>Oldcastle Storm Capture SC1 2' x 4</b> Inside #1 Inside= 84.0"W x 24.0"H => 13.13 sf x 16.00'L = 210.0 cf Outside= 96.0"W x 31.0"H => 20.67 sf x 16.00'L = 330.7 cf
		1,045 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	10.60'	<b>6.0" Round Culvert</b> L= 6.0' Ke= 0.500 Inlet / Outlet Invert= 10.60' / 10.45' S= 0.0250 ' / Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Secondary	10.60'	<b>12.0" Round Culvert</b> L= 12.0' Ke= 0.500 Inlet / Outlet Invert= 10.60' / 10.30' S= 0.0250 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	11.65'	<b>8.0" W x 4.0" H Vert. Orifice/Grate</b> C= 0.600
#4	Device 2	12.50'	<b>Custom Weir/Orifice, Cv= 2.62 (C= 3.28)</b> Head (feet) 0.00 1.50 Width (feet) 4.00 4.00

**Primary OutFlow** Max=1.02 cfs @ 12.13 hrs HW=12.02' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 1.02 cfs @ 5.20 fps)

**Secondary OutFlow** Max=0.46 cfs @ 12.13 hrs HW=12.02' TW=10.35' (Dynamic Tailwater)

↑2=Culvert (Passes 0.46 cfs of 3.62 cfs potential flow)

↑3=Orifice/Grate (Orifice Controls 0.46 cfs @ 2.09 fps)

↑4=Custom Weir/Orifice ( Controls 0.00 cfs)

**Summary for Link PA1:**

Inflow Area = 64,604 sf, 96.99% Impervious, Inflow Depth > 5.19" for 10-Yr event  
 Inflow = 1.65 cfs @ 12.08 hrs, Volume= 27,944 cf  
 Primary = 1.65 cfs @ 12.08 hrs, Volume= 27,944 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 = 25,065 sf, 68.10% Impervious, Inflow Depth > 5.23" for 10-Yr event  
 Inflow = 3.15 cfs @ 12.07 hrs, Volume= 10,930 cf  
 Primary = 3.15 cfs @ 12.07 hrs, Volume= 10,930 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**T-5037-002 POST**

Type III 24-hr 10-Yr Rainfall=5.59"

Prepared by Tighe & Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 12

**Summary for Link PA3:**

Inflow Area = 75,747 sf, 81.79% Impervious, Inflow Depth > 4.13" for 10-Yr event  
Inflow = 7.65 cfs @ 12.09 hrs, Volume= 26,098 cf  
Primary = 7.65 cfs @ 12.09 hrs, Volume= 26,098 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

**T-5037-002 POST**

Type III 24-hr 25-Yr Rainfall=7.08"

Prepared by Tighe &amp; Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 13

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=8,504 sf 88.63% Impervious Runoff Depth>6.60"  
 Flow Length=336' Tc=5.0 min CN=96 Runoff=1.35 cfs 4,677 cf

**Subcatchment POST 1.1:** Runoff Area=56,100 sf 98.25% Impervious Runoff Depth>6.84"  
 Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=9.00 cfs 31,966 cf

**Subcatchment POST 2.0:** Runoff Area=25,065 sf 68.10% Impervious Runoff Depth>6.72"  
 Flow Length=420' Slope=0.0193 '/' Tc=5.0 min CN=97 Runoff=4.01 cfs 14,034 cf

**Subcatchment POST 3.0:** Runoff Area=60,974 sf 77.60% Impervious Runoff Depth>5.33"  
 Flow Length=726' Tc=5.0 min CN=85 Runoff=8.55 cfs 27,063 cf

**Subcatchment POST 3.1:** Runoff Area=14,773 sf 99.09% Impervious Runoff Depth>6.72"  
 Flow Length=139' Slope=0.0050 '/' Tc=5.0 min CN=97 Runoff=2.36 cfs 8,271 cf

**Pond PJFF 1:** Peak Elev=7.36' Inflow=1.45 cfs 31,062 cf  
 18.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=1.45 cfs 31,062 cf

**Pond PJFF 2:** Peak Elev=10.48' Inflow=0.76 cfs 594 cf  
 12.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=0.76 cfs 594 cf

**Pond POND 1.1:** Peak Elev=11.45' Storage=13,716 cf Inflow=9.00 cfs 31,966 cf  
 Outflow=1.45 cfs 31,062 cf

**Pond POND 3.1:** Peak Elev=12.33' Storage=931 cf Inflow=2.36 cfs 8,271 cf  
 Primary=1.15 cfs 7,438 cf Secondary=0.76 cfs 594 cf Outflow=1.91 cfs 8,031 cf

**Link PA1:** Inflow=2.21 cfs 35,740 cf  
 Primary=2.21 cfs 35,740 cf

**Link PA2:** Inflow=4.01 cfs 14,034 cf  
 Primary=4.01 cfs 14,034 cf

**Link PA3:** Inflow=10.24 cfs 35,094 cf  
 Primary=10.24 cfs 35,094 cf

**Total Runoff Area = 165,416 sf Runoff Volume = 86,011 cf Average Runoff Depth = 6.24"**  
**14.35% Pervious = 23,738 sf 85.65% Impervious = 141,678 sf**

**T-5037-002 POST**

Type III 24-hr 50-Yr Rainfall=8.48"

Prepared by Tighe &amp; Bond

Printed 7/20/2022

HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Page 14

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=8,504 sf 88.63% Impervious Runoff Depth>8.00"  
 Flow Length=336' Tc=5.0 min CN=96 Runoff=1.63 cfs 5,666 cf

**Subcatchment POST 1.1:** Runoff Area=56,100 sf 98.25% Impervious Runoff Depth>8.24"  
 Flow Length=158' Slope=0.0050 '/' Tc=5.0 min CN=98 Runoff=10.80 cfs 38,504 cf

**Subcatchment POST 2.0:** Runoff Area=25,065 sf 68.10% Impervious Runoff Depth>8.12"  
 Flow Length=420' Slope=0.0193 '/' Tc=5.0 min CN=97 Runoff=4.81 cfs 16,952 cf

**Subcatchment POST 3.0:** Runoff Area=60,974 sf 77.60% Impervious Runoff Depth>6.67"  
 Flow Length=726' Tc=5.0 min CN=85 Runoff=10.59 cfs 33,909 cf

**Subcatchment POST 3.1:** Runoff Area=14,773 sf 99.09% Impervious Runoff Depth>8.12"  
 Flow Length=139' Slope=0.0050 '/' Tc=5.0 min CN=97 Runoff=2.84 cfs 9,992 cf

**Pond PJFF 1:** Peak Elev=7.57' Inflow=2.39 cfs 37,320 cf  
 18.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=2.39 cfs 37,320 cf

**Pond PJFF 2:** Peak Elev=10.61' Inflow=1.13 cfs 972 cf  
 12.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=1.13 cfs 972 cf

**Pond POND 1.1:** Peak Elev=12.24' Storage=16,307 cf Inflow=10.80 cfs 38,504 cf  
 Outflow=2.39 cfs 37,320 cf

**Pond POND 3.1:** Peak Elev=12.59' Storage=1,040 cf Inflow=2.84 cfs 9,992 cf  
 Primary=1.25 cfs 8,776 cf Secondary=1.13 cfs 972 cf Outflow=2.38 cfs 9,748 cf

**Link PA1:** Inflow=2.83 cfs 42,987 cf  
 Primary=2.83 cfs 42,987 cf

**Link PA2:** Inflow=4.81 cfs 16,952 cf  
 Primary=4.81 cfs 16,952 cf

**Link PA3:** Inflow=12.66 cfs 43,657 cf  
 Primary=12.66 cfs 43,657 cf

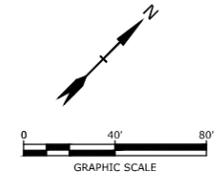
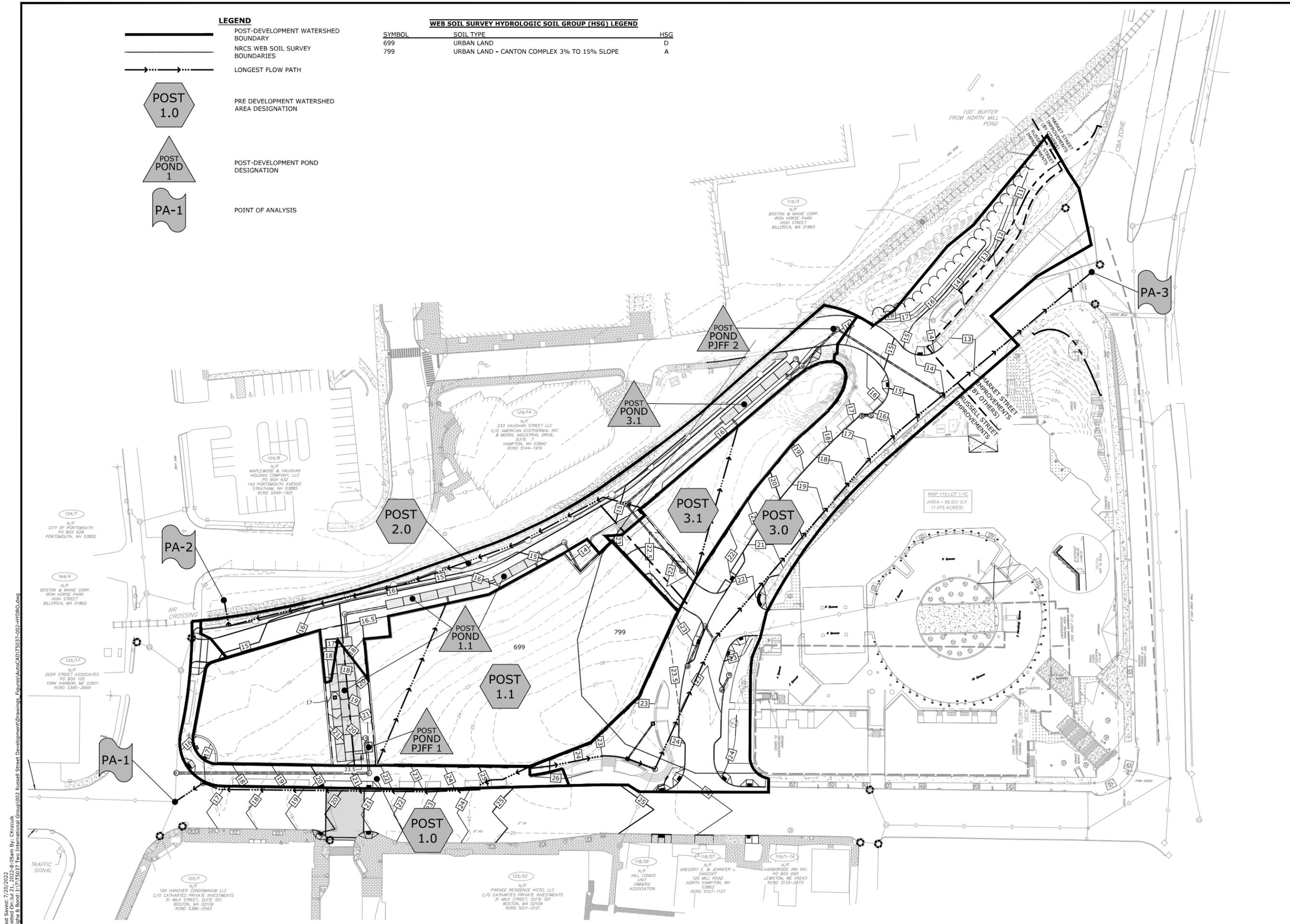
**Total Runoff Area = 165,416 sf Runoff Volume = 105,023 cf Average Runoff Depth = 7.62"**  
**14.35% Pervious = 23,738 sf 85.65% Impervious = 141,678 sf**

**LEGEND**

-  POST-DEVELOPMENT WATERSHED BOUNDARY
-  NRCS WEB SOIL SURVEY BOUNDARIES
-  LONGEST FLOW PATH
-  PRE DEVELOPMENT WATERSHED AREA DESIGNATION
-  POST-DEVELOPMENT POND DESIGNATION
-  POINT OF ANALYSIS

**WEB SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND**

SYMBOL	SOIL TYPE	HSG
699	URBAN LAND	D
799	URBAN LAND - CANTON COMPLEX 3% TO 15% SLOPE	A



**North End Mixed Use Development**

Two International Group

Russell Street & Deer Street  
Portsmouth, NH

E		
D		
C		
B		
A	7/21/2022	TAC Resubmission
MARK	DATE	DESCRIPTION
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: 7/20/2022  
 Plotted On: Jun 21, 2022 8:05am By: Ckrzoulik  
 Tighe & Bond File: 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)**

	<b>2-Year Storm</b>	<b>10-Year Storm</b>	<b>25-Year Storm</b>	<b>50-Year Storm</b>
<b>Pre-Development Watershed</b>				
PA-1	1.16	1.83	2.34	2.83
PA-2	5.91	9.44	12.16	14.70
PA-3	4.38	7.71	10.30	12.71
<b>Post-Development Watershed</b>				
PA-1	1.14	1.65	2.19	2.82
PA-2	2.05	3.15	4.01	4.81
PA-3	4.31	7.65	10.24	12.66

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 all points of analysis.



**Tighe&Bond**

**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 existing 90,030 SF lot is comprised of 72,833 SF (80.90%) of impervious area. Per the City of Portsmouth’s Site Plan regulations, Section 7.6.2.2, the proposed project qualifies as a redevelopment project being that greater than 40% of the developable land is existing impervious surface. The proposed development lot contains 88,455 SF of impervious surface and is proposed to treat 69,757 SF of this impervious surface. The project is required to treat at least 30% of the existing impervious surface and 100% of the additional impervious surfaces. The proposed stormwater management system treats 100% (15,622 SF) of the additional impervious surface and 74% (54,135 SF) of the existing impervious surface.

The runoff from the proposed impervious areas will be treated by two Contech Jellyfish stormwater filtration systems. The Jellyfish systems are sized to treat their respective Water Quality Flows of their sub-catchment areas. The first system is outfitted with an internal bypass that diverts peak flows away from treatment. The second system is designed to direct the WQF to the treatment unit and discharge the higher flows to a bypass outlet control unit. The BMP worksheet for these treatment practices has been included in Section 6 of this report.

The proposed stormwater management system is required to removal 80% of the annual Total Suspended Solids (TSS) loads and 50% of the annual Total Nitrogen (TN) loads per the City of Portsmouth’s Site Plan regulations, Section 7.6.2.1.a.i. As shown in table 5.1 the pollutant removal efficiencies for the proposed treatment systems exceeds the City of Portsmouth’s removal requirements.

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment <sup>1</sup>	91%	53%	61%

1. Pollutant removal calculations for Jellyfish Filter with deep sump catchbasin pretreatment are shown in Table 5.2.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

<b>Table 5.2 – Pollutant Removal Calculations</b>				
<b>Contech Jellyfish Filter</b>				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood <sup>1</sup>	0.15	1.00	0.15	0.85
Jellyfish Filter <sup>2</sup>	0.89	0.85	0.76	0.09
<b>Total Suspended Solids Removed:</b>				<b>91%</b>
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catchbasin w/Hood <sup>1</sup>	0.05	1.00	0.05	0.95
Jellyfish Filter <sup>2</sup>	0.51	0.95	0.48	0.47
<b>Total Nitrogen Removed:</b>				<b>53%</b>
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catchbasin w/Hood <sup>1</sup>	0.05	1.00	0.05	0.95
Jellyfish Filter <sup>2</sup>	0.59	0.95	0.56	0.39
<b>Total Phosphorus Removed:</b>				<b>61%</b>

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.

**Tighe&Bond**

**SECTION 6**



# **Section 6**

## **BMP Worksheet**





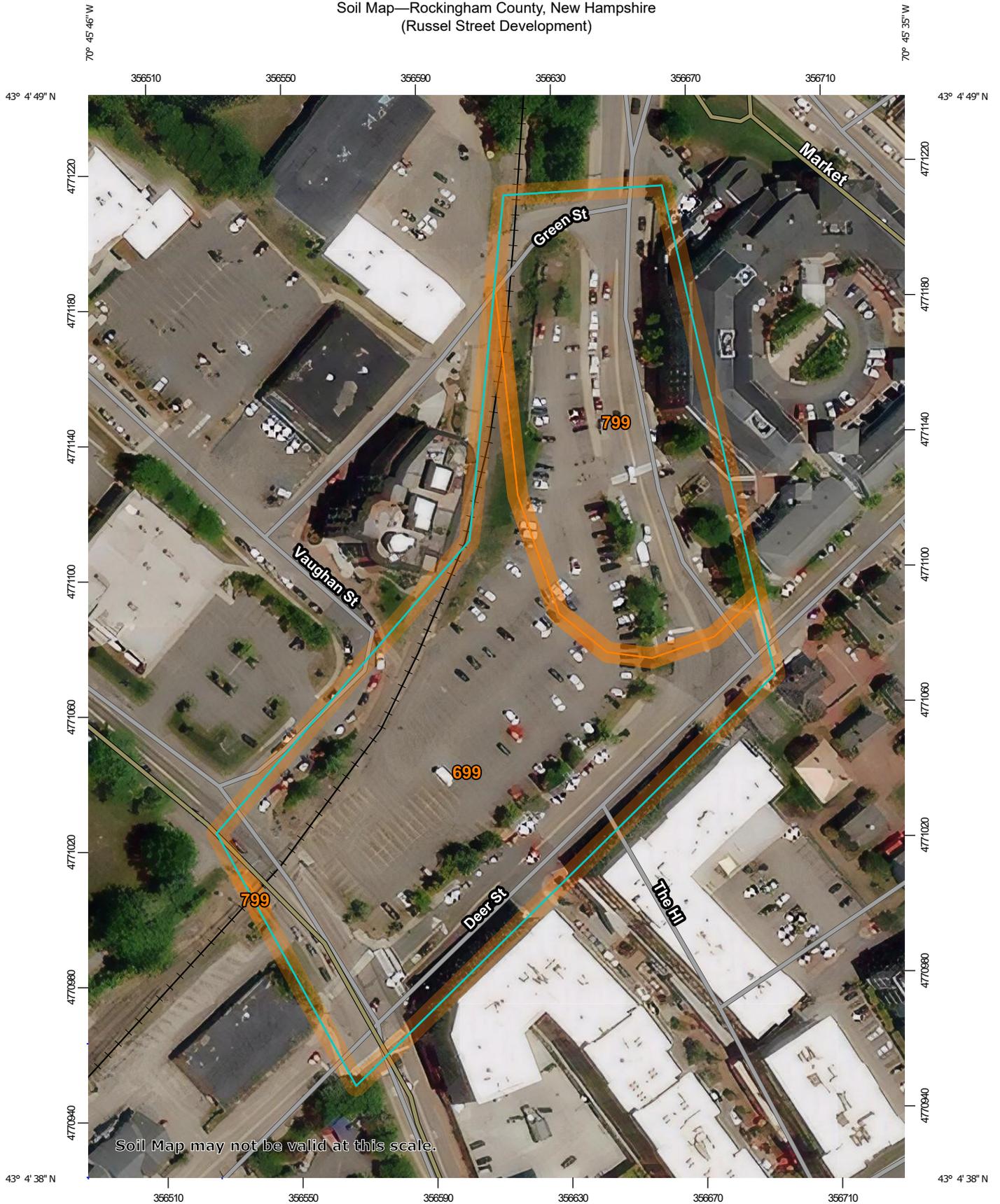


**Tighe&Bond**

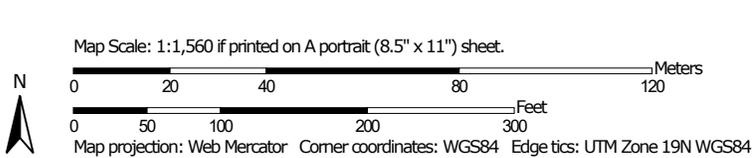
**APPENDIX A**



Soil Map—Rockingham County, New Hampshire  
(Russel Street Development)



Soil Map may not be valid at this scale.



## 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%
<b>Totals for Area of Interest</b>		<b>5.2</b>	<b>100.0%</b>



**Tighe&Bond**

**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.

<b>Smoothing</b>	Yes
<b>State</b>	New Hampshire
<b>Location</b>	
<b>Longitude</b>	70.761 degrees West
<b>Latitude</b>	43.079 degrees North
<b>Elevation</b>	0 feet
<b>Date/Time</b>	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	
<b>1yr</b>	0.26	0.40	0.50	0.65	0.81	1.04	<b>1yr</b>	0.70	0.98	1.21	1.56	2.03	2.65	2.92	<b>1yr</b>	2.35	2.81	3.22	3.94	4.54	<b>1yr</b>
<b>2yr</b>	0.32	0.50	0.62	0.81	1.02	1.30	<b>2yr</b>	0.88	1.18	1.52	1.94	2.48	3.20	3.57	<b>2yr</b>	2.84	3.43	3.93	4.67	5.32	<b>2yr</b>
<b>5yr</b>	0.37	0.58	0.73	0.97	1.25	1.61	<b>5yr</b>	1.08	1.47	1.89	2.43	3.14	4.06	4.57	<b>5yr</b>	3.59	4.40	5.03	5.93	6.69	<b>5yr</b>
<b>10yr</b>	0.41	0.65	0.82	1.11	1.45	1.89	<b>10yr</b>	1.25	1.72	2.23	2.89	3.74	4.86	5.52	<b>10yr</b>	4.30	5.31	6.07	7.09	7.96	<b>10yr</b>
<b>25yr</b>	0.48	0.76	0.97	1.33	1.77	2.33	<b>25yr</b>	1.53	2.14	2.77	3.62	4.73	6.16	7.09	<b>25yr</b>	5.45	6.81	7.78	9.00	10.03	<b>25yr</b>
<b>50yr</b>	0.53	0.86	1.10	1.53	2.07	2.75	<b>50yr</b>	1.78	2.52	3.28	4.31	5.65	7.37	8.57	<b>50yr</b>	6.53	8.24	9.40	10.79	11.95	<b>50yr</b>
<b>100yr</b>	0.59	0.96	1.24	1.76	2.41	3.25	<b>100yr</b>	2.08	2.97	3.90	5.15	6.75	8.83	10.36	<b>100yr</b>	7.82	9.96	11.35	12.93	14.24	<b>100yr</b>
<b>200yr</b>	0.67	1.10	1.42	2.04	2.82	3.82	<b>200yr</b>	2.43	3.51	4.60	6.11	8.06	10.58	12.52	<b>200yr</b>	9.37	12.04	13.71	15.50	16.98	<b>200yr</b>
<b>500yr</b>	0.80	1.31	1.71	2.48	3.47	4.75	<b>500yr</b>	2.99	4.37	5.75	7.68	10.19	13.45	16.11	<b>500yr</b>	11.90	15.49	17.61	19.72	21.44	<b>500yr</b>

### Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.23	0.36	0.44	0.59	0.73	0.88	<b>1yr</b>	0.63	0.86	0.92	1.33	1.68	2.23	2.48	<b>1yr</b>	1.97	2.39	2.86	3.18	3.88	<b>1yr</b>
<b>2yr</b>	0.31	0.49	0.60	0.81	1.00	1.19	<b>2yr</b>	0.86	1.16	1.37	1.82	2.34	3.05	3.45	<b>2yr</b>	2.70	3.31	3.82	4.54	5.07	<b>2yr</b>
<b>5yr</b>	0.35	0.54	0.67	0.92	1.17	1.40	<b>5yr</b>	1.01	1.37	1.61	2.12	2.73	3.78	4.18	<b>5yr</b>	3.34	4.02	4.71	5.52	6.23	<b>5yr</b>
<b>10yr</b>	0.38	0.59	0.73	1.02	1.32	1.60	<b>10yr</b>	1.14	1.56	1.80	2.39	3.06	4.36	4.85	<b>10yr</b>	3.86	4.66	5.42	6.39	7.17	<b>10yr</b>
<b>25yr</b>	0.44	0.67	0.83	1.18	1.56	1.90	<b>25yr</b>	1.34	1.86	2.10	2.76	3.54	4.70	5.87	<b>25yr</b>	4.16	5.64	6.62	7.76	8.65	<b>25yr</b>
<b>50yr</b>	0.48	0.73	0.91	1.31	1.76	2.17	<b>50yr</b>	1.52	2.12	2.34	3.07	3.93	5.31	6.77	<b>50yr</b>	4.70	6.51	7.68	9.00	9.98	<b>50yr</b>
<b>100yr</b>	0.53	0.81	1.01	1.46	2.00	2.47	<b>100yr</b>	1.73	2.41	2.62	3.42	4.35	5.96	7.81	<b>100yr</b>	5.28	7.51	8.92	10.45	11.52	<b>100yr</b>
<b>200yr</b>	0.59	0.89	1.12	1.63	2.27	2.81	<b>200yr</b>	1.96	2.75	2.93	3.79	4.79	6.68	9.01	<b>200yr</b>	5.91	8.66	10.34	12.15	13.31	<b>200yr</b>
<b>500yr</b>	0.68	1.02	1.31	1.90	2.70	3.36	<b>500yr</b>	2.33	3.28	3.41	4.32	5.46	7.76	10.87	<b>500yr</b>	6.87	10.45	12.58	14.86	16.11	<b>500yr</b>

### Upper Confidence Limits

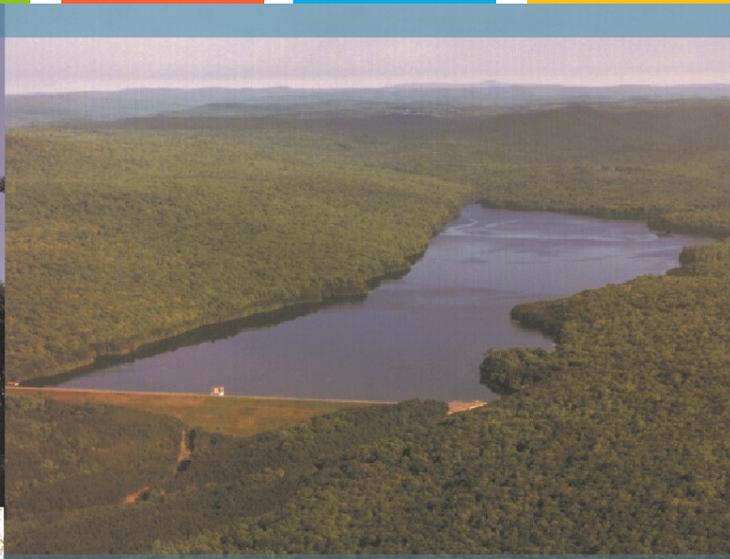
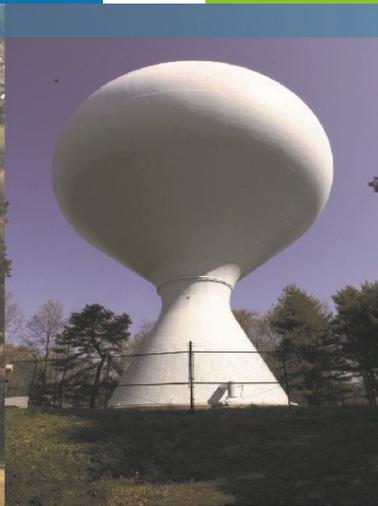
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
<b>1yr</b>	0.28	0.44	0.54	0.72	0.89	1.08	<b>1yr</b>	0.77	1.06	1.26	1.74	2.21	2.98	3.16	<b>1yr</b>	2.64	3.04	3.58	4.37	5.04	<b>1yr</b>
<b>2yr</b>	0.34	0.52	0.64	0.86	1.07	1.27	<b>2yr</b>	0.92	1.24	1.48	1.96	2.52	3.42	3.70	<b>2yr</b>	3.03	3.56	4.08	4.83	5.62	<b>2yr</b>
<b>5yr</b>	0.40	0.62	0.76	1.05	1.34	1.62	<b>5yr</b>	1.15	1.58	1.88	2.53	3.25	4.33	4.96	<b>5yr</b>	3.84	4.77	5.37	6.37	7.15	<b>5yr</b>
<b>10yr</b>	0.47	0.72	0.89	1.24	1.61	1.97	<b>10yr</b>	1.39	1.93	2.28	3.11	3.95	5.33	6.20	<b>10yr</b>	4.72	5.96	6.82	7.83	8.74	<b>10yr</b>
<b>25yr</b>	0.57	0.87	1.09	1.55	2.04	2.57	<b>25yr</b>	1.76	2.51	2.95	4.07	5.15	7.77	8.34	<b>25yr</b>	6.88	8.02	9.15	10.33	11.40	<b>25yr</b>
<b>50yr</b>	0.67	1.02	1.27	1.82	2.46	3.12	<b>50yr</b>	2.12	3.05	3.59	5.00	6.32	9.73	10.46	<b>50yr</b>	8.62	10.06	11.45	12.71	13.95	<b>50yr</b>
<b>100yr</b>	0.79	1.19	1.49	2.15	2.95	3.80	<b>100yr</b>	2.55	3.72	4.37	6.15	7.76	12.18	13.11	<b>100yr</b>	10.78	12.61	14.32	15.68	17.08	<b>100yr</b>
<b>200yr</b>	0.92	1.39	1.76	2.54	3.55	4.64	<b>200yr</b>	3.06	4.54	5.33	7.58	9.53	15.29	16.45	<b>200yr</b>	13.53	15.82	17.94	19.34	20.91	<b>200yr</b>
<b>500yr</b>	1.14	1.70	2.19	3.18	4.52	6.02	<b>500yr</b>	3.90	5.89	6.92	10.01	12.54	20.67	22.22	<b>500yr</b>	18.29	21.37	24.18	25.50	27.33	<b>500yr</b>



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







North End Mixed Use Development  
Russell Street & Deer Street  
Portsmouth, NH

## Long-Term Operation & Maintenance Plan

Two International Group

May 24, 2022

**Tighe&Bond**



**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 Underground Detention System Maintenance Requirements .....1-3

1.5 Contech Jellyfish Filter System Maintenance Requirements.....1-3

1.6 Snow & Ice Management for Standard Asphalt and Walkways.....1-4

**Section 2 Invasive Species**

**Section 3 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**

Port Harbor Land, LLC  
1000 Market Street, 3<sup>rd</sup> 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

<b>Underground Detention System Inspection/Maintenance Requirements</b>		
<b>Inspection/ Maintenance</b>	<b>Frequency</b>	<b>Action</b>
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	<ul style="list-style-type: none"> <li>- Trash, debris and sediment to be removed</li> <li>- Any required maintenance shall be addressed</li> </ul>
Deep Sump Catchbasins	Two (2) times annually	<ul style="list-style-type: none"> <li>- Removal of sediment as warranted by inspection</li> <li>- No less than once annually</li> </ul>
Monitor detention system for sediment accumulation	Two (2) times annually	<ul style="list-style-type: none"> <li>- Trash, debris and sediment to be removed</li> <li>- Any required maintenance shall be addressed</li> </ul>

### 1.5 Contech Jellyfish Filter System Maintenance Requirements

<b>Contech Jellyfish Filter System Inspection/Maintenance Requirements</b>		
<b>Inspection/ Maintenance</b>	<b>Frequency</b>	<b>Action</b>
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

**Jellyfish<sup>®</sup> Filter  
Owner's Manual**



# Table of Contents

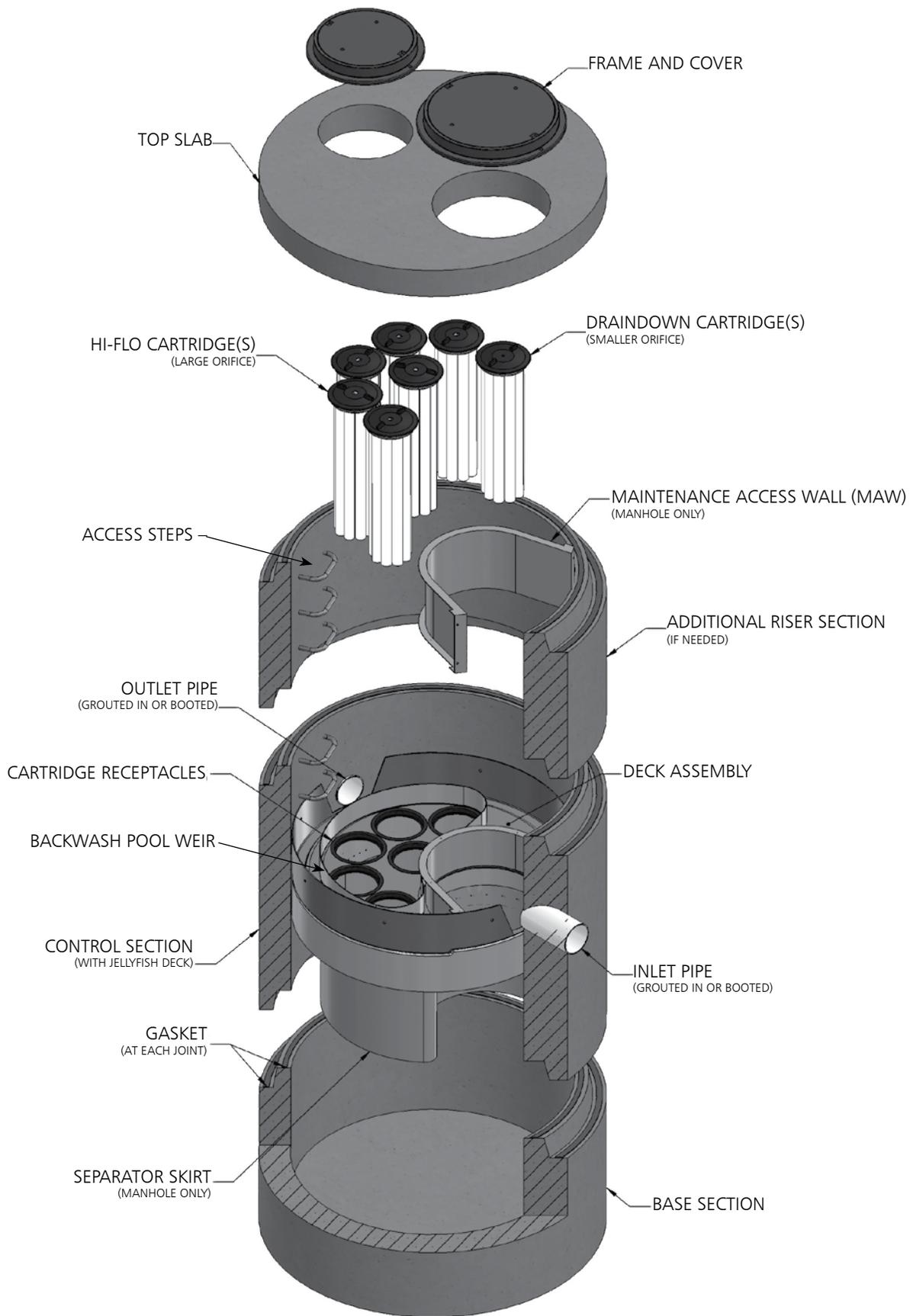
Chapter 1	1.0 Owner Specific Jellyfish Product Information.....	4
Chapter 2	2.0 Jellyfish Filter System Operations & Functions .....	5
	2.1 Components & Cartridges .....	6
	2.2 Jellyfish Membrane Filtration Cartridges Assembly .....	7
	2.3 Installation of Jellyfish Membrane Filtration Cartridges.....	7
Chapter 3	3.0 Inspection and Maintenance Overview .....	8
Chapter 4	4.0 Inspection Timing .....	8
Chapter 5	5.0 Inspection Procedure.....	8
	5.1 Dry Weather Inspections .....	8
	5.1 Wet Weather Inspections .....	9
Chapter 6	6.0 Maintenance Requirements.....	9
Chapter 7	7.0 Maintenance Procedure .....	9
	7.1 Filter Cartridge Removal .....	9
	7.2 Filter Cartridge Rinsing .....	9
	7.3 Sediment and Flotables Extraction .....	10
	7.4 Filter Cartridge Reinstallation and Replacement.....	10
	7.5 Chemical Spills.....	10
	5.6 Material Disposal .....	10
	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](http://www.ContechES.com)  
[info@conteches.com](mailto:info@conteches.com)



## 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:

---

---

---

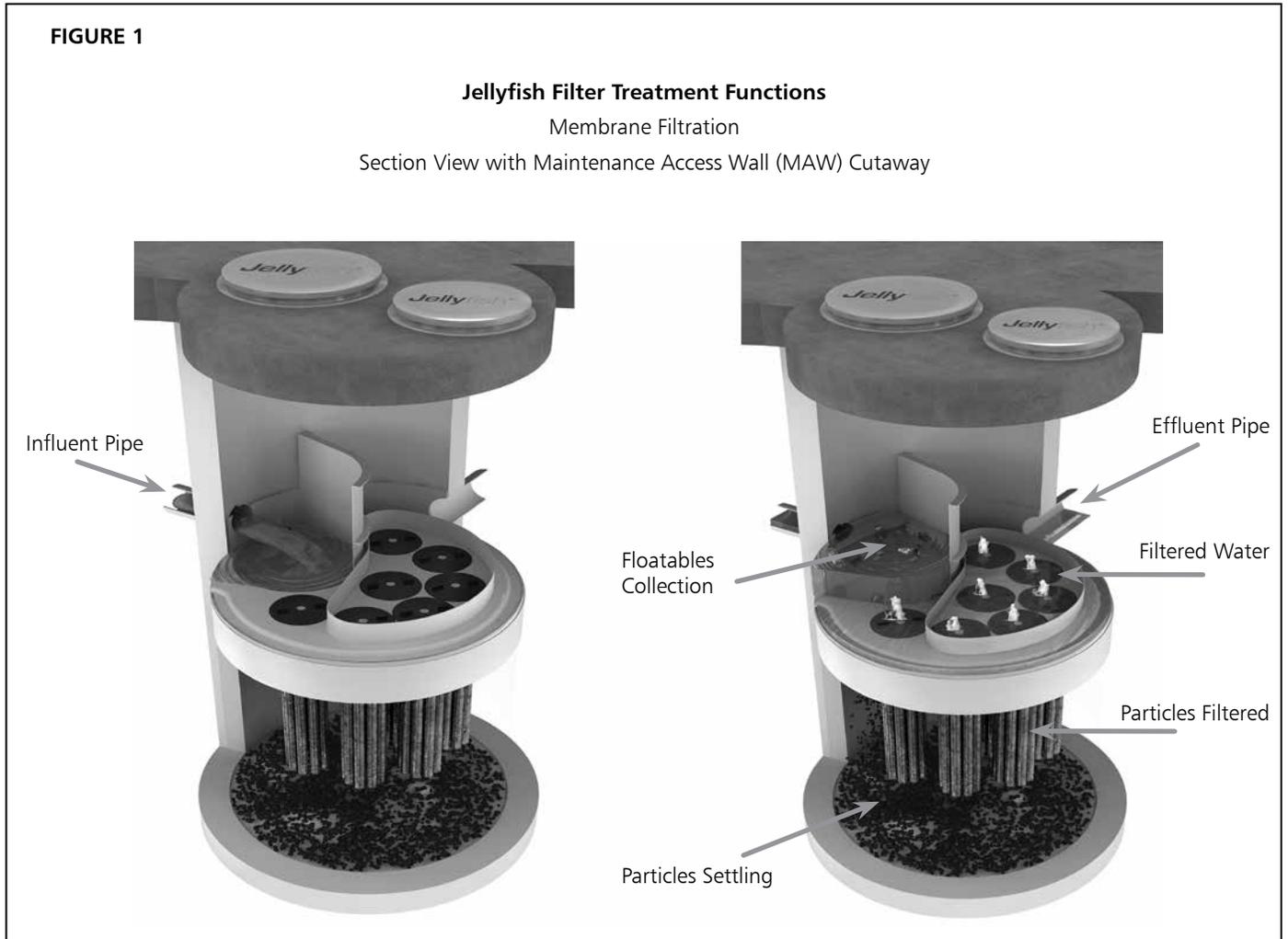
---

## 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.



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.

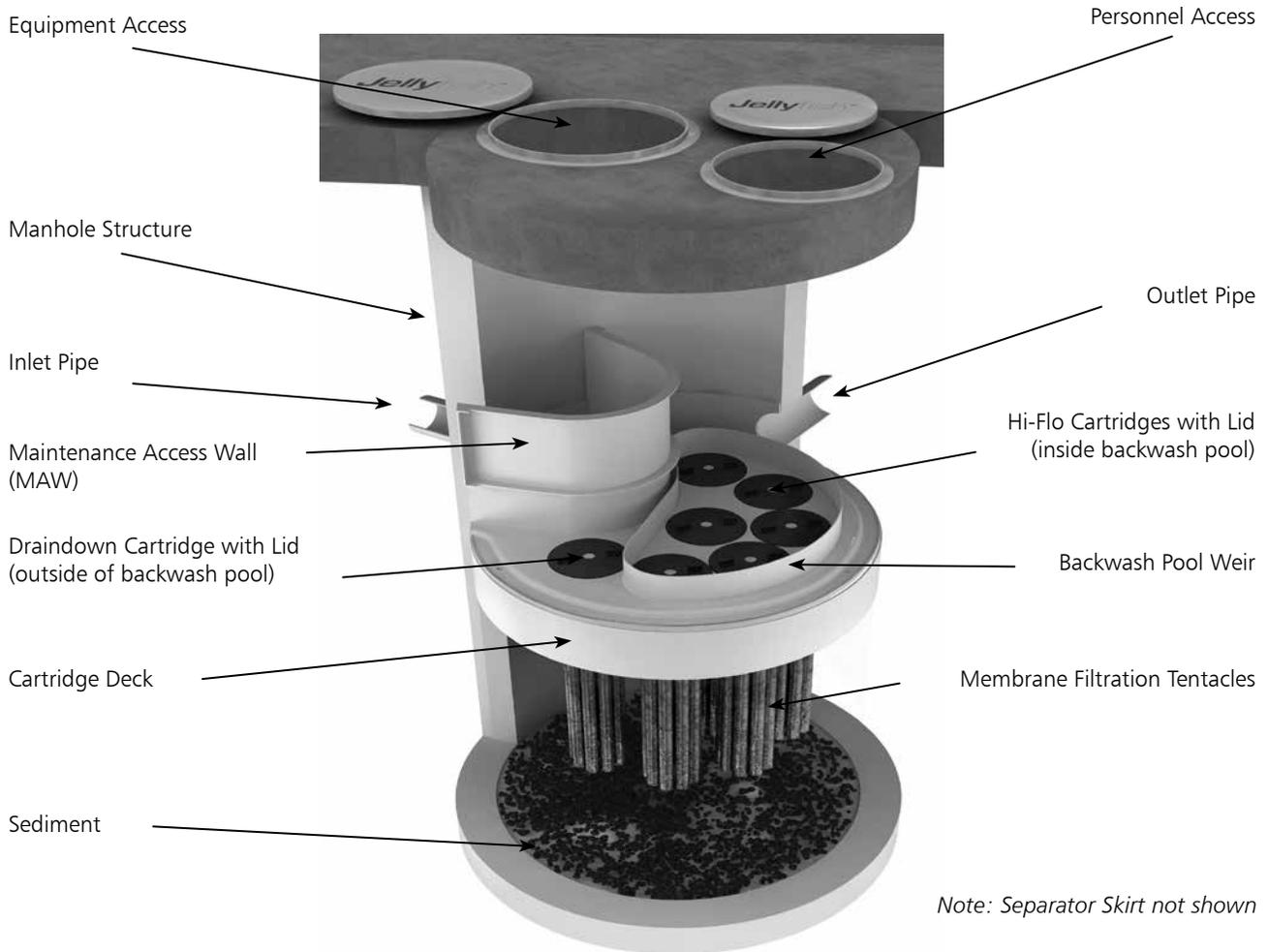
For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at [www.ContechES.com](http://www.ContechES.com).

## 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:

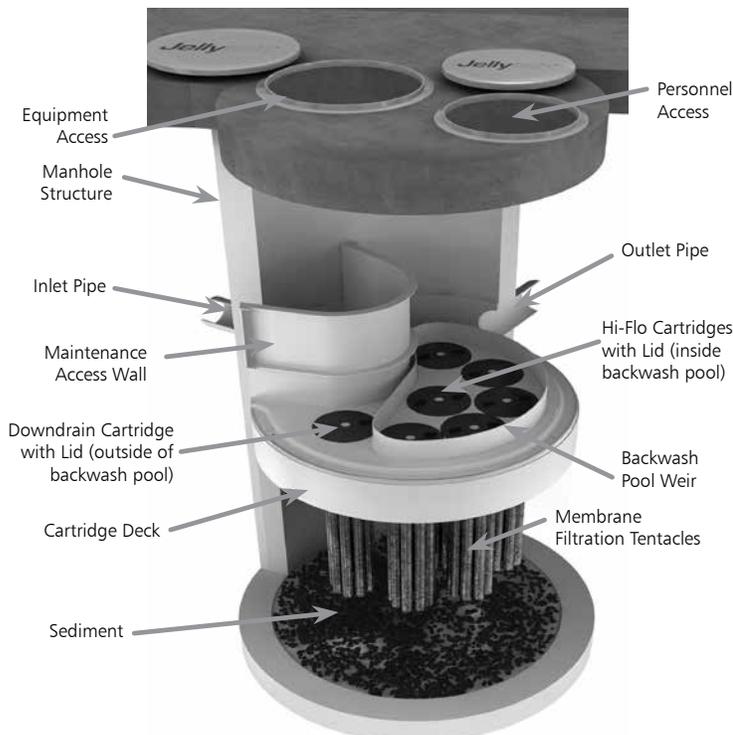
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

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 ( $\geq 1/16''$ ) 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



Cartridge Removal & Lifting Device



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.

### 7.3 Sediment and Floatables 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 ( $\geq 8$ -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

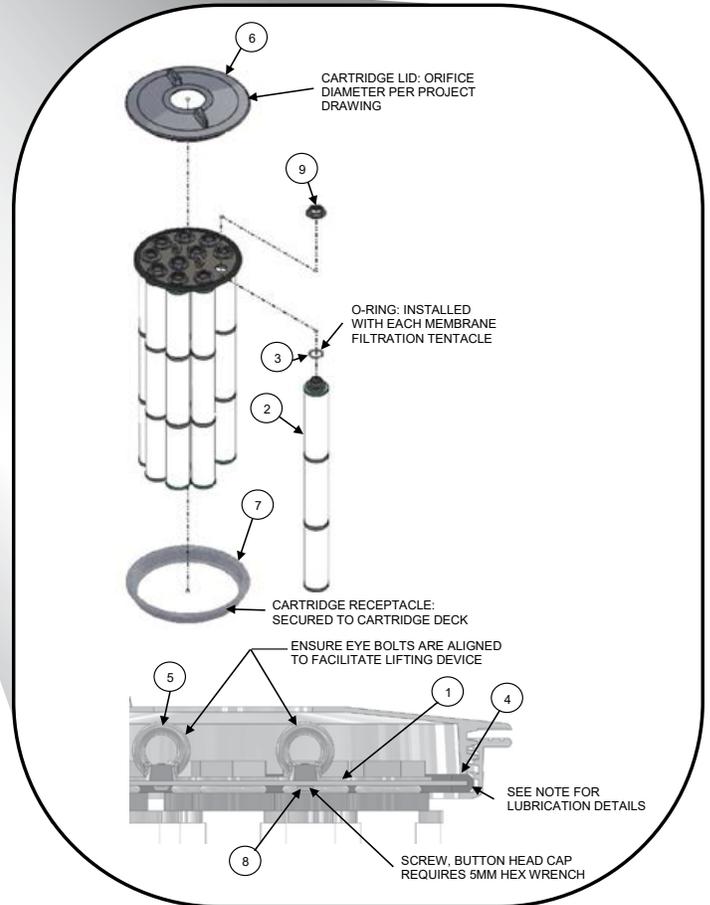
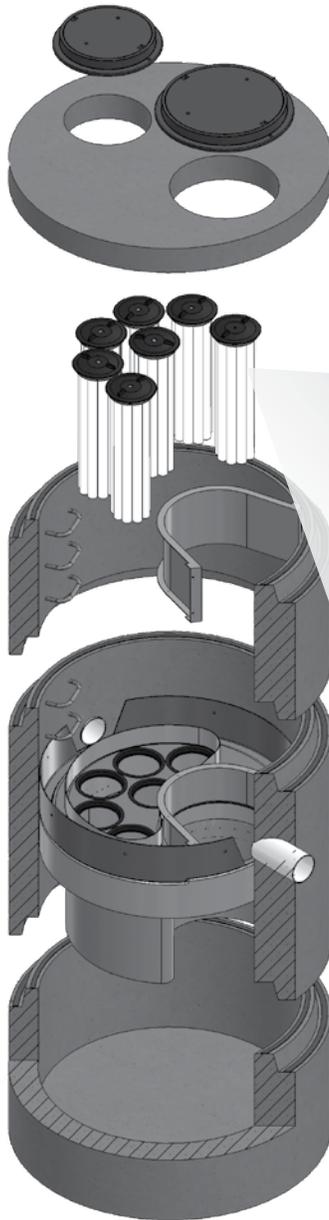


TABLE 1: BOM

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 (typical 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.

Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Pounds per two-lane mile			
			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<sub>2</sub> or CaCl<sub>2</sub> 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**

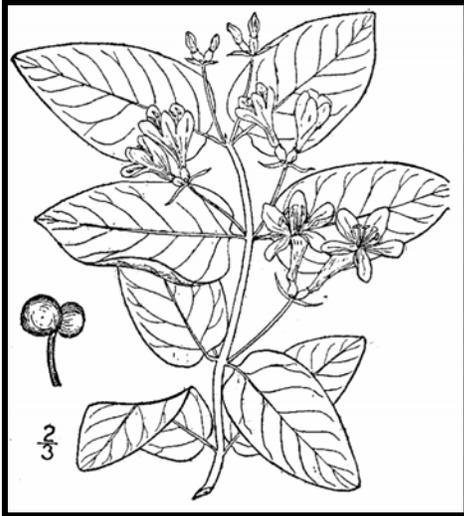
# **Invasive Species**

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.





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](http://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.

**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.



**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.

**Be diligent looking for seedlings for years in areas where removal and disposal took place.**

## Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple <i>(Acer platanoides)</i> European barberry <i>(Berberis vulgaris)</i> Japanese barberry <i>(Berberis thunbergii)</i> autumn olive <i>(Elaeagnus umbellata)</i> burning bush <i>(Euonymus alatus)</i> Morrow's honeysuckle <i>(Lonicera morrowii)</i> Tatarian honeysuckle <i>(Lonicera tatarica)</i> showy bush honeysuckle <i>(Lonicera x bella)</i> common buckthorn <i>(Rhamnus cathartica)</i> glossy buckthorn <i>(Frangula alnus)</i>		<p><b>Prior to fruit/seed ripening</b></p> <p>Seedlings and small plants</p> <ul style="list-style-type: none"> <li>▪ Pull or cut and leave on site with roots exposed. No special care needed.</li> </ul> <p>Larger plants</p> <ul style="list-style-type: none"> <li>▪ Use as firewood.</li> <li>▪ Make a brush pile.</li> <li>▪ Chip.</li> <li>▪ Burn.</li> </ul>
		<p><b>After fruit/seed is ripe</b></p> <p>Don't remove from site.</p> <ul style="list-style-type: none"> <li>▪ Burn.</li> <li>▪ Make a covered brush pile.</li> <li>▪ Chip once all fruit has dropped from branches.</li> <li>▪ Leave resulting chips on site and monitor.</li> </ul>
oriental bittersweet <i>(Celastrus orbiculatus)</i> multiflora rose <i>(Rosa multiflora)</i>		<p><b>Prior to fruit/seed ripening</b></p> <p>Seedlings and small plants</p> <ul style="list-style-type: none"> <li>▪ Pull or cut and leave on site with roots exposed. No special care needed.</li> </ul> <p>Larger plants</p> <ul style="list-style-type: none"> <li>▪ Make a brush pile.</li> <li>▪ Burn.</li> </ul>
		<p><b>After fruit/seed is ripe</b></p> <p>Don't remove from site.</p> <ul style="list-style-type: none"> <li>▪ Burn.</li> <li>▪ Make a covered brush pile.</li> <li>▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</li> </ul>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
<p>garlic mustard (<i>Alliaria petiolata</i>)</p> <p>spotted knapweed (<i>Centaurea maculosa</i>)</p> <ul style="list-style-type: none"> <li>▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling.</li> </ul> <p>black swallow-wort (<i>Cynanchum nigrum</i>)</p> <ul style="list-style-type: none"> <li>▪ May cause skin rash. Wear gloves and long sleeves when handling.</li> </ul> <p>pale swallow-wort (<i>Cynanchum rossicum</i>)</p> <p>giant hogweed (<i>Heracleum mantegazzianum</i>)</p> <ul style="list-style-type: none"> <li>▪ Can cause major skin rash. Wear gloves and long sleeves when handling.</li> </ul> <p>dame's rocket (<i>Hesperis matronalis</i>)</p> <p>perennial pepperweed (<i>Lepidium latifolium</i>)</p> <p>purple loosestrife (<i>Lythrum salicaria</i>)</p> <p>Japanese stilt grass (<i>Microstegium vimineum</i>)</p> <p>mile-a-minute weed (<i>Polygonum perfoliatum</i>)</p>	<p><b>Fruits and Seeds</b></p> 	<p><b>Prior to flowering</b></p> <p>Depends on scale of infestation</p> <p>Small infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and leave on site with roots exposed.</li> </ul> <p>Large infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting).</li> <li>▪ Monitor. Remove any re-sprouting material.</li> </ul> <hr/> <p><b>During and following flowering</b></p> <p>Do nothing until the following year or remove flowering heads and bag and let rot.</p> <p>Small infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and leave on site with roots exposed.</li> </ul> <p>Large infestation</p> <ul style="list-style-type: none"> <li>▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting).</li> <li>▪ Monitor. Remove any re-sprouting material.</li> </ul>
<p>common reed (<i>Phragmites australis</i>)</p> <p>Japanese knotweed (<i>Polygonum cuspidatum</i>)</p> <p>Bohemian knotweed (<i>Polygonum x bohemicum</i>)</p>	<p><b>Fruits, Seeds, Plant Fragments</b></p> <p>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.</p>	<p><b>Small infestation</b></p> <ul style="list-style-type: none"> <li>▪ Bag all plant material and let rot.</li> <li>▪ Never pile and use resulting material as compost.</li> <li>▪ Burn.</li> </ul> <p><b>Large infestation</b></p> <ul style="list-style-type: none"> <li>▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile.</li> <li>▪ Monitor and remove any sprouting material.</li> <li>▪ Pile, let dry, and burn.</li> </ul>

January 2010

UNH Cooperative Extension programs and policies are consistent with pertinent Federal and State laws and regulations, and prohibits discrimination in its programs, activities and employment on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sex, sexual orientation, or veteran's, marital or family status. College of Life Sciences and Agriculture, County Governments, NH Dept. of Resources and Economic Development, Division of Forests and Lands, NH Fish and Game ,and U.S. Dept. of Agriculture cooperating.

# 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



Spraying chemicals to control invasive plants.

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.

### 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](http://tncweeds.ucdavis.edu)). An upcoming posting on the Invasive Plant Atlas of New England ([www.ipane.org](http://www.ipane.org)) and the New England Wild Flower Society ([www.newfs.org](http://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](http://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](http://www.state.me.us/dep/blwq/docstand/nrpapage.htm)

**NH:** Department of Environmental Services  
[www.des.state.nh.us/wetlands/](http://www.des.state.nh.us/wetlands/)

**VT:** Department of Environmental Conservation  
[www.anr.state.vt.us/dec/waterq/permits/htm/pm\\_cud.htm](http://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](http://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.



<b>Stormwater Management Report</b>						
<b>North End Mixed Use Development</b>			<b>Russell Street – Map 118 Lot 28, Map 119 Lot 4, Map 124 Lot 12, Map 125 Lot 21</b>			
<b>BMP Description</b>	<b>Date of Inspection</b>	<b>Inspector</b>	<b>BMP Installed and Operating Properly?</b>	<b>Cleaning / Corrective Action Needed</b>	<b>Date of Cleaning / Repair</b>	<b>Performed By</b>
Deep Sump CB's			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Underground Detention			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Jellyfish Filter 1			<input type="checkbox"/> Yes <input type="checkbox"/> No			

BUILDING 1 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
17.24'	77.24'	74.16'	60.00'	56.92'

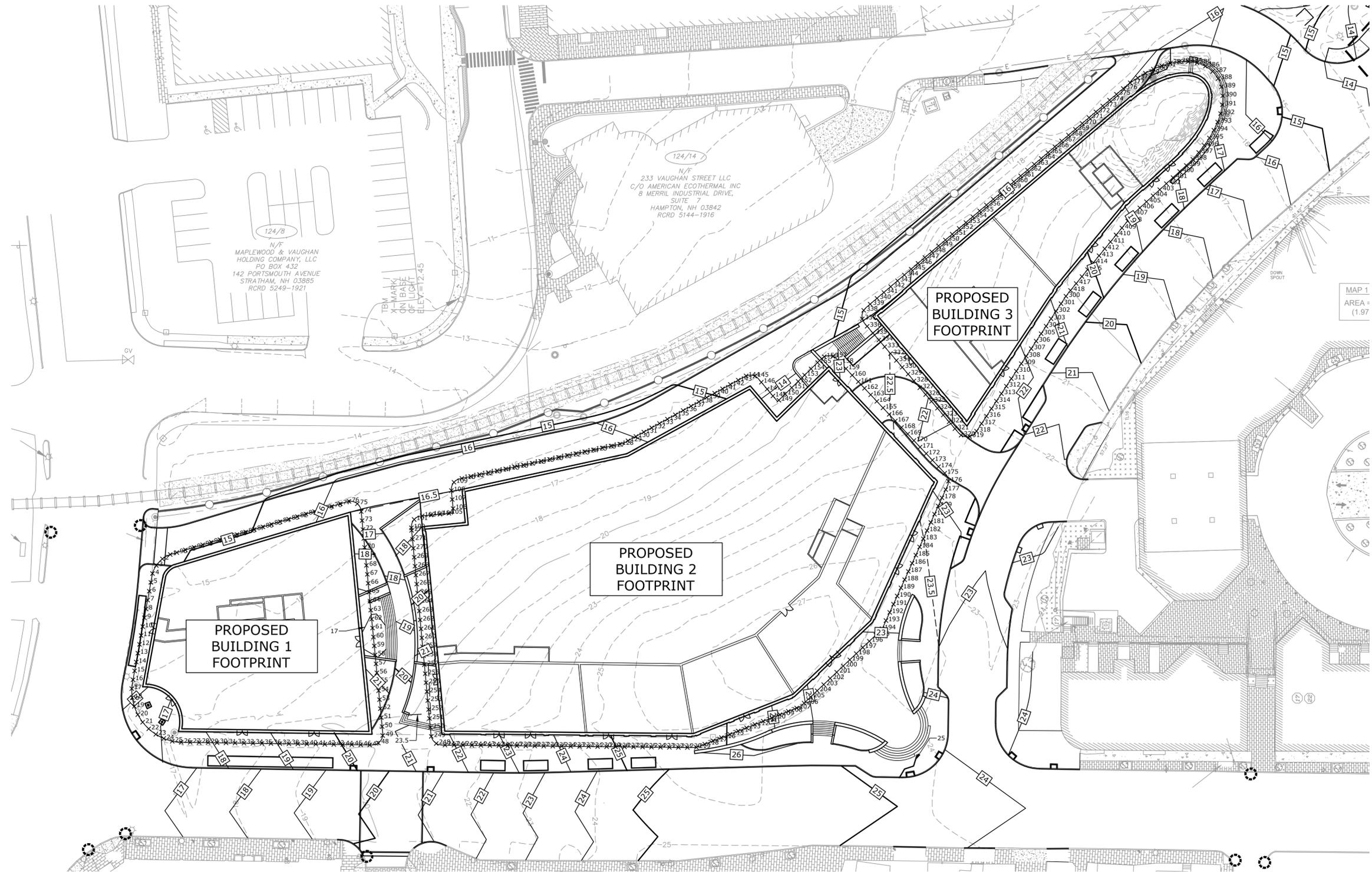
BUILDING 2 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
20.56'	80.56'	80.38'	60.00'	59.82'

BUILDING 3 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
18.65'	78.65'	78.64'	60.00'	59.99'

**NORTH END MIXED USE DEVELOPMENT  
RUSSELL STREET & DEER STREET  
PORTSMOUTH, NEW HAMPSHIRE**

---

**GRADE PLANE EXHIBIT**

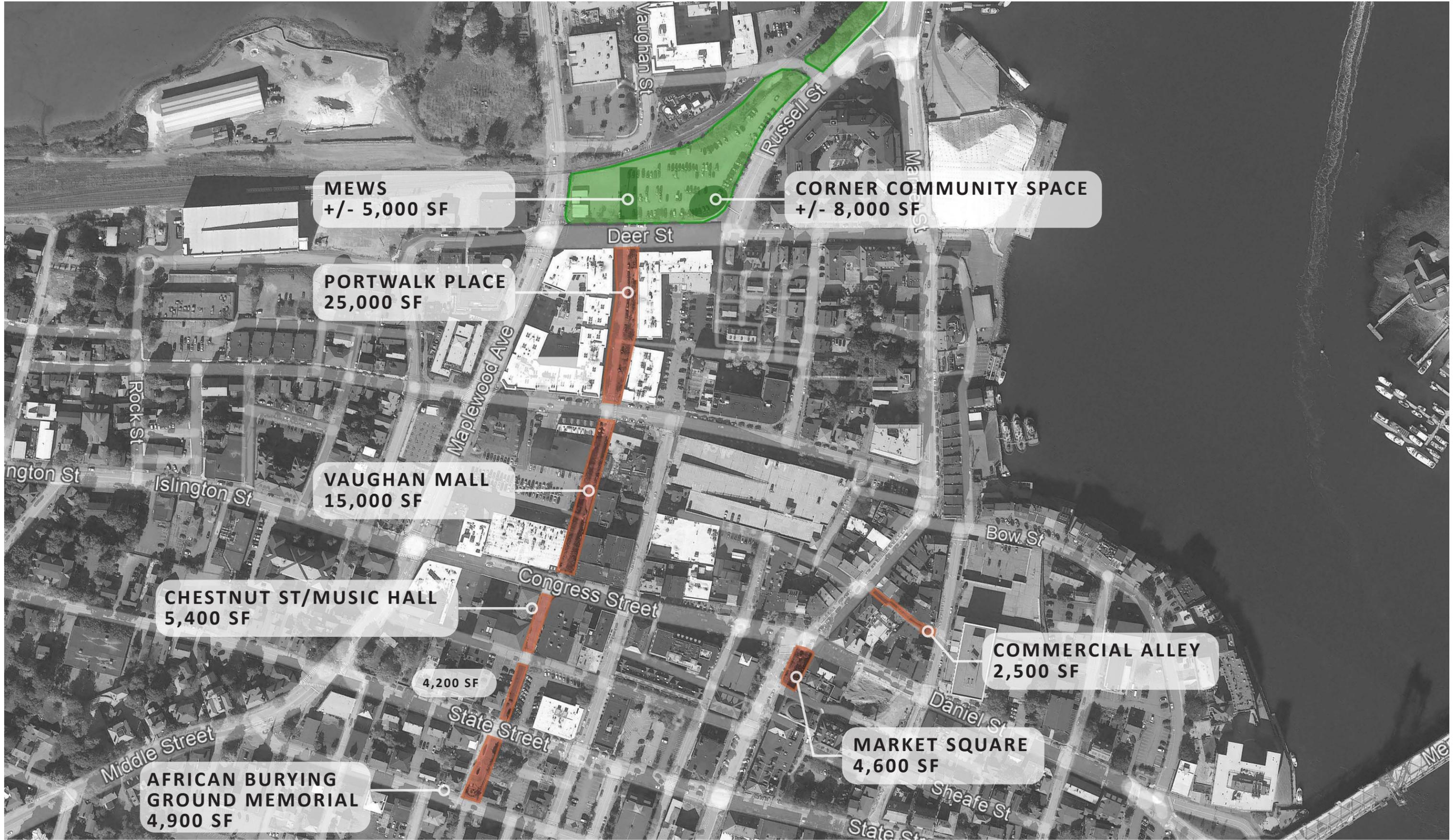


MAP 1  
AREA -  
(1.97)



**Tighe & Bond**





**MEWS**  
+/- 5,000 SF

**CORNER COMMUNITY SPACE**  
+/- 8,000 SF

**PORTWALK PLACE**  
25,000 SF

**VAUGHAN MALL**  
15,000 SF

**CHESTNUT ST/MUSIC HALL**  
5,400 SF

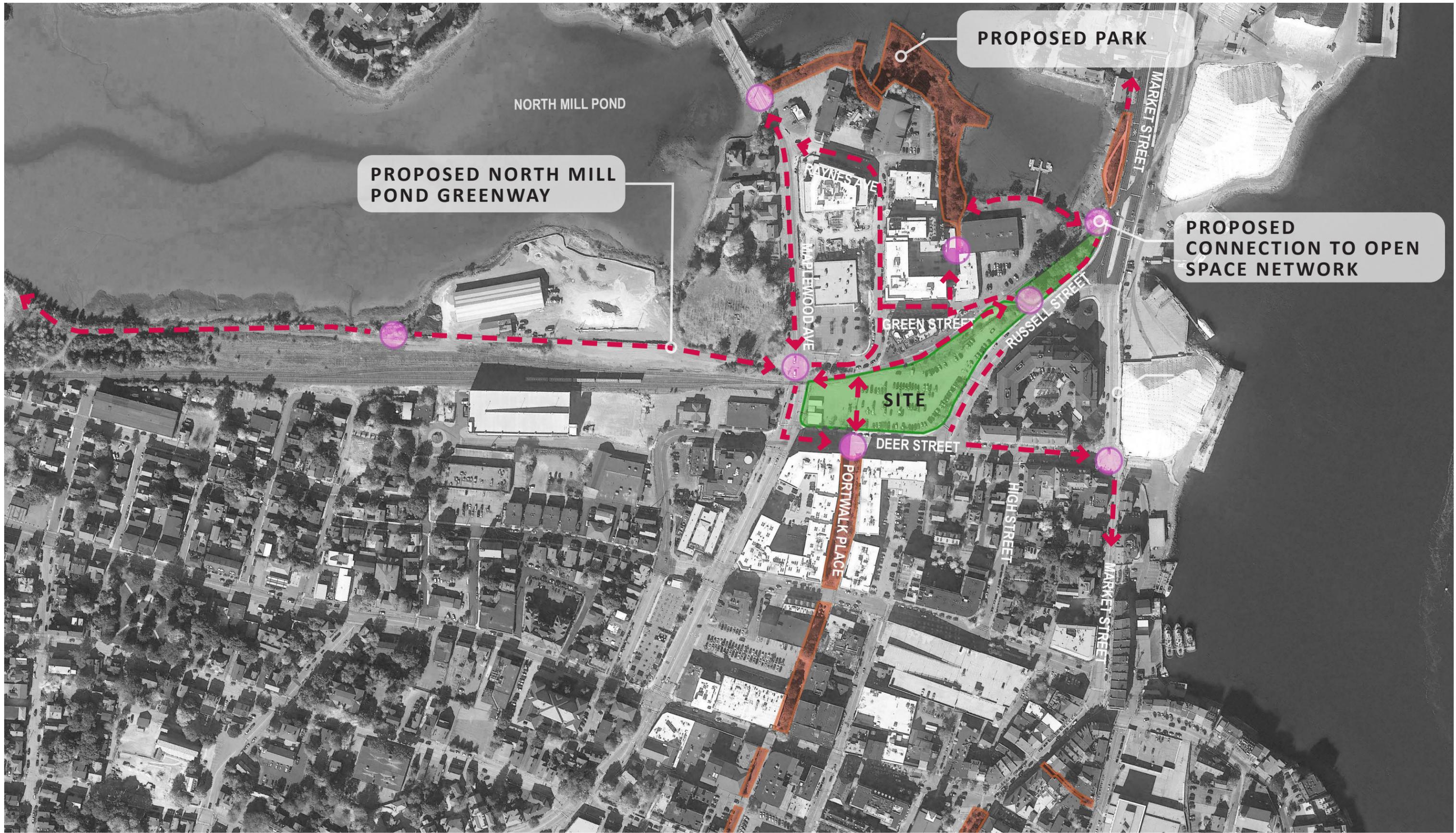
4,200 SF

**AFRICAN BURYING  
GROUND MEMORIAL**  
4,900 SF

**COMMERCIAL ALLEY**  
2,500 SF

**MARKET SQUARE**  
4,600 SF

**SITE CONTEXT**

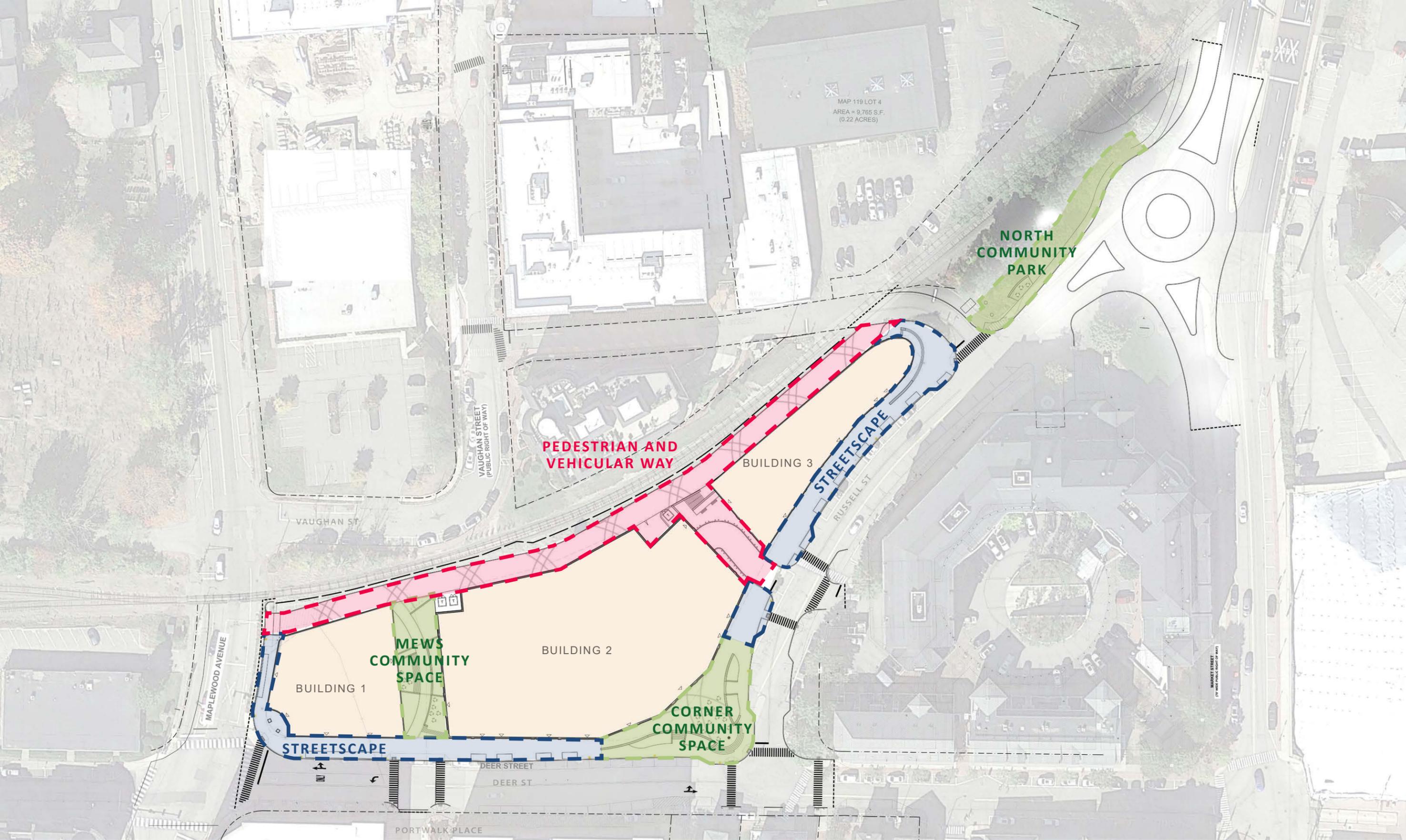


PROPOSED NORTH MILL POND GREENWAY

PROPOSED PARK

PROPOSED CONNECTION TO OPEN SPACE NETWORK

NEIGHBORHOOD CIRCULATION



**OPEN SPACE - KEY PLAN**

**RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH**

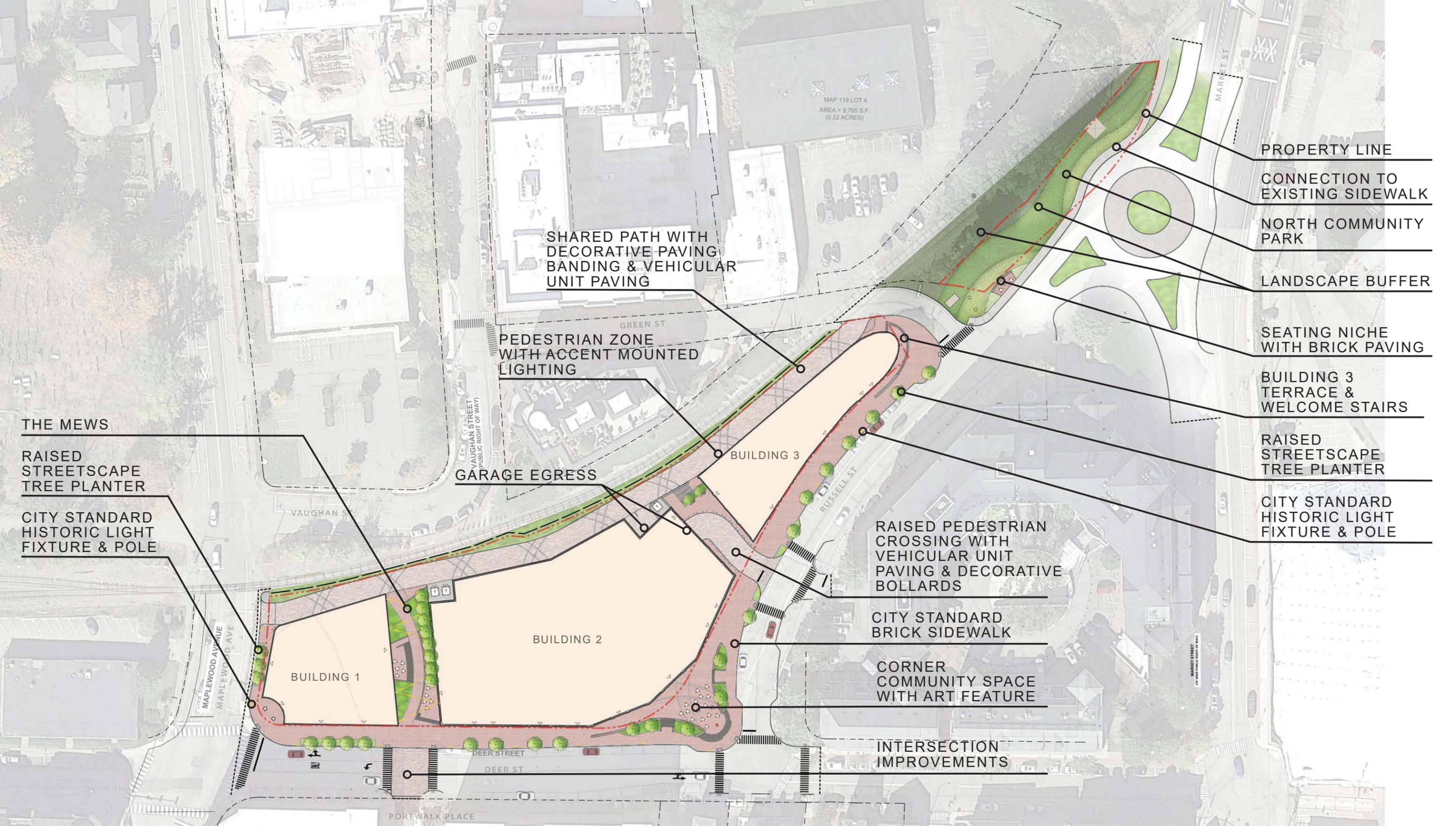
7/21/2022











THE MEWS  
 RAISED STREETSCAPE TREE PLANTER  
 CITY STANDARD HISTORIC LIGHT FIXTURE & POLE

SHARED PATH WITH DECORATIVE PAVING BANDING & VEHICULAR UNIT PAVING  
 PEDESTRIAN ZONE WITH ACCENT MOUNTED LIGHTING  
 GARAGE EGRESS

RAISED PEDESTRIAN CROSSING WITH VEHICULAR UNIT PAVING & DECORATIVE BOLLARDS  
 CITY STANDARD BRICK SIDEWALK  
 CORNER COMMUNITY SPACE WITH ART FEATURE  
 INTERSECTION IMPROVEMENTS

PROPERTY LINE  
 CONNECTION TO EXISTING SIDEWALK  
 NORTH COMMUNITY PARK  
 LANDSCAPE BUFFER  
 SEATING NICHE WITH BRICK PAVING  
 BUILDING 3 TERRACE & WELCOME STAIRS  
 RAISED STREETSCAPE TREE PLANTER  
 CITY STANDARD HISTORIC LIGHT FIXTURE & POLE



**SITE PLAN**



**CORNER COMMUNITY SPACE- SCALE COMPARISON**



**CORNER COMMUNITY SPACE - SCALE COMPARISON - QUINCY PARK CAMBRIDGE**

**RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH**

7/21/2022



DESIMONE

JBB



**Tighe&Bond HALVORSON**  
Tighe&Bond STUDIO



**CORNER COMMUNITY SPACE - SCALE COMPARISON - MARKET SQUARE**



**STANDARD BRICK SIDEWALK PAVING**



**PLACE-MAKING SEATING NICHE**



**LANDSCAPE FEATURE**



**CORNER COMMUNITY SPACE - ENLARGEMENT**



CORNER COMMUNITY SPACE - PERSPECTIVE VIEW A.1



**CORNER COMMUNITY SPACE - PERSPECTIVE VIEW A.2**

**RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH**

7/21/2022

LIGHTBOX  
STUDIOS™

DESIMONE

JBB

MARKET  
SQUARE  
ARCHITECTS

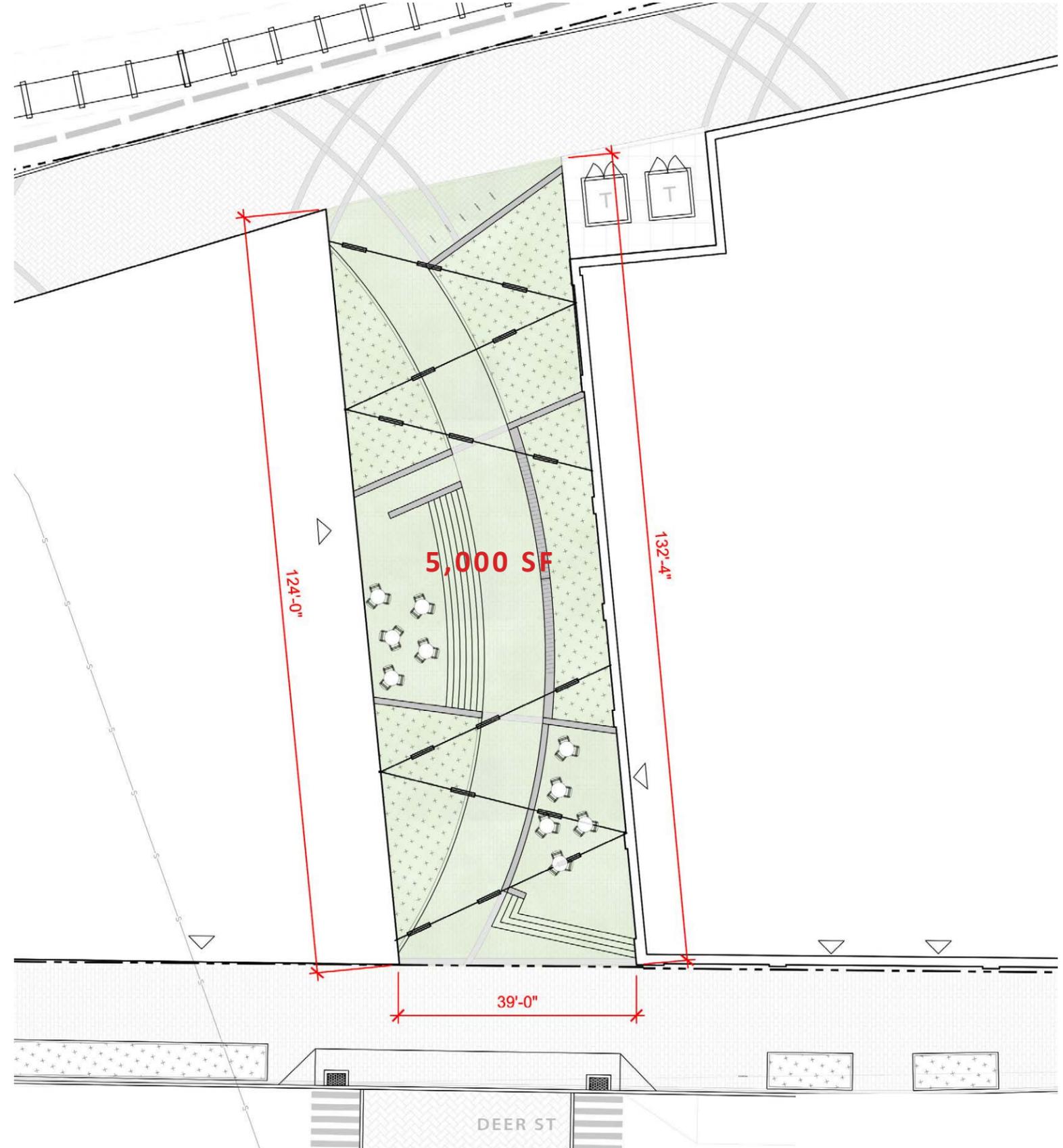
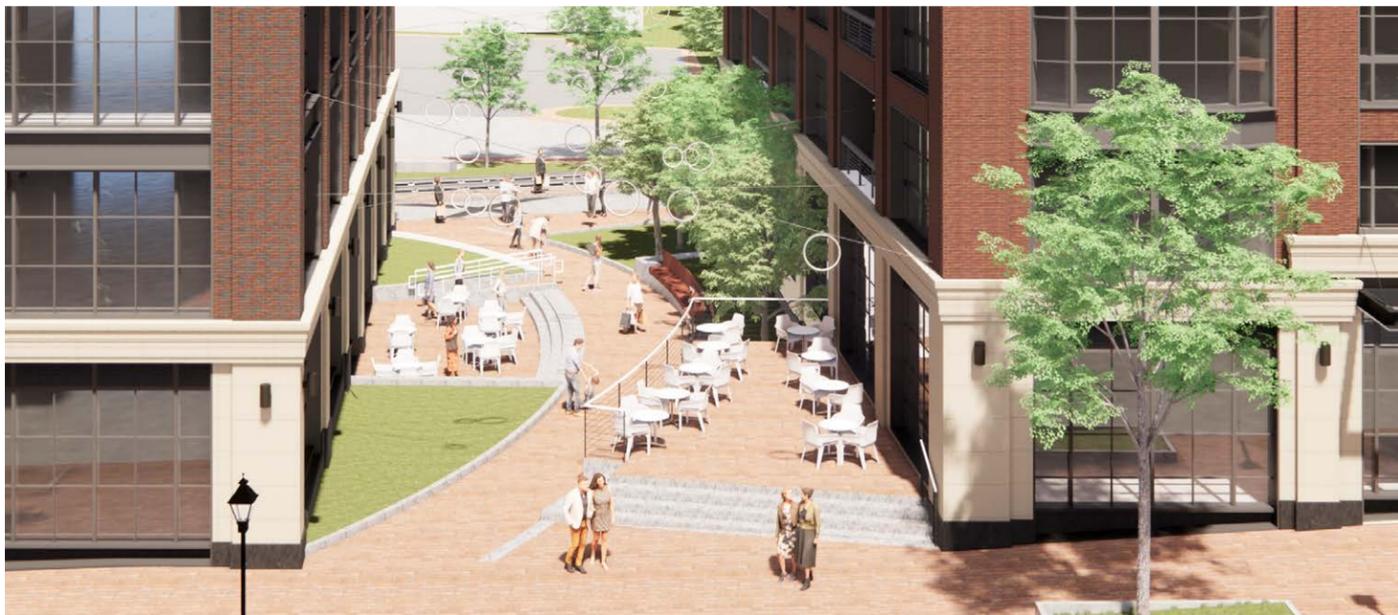
SCA

TWO INTERNATIONAL  
GROUP

**Tighe&Bond HALVORSON**  
Tighe&Bond STUDIO



CORNER COMMUNITY SPACE - PERSPECTIVE VIEW A.3



**THE MEWS COMMUNITY SPACE - SCALE COMPARISON**





THE MEWS COMMUNITY SPACE - SCALE COMPARISON - THOMSON PLACE

RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

7/21/2022



DESIMONE

JBB





THE MEWS COMMUNITY SPACE - SCALE COMPARISON - VAUGHAN MALL

RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH

7/21/2022

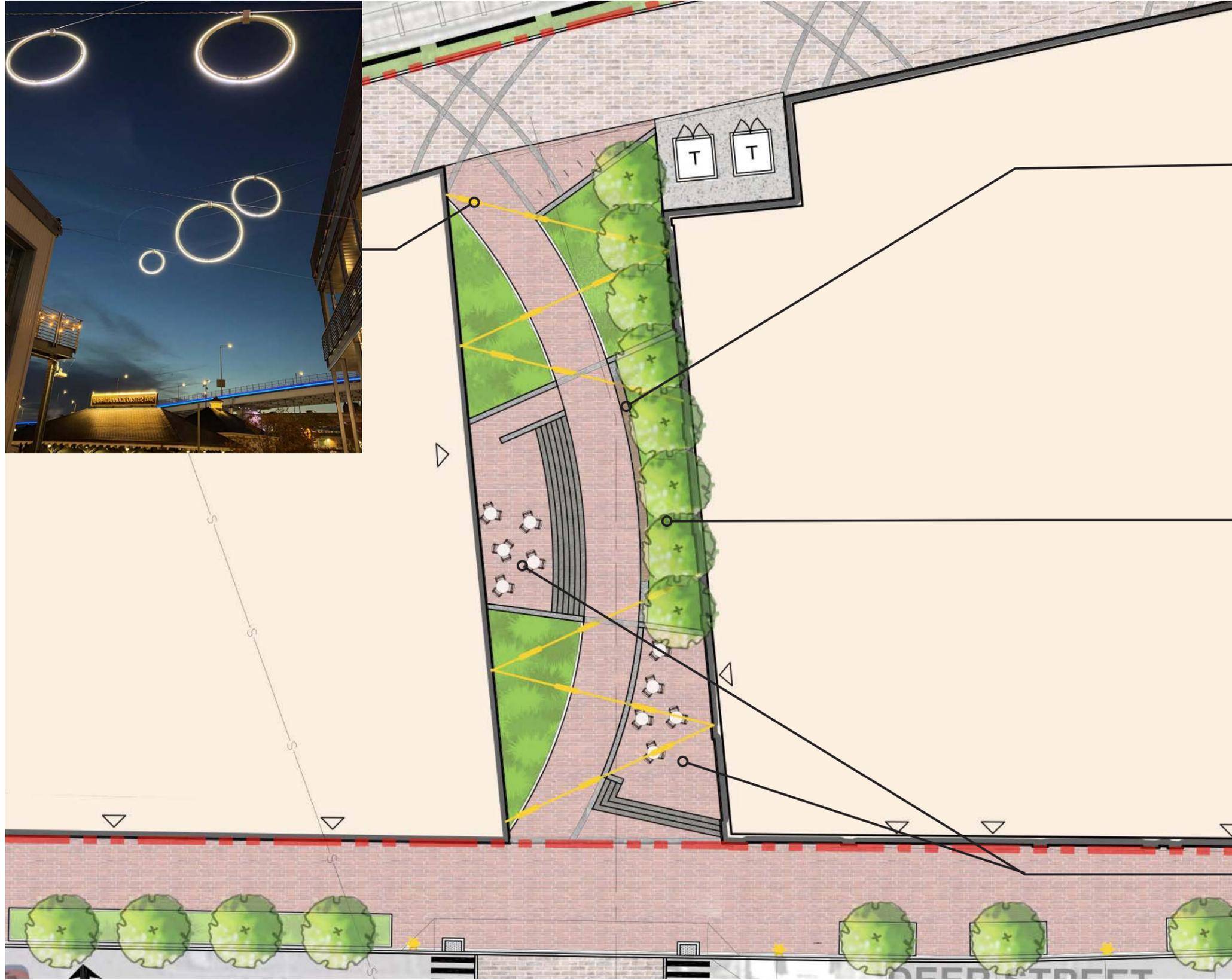
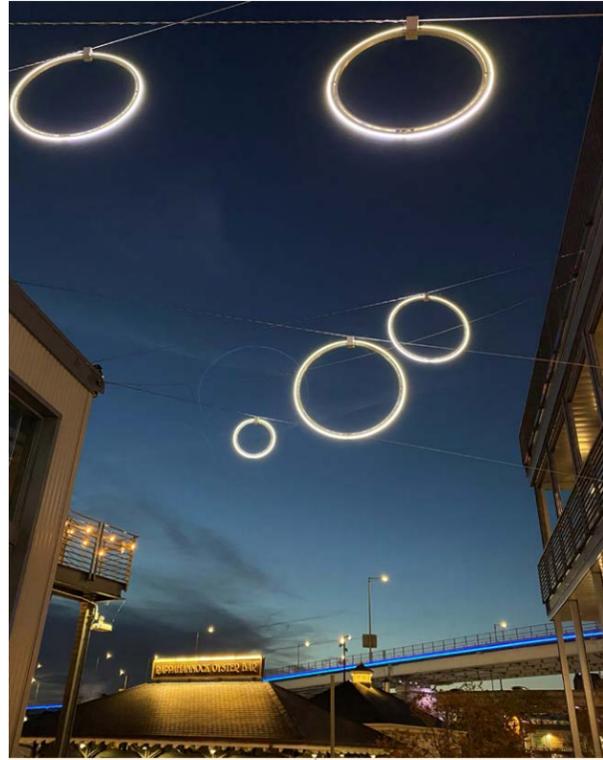


DESIMONE

JBB



# CATENARY LIGHTING



# SEAT WALL WOOD MOUNTED BENCHES



# PLAYFUL PLANTING BACKDROP



# PLACE-MAKING SEATING NODES



# THE MEWS COMMUNITY SPACE - ENLARGEMENT



THE MEWS COMMUNITY SPACE - PERSPECTIVE VIEW A.1



MEWS COMMUNITY SPACE - PERSPECTIVE VIEW A.2



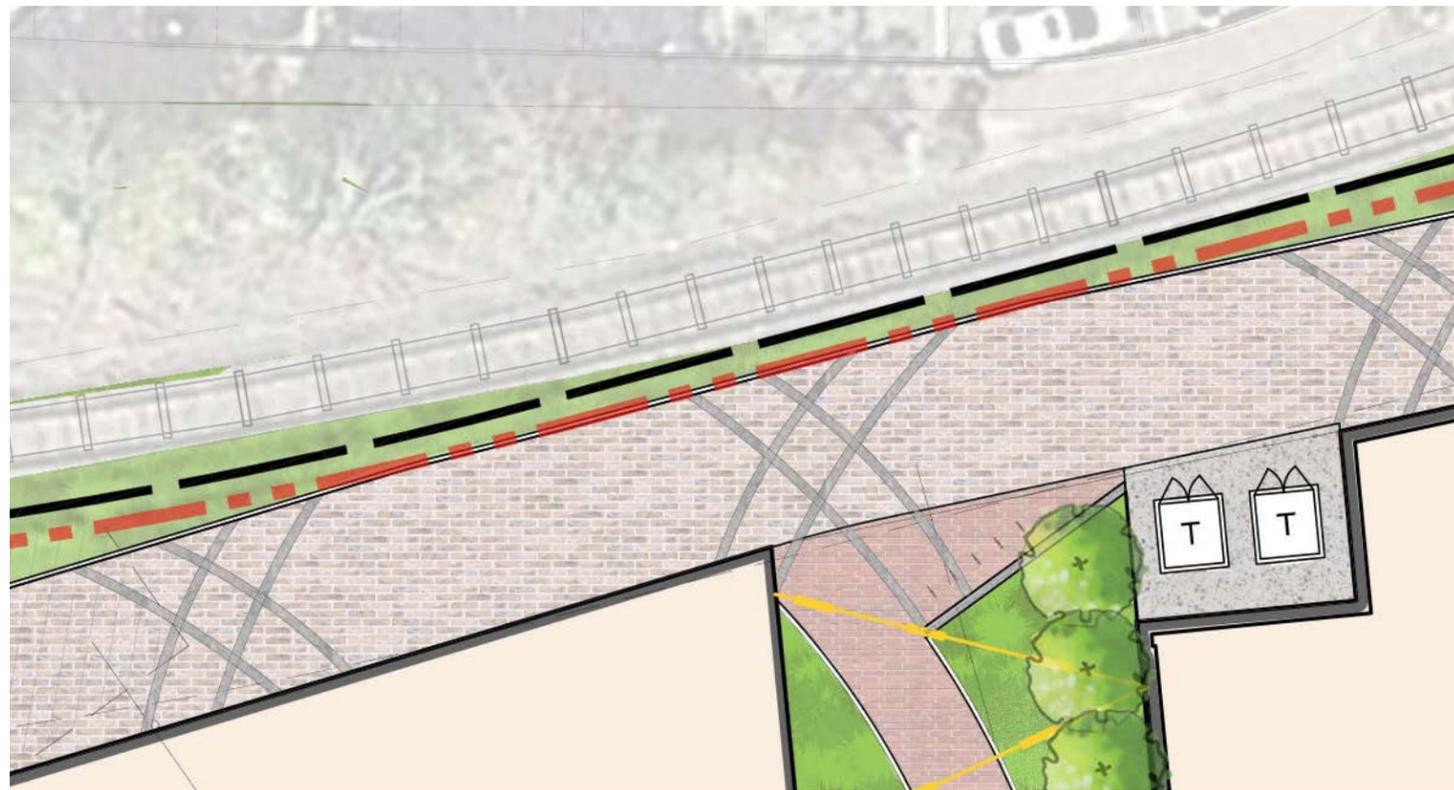
MEWS COMMUNITY SPACE - PERSPECTIVE VIEW A.3



**STANDARD BRICK PAVING & LIGHTING**

**RAISED CURB STREETScape TREE PLANTERS**

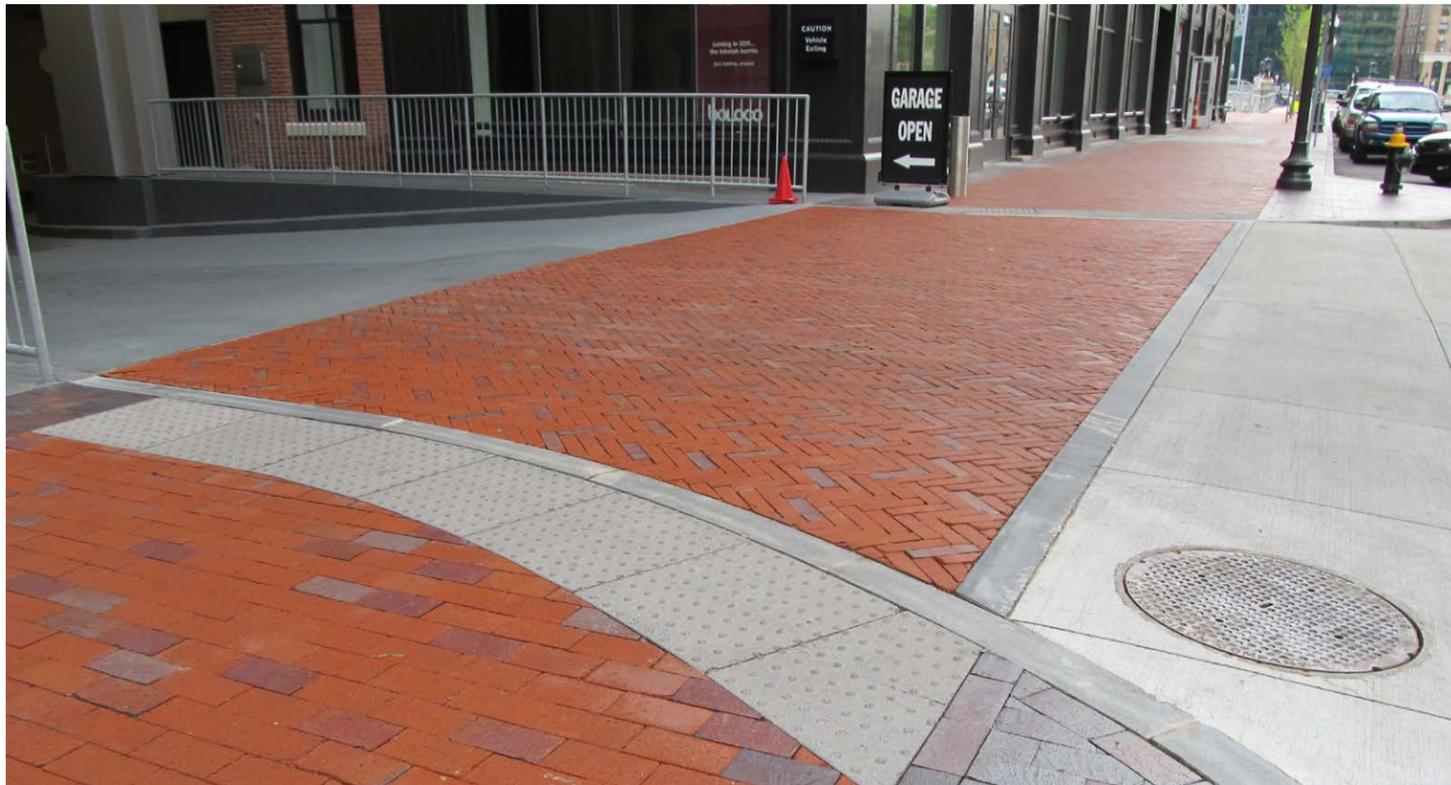
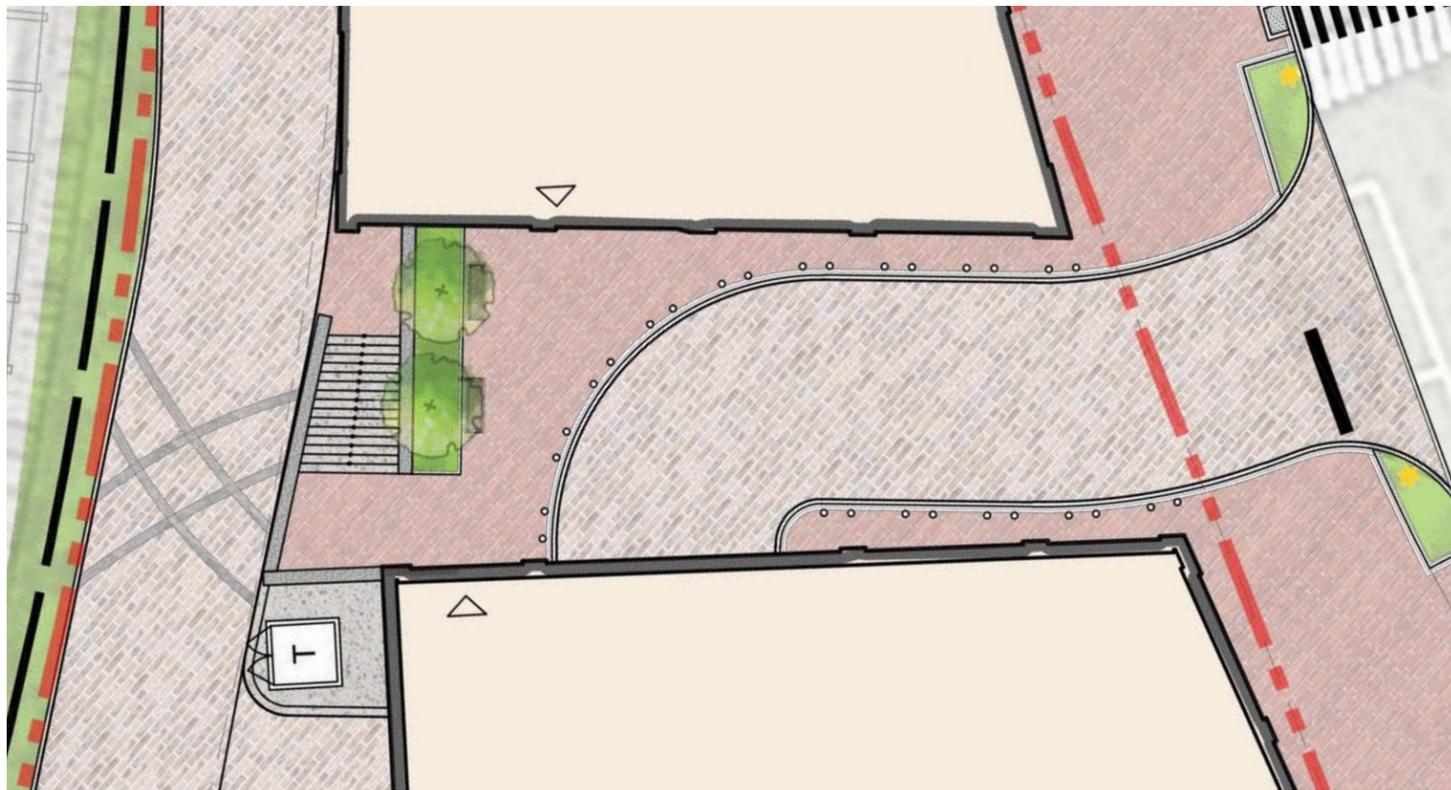
**STREETScape DESIGN**



**SHARED PEDESTRIAN AND VEHICULAR WAY**

**DECORATIVE PAVING BANDING & VEHICULAR UNIT PAVING**

**PEDESTRIAN AND VEHICULAR WAY - ALONG TRACK**

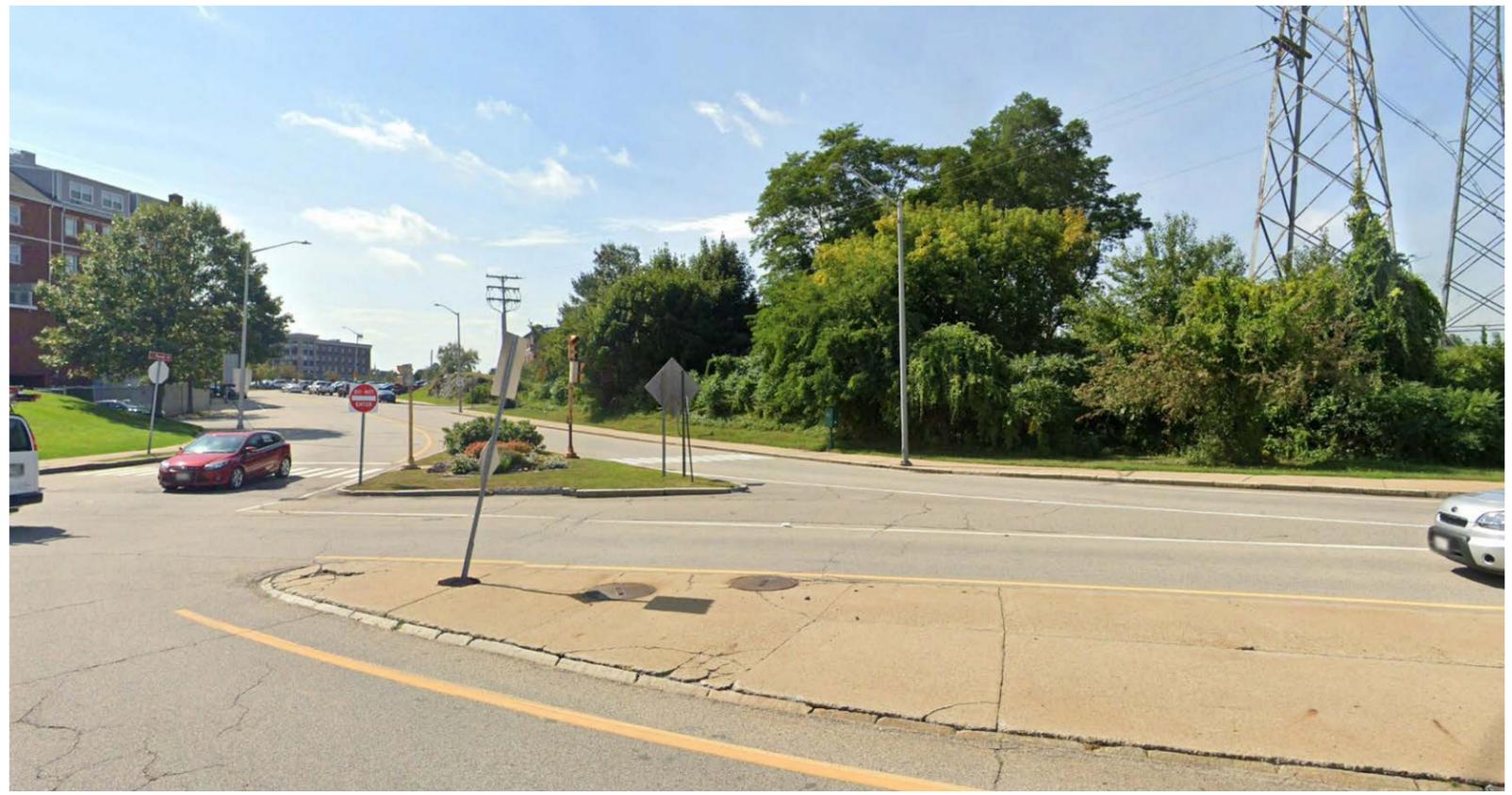


**RAISED PEDESTRIAN CROSSING**



**PEDESTRIAN & VEHICULAR WAY DEFINED WITH BOLLARDS**

**PEDESTRIAN AND VEHICULAR WAY - BETWEEN BUILDING 2 & 3**



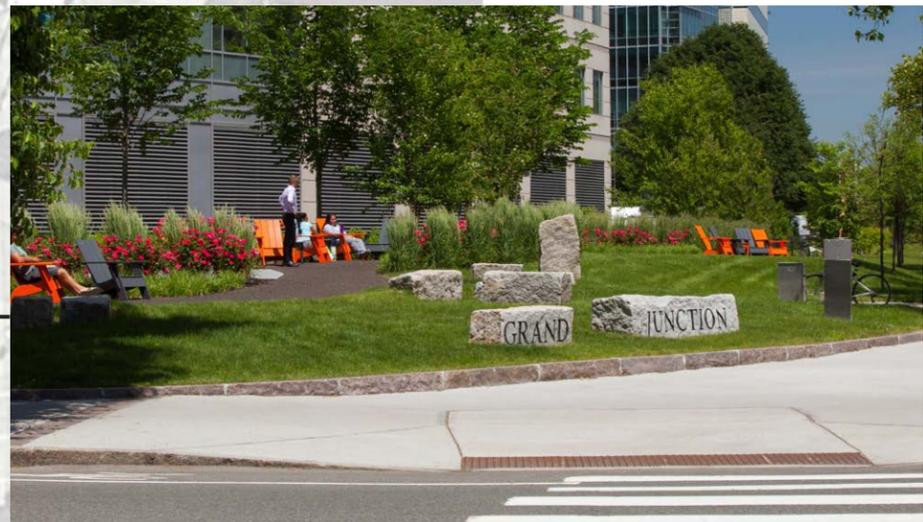
**NORTH COMMUNITY PARK - EXISTING CONDITIONS**



**EXISTING CLEANED UP BUFFER**



**PLACE-MAKING SEATING NICHE**



**SEASONAL PLANTINGS**



**NORTH COMMUNITY PARK - ENLARGEMENT**

# THANK YOU



**SITE PLAN**

**RUSSELL STREET DEVELOPMENT - PORTSMOUTH, NH**

7/21/2022

LIGHTBOX  
STUDIOS™

DESIMONE

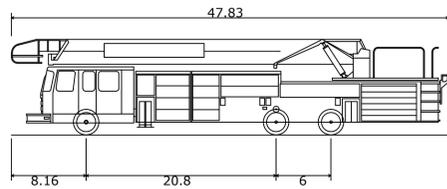
JBB

MARKET  
SQUARE  
ARCHITECTS

SEA

TWO INTERNATIONAL  
GROUP

**Tighe&Bond HALVORSON**  
Tighe&Bond STUDIO



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°

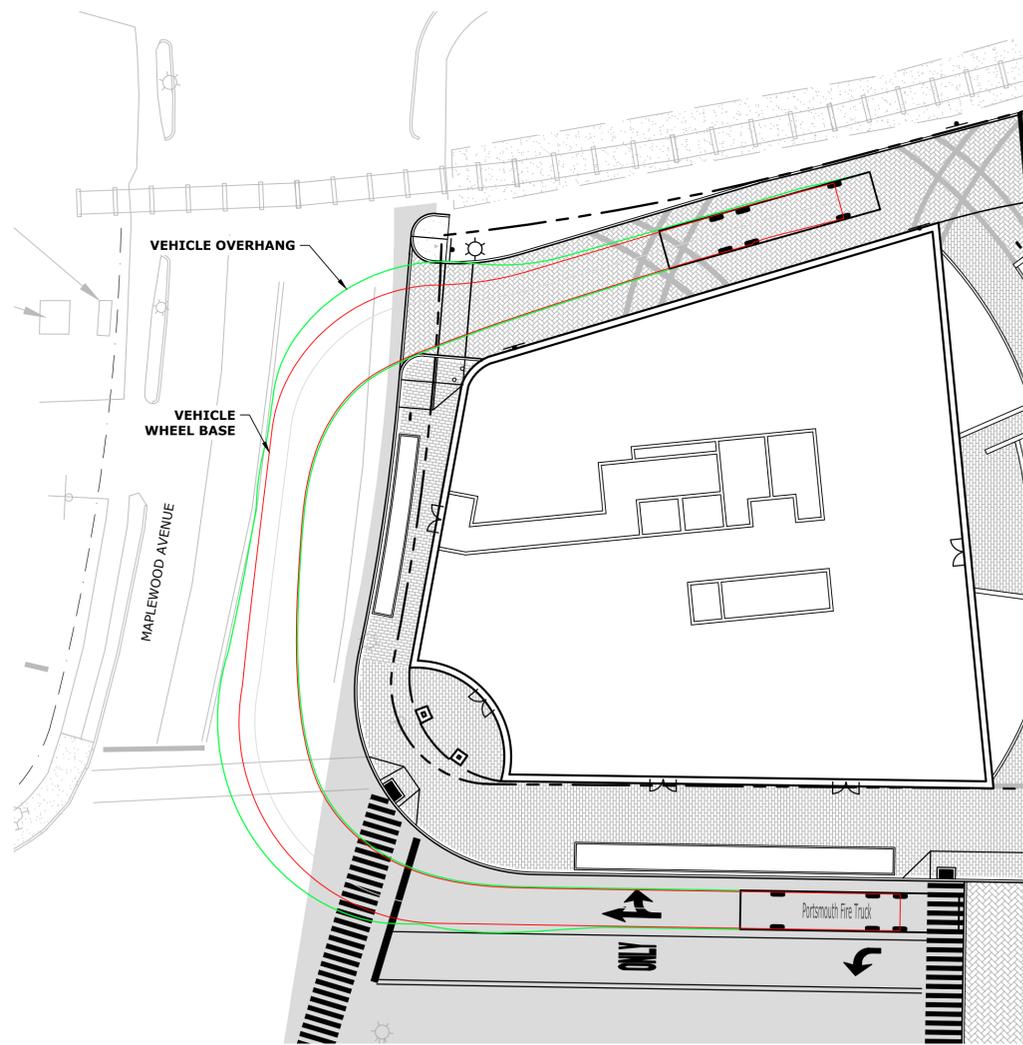
**LEGEND**

- VEHICLE WHEEL BASE
- VEHICLE OVERHANG

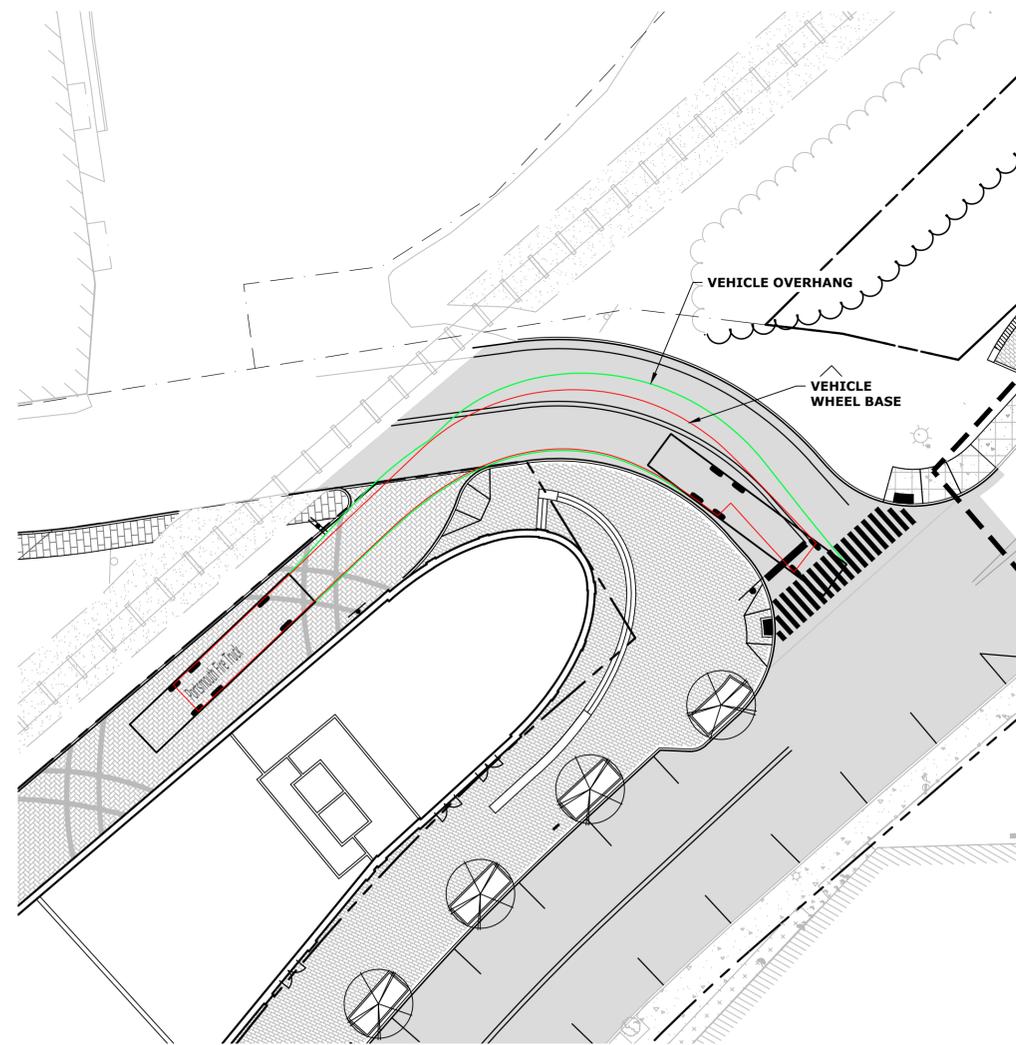
**NORTH END MIXED USE DEVELOPMENT  
RUSSELL STREET & DEER STREET  
PORTSMOUTH, NEW HAMPSHIRE**

---

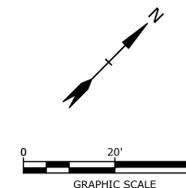
**FIRE TRUCK TURNING EXHIBIT**



**MAPLEWOOD AVENUE ENTRANCE**



**GREEN STREET EXIT**



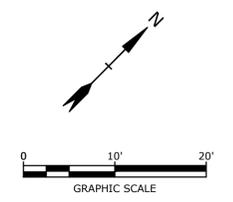
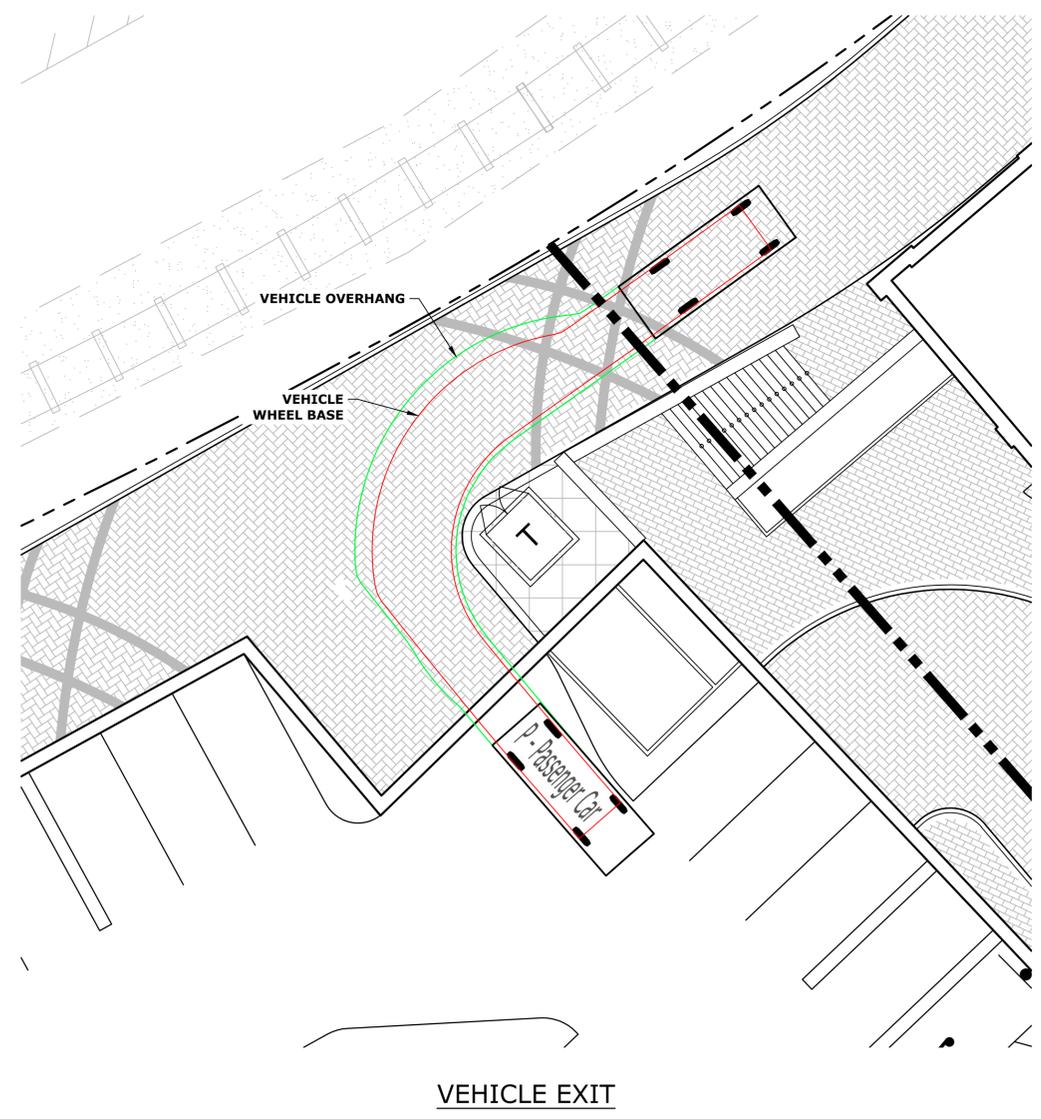
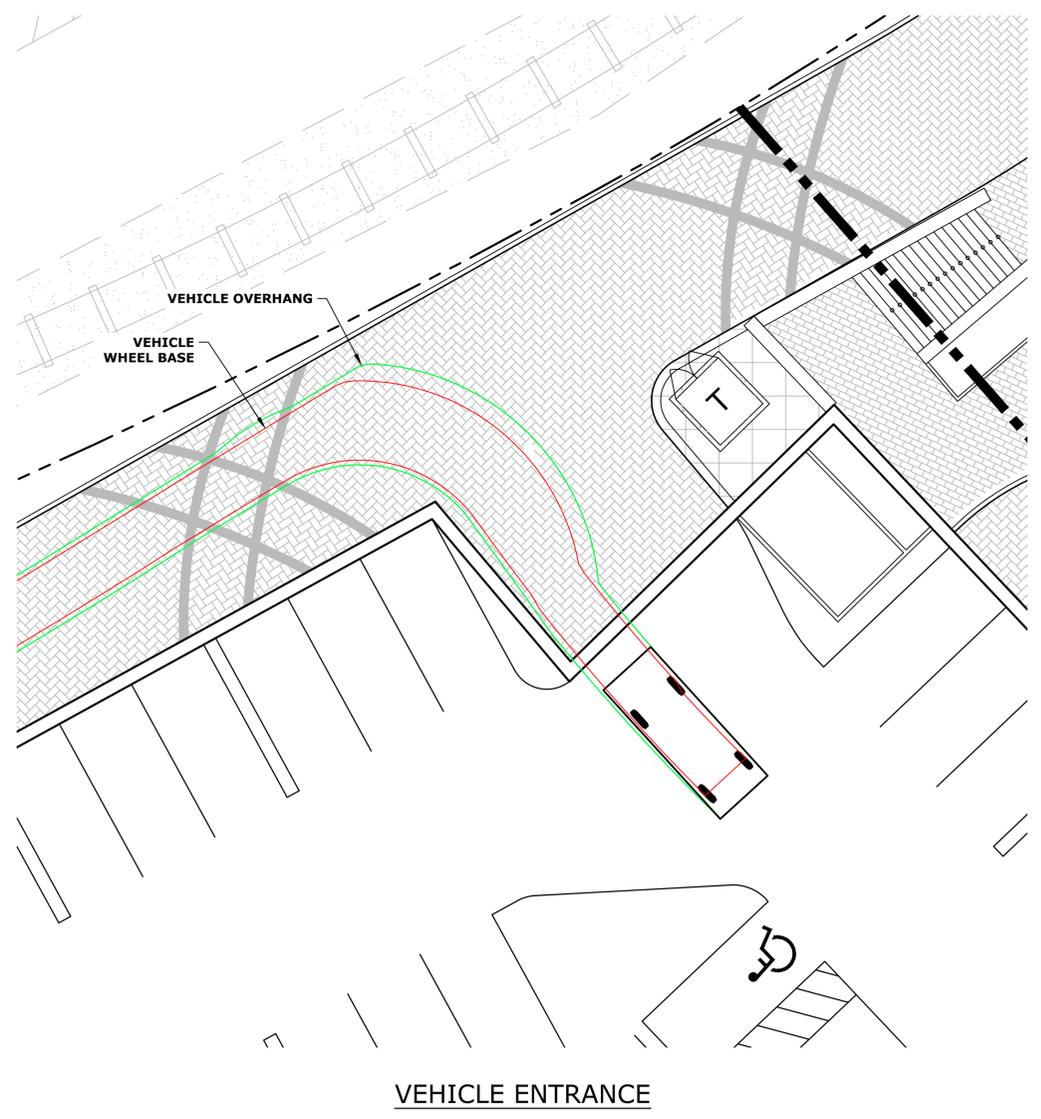
**Tighe&Bond**

NORTH END MIXED USE DEVELOPMENT  
 RUSSELL STREET & DEER STREET  
 PORTSMOUTH, NEW HAMPSHIRE

---

PASSENGER VEHICLE TURNING EXHIBIT

- LEGEND**
- VEHICLE WHEEL BASE
  - VEHICLE OVERHANG



Last Save Date: July 20, 2022 6:04 PM By: CML  
 Plot Date: Wednesday, July 20, 2022 Plotted By: Colter Krzucik  
 T88 File Location: J:\T5037 Two International Group\002 Russell Street Development\Drawings Figures\AutoCAD\T5037-002-C-DSGN.dwg Layout Tab: Pedestrian Turning

May 23, 2022

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 3 separate buildings: 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 in Portsmouth, NH.

The developer will be responsible for the installation of all underground facilities and infrastructure required to service the new buildings. The proposed building services will be fed from three loop fed pad mounted transformers 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 C-104" dated 05/24/2022, shows transformers, manholes, and duct bank 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



*April 19<sup>th</sup>, 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,

A handwritten signature in blue ink, appearing to read "D. MacLean", is written over a light blue horizontal line.

**Dave MacLean**  
Senior Business Development Rep



**T** 603.294.5261 **M** 603.534.2379 **F** 603.294.5264  
**Email** [macleand@unitil.com](mailto: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

- **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

---

SGA-ARCH.COM  
857.300.2610