

C0960-011  
May 19, 2021

Ms. Juliet Walker Planning Director  
City of Portsmouth Planning Department  
1 Junkins Avenue  
Portsmouth, New Hampshire 03801

**Re: Site Review Permit & Lot Line Revision Applications  
Proposed Mixed Use Development 53 Green Street, Portsmouth, NH**

Dear Juliet:

On behalf of Stone Creek Realty, LLC (owner), and CPI Management, LLC (applicant), we are pleased to submit the following information to support a request for a Site Review Permit and Lot Line Revision Permit for the above referenced project:

- One (1) full size & one (1) half size copy of the Site Plan Set, last revised May 19, 2021;
- One (1) copy of the TAC Comment Response, dated May 19, 2021;
- One (1) copy of the Site Review Checklist, dated March 22, 2021;
- One (1) copy of the Subdivision Checklist, last revised May 19, 2021;
- One (1) copy of the Boundary Line Adjustment Plan, dated May 17, 2021;
- One (1) copy of the Drainage Analysis, last revised May 19, 2021;
- One (1) copy of the Operations and Maintenance Plan, dated May 19, 2021;
- One (1) copy of the Aerial Site Plan, last revised May 19, 2021;
- One (1) copy of the Grade Plane Exhibit, last revised May 19, 2021;
- One (1) copy of the Wetland and Buffer Report, dated January 6, 2020;
- One (1) copy of the Existing Buffer Photograph Log, dated January 27, 2021;
- One (1) copy of the Wetland Buffer Impervious Surface Exhibit, last revised May 19, 2021;
- One (1) copy of the Community Space Exhibit, last revised May 19, 2021;
- One (1) copy of the Fire Truck Turning Exhibit, last revised May 19, 2021;
- One (1) copy of the Site Traffic Exhibit, dated May 19, 2021;
- One (1) copy of the Trip Generation Analysis, last revised May 19, 2021;
- One (1) copy of the Unitil Will Service Letter, dated February 22, 2021;
- One (1) copy of the Green Building Statement, dated March 22, 2021;
- One (1) copy of the Site Lighting Fixture Cut Sheets

The proposed project is located at 53 Green Street on property identified as Map 119 Lot 2 on the City of Portsmouth Tax Maps. The existing 1.66-acre parcel is bound by Green Street to south, the AC Hotel to the west, North Mill Pond to the north and the railroad to the east.

The project will include a lot line revision between Map 119 Lot 2 and Map 119 Lot 3 as shown in the enclosed Boundary Line Adjustment Plan prepared by Doucet Survey Inc. The proposed lot line revision will relocate the lot line between the project parcel and the adjacent railroad. This will increase the development lot area by 0.12 acres for a total lot area of 1.78 acres. The project is also currently under review by the Historic District Commission (HDC).



The proposed project will include the construction of a 5-story mixed-use residential building that includes basement level parking, first floor residential lobby, commercial space and parking, and 48 upper floor residential units. The project will include associated site improvements such as paving, utilities, lighting, landscaping and community space. The proposed project is providing 22,100 SF of community spaces (28.5% of the total lot area) which meets the 20% of total lot area required to receive the incentive bonus for one additional story (10 ft) above the maximum height requirement on the building. The community space calculation is depicted in the enclosed Community Space Exhibit. A Conditional Use Permit for Wetland Buffer Impact will be required for the project for work within the 100 ft wetland buffer. The project received a unanimous recommendation for approval from the Conservation Commission at their April 14, 2021 meeting.

To date the applicant has attending the following meetings with the local land-use boards related to the Site Plan:

- January 21, 2021 – Planning Board Conceptual Consultation
- February 9, 2021 – Technical Advisory Committee Work Session
- February 10, 2021 – Conservation Commission Work Session
- April 6, 2021 - Technical Advisory Committee Meeting
- April 14, 2021 – Conservation Commission Regular Meeting
- May 4, 2021 - Technical Advisory Committee Meeting

The enclosed revised plans and supplemental materials have been provided to address comments received from the Technical Advisory Committee (TAC) in correspondence dated May 4, 2021 and at their meeting held on May 4, 2021.

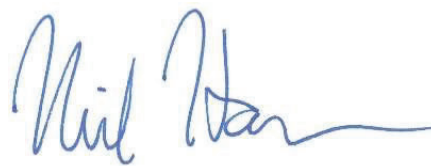
We respectfully request to be placed on the TAC meeting agenda for June 1, 2021. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at [pmcrimmins@tighebond.com](mailto:pmcrimmins@tighebond.com).

Sincerely,

**TIGHE & BOND, INC.**



Patrick M. Crimmins, PE  
Senior Project Manager



Neil A. Hansen, PE  
Project Engineer

Cc: Stone Creek Realty, LLC (via e-mail)  
CPI Management, LLC (via e-mail)



# City of Portsmouth, New Hampshire

## Site Plan Application Checklist

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

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

Name of Applicant: CPI Management, LLC Date Submitted: March 22, 2021

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

Site Address: 53 Green Street Map: 119 Lot: 2

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

Site Plan Review Application Required Information			
<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	Statement that lists and describes "green" building components and systems. (2.5.3.1B)	Enclosed	
<input checked="" type="checkbox"/>	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. (2.5.3.1C)	Site Plan Sheet C-102.1	N/A
<input checked="" type="checkbox"/>	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1D)	Site Plan Sheet C-102.1	N/A

<b>Site Plan Review Application Required Information</b>			
<input checked="" type="checkbox"/>	<b>Required Items for Submittal</b>	<b>Item Location (e.g. Page/line or Plan Sheet/Note #)</b>	<b>Waiver Requested</b>
<input checked="" type="checkbox"/>	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. <b>(2.5.3.1E)</b>	Enclosed Existing Conditions Plan	N/A
<input checked="" type="checkbox"/>	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. <b>(2.5.3.1F)</b>	Existing Conditions Plan	N/A
<input checked="" type="checkbox"/>	Names, addresses and telephone numbers of all professionals involved in the site plan design. <b>(2.5.3.1G)</b>	Cover Sheet	N/A
<input checked="" type="checkbox"/>	List of reference plans. <b>(2.5.3.1H)</b>	Existing Conditions Plan	N/A
<input checked="" type="checkbox"/>	List of names and contact information of all public or private utilities servicing the site. <b>(2.5.3.1I)</b>	Utilities Plan Sheet C-104	N/A

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

**Site Plan Specifications – Required Exhibits and Data**

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	<p><b>1. Existing Conditions: (2.5.4.3A)</b></p> <ul style="list-style-type: none"> <li>• Surveyed plan of site showing existing natural and built features;</li> <li>• Existing building footprints and gross floor area;</li> <li>• Existing parking areas and number of parking spaces provided;</li> <li>• Zoning district boundaries;</li> <li>• Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre;</li> <li>• Existing impervious and disturbed areas;</li> <li>• Limits and type of existing vegetation;</li> <li>• Wetland delineation, wetland function and value assessment (including vernal pools);</li> <li>• SFHA, 100-year flood elevation line and BFE data, as required.</li> </ul>	Existing Conditions Plan	
<input checked="" type="checkbox"/>	<p><b>2. Buildings and Structures: (2.5.4.3B)</b></p> <ul style="list-style-type: none"> <li>• Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;</li> <li>• Elevations: Height, massing, placement, materials, lighting, façade treatments;</li> <li>• Total Floor Area;</li> <li>• Number of Usable Floors;</li> <li>• Gross floor area by floor and use.</li> </ul>	Site Plan Sheets C.102.1 & C.102.2	
<input checked="" type="checkbox"/>	<p><b>3. Access and Circulation: (2.5.4.3C)</b></p> <ul style="list-style-type: none"> <li>• Location/width of access ways within site;</li> <li>• Location of curbing, right of ways, edge of pavement and sidewalks;</li> <li>• Location, type, size and design of traffic signing (pavement markings);</li> <li>• Names/layout of existing abutting streets;</li> <li>• Driveway curb cuts for abutting prop. and public roads;</li> <li>• If subdivision; Names of all roads, right of way lines and easements noted;</li> <li>• AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).</li> </ul>	Site Plan Sheet C-102.1	
<input checked="" type="checkbox"/>	<p><b>4. Parking and Loading: (2.5.4.3D)</b></p> <ul style="list-style-type: none"> <li>• Location of off street parking/loading areas, landscaped areas/buffers;</li> <li>• Parking Calculations (# required and the # provided).</li> </ul>	Site Plan Sheet C-102.1	
<input checked="" type="checkbox"/>	<p><b>5. Water Infrastructure: (2.5.4.3E)</b></p> <ul style="list-style-type: none"> <li>• Size, type and location of water mains, shut-offs, hydrants &amp; Engineering data;</li> <li>• Location of wells and monitoring wells (include protective radii).</li> </ul>	Utilities Plan Sheet C-104	
<input checked="" type="checkbox"/>	<p><b>6. Sewer Infrastructure: (2.5.4.3F)</b></p> <ul style="list-style-type: none"> <li>• Size, type and location of sanitary sewage facilities &amp; Engineering data, including any onsite temporary facilities during construction period.</li> </ul>	Utilities Plan Sheet C-104	

<input checked="" type="checkbox"/>	<b>7. Utilities: (2.5.4.3G)</b> <ul style="list-style-type: none"> <li>The size, type and location of all above &amp; below ground utilities;</li> <li>Size type and location of generator pads, transformers and other fixtures.</li> </ul>	Utilities Plan Sheet C-104	
<input checked="" type="checkbox"/>	<b>8. Solid Waste Facilities: (2.5.4.3H)</b>	Site Plan Sheet C-102.1	
	<ul style="list-style-type: none"> <li>The size, type and location of solid waste facilities.</li> </ul>	Site Plan Sheet C-102.1	
<input checked="" type="checkbox"/>	<b>9. Storm water Management: (2.5.4.3I)</b> <ul style="list-style-type: none"> <li>The location, elevation and layout of all storm-water drainage.</li> <li>The location of onsite snow storage areas and/or proposed off-site snow removal provisions.</li> <li>Location and containment measures for any salt storage facilities</li> <li>Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.</li> </ul>	Grading and Drainage Plan Sheet C-103	
<input checked="" type="checkbox"/>	<b>10. Outdoor Lighting: (2.5.4.3J)</b> <ul style="list-style-type: none"> <li>Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.</li> </ul>	Photometrics Plan Sheet	
<input checked="" type="checkbox"/>	<b>11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)</b>	Photometrics Plan Sheets	
<input checked="" type="checkbox"/>	<b>12. Landscaping: (2.5.4.3K)</b> <ul style="list-style-type: none"> <li>Identify all undisturbed area, existing vegetation and that which is to be retained;</li> <li>Location of any irrigation system and water source.</li> </ul>	Landscaping Plan Sheets L-1 & L-2	
<input checked="" type="checkbox"/>	<b>13. Contours and Elevation: (2.5.4.3L)</b> <ul style="list-style-type: none"> <li>Existing/Proposed contours (2 foot minimum) and finished grade elevations.</li> </ul>	Grading and Drainage Plan Sheet C-103	
<input checked="" type="checkbox"/>	<b>14. Open Space: (2.5.4.3M)</b> <ul style="list-style-type: none"> <li>Type, extent and location of all existing/proposed open space.</li> </ul>	Site Plan Sheet C-102 & Open Space Exhibit	
<input checked="" type="checkbox"/>	<b>15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)</b>	Existing Conditions Plan	
<input checked="" type="checkbox"/>	<b>16. Character/Civic District (All following information shall be included): (2.5.4.3P)</b> <ul style="list-style-type: none"> <li>Applicable Building Height (10.5A21.20 &amp; 10.5A43.30);</li> <li>Applicable Special Requirements (10.5A21.30);</li> <li>Proposed building form/type (10.5A43);</li> <li>Proposed community space (10.5A46).</li> </ul>	Site Plan Sheet C-102.1	
<input checked="" type="checkbox"/>	<b>17. Special Flood Hazard Areas (2.5.4.3Q)</b> <ul style="list-style-type: none"> <li>The proposed development is consistent with the need to minimize flood damage;</li> <li>All public utilities and facilities are located and construction to minimize or eliminate flood damage;</li> <li>Adequate drainage is provided so as to reduce exposure to flood hazards.</li> </ul>	Grading and Drainage Plan Sheet and Utility Plan Sheet C.103 & C.104	

<b>Other Required Information</b>			
<input checked="" type="checkbox"/>	<b>Required Items for Submittal</b>	<b>Item Location (e.g. Page/line or Plan Sheet/Note #)</b>	<b>Waiver Requested</b>
<input checked="" type="checkbox"/>	Traffic Impact Study or Trip Generation Report, as required. <b>(3.2.1-2)</b>	Enclosed	
<input checked="" type="checkbox"/>	Indicate where Low Impact Development Design practices have been incorporated. <b>(7.1)</b>	Grading and Drainage Plan Sheet C-103	
<input checked="" type="checkbox"/>	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. <b>(7.3.1)</b>	N/A	
<input checked="" type="checkbox"/>	Stormwater Management and Erosion Control Plan. <b>(7.4)</b>	Enclosed	
<input checked="" type="checkbox"/>	Inspection and Maintenance Plan <b>(7.6.5)</b>	Enclosed	

<b>Final Site Plan Approval Required Information</b>			
<input checked="" type="checkbox"/>	<b>Required Items for Submittal</b>	<b>Item Location (e.g. Page/line or Plan Sheet/Note #)</b>	<b>Waiver Requested</b>
<input checked="" type="checkbox"/>	All local approvals, permits, easements and licenses required, including but not limited to: <ul style="list-style-type: none"> <li>• Waivers;</li> <li>• Driveway permits;</li> <li>• Special exceptions;</li> <li>• Variances granted;</li> <li>• Easements;</li> <li>• Licenses.</li> </ul> <b>(2.5.3.2A)</b>	Cover Sheet	
<input checked="" type="checkbox"/>	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: <ul style="list-style-type: none"> <li>• Calculations relating to stormwater runoff;</li> <li>• Information on composition and quantity of water demand and wastewater generated;</li> <li>• Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls;</li> <li>• Estimates of traffic generation and counts pre- and post-construction;</li> <li>• Estimates of noise generation;</li> <li>• A Stormwater Management and Erosion Control Plan;</li> <li>• Endangered species and archaeological / historical studies;</li> <li>• Wetland and water body (coastal and inland) delineations;</li> <li>• Environmental impact studies.</li> </ul> <b>(2.5.3.2B)</b>	Enclosed	
<input checked="" type="checkbox"/>	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. <b>(2.5.3.2D)</b>	Enclosed	

**Final Site Plan Approval Required Information**

<input checked="" type="checkbox"/>	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
<input checked="" type="checkbox"/>	A list of any required state and federal permit applications required for the project and the status of same. <b>(2.5.3.2E)</b>	Cover Sheet	
<input checked="" type="checkbox"/>	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." <b>(2.5.4.2E)</b>	Site Plan Sheets C-102	N/A
<input checked="" type="checkbox"/>	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. <b>(2.5.4.2F)</b>	N/A	
<input checked="" type="checkbox"/>	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." <b>(2.13.3)</b>	Site Plan Sheets C-102.1	N/A

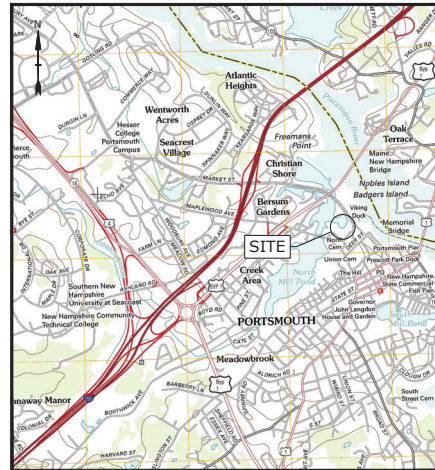
Applicant's Signature:  Date: 3/22/21



# PROPOSED MIXED USE DEVELOPMENT

53 GREEN STREET  
 PORTSMOUTH, NEW HAMPSHIRE  
 JANUARY 27, 2021  
 LAST REVISED: MAY 19, 2021

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	5/19/2021
1 OF 2	EXISTING CONDITIONS PLAN	5/17/2021
2 OF 2	EXISTING CONDITIONS PLAN	5/17/2021
C-101	DEMOLITION PLAN	5/19/2021
C-102.1	SITE PLAN	5/19/2021
C-102.2	BASEMENT & UPPER FLOOR PLAN	5/19/2021
C-103	GRADING, DRAINAGE AND EROSION CONTROL PLAN	5/19/2021
C-104	UTILITIES PLAN	5/19/2021
C-201	WATER MAIN REPLACEMENT PLAN	5/19/2021
C-301	EASEMENT PLAN	5/19/2021
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	5/19/2021
C-502	DETAILS SHEET	5/19/2021
C-503	DETAILS SHEET	5/19/2021
C-504	DETAILS SHEET	5/19/2021
C-505	DETAILS SHEET	5/19/2021
C-506	DETAILS SHEET	5/19/2021
C-507	DETAILS SHEET	5/19/2021
C-508	DETAILS SHEET	5/19/2021
L-1	LANDSCAPE PLAN	5/19/2021
1 OF 1	PHOTOMETRIC PLAN	3/22/2021
1	BUILDING ELEVATION	3/22/2021



LOCATION MAP  
 SCALE: 1" = 2,000'

PREPARED BY:  
**Tighe & Bond**  
 177 CORPORATE DRIVE  
 PORTSMOUTH, NEW HAMPSHIRE 03801  
 603-433-8818

APPLICANT:  
 CPI MANAGEMENT, LLC  
 100 SUMMER STREET, SUITE 1600  
 BOSTON, MASSACHUSETTS 02110

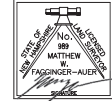
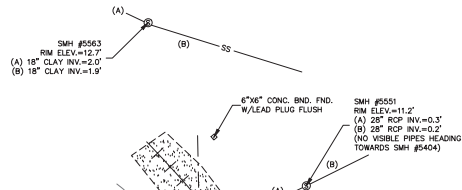
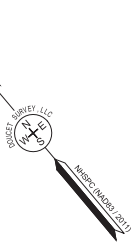
OWNER:  
 TAX MAP 119, LOT 12  
 STONE CREEK REALTY, LLC  
 C/O DOUGLAS PINCIARO  
 PO BOX 121  
 NEW CASTLE, NEW HAMPSHIRE 03854

SURVEYOR:  
 DOUCET SURVEY, LLC  
 192 KENT PLACE  
 NEWMARKET, NEW HAMPSHIRE 30857

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
LOT LINE REVISION PERMIT	PENDING	
CONDITIONAL USE PERMIT - WETLAND BUFFER	PENDING	
STATE		
NHDES - SEWER CONNECTION PERMIT	PENDING	
NHDES - ALTERATION OF TERRAIN PERMIT	PENDING	
NHDES - WETLAND PERMIT	PENDING	



**TAC RESUBMISSION SET  
 COMPLETE SET 21 SHEETS**



I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE (NH RSA TITLE LXIV) AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN. I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSES FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRANSVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

DATE: 5/11/21

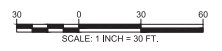
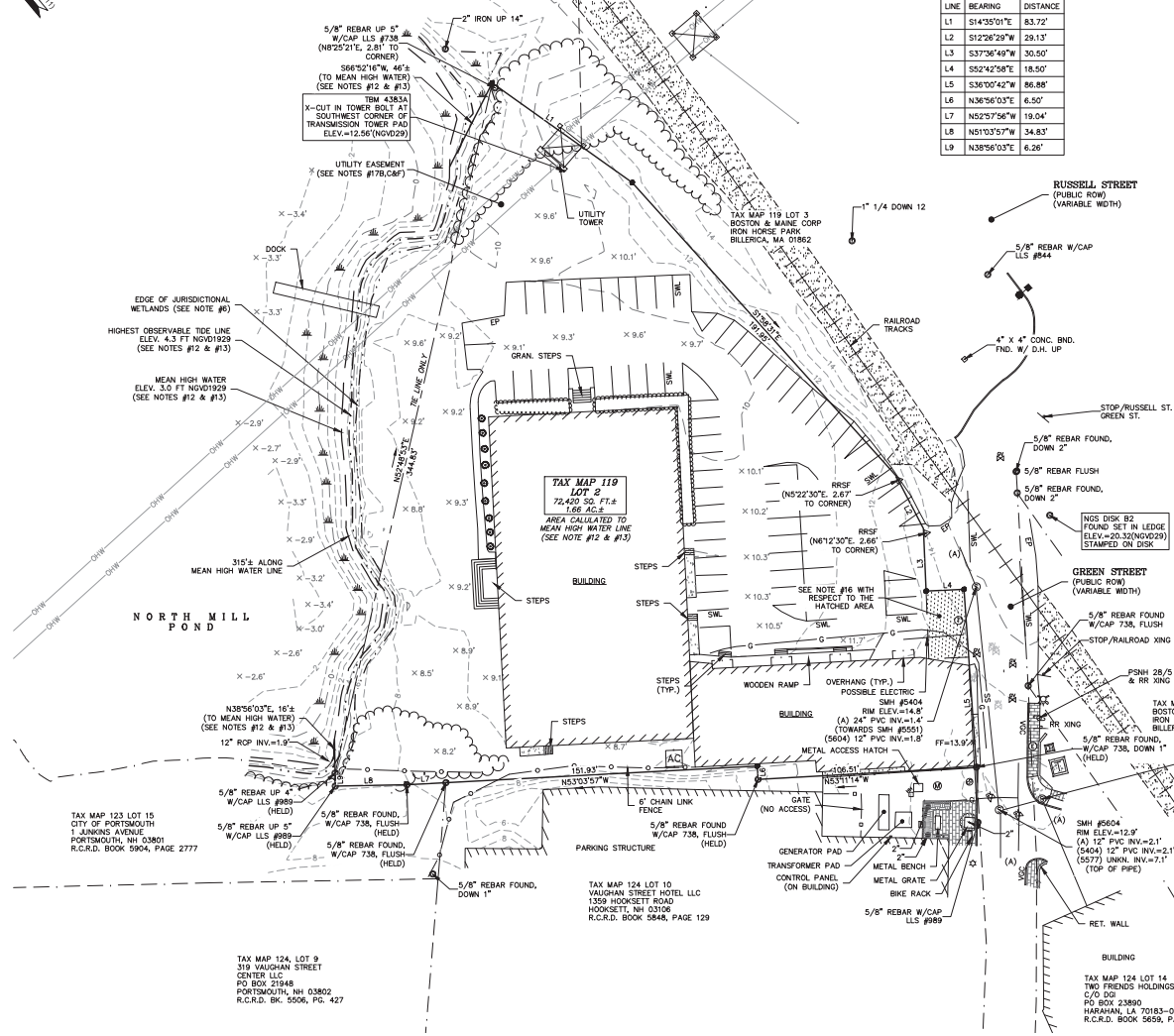
L.L.S. #89

THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEED REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY. SHOW OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

LINE	BEARING	DISTANCE
L1	S14°35'01"E	83.72'
L2	S12°26'29"W	28.13'
L3	S37°34'49"W	30.50'
L4	S52°42'58"E	18.50'
L5	S36°00'42"W	86.88'
L6	N36°56'03"E	6.50'
L7	N52°57'56"W	19.04'
L8	N51°03'57"W	34.83'
L9	N38°56'03"E	6.26'

SEE SHEET 2 FOR NOTES, REFERENCE PLANS & LOCUS

- LEGEND**
- LOT LINE
  - APPROXIMATE ABUTTERS LOT LINE
  - STOCKADE FENCE
  - CHAIN LINK FENCE
  - OVERHEAD WIRE
  - SS SEWER LINE
  - SD DRAIN LINE
  - G GAS LINE
  - 100' MAJOR CONTOUR LINE
  - 50' MINOR CONTOUR LINE
  - MEAN HIGH WATER LINE
  - HIGH TIDE LINE
  - TREE LINE
  - SHRUB LINE
  - EDGE OF WETLAND
  - WETLAND AREA
  - CONCRETE
  - BRUSHED STONE
  - BRICK
  - UTILITY POLE
  - LIGHT POLE W/ARM
  - SIGN
  - ROUND FOUND
  - IRON PIPE/ROD FOUND
  - FIRE HYDRANT
  - WATER GATE VALVE
  - WATER SHUTOFF VALVE
  - GAS GATE VALVE
  - TRANSFORMER
  - ELECTRIC MANHOLE
  - SEWER MANHOLE
  - HAND HOLE
  - DECIDUOUS TREE
  - CONIFEROUS SHRUB
  - TYP. BOND FND.
  - FINISHED FLOOR CONCRETE
  - FF
  - EDGE OF PAVEMENT
  - VERTICAL GRANITE CURB
  - SINGLE WHITE LINE
  - 5/8" REBAR W/D CAP TO BE SET



EXISTING CONDITIONS PLAN FOR TIGHE & BOND OF STONE CREEK REALTY LLC (TAX MAP 119, LOT 2) 53 GREEN STREET PORTSMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY

DRAWN BY: E.D.P.	DATE: NOVEMBER 2019
CHECKED BY: M.W.F.	DRAWING NO.: 4383F
JOB NO.: 4383	SHEET: 1 OF 2

**DOUCET SURVEY**

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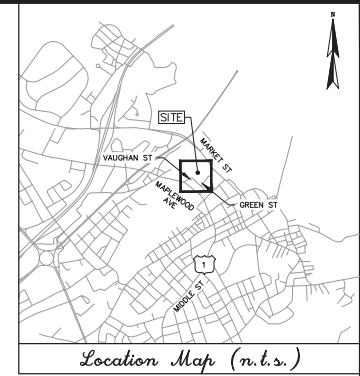
PLAN FILE: V:\Projects\4383\4383.dwg (DATE: 11/11/2019 10:58:10 AM) PLOT DATE: 11/11/2019 10:58:10 AM PLOT SCALE: 1"=30' PLOT SHEET: 1 OF 2 PLOT TOTAL SHEETS: 2

NOTES:

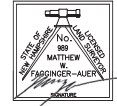
1. REFERENCE: TAX MAP 119, LOT 2  
53 GREEN STREET  
D.S.I. PROJECT NO. 4383
  2. TOTAL PARCEL AREA: 72,420 SQ. FT.± OR 1.66 AC.±  
(AREA CALCULATED TO MEAN HIGH WATER)  
(SEE NOTE #12)
  3. OWNER OF RECORD: STONE CREEK REALTY LLC  
C/O DOUGLAS PINARD  
PO BOX 121  
NEW CASTLE, NH 03854  
R.C.R.D. BOOK 3300, PAGE 329
  4. ZONE: CDS  
OVERLAY DISTRICTS  
-DOWNTOWN OVERLAY DISTRICT  
-HISTORIC DISTRICT
- ZONING DISTRICTS BASED ON THE CITY OF PORTSMOUTH ZONING MAP DATED 11/12/15 AS AVAILABLE ON THE CITY WEBSITE ON 11/18/19. SEE CITY OF PORTSMOUTH ZONING ORDINANCE ARTICLE 24, SECTION 10.0440 FOR DIMENSIONAL REGULATIONS. THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE MUNICIPAL, STATE AND FEDERAL REGULATIONS.
- THE SITE IS SUBJECT TO THE STATE OF NH SHORELAND WATER QUALITY PROTECTION ACT. SEE NHDES WEBSITE FOR SPECIFIC DIMENSIONAL REQUIREMENT.
5. FIELD SURVEY PERFORMED BY D.C.B. & K.L.L. DURING NOVEMBER 2019 USING A TRIMBLE S7 TOTAL STATION AND A TRIMBLE R8 SURVEY GRADE GPS WITH A TRIMBLE TSC3 DATA COLLECTOR AND A TRIMBLE DINI DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
  6. JURISDICTIONAL WETLANDS DELINEATED BY TIGHE & BOND, DURING OCTOBER 2019 IN ACCORDANCE WITH 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 AND THE INTERIM REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTH-EAST REGION (OCTOBER, 2009).
  7. VERTICAL DATUM IS BASED ON NVD629 PER DISK 82 1923.
  8. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2002) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS NETWORK.
  9. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOCKET SURVEY, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.
  10. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON OBSERVABLE PHYSICAL EVIDENCE AND PAINT MARKS FOUND ON-SITE.
  11. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.
  12. WATER BOUNDARIES ARE DYNAMIC IN NATURE AND ARE SUBJECT TO CHANGE DUE TO NATURAL CAUSES SUCH AS EROSION OR ACCRETION.
  13. MEAN HIGH WATER (E.L. 3.0' NVD01929) AND HIGHEST OBSERVABLE TIDE (E.L. 4.3' NVD01929) ELEVATIONS PER "MAPLEWOOD AVENUE CULVERT REPLACEMENT AND NORTH MILL POND RESTORATION, WATERFRONT STRUCTURAL BASIS OF DESIGN, BY WATERFRONT ENGINEERS, LLC, DATED DECEMBER 30, 2009", PROVIDED BY TIGHE & BOND ON 11-30-15.
  14. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT LEGAL DESCRIPTION, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.
  15. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCLUSIVE, OBLIVIOUS, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF GREEN STREET AS DEPICTED HEREON IS/ARE BASED ON RESEARCH CONDUCTED AT THE CITY OF PORTSMOUTH CITY HALL, THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS & THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
  16. THE GEOMETRY SHOWN ON REFERENCE PLANS 12 & 13 INDICATE THE HATCHED AREA MAY BE SUBJECT TO THE GREEN STREET RIGHT-OF-WAY. R.C.R.D. BOOK 589, PAGE 206 INDICATES FEZ OWNERSHIP EXTENDS TO THE CENTERLINE OF GREEN STREET IN THIS AREA.
  17. TAX MAP 119 LOT 2 SHOWN HEREON IS SUBJECT TO AND/OR IN BENEFIT OF THE FOLLOWING EASEMENTS & COVENANTS:
    - A) SIGNAL FACILITIES EXCEPTIONS AND RESERVATIONS, SEE R.C.R.D. BOOK 1339, PAGE 298, (LOCATION UNKNOWN).
    - B) EASEMENT IN FAVOR OF WESTERN UNION TELEGRAPH COMPANY, SEE R.C.R.D. BOOK 1339, PAGE 298 (NO DIMENSIONS GIVEN).
    - C) ELECTRIC EASEMENT IN FAVOR OF NEW HAMPSHIRE ELECTRIC COMPANY, SEE R.C.R.D. BOOK 1339, PAGE 298 (NO DIMENSIONS GIVEN).
    - D) SENIOR LINE EASEMENT IN FAVOR OF THE CITY OF PORTSMOUTH, SEE R.C.R.D. BOOK 1339, PAGE 298 (LOCATION UNKNOWN).
    - E) ADDITIONAL FIRE RESTRICTION, SEE R.C.R.D. BOOK 1339, PAGE 298.
    - F) POLE AND WIRE AGREEMENT, PER NOTE #8 ON REFERENCE PLAN #1, (RECORDED AGREEMENT NOT FOUND).
    - G) ACCESS RIGHTS, SEE R.C.R.D. BOOK 589, PAGE 206 (LOCATION UNKNOWN).
  18. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL, WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER USING THIS PLAN TO LOCATE THE ABOVE SERVICES CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

REFERENCE PLANS:

1. "STANDARD BOUNDARY SURVEY, TAX MAP 119 - LOT 2, LAND OF STONE CREEK REALTY", DATED MARCH 2016, BY AMBT ENGINEERING, INC., NOT RECORDED.
2. "PLAN OF LAND, VAUGHAN AND GREEN STREETS, PORTSMOUTH, NH" DATED JULY 1955 BY JOHN W. DURGIN R.C.R.D. PLAN #02541.
3. "STANDARD BOUNDARY SURVEY, TAX MAP 123 - LOT 15 & TAX MAP 124 LOT 10" DATED JULY 2008, REVISED 4/25/12 BY AMBT ENGINEERING, INC. R.C.R.D. PLAN #0-37722.
4. "EASEMENT PLAN, EXPRESS EASEMENT TO 319 VAUGHAN STREET CENTER, LLC, TAX MAP 124, LOT 9 & TAX MAP 123, LOT 15, PROPERTY OF 299 VAUGHAN STREET, LLC C/O CATHARTES PRIVATE INVESTMENTS", BY AMBT ENGINEERING, INC., DATED MARCH 2014, R.C.R.D. PLAN #0-35358.
5. "CONDOMINIUM SITE PLAN TAX MAP 124 LOT 14, 253 VAUGHAN STREET, A CONDOMINIUM FOR 233 VAUGHAN STREET, LLC", BY AMBT ENGINEERING, INC., DATED NOVEMBER 2013, R.C.R.D. PLAN #0-39078.
6. "LOT LINE RELOCATION PLAN PROPERTY OF HARBORCORP, LLC & BOSTON & MAINE CORPORATION", BY AMES MSC, DATED MARCH 15, 2006, R.C.R.D. PLAN #0-32675.
7. "LAND AT 233 VAUGHAN STREET PORTSMOUTH, NH BOSTON & MAINE CORPORATION TO BLUE STAR PROPERTIES, LLC", BY JAMES VERRA & ASSOCIATES, INC., DATED 6/5/01, R.C.R.D. PLAN #0-29702.
8. "VAUGHAN STREET URBAN RENEWAL PROJECT N.H. R-10 PORTSMOUTH, NH DISPOSITION MAP", BY ANDERSON-NICHOLS & CO., INC., DATED NOVEMBER 1969, R.C.R.D. PLAN D-2408.
9. "PLAN OF LAND FOR SOLOMON NEGM", BY TOWN PLANNING & ENGINEERING ASSOCIATES, INC., DATED 3/28/79, R.C.R.D. PLAN #0-8575.
10. "VAUGHAN STREET URBAN RENEWAL PROJECT N.H. R-10 PORTSMOUTH, NH, DISPOSITION PLAN PARCEL 2", BY ANDERSON-NICHOLS & CO., INC., DATED OCTOBER 1973, R.C.R.D. PLAN D-4115.
11. "PLAN OF PROPERTY CORNER VAUGHAN AND GREEN STREETS", DATED FEBRUARY 1907, R.C.R.D. PLAN #306.
12. "LAND SHOWING LAND AND WHARFAGE OWNED BY SILAS PERCE AND CO. LTD.", BY A.C. HOYT SURVEYOR, DATED AUGUST 8, 1902, R.C.R.D. PLAN #266.
13. "PLAN OF LAND PORTSMOUTH, NH FOR GEORGE D. EMERSON CO., BY JOHN W. DURGIN, DATED APRIL 1952, ON FILE AT JAMES VERRA AND ASSOCIATES.
14. "PLAN OF LAND VAUGHAN AND GREEN STREETS PORTSMOUTH, NH FOR SAMUEL W. & SUMNER L. POORVU", BY JOHN W. DURGIN, DATED JANUARY 1956, ON FILE AT JAMES VERRA AND ASSOCIATES.
15. "PLAN OF PROPERTY IN PORTSMOUTH, NH OWNED BY R.L. SUGDEN", BY WM A. GROVER, DATED APRIL 15, 1919, ON FILE AT JAMES VERRA AND ASSOCIATES.
16. "LAND ON VAUGHAN STREET PORTSMOUTH, NH, ESTATE OF CARRIE HAM TO LAWRENCE V. REGAN" BY JOHN W. DURGIN, DATED AUGUST 6, 1937, ON FILE AT JAMES VERRA AND ASSOCIATES.
17. "LAND IN PORTSMOUTH, NH, BOSTON & MAINE RAILROAD TO GEORGE D. EMERSON COMPANY", DATED JUNE 1994, R.C.R.D. BOOK 1339, PAGE 305.
18. TRACK PLAN, R.C.R.D. BOOK 1346, PAGE 51.
19. "VAUGHAN STREET URBAN RENEWAL PROJECT N.H. R-10 PORTSMOUTH, NH, APPROVED AS SHOWING VAUGHAN STREET URBAN RENEWAL PROJECT BOUNDARIES AND AREA ONLY, CONDEMNATION MAP", BY ANDERSON-NICHOLS & CO., INC., DATED FEBRUARY 1971, R.C.R.D. PLAN 2425.
20. "SURVEY OF HARBORSIDE & HARBORPARK LAND IN PORTSMOUTH, NH", BY BRIGGS ASSOCIATES, INC., DATED AUGUST 15, 1985, REV. AUGUST 27, 1985, R.C.R.D. PLAN 16043.
21. "SUBDIVISION PLAN OF TAX MAP 123, LOT 15 FOR 299 VAUGHAN STREET, LLC", BY DOUCET SURVEY, INC., DATED MAY 19, 2017, R.C.R.D. PLAN D-40759.
22. "LICENSE, EASEMENT & LAND TRANSFER PLAN FOR VAUGHAN STREET, LLC AND VAUGHAN STREET HOTEL, LLC", BY DOUCET SURVEY, INC., DATED AUGUST 2017, R.C.R.D. PLAN D-40760.
23. "LOT MERGER PLAN FOR VAUGHAN STREET HOTEL, LLC", BY DOUCET SURVEY, INC., DATED SEPTEMBER 2017.
24. "STATION MAP - LANDS, BOSTON AND MAINE RAILROAD OPERATED BY THE BOSTON AND MAINE RAILROAD, STATION 2864+20 TO STATION 3019+0", DATED JUNE 30, 1914, ON FILE AT THE BOSTON AND MAINE CORPORATION.
25. "VAUGHAN STREET PROJECT, PROJECT NO. N.H. R-10, RIGHT OF WAY ADJUSTMENT", BY METCALF & EDDY, DATED MAY 5, 1966, R.C.R.D. PLAN D-2413.
26. "SKETCH OF RAILROAD CONVEYANCE, SEE R.C.R.D. BOOK 446, PAGE 1644.
27. "VAUGHAN STREET URBAN RENEWAL PROJECT N.H. R-10, PORTSMOUTH, NH, DISPOSITION PLAN, PARCEL 2B", BY ANDERSON-NICHOLS & CO., INC., DATED APRIL 1974, R.C.R.D. PLAN DC-4518.
28. "SEWER EASEMENT PLAN, TAX MAP 119, LOT 4, PROPERTY OF NORTH END MASTER DEVELOPMENT LP, GREEN, MARKET & RUSSELL STREETS, PORTSMOUTH, NEW HAMPSHIRE, COUNTY OF ROCKINGHAM", BY TML, DATED JULY 16, 2019.
29. "SUBDIVISION PLAN OF PARCELS 1 & 2 IN PORTSMOUTH, NH FOR THE CITY OF PORTSMOUTH", BY BRIGGS ASSOCIATES INC., DATED AUGUST 1, 1984, R.C.R.D. PLAN D-13798.
30. "VAUGHAN STREET PROJECT, PROJECT NO. N.H. R-10, PROPERTY MAP-A, PORTSMOUTH HOUSING AUTHORITY, PORTSMOUTH, NEW HAMPSHIRE, ROCKINGHAM COUNTY", BY METCALF & EDDY, DATED MAY 5, 1966, R.C.R.D. PLAN D-2410.
31. LAND IN PORTSMOUTH, NH, BOSTON & MAINE RAILROAD TO ROSE R. WOLFSON", DATED JUNE 1954, R.C.R.D. PLAN 2282.



EXISTING CONDITIONS PLAN  
FOR  
TIGHE & BOND  
OF  
STONE CREEK REALTY LLC  
(TAX MAP 119, LOT 2)  
53 GREEN STREET  
PORTSMOUTH, NEW HAMPSHIRE



NO.	DATE	DESCRIPTION	BY

DRAWN BY: E.D.P.	DATE: NOVEMBER 2019
CHECKED BY: M.W.F.	DRAWING NO.: 4383F
JOB NO.: 4383	SHEET: 2 OF 2

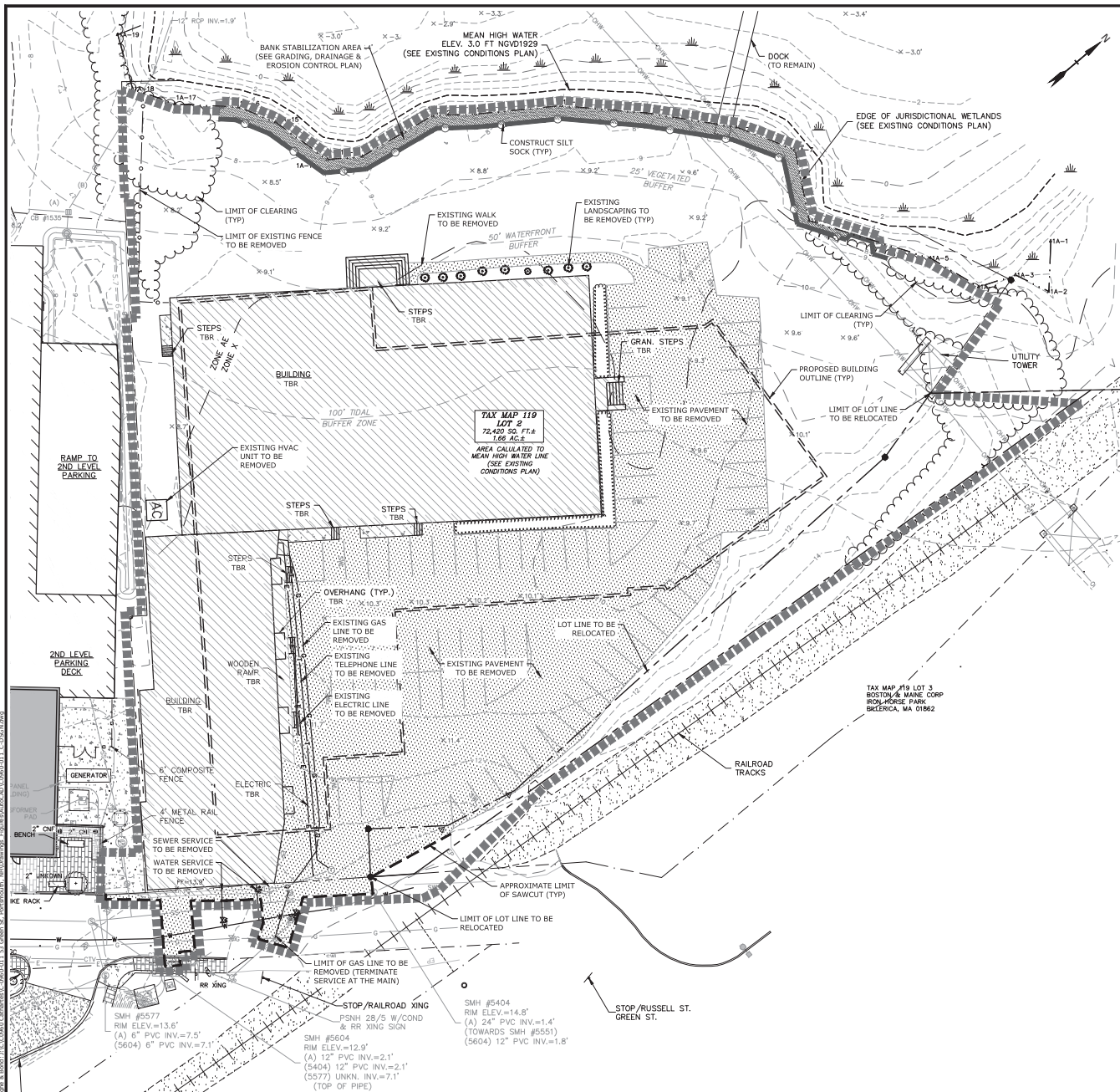
I CERTIFY THAT THIS SURVEY PLAN IS NOT A SUBDIVISION PURSUANT TO THIS TITLE (NHSA TITLE LIV) AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN. I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION AND FALLS UNDER THE URBAN SURVEY CLASSIFICATION OF THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSES FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. RANDOM TRAVERSE SURVEY BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:10,000.

*Matthew W. Fischer*  
DATE: 5/17/23  
L.L.S. #889

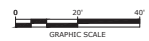


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THE CERTIFICATIONS SHOWN HEREON ARE INTENDED TO MEET REGISTRY OF DEEDS REQUIREMENTS AND ARE NOT A CERTIFICATION TO TITLE OR OWNERSHIP OF PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.



- DEMOLITION NOTES:**
1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
  2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES, CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
  3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
  4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
  5. ANY EXISTING WORK OR PROPERTY DAMAGED OR INTERRUPTED BY CONSTRUCTION/DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
  6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
  7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
  8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
  9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
  10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK. CONTRACTOR SHALL VERIFY LOCATION 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. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
  11. 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.
  12. 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.
  13. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
  14. 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.
  15. 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.
  16. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT MAY 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 ACP 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 LOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
  17. 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.
  18. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
  19. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADEING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
  20. 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.



**Proposed Mixed Use Development**

**CPI Management, LLC**

53 Green Street  
Portsmouth, NH

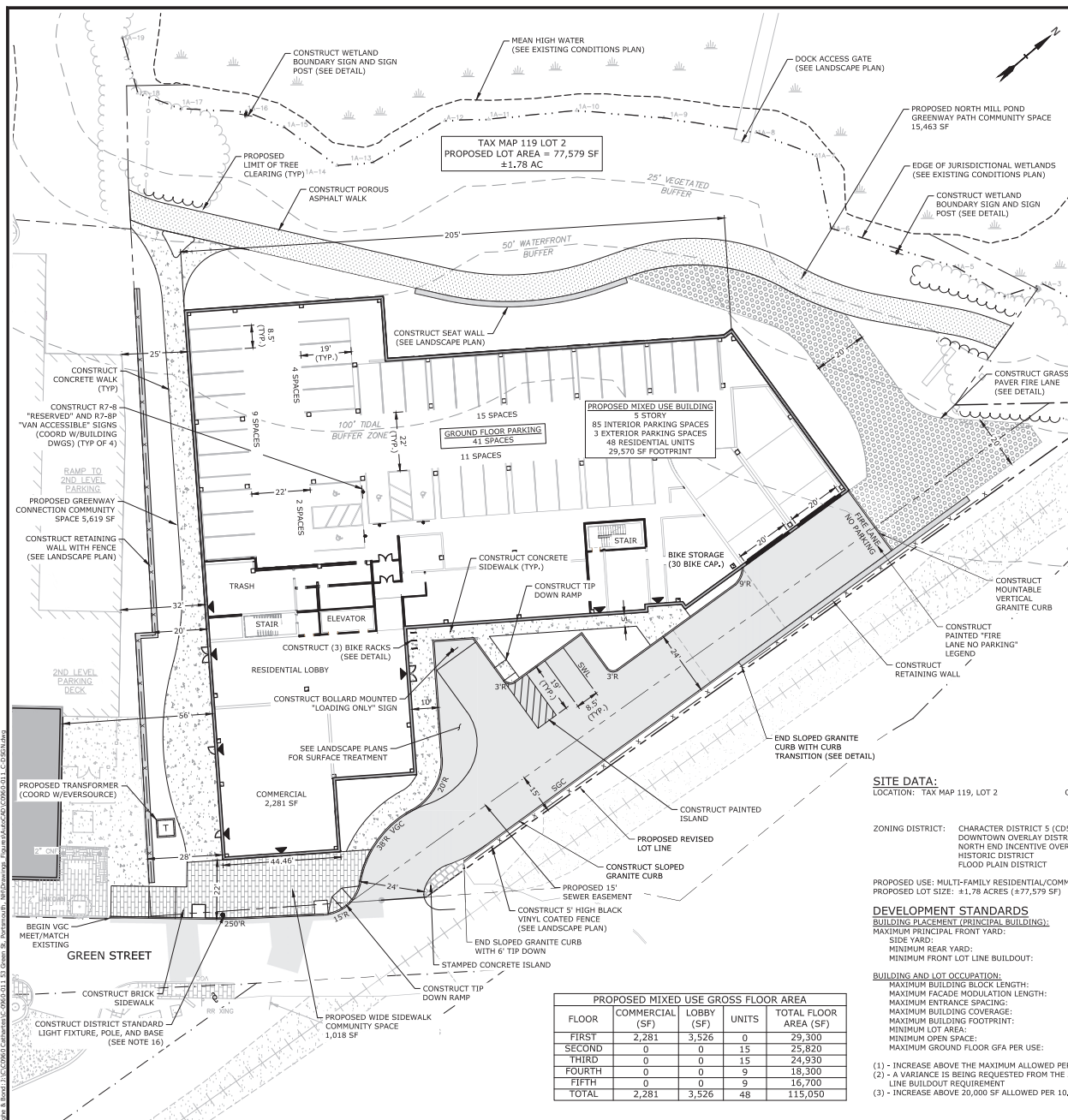
- LEGEND**
- APPROXIMATE LIMIT OF PROPOSED SAW CUT
  - PROPERTY LINE
  - PROPERTY LINE TO BE REMOVED
  - LIMIT OF WORK
  - PROPOSED SILT SOCK
  - APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
  - LOCATION OF PROPOSED BUILDING
  - BUILDING TO BE REMOVED
  - TBR --- TO BE REMOVED
  - TYP --- TYPICAL

MARK	DATE	DESCRIPTION
D	5/19/2021	TAC Resubmission
C	4/21/2021	TAC Resubmission
B	3/22/2021	TAC & CC Submission
A	1/27/2021	CC Work Session

PROJECT NO: C0960-011  
DATE: January 27, 2021  
FILE: C0960-011\_C\_DSGN.DWG  
DRAWN BY: JES  
CHECKED: NHH/PMC  
APPROVED: BLM

**DEMOLITION PLAN**

SCALE: AS SHOWN



- SITE NOTES:**
1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSSWALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M249 TYPE "F").
  2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
  3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
  4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
  5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3"-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
  6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
  7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
  8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND CITY CODES & SPECIFICATIONS.
  9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
  10. CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILE) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
  11. SEE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
  12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS.
  13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
  14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
  15. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
  16. THE STREET LIGHTING TYPE TO BE DISTRICT STYLE FIXTURE AND POLE TO MATCH EXISTING LIGHTING ON GREEN STREET.
  17. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
  18. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
  19. ALL TREES PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
  20. THE APPLICANT SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.
  21. A TEMPORARY SUPPORT OF EXCAVATION (SOE) PLAN SHALL BE PREPARED BY THE APPLICANT'S CONTRACTOR TO COVER 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.
  22. ALL EXCESS SNOW SHALL BE HAULED OFF-SITE IN ACCORDANCE TO ALL LOCAL AND STATE LAWS. PROPOSED SNOW STAGING AREAS HAVE BEEN PROVIDED TO SHOW TEMPORARY SNOW STORAGE AREAS.
  23. AREAS DESIGNATED FOR FIRE EMERGENCY ACCESS SHALL BE KEPT CLEAR OF SNOW.

- SITE RECORDING NOTES:**
1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
  2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
  3. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

**LEGEND**

	PROPERTY LINE		PROPOSED POROUS PAVEMENT
	PROPOSED PROPERTY LINE		PROPOSED PAVEMENT
	ABUTTER PROPERTY LINE		PROPOSED GRASS PAVER
	PROPOSED EASEMENT		TYPICAL
	PROPOSED EDGE OF PAVEMENT		PROPOSED CURB RADIUS
	PROPOSED CURB		PROPOSED VERTICAL GRANITE CURB
	PROPOSED BUILDING		PROPOSED SLOPED GRANITE CURB
	PROPOSED BRICK SIDEWALK		SOLID WHITE LINE
	PROPOSED CONCRETE SIDEWALK		CAPACITY
	PROPOSED STAMPED CONCRETE		

**SITE DATA:**  
 LOCATION: TAX MAP 119, LOT 2  
 OWNER: STONE CREEK REALTY LLC  
 C/O DOUGLAS PINCIARO  
 90 BOX 121  
 NEW CASTLE, NH 03854

**ZONING DISTRICT:** CHARACTER DISTRICT 5 (CDS)  
 DOWNTOWN OVERLAY DISTRICT  
 NORTH END INCENTIVE OVERLAY DISTRICT  
 HISTORIC DISTRICT  
 FLOOD PLAIN DISTRICT

**PROPOSED USE:** MULTI-FAMILY RESIDENTIAL/COMMERCIAL  
 PROPOSED LOT SIZE: ±1.78 ACRES (±77,579 SF)

**BUILDING FORM (PRINCIPAL BUILDING):**

BUILDING HEIGHT:	REQUIRED 5 STORIES <sup>(1)</sup>	PROPOSED 5 STORIES
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	0 IN
MINIMUM GROUND STORY HEIGHT:	12 FT	> 12 FT
MINIMUM SECOND STORY HEIGHT:	10 FT	> 10 FT

**FAÇADE GLAZING:**

SHOP FRONT	20% - 50%	20% - 50%
ALLOWED ROOF TYPES	FLAT, GABLE, HIP, GAMBREL, MANSARD	FLAT

(3) - ADDITIONAL 1 STORY UP TO 10FT ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE PER 10,5446.10.

**DEVELOPMENT STANDARDS**

**BUILDING PLACEMENT (PRINCIPAL BUILDING):**

REQUIRED	PROPOSED
5 FT	16 FT <sup>(2)</sup>
MAXIMUM PRINCIPAL FRONT YARD:	
SIDE YARD:	> 5 FT
MINIMUM REAR YARD:	42.9% <sup>(2)</sup>
MINIMUM FRONT LOT LINE BUILDOUT:	
REQUIRED	PROPOSED
225 FT	205 FT
MAXIMUM BUILDING BLOCK LENGTH:	
100 FT	< 100 FT
MAXIMUM FACADE MODULATION LENGTH:	
50 FT	< 50 FT
MAXIMUM ENTRANCE SPACING:	
95%	38%
MAXIMUM BUILDING COVERAGE:	
30,000 SF <sup>(3)</sup>	29,570 SF
MAXIMUM BUILDING FOOTPRINT:	
NR	5%
MINIMUM LOT AREA:	
5%	35%
MINIMUM OPEN SPACE:	
15,000 SF	5,500 SF

**COMMUNITY SPACE:**

REQUIRED	PROPOSED
20%	28.5%
15,516 SF	22,100 SF

**PARKING REQUIREMENTS**

RESIDENTIAL UNITS (> 750 SF)	48 UNITS x 1.3 SPACES	63 SPACES
VISITOR SPACES	1 SPACE / 5 UNITS	10 SPACES
DOWNTOWN OVERLAY DISTRICT	-4 SPACES	-4 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		69 SPACES

**PARKING SPACES**

REQUIRED	PROPOSED
69 SPACES	88 SPACES

**ADA PARKING SPACES**

REQUIRED	PROPOSED
4 SPACES	4 SPACES

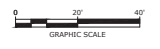
**BICYCLE SPACES**

REQUIRED	PROPOSED
1 BICYCLE SPACE / 10 PARKING SPACES:	10 SPACES
INDOOR BIKE STORAGE WILL BE PROVIDED THAT MEETS OR EXCEEDS REQUIRED.	30 SPACES

**PROPOSED MIXED USE GROSS FLOOR AREA**

FLOOR	COMMERCIAL (SF)	LOBBY (SF)	UNITS	TOTAL FLOOR AREA (SF)
FIRST	2,281	3,526	0	29,300
SECOND	0	0	15	25,820
THIRD	0	0	15	24,930
FOURTH	0	0	9	18,300
FIFTH	0	0	9	16,700
TOTAL	2,281	3,526	48	115,050

- (1) - INCREASE ABOVE THE MAXIMUM ALLOWED PER 10,5442.12
- (2) - A VARIANCE IS BEING REQUESTED FROM THE ZONING BOARD FROM THE FRONT LOT LINE BUILDOUT REQUIREMENT
- (3) - INCREASE ABOVE 20,000 SF ALLOWED PER 10,5443.42



**Proposed Mixed Use Development**

**CPI Management, LLC**

53 Green Street  
 Portsmouth, NH

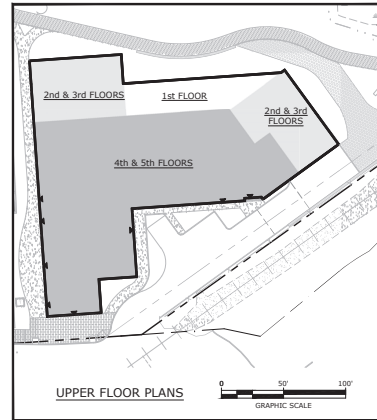
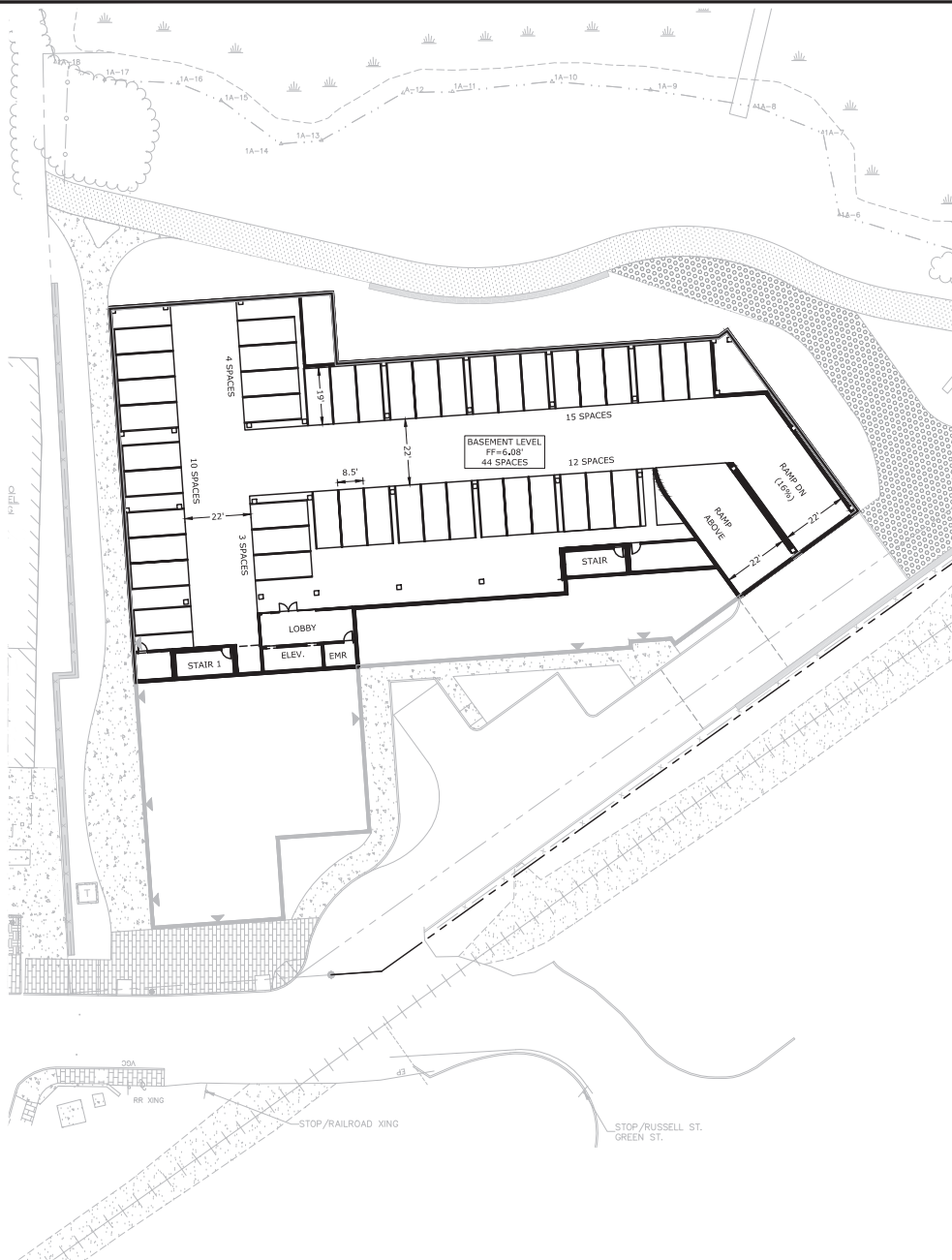
MARK	DATE	DESCRIPTION
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A	1/27/2021	CC Work Session

PROJECT NO: C0960-011  
 DATE: January 27, 2021  
 FILE: C0960-011\_C\_DSGN.DWG  
 DRAWN BY: JDS  
 CHECKED: NHH/PMC  
 APPROVED: BLM

**SITE PLAN**

SCALE: AS SHOWN

53 Green Street, Portsmouth, NH 03801  
 Date: 1/27/2021  
 Drawn by: BLM  
 Checked by: BLM  
 Project No: C0960-011  
 File: C:\Users\blm\OneDrive\Projects\C0960-011\_C-DWG.dwg



**Tight & Bond**



**Proposed Mixed Use Development**

CPI Management, LLC

53 Green Street  
Portsmouth, NH


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DRAWN BY:	BLM	
CHECKED BY:	NAH/PMC	
APPROVED:	BLM	

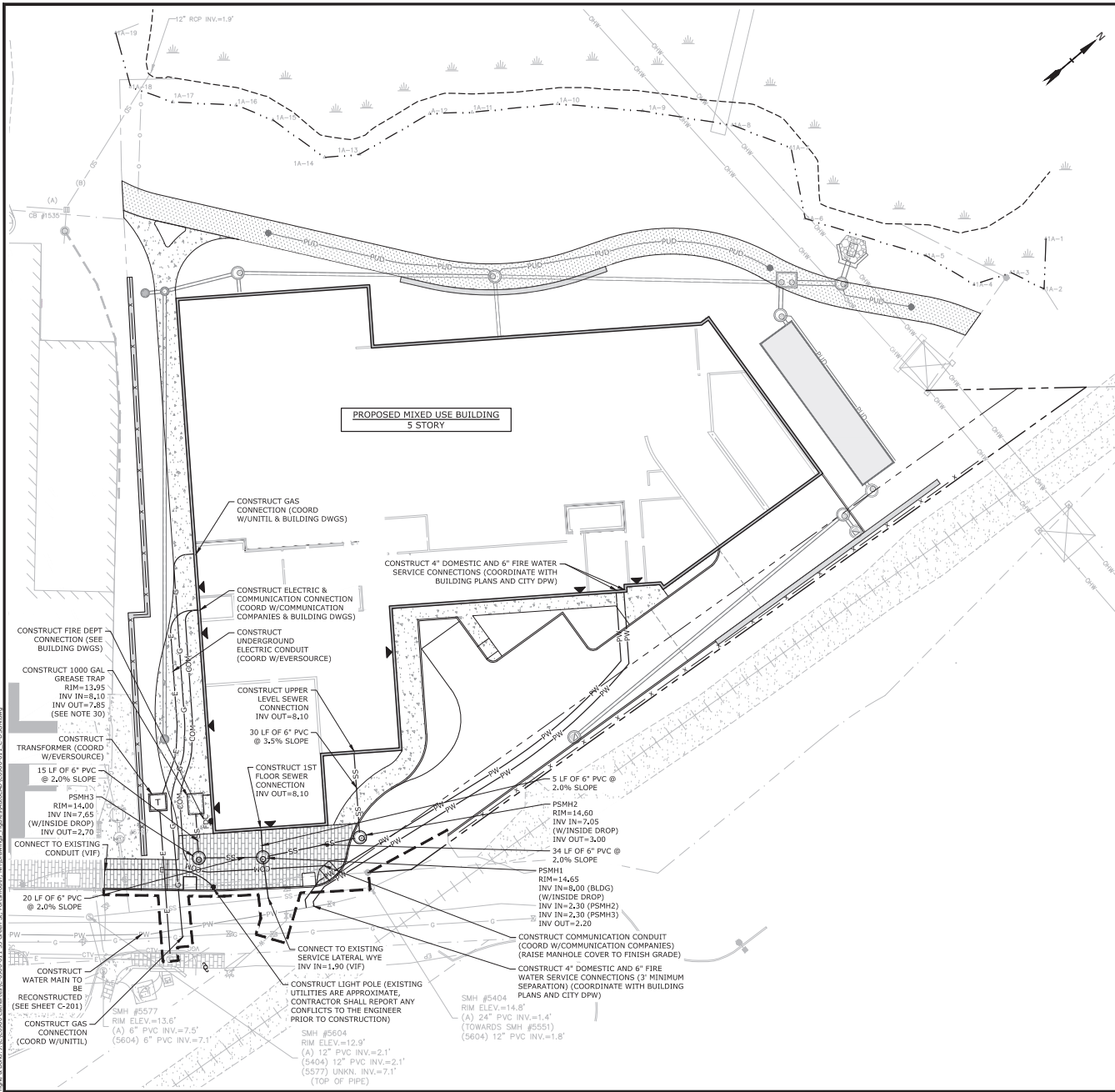
BASEMENT & UPPER FLOOR PLAN  
SCALE: AS SHOWN

C-102.2

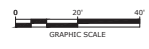


STATE OF NEW HAMPSHIRE  
 BRADLEE WILCOULTA  
 NO. 6630  
 LICENSED PROFESSIONAL ENGINEER  
 5-19-21

STATE OF NEW HAMPSHIRE  
 PATRICK M. HARRIS  
 NO. 12175  
 LICENSED PROFESSIONAL ENGINEER  
 5-19-21



- UTILITY NOTES**
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
  - COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
    - NATURAL GAS - UNITIL
    - WATER/SEWER - CITY OF PORTSMOUTH
    - ELECTRIC - EVERSOURCE
    - COMMUNICATIONS - FAIRPOINT AND COMCAST
  - SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
  - SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
  - ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
  - 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 PORTSMOUTH WATER DEPARTMENT.
  - ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
  - COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
  - CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ADJUTING PROPERTIES THROUGHOUT CONSTRUCTION.
  - CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
  - 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.
  - ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
  - THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
  - ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
  - ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
  - THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
  - 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.
  - CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
  - A 18-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.
  - THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
  - CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
  - SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
  - HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
  - COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
  - ALL SEWER PIPE WITH LESS THAN 5' OF COVER SHALL BE INSULATED.
  - 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.
  - CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ADJUTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ADJUTERS WITH THE UTILITY COMPANY AND AFFECTED ADJUTER.
  - SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
  - CONTRACTOR SHALL PERFORM TEST FITS TO VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IF CONNECTIONS DIFFER FROM PLAN.
  - PROPOSED GREASE TRAP AND GREASE WASTE SERVICE CONNECTION TO BE CONSTRUCTED IF PROPOSED COMMERCIAL SPACE BECOMES RESTAURANT USE.



**Proposed Mixed Use Development**

CPI Management, LLC

53 Green Street  
Portsmouth, NH

**LEGEND**

SD	EXISTING STORM DRAIN
SS	EXISTING SANITARY SEWER
SS	EXISTING SANITARY SEWER TO BE ABANDONED
W	EXISTING WATER SERVICE
G	EXISTING GAS SERVICE
E	EXISTING UNDERGROUND ELECTRIC SERVICE
DHW	EXISTING OVERHEAD UTILITY SERVICE
SS	PROPOSED SEWER
SS	PROPOSED STORM DRAIN
SS	PROPOSED SANITARY SEWER
PW	PROPOSED WATER SERVICE
G	PROPOSED GAS SERVICE
G	PROPOSED STREET LIGHTING CONDUIT
PE&C	PROPOSED UNDERGROUND ELECTRIC AND COMMUNICATION SERVICE

⊙	EXISTING DRAIN MANHOLE	⊙	PROPOSED CATCHBASIN
⊙	EXISTING SEWER MANHOLE	⊙	PROPOSED DRAIN MANHOLE
⊙	PREVIOUSLY APPROVED SEWER MANHOLE	⊙	PROPOSED SEWER MANHOLE
⊙	EXISTING HYDRANT	⊙	PROPOSED WATER VALVE
⊙	EXISTING WATER VALVE	⊙	PROPOSED FIRE DEPARTMENT BUILDING CONNECTION
⊙	EXISTING WATER SHUTOFF	⊙	PROPOSED GAS VALVE
⊙	EXISTING ELECTRIC MANHOLE	⊙	PROPOSED LIGHT POLE BASE
⊙	EXISTING PAD MOUNTED TRANSFORMER	BLDG	BUILDING
⊙	EXISTING GAS VALVE	TYP	TYPICAL
⊙	EXISTING MANHOLE	COORD	COORDINATE
⊙	EXISTING COMMUNICATION MANHOLE	VIF	VERIFY IN FIELD

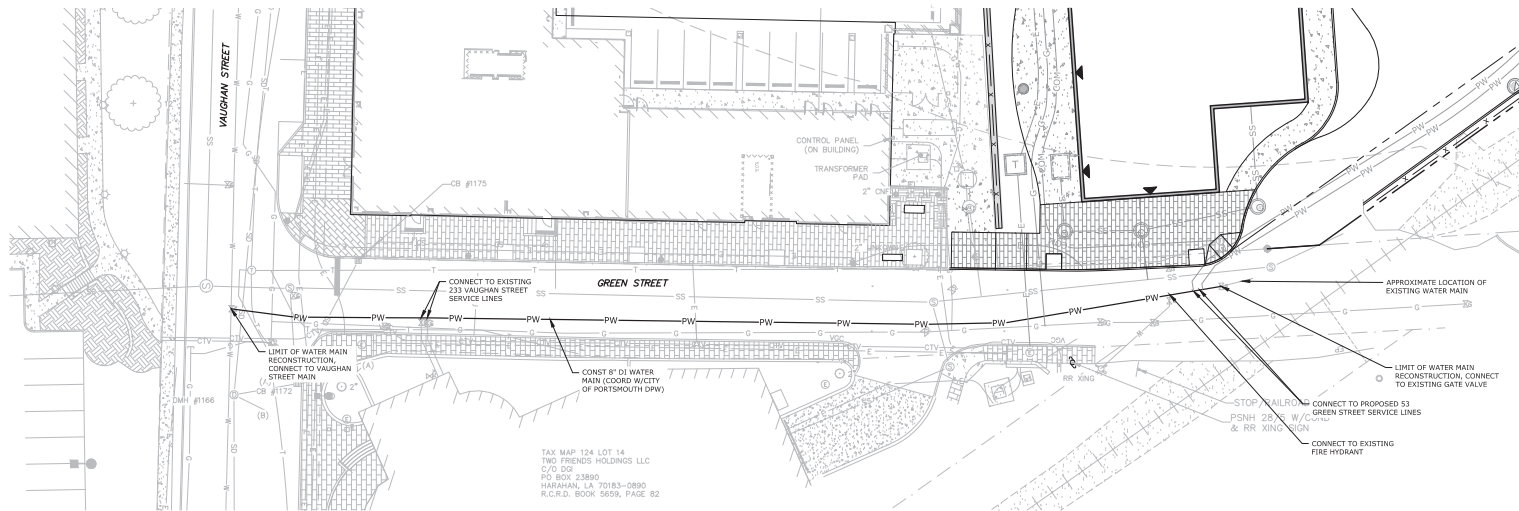
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DRAWN BY:	JDS
CHECKED:	NAH/PVC
APPROVED:	BLM

**UTILITIES PLAN**

SCALE: AS SHOWN





TAX MAP 124 LOT 14  
TWO FRIENDS HOLDINGS LLC  
C/O DD  
PO BOX 53860  
HARRAHAN, LA 70183-0860  
R.C.R.D. BOOK 5659, PAGE 82



**UTILITY NOTES:**

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
  - NATURAL GAS - UNTIL
  - WATER/SEWER - CITY OF PORTSMOUTH
  - ELECTRIC - EVERSOURCE
  - COMMUNICATIONS - FAIRPOINT AND COMCAST
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
6. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE PORTSMOUTH WATER DEPARTMENT.
7. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
8. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
9. CONNECTIONS TO EXISTING WATER LINES SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
10. 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.
11. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
12. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC., WITHIN LIMITS OF WORK TO FINISH GRADE.
13. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
14. 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.
15. 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.
16. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
17. CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (DWG FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
18. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
19. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
20. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
21. CONTRACTOR SHALL PERFORM TEST PITS TO VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION AND SHALL NOTIFY ENGINEER IF LOCATIONS DIFFER FROM PLAN.

**GREEN STREET PAVING:**

1. AFTER UTILITY CONSTRUCTION, CONTRACTOR SHALL MILL GREEN STREET PAVEMENT AT A DEPTH OF 1.5" AND PAVE WEARING COURSE TO EXISTING GRADE. LIMITS OF MILL AND PAVING SHALL BE COORDINATED WITH THE CITY PRIOR TO CONSTRUCTION.

**LEGEND**

—SS—	EXISTING STORM DRAIN	⊗	PROPOSED CATCHBASIN
—SS—	EXISTING SANITARY SEWER	⊗	PROPOSED DRAIN MANHOLE
—SS—	EXISTING SANITARY SEWER TO BE ABANDONED	⊗	PROPOSED SEWER MANHOLE
—W—	EXISTING WATER SERVICE	⊗	PROPOSED WATER VALVE
—G—	EXISTING GAS SERVICE	⊗	PROPOSED GAS VALVE
—E—	EXISTING UNDERGROUND ELECTRIC SERVICE	⊗	PROPOSED LIGHT POLE BASE
—OHV—	EXISTING OVERHEAD UTILITY SERVICE	BLDG	BUILDING
—SS—	PREVIOUSLY APPROVED SEWER	TYP	TYPICAL
—SS—	PROPOSED STORM DRAIN	COORD	COORDINATE
—SS—	PROPOSED SANITARY SEWER	VIF	VERIFY IN FIELD
—PW—	PROPOSED WATER SERVICE	DWGS	DRAWINGS
—G—	PROPOSED GAS SERVICE		
—E—	PROPOSED STREET LIGHTING CONDUIT		
—PE&C—	PROPOSED UNDERGROUND ELECTRIC AND COMMUNICATION SERVICE		
⊗	EXISTING DRAIN MANHOLE		
⊗	EXISTING SEWER MANHOLE		
⊗	PREVIOUSLY APPROVED SEWER MANHOLE		
⊗	EXISTING HYDRANT		
⊗	EXISTING WATER VALVE		
⊗	EXISTING WATER SHUTOFF		
⊗	EXISTING ELECTRIC MANHOLE		
⊗	EXISTING PAD MOUNTED TRANSFORMER		
⊗	EXISTING GAS VALVE		
⊗	EXISTING HANDHOLE		
⊗	EXISTING COMMUNICATION MANHOLE		

**Proposed Mixed Use Development**

**CPI Management, LLC**

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Portsmouth, NH

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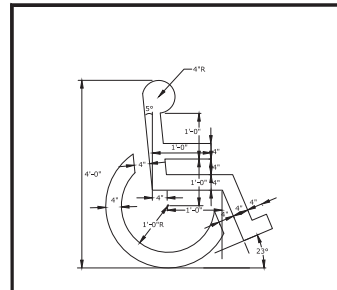
**WATER MAIN REPLACEMENT PLAN**

SCALE: AS SHOWN

Lark Street 5/19/2021 11:10 AM by: MHA/NAH  
 Name & Email: L:\CADD\submittals\C0960-011\_C-DSGN.DWG  
 Lark Street 5/19/2021 11:10 AM by: MHA/NAH

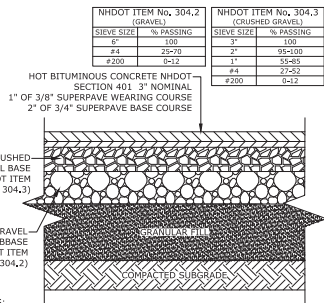






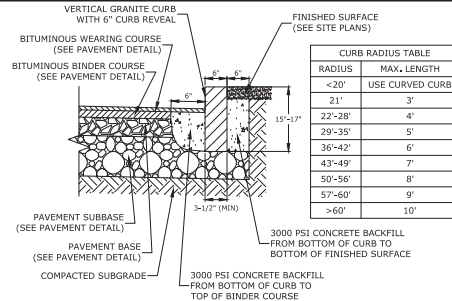
- NOTES:
- SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
  - SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

**ACCESSIBLE SYMBOL**  
NO SCALE



- NOTES:
- SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
  - SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
  - A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
  - REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.
  - CONTRACTOR SHALL CONFIRM THIS PAVEMENT SECTION WITH THE PROJECT'S GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.

**ON-SITE PAVEMENT SECTION**  
NO SCALE



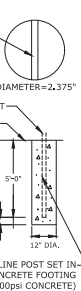
- NOTES:
- SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
  - ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
  - MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
  - MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
  - MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (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



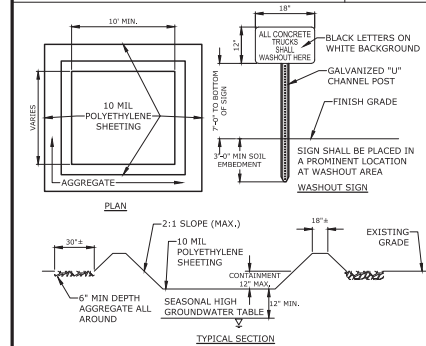
- NOTES:
- ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
  - POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
  - FINISH: POST TO BE POWDER COATED GLOSS BLACK
  - LENGTH: AS REQUIRED
  - WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)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



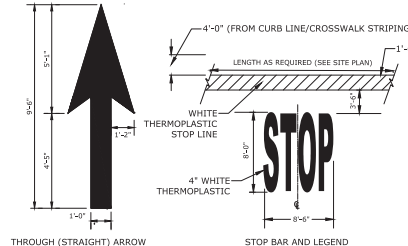
LINE POST SET IN CONCRETE FOOTING (3,000psi CONCRETE)

**Tight & Bond**



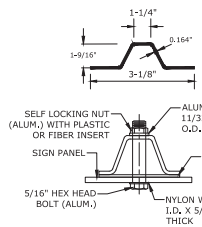
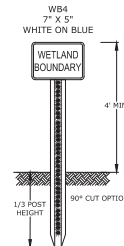
- NOTES:
- CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
  - CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
  - WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
  - WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
  - ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
  - AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

**CONCRETE WASHOUT AREA**  
NO SCALE



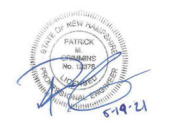
- NOTE:
- PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
  - ALL STOP BARS, WORDS, SYMBOLS AND ARROWS SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC. REFLECTORIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4595

**PAVEMENT MARKINGS**  
NO SCALE



- POST:
- LENGTH: AS REQUIRED
  - WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
  - HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080) SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.
  - FINISH:

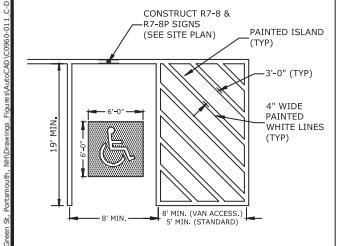
**WETLAND BOUNDARY SIGN & SIGN POST**  
NO SCALE



**Proposed Mixed Use Development**

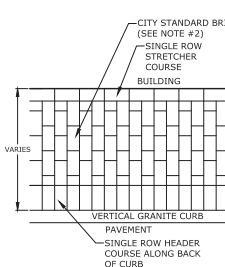
CPI Management, LLC

53 Green Street  
Portsmouth, NH

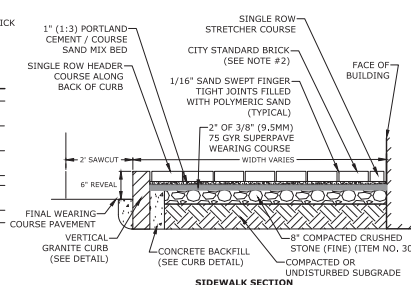


- NOTES:
- ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
  - SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN DISABILITIES ACT.

**ACCESSIBLE PARKING STALL**  
NO SCALE



**SIDEWALK PLAN VIEW**

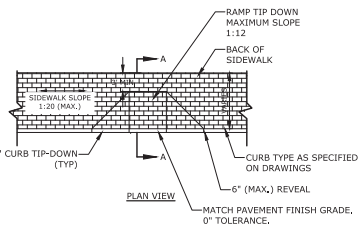


**SIDEWALK SECTION**

- NOTES:
- BRICK SIDEWALK SHALL BE INSTALLED AS DETAILED AND PER CITY OF PORTSMOUTH REQUIREMENTS/SPECIFICATIONS AND SHALL INCLUDE A CONTINUOUS APPROVED 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" PAVEN, 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 I/TYPE II.

**BRICK SIDEWALK**  
NO SCALE

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIIEVE SIZE	% PASSING
2"	100
20"	85-100
1"	50-60
#4	25-50
#200	0-12



- NOTES:
- RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
  - A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
  - 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.
  - TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 3% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURBLINE.
  - THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.

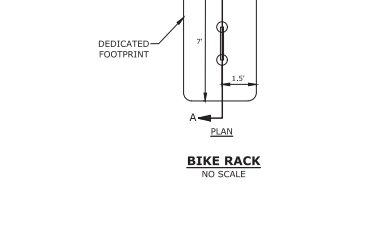
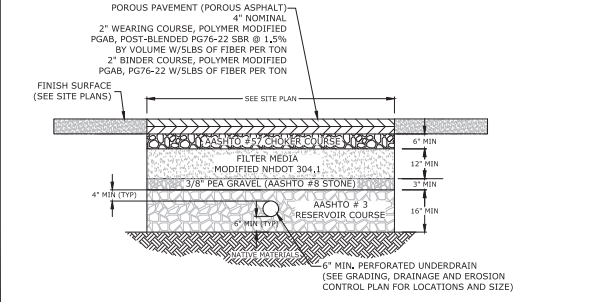
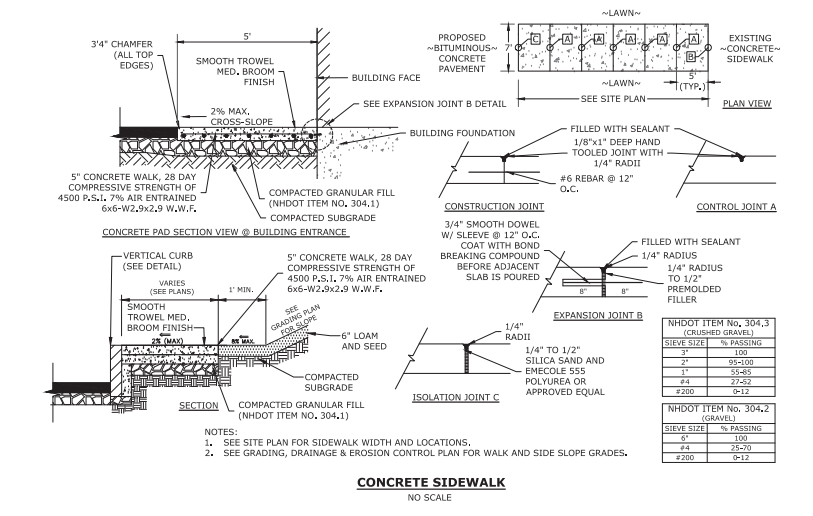
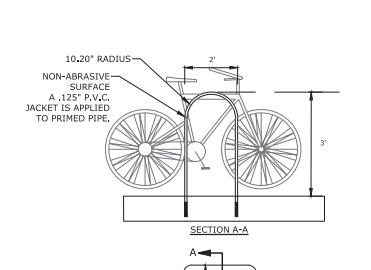
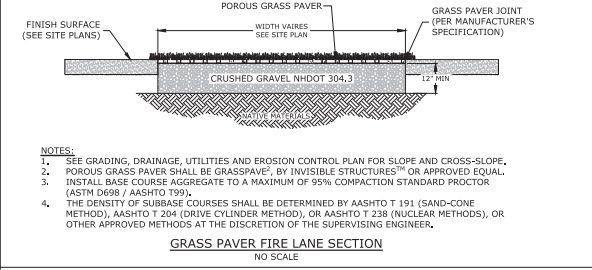
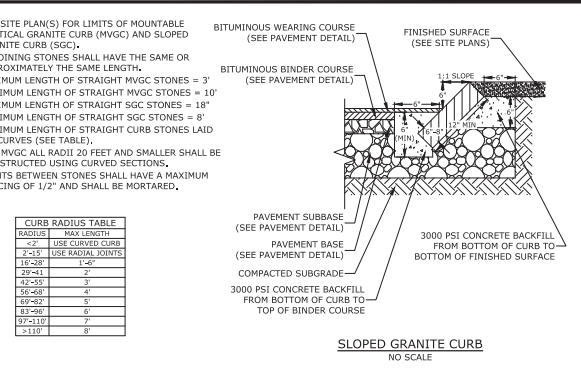
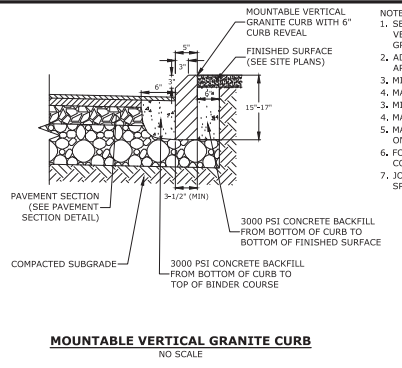
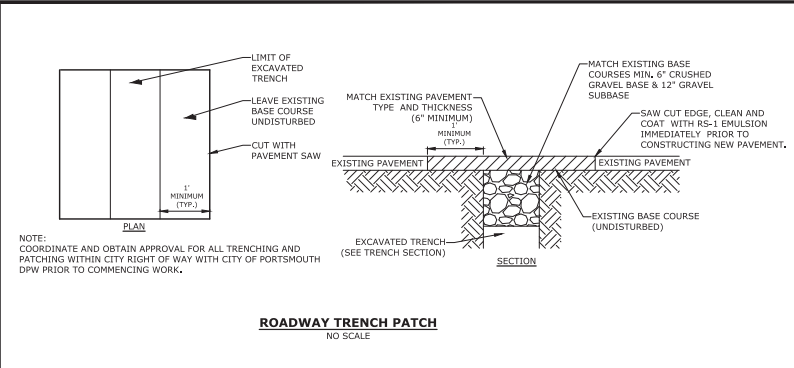
**SIDEWALK TIP DOWN RAMP**  
NO SCALE

MARK	DATE	DESCRIPTION
D	5/19/2021	TAC Resubmission
C	4/21/2021	TAC Resubmission
B	3/22/2021	TAC & CC Submission
A	1/17/2021	CC Work Session

PROJECT NO: C0960-011  
DATE: January 27, 2021  
FILE: C0960-011\_C-UTLS.DWG  
DRAWN BY: JWS  
CHECKED: NAW/PNC  
APPROVED: BLM

**DETAILS SHEET**

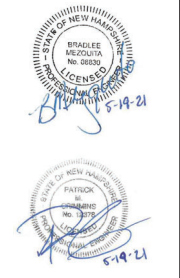
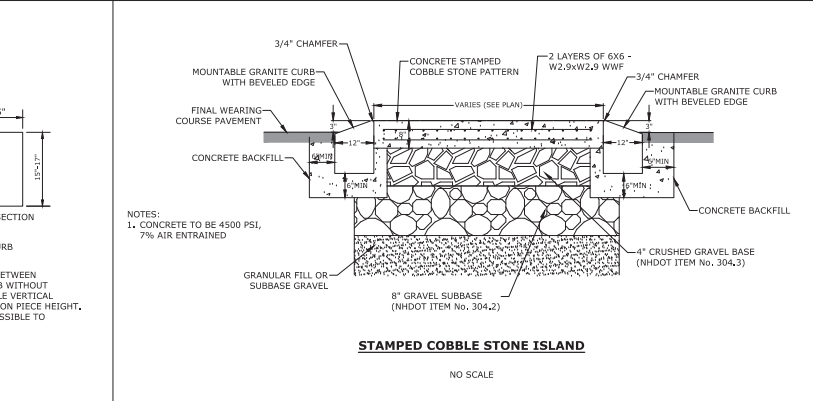
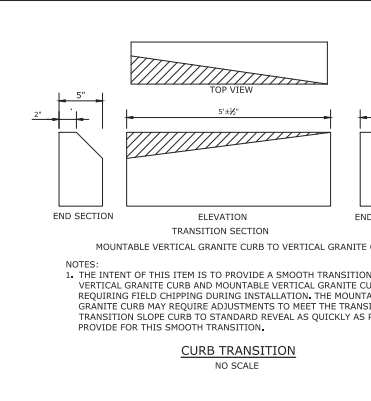
SCALE: AS SHOWN



**NOTES:**

- SEE GRADING, DRAINAGE, UTILITIES AND EROSION CONTROL PLAN FOR SLOPE AND CROSS-SLOPE.
- GRAVEL SECTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS FROM THE UNH STORMWATER CENTER FOR POROUS ASPHALT.
- FILTER COURSE TO BE INCREASED AS NECESSARY TO MEET PROPOSED GRADES.
- INSTALL FILTER COURSE AGGREGATE IN 8-INCH MAXIMUM LIFTS TO A MAXIMUM OF 95% STANDARD PROCTOR COMPACTION (ASTM D698 / AASHTO T99). INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
- INSTALL CHOKER, GRAVEL, AND STONE BASE COURSE AGGREGATE TO A MAXIMUM OF 95% COMPACTION STANDARD PROCTOR (ASTM D698 / AASHTO T99). CHOKER SHOULD BE PLACED EVENLY OVER SURFACE OF FILTER COURSE BED, SUFFICIENT TO ALLOW PLACEMENT OF PAVEMENT. AND NOTIFY ENGINEER FOR APPROVAL. CHOKER BASE COURSE THICKNESS SHALL BE SUFFICIENT TO ALLOW FOR EVEN PLACEMENT OF THE POROUS ASPHALT BUT NO LESS THAN 4-INCHES IN DEPTH.
- THE DENSITY OF SUBBASE COURSES SHALL BE DETERMINED BY AASHTO T 191 (SAND-CONE METHOD), AASHTO T 204 (DRIVE CYLINDER METHOD), OR AASHTO T 238 (NUCLEAR METHODS), OR OTHER APPROVED METHODS AT THE DISCRETION OF THE SUPERVISING ENGINEER.

AASHTO #3 STONE (RESERVOIR COURSE)		AASHTO #8 STONE (PEA GRAVEL)		MODIFIED NHDOT 304.1		NHDOT ITEM No. 304.2 (CRUSHED GRAVEL)	
SIZE	% PASSING	SIZE	% PASSING	SIZE	% PASSING	SIZE	% PASSING
24"	100	2"	100	6"	100	2"	95-100
2"	95-100	4"	95-100	4"	95-100	4"	55-65
1 1/2"	35-70	2 1/4"	10-30	#200	0-5	2 1/2"	27-32
1"	0-15	#8	0-10			#200	0-12
3/4"	0-5	#16	0-5				



**Proposed Mixed Use Development**

CPI Management, LLC

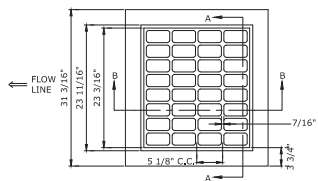
53 Green Street  
Portsmouth, NH

MARK	DATE	DESCRIPTION
D	5/19/2021	TAC Resubmission
C	4/21/2021	TAC Resubmission
B	3/22/2021	TAC & CC Submission
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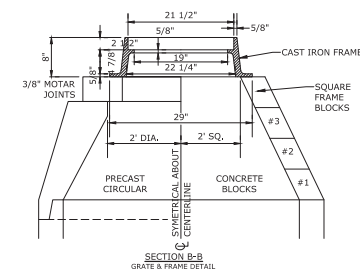
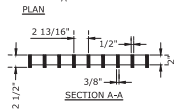
PROJECT NO: C0960-011  
DATE: January 27, 2021  
FILE: C0960-011\_C-UTLS.DWG  
DRAWN BY: JPS  
CHECKED: NAW/PNC  
APPROVED: BLM

**DETAILS SHEET**

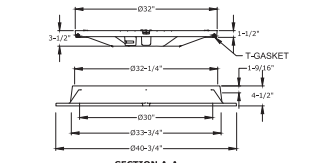
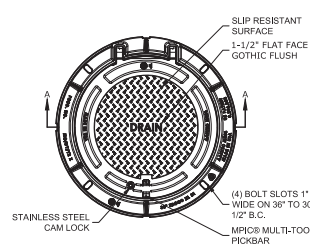
SCALE: AS SHOWN



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

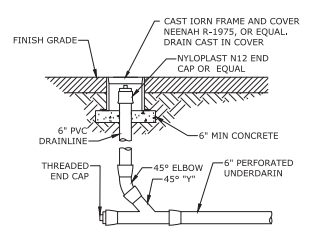


**CATCH BASIN FRAME & GRATE**  
NO SCALE

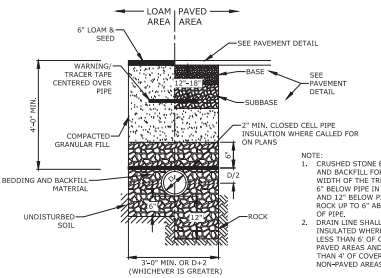


- NOTES:  
1. MANHOLE FRAME AND COVER SHALL BE 32\"/>

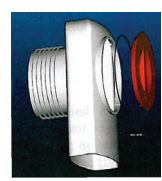
**DRAIN MANHOLE FRAME & COVER**  
NO SCALE



**DRAIN CLEAN-OUT**  
NO SCALE



**STORM DRAIN TRENCH**  
NO SCALE

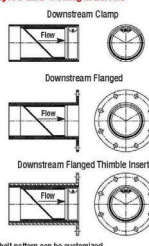


- NOTES:  
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTRAP (NO EQUAL)  
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.  
3. 1/4\"/>

**"ELIMINATOR" OIL FLOATING DEBRIS TRAP**  
NO SCALE

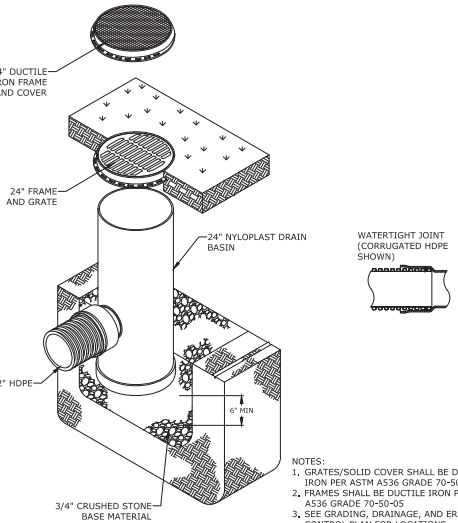
NOMINAL PIPE SIZE I.D.*		OVERALL LENGTH**		NUMBER OF CLAMPS	CHFF DEPTH	BACK PRESSURE RATING	
Inches	Millimeters	Inches	Millimeters		Inches	Feet	Meters
18	450	31	787	1	4	102	20
							6

**Mounting Styles and Configurations**



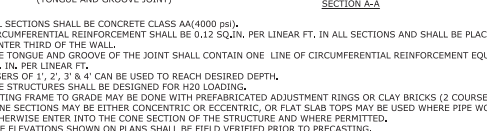
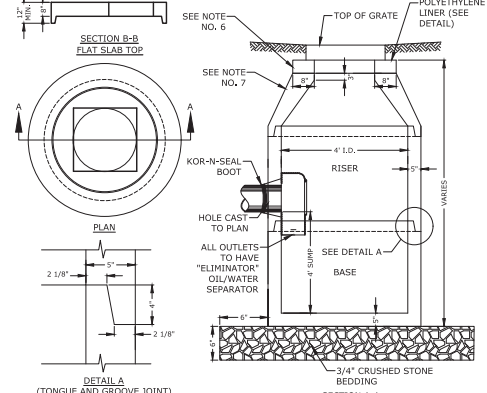
Flange shape and bolt pattern can be customized. Flangeless thimble inserts are available.

**TYPICAL BACK FLOW PREVENTER**  
NO SCALE



- NOTES:  
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.  
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05  
3. SEE GRADING, DRAINAGE, AND EROSION CONTROL PLAN FOR LOCATIONS.

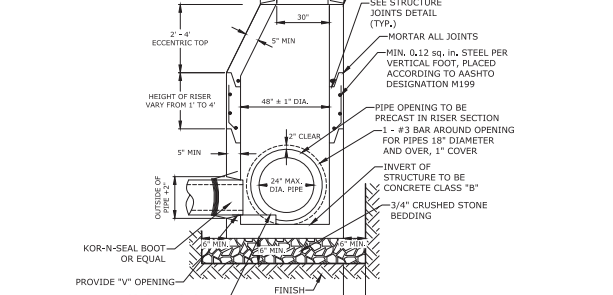
**YARD DRAIN**  
NO SCALE



- 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\"/>

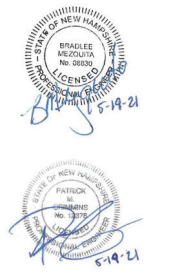
**4\"/>**

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	% 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. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6\"/>

**4\"/>**



**Proposed Mixed Use Development**

CPI Management, LLC

53 Green Street  
Portsmouth, NH

MARK	DATE	DESCRIPTION
D	5/19/2021	TAC Resubmission
C	4/21/2021	TAC Resubmission
C	3/22/2021	TAC & CC Submission
A	1/27/2021	CC Work Session

PROJECT NO: C0960-011

DATE: January 27, 2021

FILE: C0960-011\_C-UTLS.DWG

DRAWN BY: JFS

CHECKED: NAW/PNC

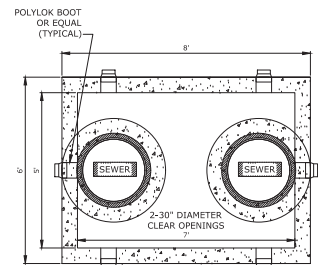
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DETAILS SHEET

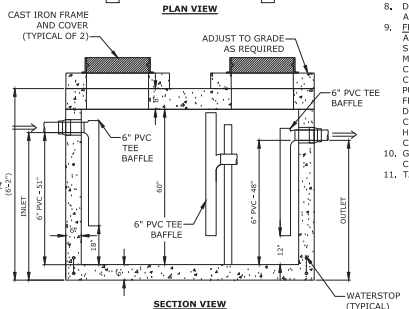
SCALE: AS SHOWN

C-504

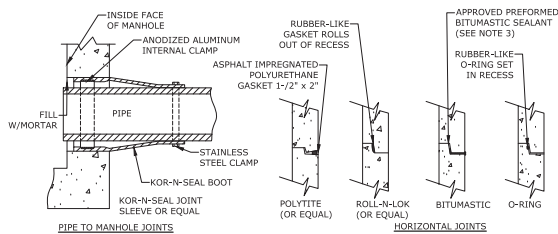
Auto Saved: 01/27/2021 14:09:00 Rev: 4546 Rev: 4546  
Name: Patrick M. Gagnier License No. 519-21  
Title: Professional Engineer State of New Hampshire  
Address: 10000 Highway 103, Portsmouth, NH 03801-3133  
Phone: 603-431-3333  
Fax: 603-431-3333  
E-mail: p.gagnier@tightandbond.com



- NOTES:**
1. STEEL REINFORCEMENT SHALL CONFORM TO LATEST ASTM SPECIFICATIONS: ASTM-A635 GRADE 60 REBAR.
  2. CONCRETE SHALL BE  $F_c=5,000$  PSI @ 28 DAYS MINIMUM.
  3. FLEXIBLE SLEEVES SHALL BE PROVIDED ON ALL PIPE CONNECTIONS.
  4. JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
  5. INLET SHALL PENETRATE AT LEAST 9" BELOW THE LIQUID LEVEL, BUT NOT DEEPER THAN THE OUTLET BAFFLE.
  6. OUTLET SHALL EXTEND BELOW THE SURFACE OF THE LIQUID EQUAL TO 40% OF THE LIQUID DEPTH (19").
  7. DESIGN LOADING SHALL BE: AASHTO-HS20-44, ASTM C-890-06.
  8. DESIGN SPECIFIED AS: ASTM C-1227-08, ASTM C-913-08.
  9. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
  10. GREASE TRAP SHALL BE PHOENIX PRECAST CONCRETE P/N: C-5420 OR EQUAL.
  11. TANK SHALL BE PUMPED AS NEEDED.

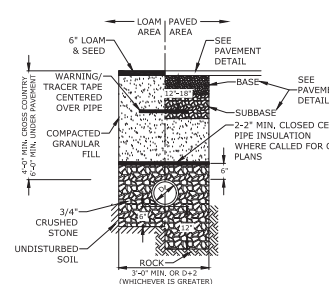


**1,000 GALLON GREASE TRAP**  
NO SCALE



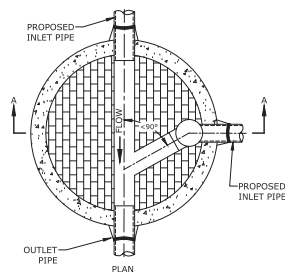
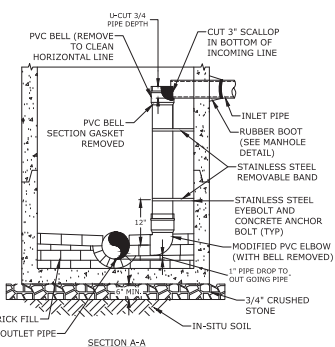
- NOTES:**
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
  2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
  3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
  4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

**MANHOLE JOINTS**  
NO SCALE



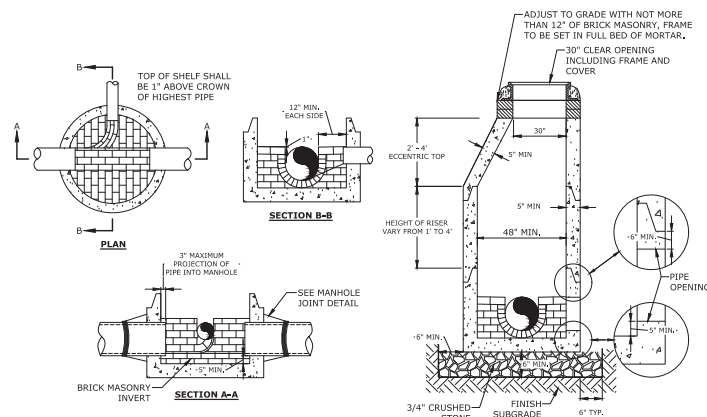
- NOTE:**
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
  2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

**SEWER SERVICE TRENCH**  
NO SCALE



- NOTES:**
1. RISER PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE INLET PIPE AND SHALL BE CONSTRUCTED OF SOR33 PVC PIPE.
  2. SANITARY SEWER SHALL BE INSTALLED PER THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS.
  3. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

**INSIDE DROP MANHOLE**  
NO SCALE



- NOTES:**
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
  2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
  3. INVERT BRICKS SHALL BE LAID ON EDGE.
  4. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
  5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY EJ. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
  6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
  7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

**SEWER MANHOLE**  
NO SCALE

**Proposed Mixed Use Development**

CPI Management, LLC

53 Green Street  
Portsmouth, NH

MARK	DATE	DESCRIPTION
D	5/19/2021	TAC Resubmission
C	4/21/2021	TAC Resubmission
B	3/22/2021	TAC & CC Submission
A	1/27/2021	CC Work Session

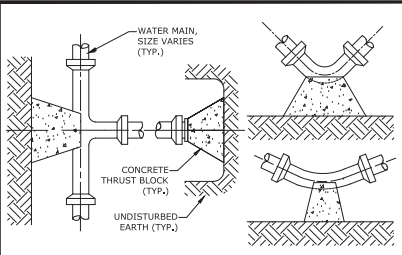
PROJECT NO: C0960-011  
DATE: January 27, 2021  
FILE: C0960-011\_C-UTLS.DWG  
DRAWN BY: JFS  
CHECKED: NHH/PMC  
APPROVED: BLM

DETAILS SHEET

SCALE: AS SHOWN

C-505

Mark Stevens 5/17/2021 10:45:10 AM Rev. 4.dwg  
 Mark & Bradlee Kilgus, P.E. (Professional Engineer)  
 License No. 6883 (Professional Engineer)  
 License No. 10197 (Professional Engineer)  
 State of New Hampshire  
 C-UTLS.DWG



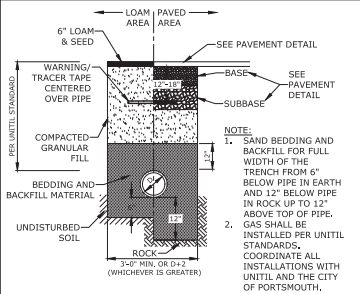
SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL

REACTION TYPE	PIPE SIZE			
	4"	6"	8"	10"
A 90°	0.89	2.19	3.82	17.24
B 180°	0.65	1.55	2.78	12.00
C 45°	0.48	1.19	2.12	6.02
D 22-1/2°	0.25	0.60	1.06	3.08
E 11-1/4°	0.13	0.30	0.54	1.54

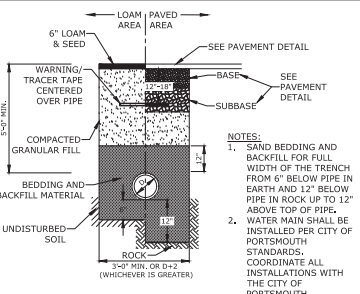
TEST PRESSURE = 200PSI

- NOTES:
- POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
  - ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
  - PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
  - WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
  - INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

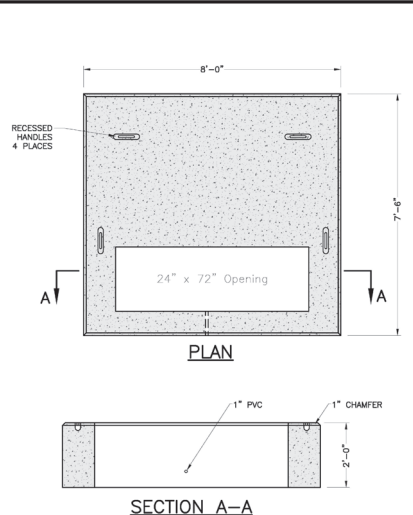
**THRUST BLOCKING DETAIL**  
NO SCALE



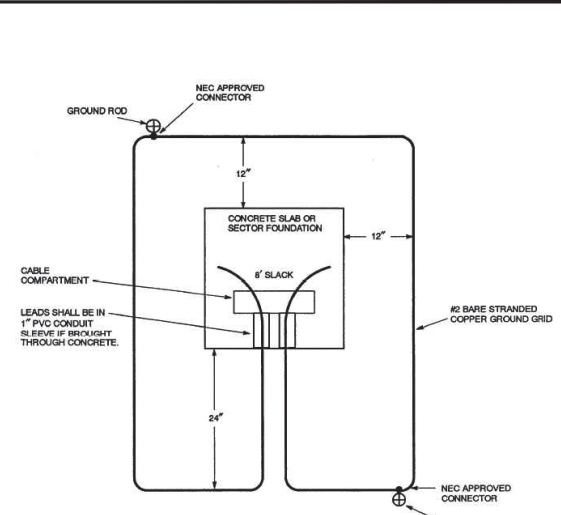
**GAS TRENCH**  
NO SCALE



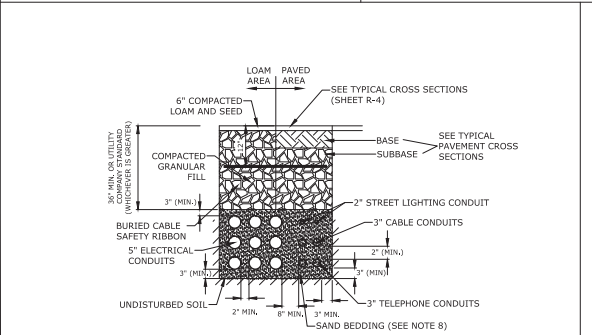
**WATER TRENCH**  
NO SCALE



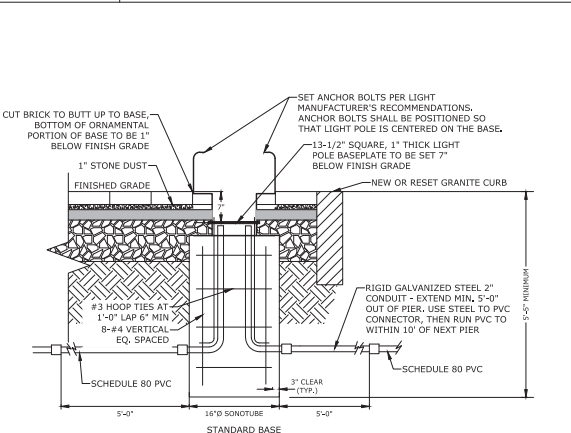
**3-PHASE TRANSFORMER PAD**  
NO SCALE



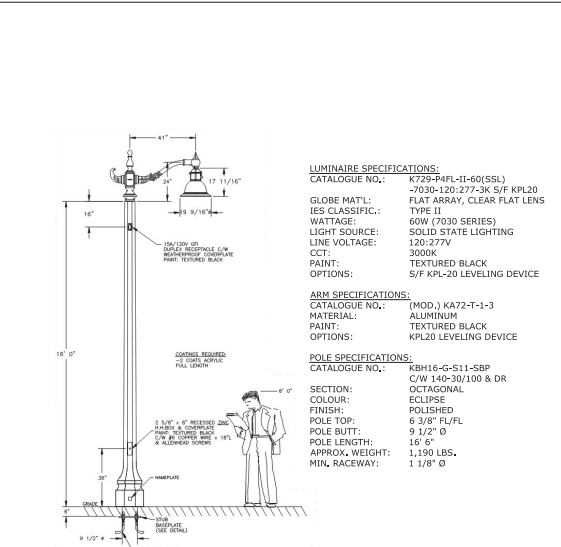
**PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL**  
NO SCALE



**ELECTRICAL AND COMMUNICATION CONDUIT**  
NO SCALE



**NORTH END LIGHT FIXTURE BASE**  
NO SCALE



**DISTRICT STANDARD LIGHT POLE & FIXTURE**  
NO SCALE

**Tight & Bond**



**Proposed Mixed Use Development**

**CPI Management, LLC**

53 Green Street  
Portsmouth, NH

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D	5/19/2021	TAC Resubmission
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PROJECT NO.:	C0960-011
DATE:	January 27, 2021
FILE:	C0960-011_C-UTLS.DWG
DRAWN BY:	JFS
CHECKED:	NAH/PVC
APPROVED:	BLM

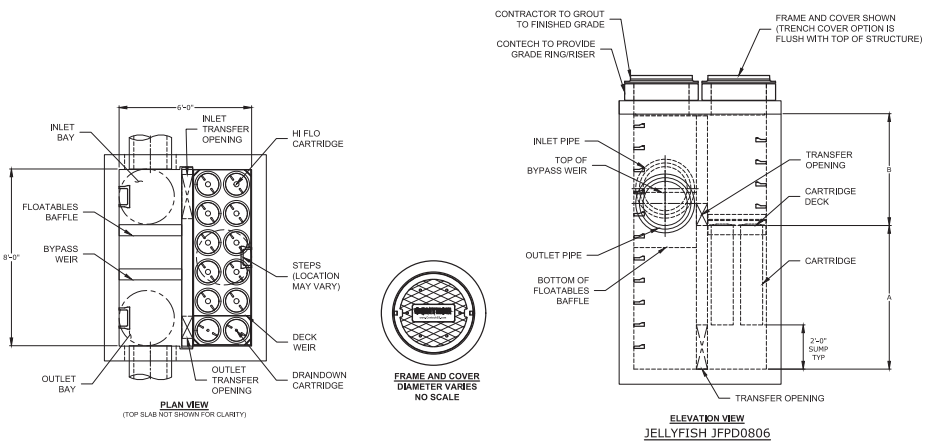
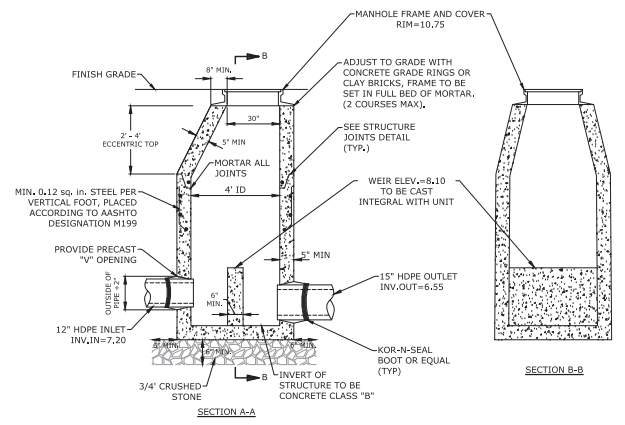
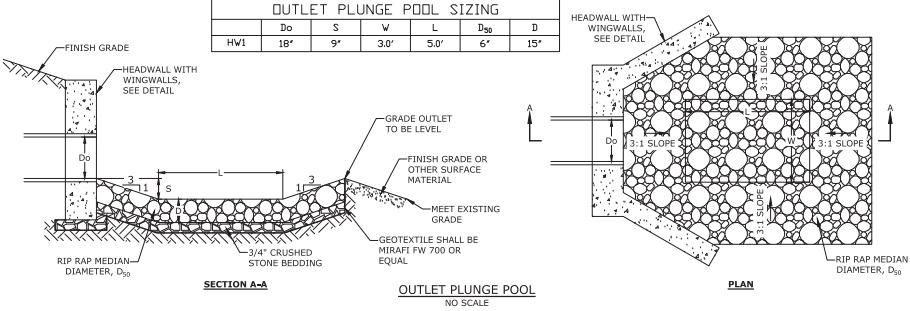
DETAILS SHEET

SCALE: AS SHOWN

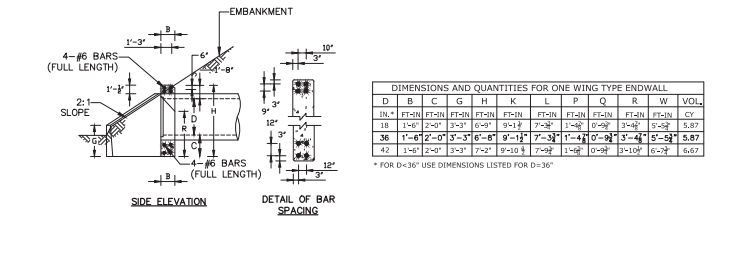
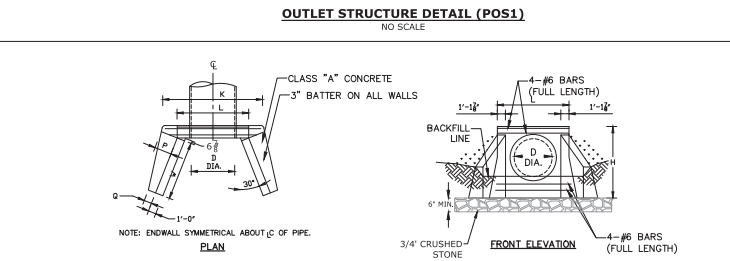
C-506

Lark Street 53/77/2021 4:43:10 PM Rev. 4/20/21  
 Naresh & Shobha S. S. Srinivasan, P.E., License No. 10000  
 Naresh & Shobha S. S. Srinivasan, P.E., License No. 10000  
 Naresh & Shobha S. S. Srinivasan, P.E., License No. 10000





- NOTES:**
- ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
  - 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.
  - THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
  - THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
  - CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
  - THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
  - PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
  - OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
  - 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.
  - 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.
  - SEE DRAINAGE MANHOLE DETAIL FOR MORE INFORMATION (CORE HOLE SIZE, MINIMUM FLOOR AND WALL THICKNESS, ETC.)



**JELLYFISH JFPD0806 - DESIGN NOTES**

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK OVERTURN STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER'S RECORD.

CARTRIDGE LENGTH	24"	40"	24"	18"
OUTLET INVERT TO STRUCTURE INVERT (ft)	6.00	6.47	6.94	7.50
FLOW RATE HEAD (ft) (DRAINDOWN (FS) PER CAST)	0.179 (0.629)	0.137 (0.697)	0.089 (0.635)	0.049 (0.225)
HEAD TREATMENT (ft)	1.90	1.47	1.00	0.64
DECK TO INVERT TOP (ft) (B)	0.00	0.00	0.00	0.00

DESCRIPTION	UNITS
MISCELLANEOUS	JFPD0806
ELECTRIC CONDUIT FLOW RATE (GPM)	0.00
PEAK FLOW RATE (GPM)	0.00
RETURN PERIOD OF PEAK FLOW (MIN)	20
# OF CARTRIDGES REQUIRED (TOP, MID, BOTTOM)	01, 01, 01
CONDUIT SIZE	02"

**JELLYFISH FILTER DETAIL (JF-1)**  
NO SCALE



CONTECH ENGINEERING & CONSTRUCTION, INC.  
1000 North Main Street, Suite 300, Dover, New Hampshire 03824  
603.288.1100 | www.contechinc.com

**Tight & Bond**



**Proposed Mixed Use Development**

CPI Management, LLC

53 Green Street  
Portsmouth, NH

DATE	DESCRIPTION
D 5/19/2021	TAC Resubmission
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MARK DATE DESCRIPTION

PROJECT NO: C0960-011  
DATE: January 27, 2021  
FILE: C0960-011\_C-UTLS.DWG  
DRAWN BY: JFS  
CHECKED: NHH/PMC  
APPROVED: BLM

**DETAILS SHEET**

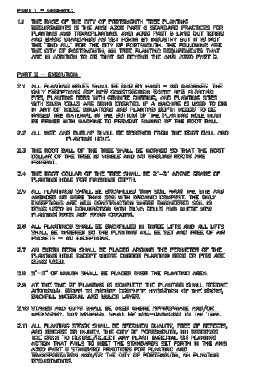
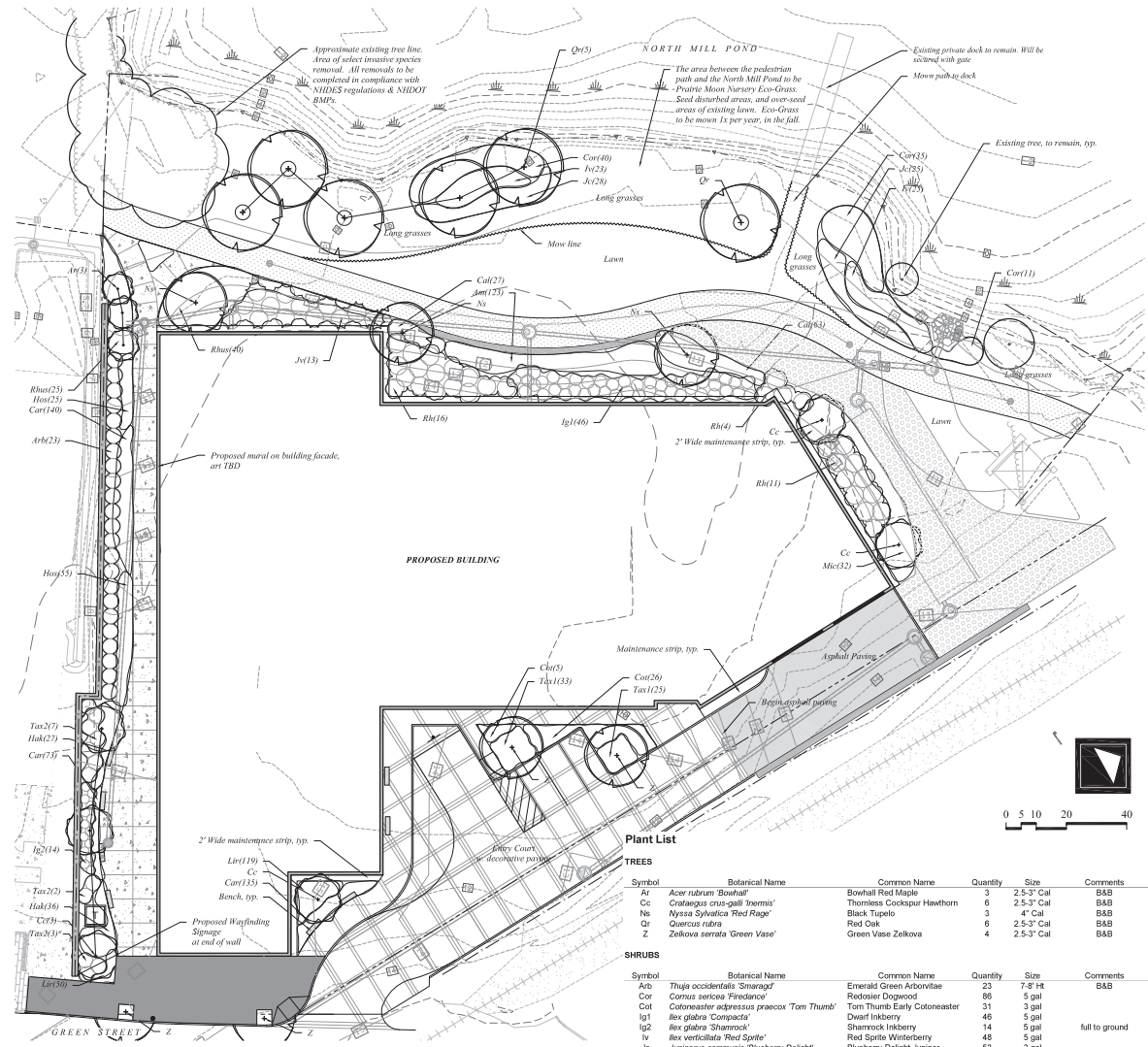
SCALE: AS SHOWN

C-507



# Landscape Notes

- Design is based on drawings by Tighe & Bond dated 5/19/2021 and may require adjustment due to actual field conditions.
- The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
- Erosion Control shall be in place prior to construction.
- Erosion Control to consist of Hay Bales and Erosion Control Fabric shall be staked in place between the work and Water Bodies, Wetlands and/or drainage ways prior to any construction.
- The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
- It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale at the request of the contractor.
- Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fit or muck on the trunk face. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive in or over the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portables within the tree protection area.
- Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
- The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call 800SAFE at 1-888-344-7233.
- The Contractor shall procure any required permits prior to construction.
- Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
- Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
- The Contractor shall furnish and plant all plants shown on the drawings and listed therein. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the *American Standard of Nursery Stock*, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20002.
- A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
- All plants shall be legibly tagged with proper botanical name.
- The Contractor shall guarantee all plants for not less than one year from time of acceptance.
- Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
- No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
- All landscaping shall be provided with the following:
  - Outside hose attachments spaced a maximum of 150 feet apart, and
  - An underground irrigation system, or
  - A temporary irrigation system designed for a two-year period of plant establishment.
- If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
- The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
- All disturbed areas will be dressed with 2" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
- Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and 1/2" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
- Drip strip shall extend to 6" beyond roof overhang and shall be edged with 3/16" thick metal edging.
- In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
- Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under free canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
- Show shall be stored a minimum of 5' from shrubs and trunks of trees.
- Landscape Architect is not responsible for the means and methods of the contractor.



### Plant List

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Ar	<i>Acer rubrum</i> 'Bowling'	Bowling Red Maple	23	2.5-3' Cal	B&B
Cc	<i>Cornus crataegifolia</i> 'Inermis'	Thornless Cockspur Hawthorn	6	2.5-3' Cal	B&B
Ns	<i>Nyssa sylvatica</i> 'Red Rage'	Black Tupelo	3	4" Cal	B&B
Qr	<i>Quercus rubra</i>	Red Oak	6	2.5-3' Cal	B&B
Z	<i>Zelkova serotina</i> 'Green Vase'	Green Vase Zelkova	4	2.5-3' Cal	B&B

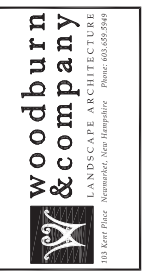
  

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Arb	<i>Thuja occidentalis</i> 'Smaragd'	Emerald Green Arborvitae	23	7-8' Ht	B&B
Cor	<i>Cornus sericea</i> 'Fireside'	Redosier Dogwood	66	3 gal	
Col	<i>Cotoneaster adpressus</i> 'praecox'	Tom Thumb Early Cotoneaster	31	3 gal	
Ig1	<i>Ilex glabra</i> 'Compacta'	Dwarf Inkberry	46	5 gal	
Ig2	<i>Ilex glabra</i> 'Shamrock'	Shamrock Inkberry	14	5 gal	
Iv	<i>Ilex verticillata</i> 'Red Sprite'	Red Sprite Winterberry	48	5 gal	full to ground
Jc	<i>Juniperus communis</i> 'Blueberry Delight'	Blueberry Delight Juniper	53	3 gal	
Jv	<i>Juniperus virginiana</i> 'Emerald Sentinel'	Emerald Sentinel Red Cedar	13	7.5' Ht	B&B
Mic	<i>Microbiota decussata</i>	Russian Cypress	32	3 gal	
Rh	<i>Rhododendron maximum</i>	Rosebay Rhododendron	31	3-4' Ht	B&B
Rhus	<i>Rhus aromatica</i> 'Glow-Low'	Glow-Low Sumac	65	3 gal	
Tax1	<i>Taxus media</i> 'Ever-Low'	Ever-Low Yew	58	3 gal	
Tax2	<i>Taxus media</i> 'Greenwave'	Greenwave Yew	12	5 gal	

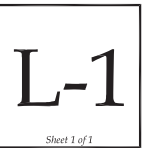
Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Am	<i>Amsonia hubrichtii</i>	Blue Star Flower	123	1 gal	
Car	<i>Carex appalachica</i>	Appalachian Sedge	348	1 gal	
Cal	<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather Reed Grass	90	1 gal	
Hak	<i>Hakonechloa macra</i>	Japanese Frost Grass	63	1 gal	
Hos	<i>Hosta 'Guacamole'</i>	Guacamole Hosta	60	1 gal	
Lir	<i>Liriodendron tulipifera</i>	Lily Turf	169	1 gal	
Lawn		Pennantton Smartseed Tall Fescue Blend			

City of Portsmouth Tree Planting Detail



# Proposed Mixed Use Development LANDSCAPE PLAN 53 Green Street Portsmouth, New Hampshire

Drawn By: VM  
 Checked By: RW  
 Scale: 1" = 20' - 0"  
 Date: March 22, 2021  
 Revisions: April 21, 2021  
 May 19, 2021





Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
⊖	11	XW1	SINGLE	WS-W54614-XX
⊖	13	XW2	SINGLE	WP-LED119-30

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts 1	Fc	0.07	10.2	0.0	N.A.	N.A.

Revisions	
4	2024-08-21
3	2024-08-21
2	2024-08-21
1	2024-08-21

Project No: 24-0001  
 Checked By: [Name]  
 Date: 2024-08-21  
 Scale: 1/8" = 1'-0"  
 Sheet: 44 of 44

**53 Green Street**  
 Portsmouth, NH

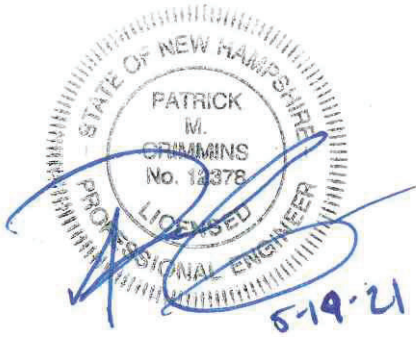
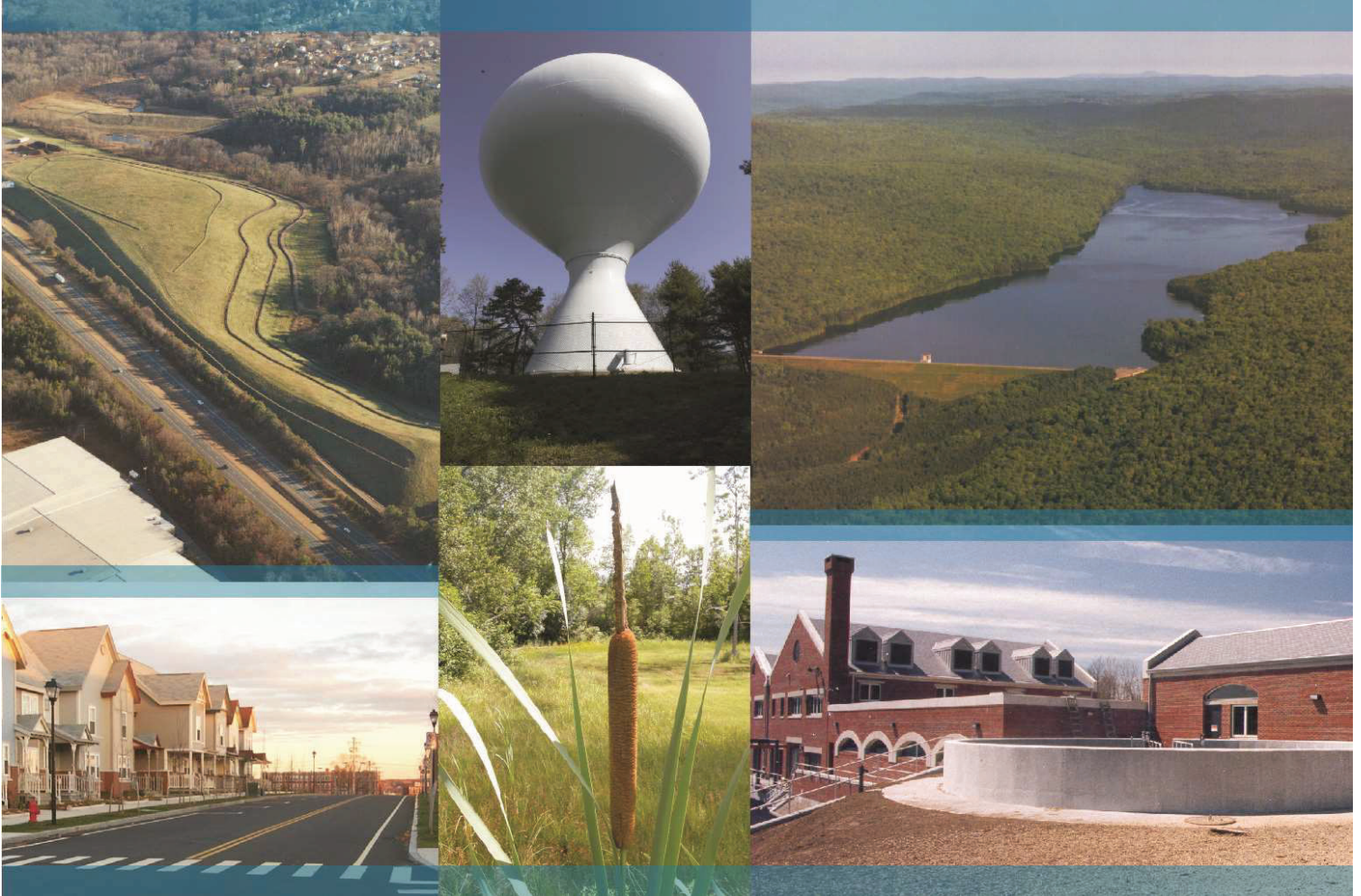


City of Portsmouth TAC, May 4, 2021:		
TAC Comment	Applicant Response	Sheet
<b>TAC Comments from 5/4 Correspondence:</b>		
1 How does this project comply with the front lot line build out requirement?	The applicant is applying for a variance from this requirement.	N/A
2 Does the driveway comply with the requirements of Section 10.5A44.33?	A dimension has been added to the plans to clarify the 24' driveway width.	C-102.1
3 What is the status of the NHDES permit for this project?	Alteration of Terrain permit application has been submitted to NHDES. The applicant has had multiple pre application meetings with NHDES in relation to the Wetland Impact Permit. The submission of the Wetland Impact Permit is pending the completion of the technical review process. Once the technical review is complete the formal wetland permit application can be submitted to NHDES.	Cover
4 Please make sure all relevant documents are included in each updated submission set (e.g. the Green Building Statement was included with last month's submission, but was not incorporated into your latest revision, nor was the will-serve letter from Unutil)	Comment acknowledged.	N/A
5 It appears you are missing a few of the will-serve letters from the private utility companies	A will serve letter from Until is included with the submission package. The project is coordinating with Eversource on required off site improvements.	N/A
6 Please add a note to the bike storage room that it must provide storage for a minimum of 10 bikes. Are you able to provide any exterior bike racks, those would be more suitable for visitors and many of the residents may prefer outdoor racks as well.	The building's bike room has been noted to have a 30 bike capacity. Outdoor bike racks have been included in the design.	C-102.1
7 Plans must stipulate that the tandem spaces meet the requirements of 10.1114.33 (must be assigned to the same dwelling unit, cannot be used for guest parking, and must measure 9' by 38'.) This requirement applies whether or not you exceed your minimum parking requirement. Your current tandem spaces are too narrow.	All tandem spaces have been removed.	C-102.1
8 Wetland buffer exhibits should quantify temporary impacts in the wetland buffer areas for construction of the pervious trail and fire access.	The Wetland Buffer Impervious Surface Exhibit has been revised to include temporary impacts in the wetland buffer for construction.	Wetland Buffer Impervious Surface Exhibit
9 Please provide a pavement maintenance plan for the porous pavement areas as required by Section 10.1018.32.	The pavement maintenance plan in the Long Term Operation and Maintenance Plan has been revised to match these requirements, specifically snow maintenance requirements.	Long Term Operation & Maintenance Plan
10 Plans should include proposed locations for permanent wetland boundary markers as required by Section 10.1018.40.	Plans have been revised to include proposed locations for permanent wetland boundary markers as required by Section 10.1018.40.	C-102.1 & C-502
11 Thank you for the addition to the planting plan to include shrubs along the top of bank. Please address the area between the top of bank and the HOTL to determine if there is active erosion and whether bank stabilization plantings could slow any active erosion in this area.	A bank stabilization area has been added to address any active erosion in the area between the top of bank and the HOTL.	C-103
12 The merging of the fire access and public trail are a positive improvement.	Comment acknowledged.	N/A
13 The greenway trail shall be designed and constructed to accommodate periodic inundation by flooding and to support maintenance vehicles as necessary.	The greenway trail is designed as a porous asphalt path. Any periodic inundation by flooding will be able to infiltrate through the asphalt section and discharge through the underdrain. Additional the porous section is deigned per UNH Stormwater Center specifications which are designed for H-20 loading.	C-503
14 Please correct references to Raynes Ave project on page 5-5 of the Drainage Report and 105 Bartlett project on page 5-7.	The Drainage Analysis has been revised.	Drainage Analysis
15 Consider a cobble stone island for the drop-off area. If possible, consider a raised planter in the middle.	The layout in this area has been updated and no longer has a middle island.	C-102.1

16	The turning diagrams show a 22 foot long delivery truck just barely being able to turn around within the site, and that's if no vehicles are parked in the loading zone or drop-off area. A 22 foot long truck is a rather short truck. Moving vans, UPS vans and box trucks are commonly 26-30 feet long. If trucks are not able to turn around on site they will likely park on Green Street and block traffic on this narrow street. There needs to be a better way to accommodate typical size trucks on the site.	The site layout has been updated to accommodate a larger truck (SU-30).	Site Traffic Exhibit
17	The sharp angle of the driveway entrance requires entering trucks to use most or all of the driveway width. This will not be possible when a vehicle is exiting the site at the same time.	Updated turning templates have been provided.	N/A
18	A tip down ramp should be provided at the edge of the driveway at its intersection with Green Street. This may require relocating the tree pit.	A tip down ramp has been added.	C-102.1
19	The Site Traffic Exhibit shows that vehicles using the garage ramps will need to be positioned against the retaining wall in order to make the turn into the garage without interfering with other vehicles. In reality, vehicles tend to shy away from a vertical element at least a foot. The exhibit also does not show the garage doors on the plan, as are shown on the other sheets such as C-102.1. We are not convinced that a vehicle will be able to make the turns in and out of the garage under the current design. The drive aisle should be widened or other alterations made to provide easier access into and out of the garage.	An updated driveway and garage entrance has been provided to address these comments.	C-102.1, Site Traffic Exhibit
20	Passenger cars making the turn around on site will need to hug the curb and hope that no vehicles are hanging over the edge of the loading zone area, in order to make the 270 degree turn, and then into a 90 degree turn. It is unrealistic to think that vehicles will be able to easily execute the turning movements shown on the plan.	This area has been updated to eliminate the turning movement.	C-102.1
21	Overall, the on-site circulation seems too tight and cramped to allow for safe and efficient vehicle maneuvering.	This driveway and building have been updated to enhance circulation.	C-102.1
22	Raise Telephone Manhole to grade	A note has been added.	C-104
23	Demo plan says gas line only removed on this property. In reality the Gas line needs to be removed/terminated at the main. Show it properly.	The plans have been updated.	C-101
24	Water line services should be 3' apart at main	The plans have been updated.	C-104
25	Any required upgrades to the Russell Street electrical system will be the responsibility of the project, in coordination with Eversource	Confirmed. The project has been coordinating with Eversource on any required off site improvements.	N/A
26	Excavate ledge for tree pits, confirm size of ledge removal necessary with City Arborist. Confirm relief in ledge hole to ensure water will drain from excavation and not drown tree.	The project proposes two tree pits. One tree pit is within the existing building footprint. The other tree pit location did not find any ledge with a ledge probe in that area. Although, if ledge is encountered the applicant will coordinate with the City Arborist to confirm adequate tree pit excavation.	N/A
27	There are only two water services for 233 Vaughn and they are the two that are shown together. Remove 3rd service from water plan.	The plans have been updated.	C-201
28	Truncated dome detail – cast iron panels are required to be the width of the crosswalk. Please update	Detail has been removed.	C-502
29	Use 6" pipe for grease trap	Detail has been updated.	C-505
30	North End Light Fixture Base Detail – field confirm appropriate depth of base below finished grade so that finished base of light is approximately 1" below finished grade.	The detail note has been revised with the updated dimension.	C-506
31	Any drainage structures with proposed invert elevations below elev. 9 should be salt proofed on the inside.	A note has been added to salt proof these structures.	C-504
32	Placing a retaining wall that close to the AC's 'rain garden' that is under the ramp will make this area almost impossible to maintain. Please explain how this use will not be impacted.	The raingarden access area within the AC's property is of sufficient size to allow for maintenance items to be completed as described in the AC's Long Term Operation & Maintenance Plan.	N/A

33	Plans shall indicate that the fire truck area shall be kept clear of snow	A note has been added as requested.	C-102.1
34	On the <i>Fire Truck Turning Exhibit</i> , show the truck and the outrigger area with the rear of the truck clearing the corner.	Exhibit has been revised.	Fire Truck Turning Exhibit





**Tighe & Bond**

Proposed Mixed-Use Development  
53 Green Street  
Portsmouth, NH

## Drainage Analysis

Prepared For:  
**CPI Management, LLC**  
**100 Summer Street**  
**Boston, Massachusetts 02110**

March 22, 2021  
Last Revised: May 19, 2021



**Section 1 Project Description**

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1.2 Pre- and Post-Development Comparison .....1-1  
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Appendices

A Site Specific Soils Report  
B Extreme Precipitation Tables  
C "Examination of Thermal Impacts from Stormwater BMPs", By The University of New Hampshire Stormwater Center



# **Section 1**

## **Project Description**

The proposed project is located at 53 Green Street in Portsmouth and is identified as Map 119, Lot 2 on the City of Portsmouth's Tax Maps. This parcel is approximately 1.65 acres. As part of this project, this parcel will acquire a portion of the adjacent lot that contains the rail line, identified as Tax Map 119 Lot 3. This will result in a total acreage of approximately 1.77 acres for the proposed parcel. The parcel is bounded to the north and west by North Mill Pond, to the south by an adjacent parcel, and to the east by Green Street and the Boston and Maine (B&M) railroad.

The lot is currently occupied by two (2) single-story commercial tenant buildings, which total approximately 21,000 square feet, and associated parking. The lot is predominantly impervious and has a maintained lawn area along the North Mill Pond shoreline. There is an existing utility easement on the north corner of the parcel which contains a utility tower with overhead wire connections, not directly associated with the site.

The proposed project includes the demolition of the two existing single-story structures and construction of a single five story mixed-use building. The project will include associated site improvements that consist of below grade parking, utilities, stormwater management and treatment, landscaping, lighting, and a public recreation trail in coordination with the City. Additionally, the land associated with the public recreation trail will be deeded to the City of Portsmouth and designated as community space for the City's North Mill Pond Trail project.

### **1.1 On-Site Soil Description**

The site is a highly disturbed site along the North Mill Pond. The property shows evidence of what appears to be very old filling and grading associated with the existing development. The site consists of terrain that is generally flat and slopes from the south to the north to North Mill Pond. The existing property has an approximate high point of elevation of 14 near Green Street

A site specific soils survey was conducted by Leonard Lord, PhD, CSS, CWS of Tighe & Bond, Inc and can be found in Appendix A of this Report. Based on the soil survey, the runoff analyzed within these studies has been modeled using mostly Hydrologic Soil Group B soils and some portions of Hydrologic Soil Group C soils, as much of the site is comprised of Udorthents with two drainage classifications, moderately poorly drained soils and portions of well drained soils.

### **1.2 Pre- and Post-Development Comparison**

The pre-development and post-development watershed areas have been analyzed at a single point of analysis. While the point of analysis remained unchanged, its 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. For reference, PA-1 assesses flows that discharge directly to North Mill Pond via overland flow or various outlets.

Since North Mill Pond is a tidal water, NHDES does not require peak runoff control requirements to be met (Env-Wq 1507.06(d)). However, a Stormtech Isolator Row and detention system is proposed on the development site for the purpose of mitigating temperature differences between the stormwater runoff and the North Mill Pond.

### 1.3 Calculation Methods

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

**Table 1.2:** Extreme Precipitation Estimates (NRCC)

<b>YEAR</b>	<b>24-hr Estimate (inches)</b>	<b>+ 15% (inches)</b>
<b>2</b>	3.20	3.68
<b>10</b>	4.86	5.59
<b>25</b>	6.16	7.08
<b>50</b>	7.37	8.48

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

#### References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

## **Section 2**

# **Pre-Development Conditions**

In order to analyze the pre-development condition, the site has been divided into one (1) watershed area modeled at one (1) point of analysis. This point of analysis and watershed are depicted on the plan entitled "Pre-Development Watershed Plan", Sheets C-801.

The point of analysis and its contributing watershed area is described below:

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

Point of Analysis 1 (PA-1) is the North Mill Pond which borders the northwest boundary of the site. The North Mill Pond is a tidal wetland which directly feeds into the Piscataqua River.

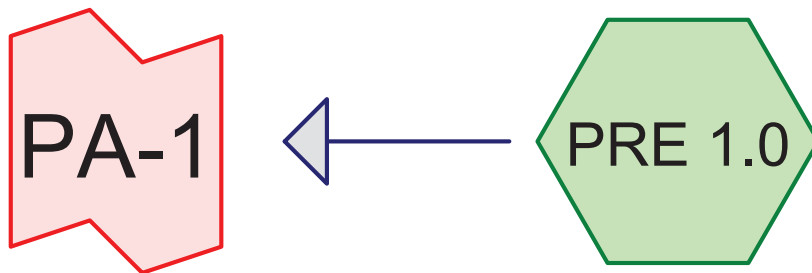
Pre-development Watershed 1.0 (PRE 1.0) is the single watershed analyzed in the pre-development condition. It is comprised of mostly impervious surfaces including paved parking and structures, disturbed forested areas to the north and west adjacent to the North Mill Pond shoreline and a maintained lawn between the building and shoreline. Runoff from this watershed area travels via overland flow to discharge into North Mill Pond. The runoff is currently untreated before discharge.

## **2.1 Pre-Development Calculations**

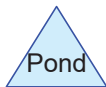
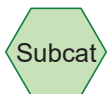
## **2.2 Pre-Development Watershed Plans**







## POINT OF ANALYSIS 1





**C0960-011 PRE**

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Page 2

**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
26,605	61	>75% Grass cover, Good, HSG B (PRE 1.0)
2,659	74	>75% Grass cover, Good, HSG C (PRE 1.0)
23,291	98	Paved parking, HSG B (PRE 1.0)
21,715	98	Roofs, HSG B (PRE 1.0)
4,041	55	Woods, Good, HSG B (PRE 1.0)
<b>78,311</b>	<b>82</b>	<b>TOTAL AREA</b>

**C0960-011 PRE**

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**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
75,652	HSG B	PRE 1.0
2,659	HSG C	PRE 1.0
0	HSG D	
0	Other	
<b>78,311</b>		<b>TOTAL AREA</b>

**C0960-011 PRE**

*Type III 24-hr 2 Year Storm Rainfall=3.68"*

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Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**SubcatchmentPRE 1.0:**

Runoff Area=78,311 sf 57.47% Impervious Runoff Depth=1.93"  
Flow Length=380' Tc=5.0 min CN=82 Runoff=4.17 cfs 12,610 cf

**Link PA-1: POINT OF ANALYSIS1**

Inflow=4.17 cfs 12,610 cf  
Primary=4.17 cfs 12,610 cf

**Total Runoff Area = 78,311 sf Runoff Volume = 12,610 cf Average Runoff Depth = 1.93"**  
**42.53% Pervious = 33,305 sf 57.47% Impervious = 45,006 sf**

**C0960-011 PRE**

Type III 24-hr 10 Year Storm Rainfall=5.59"

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Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**SubcatchmentPRE 1.0:**

Runoff Area=78,311 sf 57.47% Impervious Runoff Depth=3.61"  
Flow Length=380' Tc=5.0 min CN=82 Runoff=7.74 cfs 23,570 cf

**Link PA-1: POINT OF ANALYSIS1**

Inflow=7.74 cfs 23,570 cf  
Primary=7.74 cfs 23,570 cf

**Total Runoff Area = 78,311 sf Runoff Volume = 23,570 cf Average Runoff Depth = 3.61"**  
**42.53% Pervious = 33,305 sf 57.47% Impervious = 45,006 sf**

**Summary for Subcatchment PRE 1.0:**

Runoff = 7.74 cfs @ 12.08 hrs, Volume= 23,570 cf, Depth= 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
 Type III 24-hr 10 Year Storm Rainfall=5.59"

Area (sf)	CN	Description
21,715	98	Roofs, HSG B
23,291	98	Paved parking, HSG B
26,605	61	>75% Grass cover, Good, HSG B
4,041	55	Woods, Good, HSG B
2,659	74	>75% Grass cover, Good, HSG C
78,311	82	Weighted Average
33,305		42.53% Pervious Area
45,006		57.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0330	1.80		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.68"
1.9	223	0.0090	1.93		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.7	57	0.0400	1.40		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
3.5	380	Total, Increased to minimum Tc = 5.0 min			

**Summary for Link PA-1: POINT OF ANALYSIS 1**

Inflow Area = 78,311 sf, 57.47% Impervious, Inflow Depth = 3.61" for 10 Year Storm event  
 Inflow = 7.74 cfs @ 12.08 hrs, Volume= 23,570 cf  
 Primary = 7.74 cfs @ 12.08 hrs, Volume= 23,570 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs

**C0960-011 PRE**

*Type III 24-hr 25 Year Storm Rainfall=7.08"*

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Page 1

Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**SubcatchmentPRE 1.0:**

Runoff Area=78,311 sf 57.47% Impervious Runoff Depth=4.99"  
Flow Length=380' Tc=5.0 min CN=82 Runoff=10.58 cfs 32,572 cf

**Link PA-1: POINT OF ANALYSIS1**

Inflow=10.58 cfs 32,572 cf  
Primary=10.58 cfs 32,572 cf

**Total Runoff Area = 78,311 sf Runoff Volume = 32,572 cf Average Runoff Depth = 4.99"**  
**42.53% Pervious = 33,305 sf 57.47% Impervious = 45,006 sf**



**C0960-011 PRE**

Type III 24-hr 50 Year Storm Rainfall=8.48"

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Page 2

Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**SubcatchmentPRE 1.0:**

Runoff Area=78,311 sf 57.47% Impervious Runoff Depth=6.32"  
Flow Length=380' Tc=5.0 min CN=82 Runoff=13.25 cfs 41,222 cf

**Link PA-1: POINT OF ANALYSIS1**

Inflow=13.25 cfs 41,222 cf  
Primary=13.25 cfs 41,222 cf

**Total Runoff Area = 78,311 sf Runoff Volume = 41,222 cf Average Runoff Depth = 6.32"**  
**42.53% Pervious = 33,305 sf 57.47% Impervious = 45,006 sf**





**Proposed  
Mixed Use  
Development**

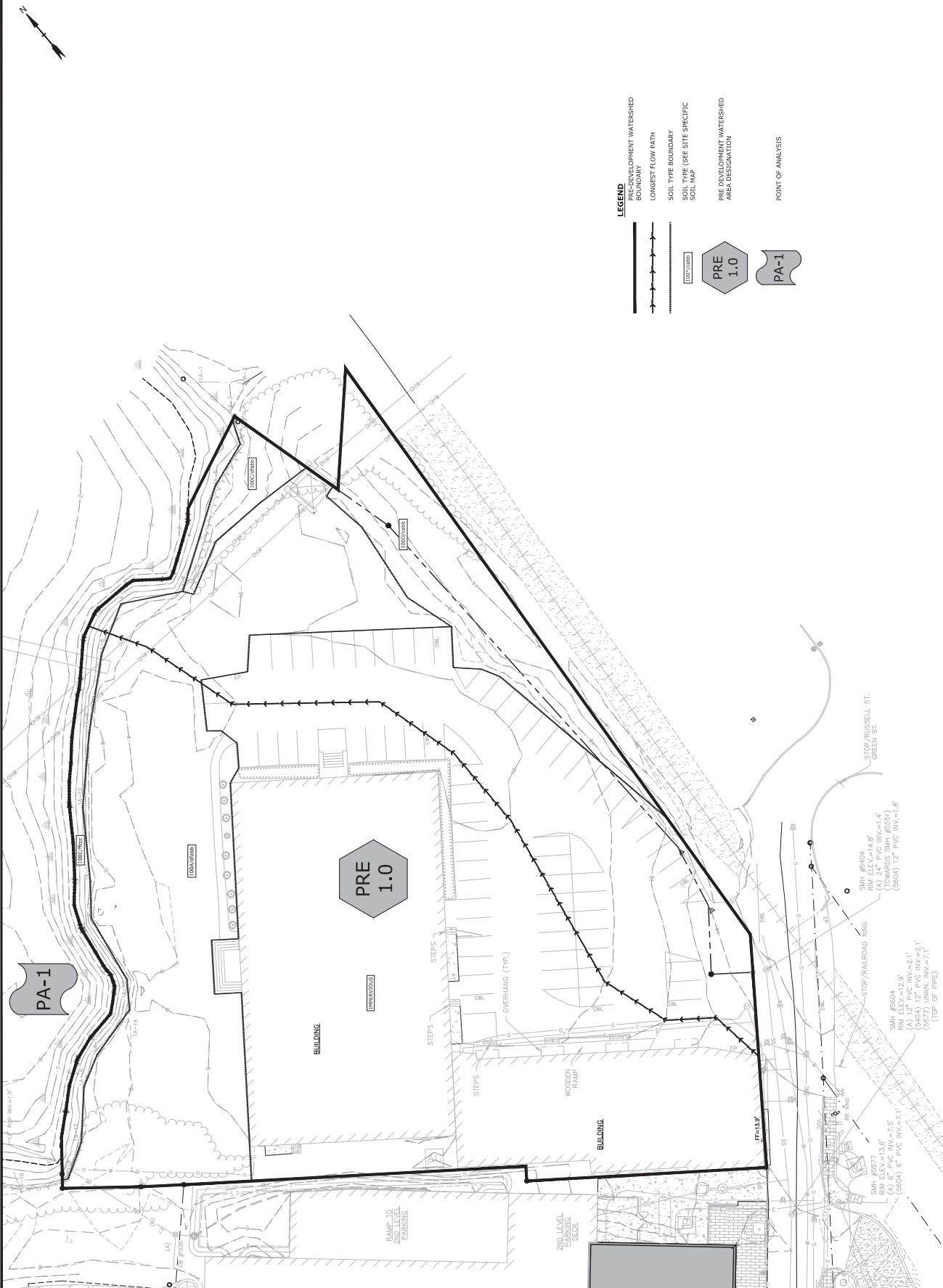
CPI  
Management,  
LLC

53 Green Street  
Portsmouth, NH

PROJECT NO.	05060411
DATE	January 27, 2021
FILE	05060411_C0506040
CLIENT	CPI MANAGEMENT, LLC
APPROVED:	NAV/DAC
	BLM

PRE-DEVELOPMENT  
WATERSHED PLAN  
SCALE: AS SHOWN

C-801



**LEGEND**

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- SOIL TYPE BOUNDARY
- SOIL TYPE (SEE SITE SPECIFIC SOIL MAP)
- PRE-DEVELOPMENT WATERSHED AREA DESIGNATION
- POINT OF ANALYSIS

PA-1  
 PRE 1.0  
 12"

Print Sheet: 9/19/2021 10:08 AM 15.30x21.49cm 87.44x30.91in  
 Sheet 8 from 13 (C:\0506\Comments\C05060411\_53 Green St Portsmouth, NH\Drawings\figures\cpi\C05060411\_C0504.dwg)  
 9/19/2021 10:08 AM 15.30x21.49cm 87.44x30.91in



## Section 3

# Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into six (6) watershed areas. Stormwater runoff from these sub-catchments predominantly flows via subsurface drainage systems prior to discharging into North Mill Pond (PA-1). A negligible amount of runoff from the sidewalk along Green Street will sheet flow into the City's closed drainage system due to the existing grades of the street sloping away from the site. The City's drainage system eventually discharges into North Mill Pond (PA-1), and, therefore, has been included in the single point of analysis.

A Stormtech Isolator Row and detention system is included on the development site for the purpose of mitigating temperature differences between the stormwater runoff and the North Mill Pond. This system and outlet structure have been designed to mitigate temperature of the water quality volume (WQV). Runoff that exceeds this volume will utilize an overflow and discharge into North Mill Pond (PA-1). This detention basin is used to mitigate increased temperature of the initial surface runoff, based on data provided in a publication by the University of New Hampshire Stormwater Center (UNHSC), titled "Examination of Thermal Impacts from Stormwater BMPs" and can be found in Appendix C. Due to this system being included in the design, post-development flows from the site have been reduced from the pre-development condition. As previously described, North Mill Pond is a tidal water, therefore, NHDES does not require peak runoff control requirements to be met (per Env-Wq 1507.06(d)).

The point of analysis and sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-802. The points of analysis and its contributing watershed areas are described below:

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

Point of Analysis 1 (PA-1), North Mill Pond, has the same overall contributing area as in the pre-development condition. PA-1 includes an underground detention basin, which is designed to detain the water quality volume of the paved surface runoff. Additional impervious surface runoff will be collected and filtered prior to discharging into the North Mill Pond.

Post-development Watershed 1.1 (POST-1.1) is approximately 72% impervious surface of either pavement or concrete surface. The area includes in the site access driveway and entrance turnaround. The pervious portion of this watershed includes a porous grass paver section intended for emergency use for fire truck access. Additional pervious areas that contribute to this watershed include a small amount of landscaped areas along the building façade. The stormwater runoff created from this area is collected via offline deep-sump and hooded catch basins and conveyed via a closed drainage system to the underground stormtech chamber system (POND-1). The detention basin is equipped with an isolator row as recommended by the UNHSC publication and is lined due to high seasonal high water table in the area. The system is underdrained and treatment is attained post detention by use of a proprietary membrane filtration treatment device identified as Jellyfish Filter 1 (JF-1). All collected runoff from this catchment is discharged into the North Mill Pond (PA-1).

Post-development Watershed 1.2 (POST-1.2) is 100% impervious roof surface that is collected via internal building plumbing system and conveyed via piping to a proprietary membrane filtration treatment device identified as Jellyfish Filter 1 (JF-1). The treated runoff eventually discharges into North Mill Pond (PA-1).

Post-development Watershed 1.3 (POST-1.3) is the connection path for public access to the public recreation trail along the shoreline. The area is approximately 50% impervious surface and consists of landscaping and grassed lawn areas in the post-development condition. The runoff associated with this area is captured via yard drains and is conveyed via piping to a proprietary membrane filtration treatment device identified as Jellyfish Filter 1 (JF-1). The treated runoff eventually discharges into North Mill Pond (PA-1).

Post-development Watershed 1.4 (POST-1.4) is 100% pervious surface. The area consists mostly of lawn, wooded, and landscaped areas. Runoff from this area remains similar to existing conditions and flows overland and discharges into the North Mill Pond.

Post-development Watershed 1.5 (POST-1.5) is 100% impervious sidewalk surface and flows overland onto Green Street. This subcatchment represents a proposed city sidewalk which flows onto the city street for collection. The closed drainage system associated with Green Street eventually discharges into North Mill Pond (PA-1).

Post-development Watershed 1.6 (POST-1.6) includes a city recreation trail which the city requested that be porous pavement, as not to increase impervious area so close to the waterfront. The runoff associated with this area flows overland and is captured and treated by the porous pavement section and is conveyed via piping to discharge into North Mill Pond.

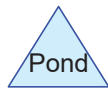
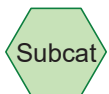
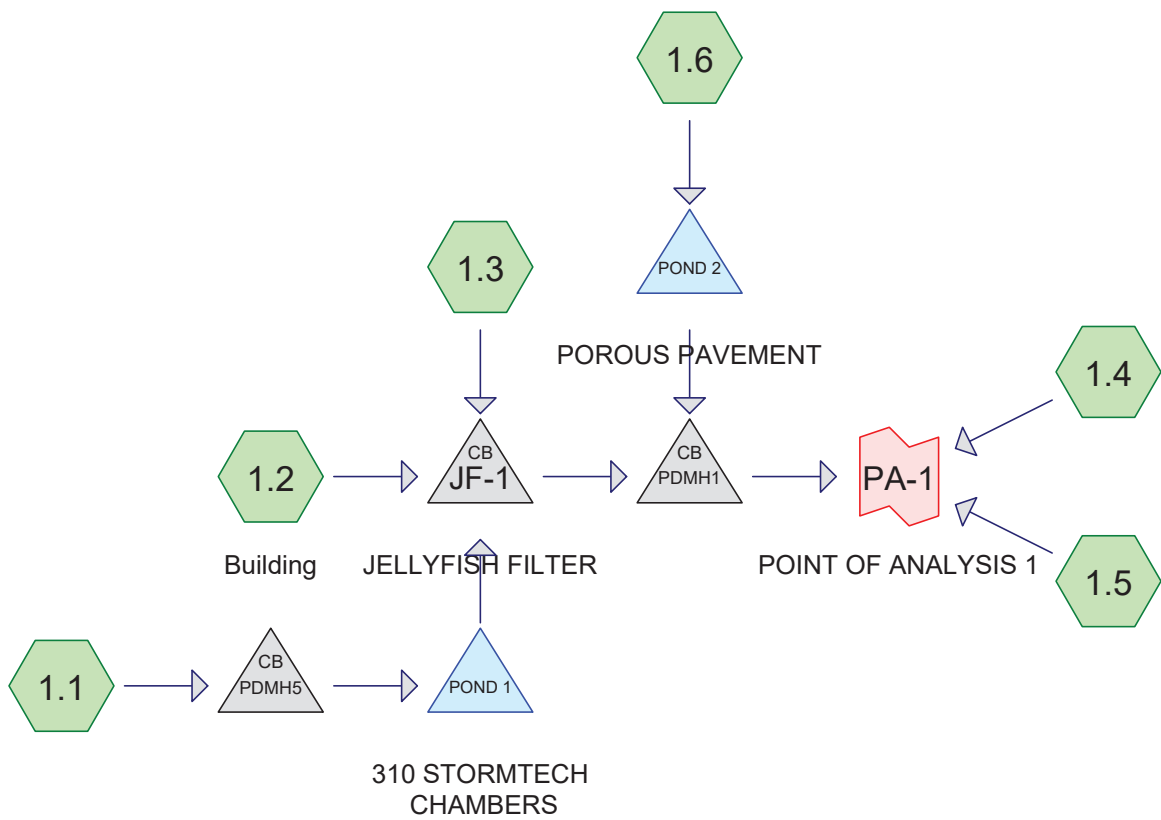
### **3.1 Peak Rate Comparison**

The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 50-year storm events at each point of analysis. Though peak flow mitigation is not required, the following table is provided for reference.

Point of Analysis	Pre/ <b>Post</b> 2-Year Storm (cfs)	Pre/ <b>Post</b> 10-Year Storm (cfs)	Pre/ <b>Post</b> 25-Year Storm (cfs)	Pre/ <b>Post</b> 50-Year Storm (cfs)
PA1	4.17/ <b>3.37</b>	7.74/ <b>5.68</b>	10.58/ <b>8.61</b>	13.25/ <b>10.81</b>

### **3.2 Post-Development Calculations**

### **3.3 Post-Development Watershed Plans**







**C0960-011 POST**

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**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
25,869	61	>75% Grass cover, Good, HSG B (1.1, 1.3, 1.4, 1.6)
2,659	74	>75% Grass cover, Good, HSG C (1.4)
14,478	98	Paved parking, HSG B (1.1, 1.3, 1.5, 1.6)
3,392	98	Porous Paved Path, HSG B (1.6)
29,486	98	Roofs, HSG B (1.2)
1,427	55	Woods, Good, HSG B (1.4)
<b>77,311</b>	<b>84</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
74,652	HSG B	1.1, 1.2, 1.3, 1.4, 1.5, 1.6
2,659	HSG C	1.4
0	HSG D	
0	Other	
<b>77,311</b>		<b>TOTAL AREA</b>

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Type III 24-hr 2 Year Storm Rainfall=3.68"

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Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1.1:** Runoff Area=14,379 sf 71.72% Impervious Runoff Depth=2.43"  
 Tc=5.0 min CN=88 Runoff=0.96 cfs 2,916 cf

**Subcatchment 1.2: Building** Runoff Area=29,486 sf 100.00% Impervious Runoff Depth=3.45"  
 Tc=5.0 min CN=98 Runoff=2.48 cfs 8,467 cf

**Subcatchment 1.3:** Runoff Area=4,788 sf 50.31% Impervious Runoff Depth=1.78"  
 Tc=5.0 min CN=80 Runoff=0.23 cfs 710 cf

**Subcatchment 1.4:** Runoff Area=15,732 sf 0.00% Impervious Runoff Depth=0.75"  
 Tc=5.0 min CN=63 Runoff=0.27 cfs 982 cf

**Subcatchment 1.5:** Runoff Area=1,321 sf 100.00% Impervious Runoff Depth=3.45"  
 Tc=5.0 min CN=98 Runoff=0.11 cfs 379 cf

**Subcatchment 1.6:** Runoff Area=11,605 sf 32.98% Impervious Runoff Depth=1.30"  
 Tc=5.0 min CN=73 Runoff=0.40 cfs 1,259 cf

**Pond JF-1: JELLYFISH FILTER** Peak Elev=7.41' Inflow=3.00 cfs 12,093 cf  
 24.0" Round Culvert n=0.013 L=70.0' S=0.0043 '/' Outflow=3.00 cfs 12,093 cf

**Pond PDMH1:** Peak Elev=7.04' Inflow=3.00 cfs 12,668 cf  
 24.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=3.00 cfs 12,668 cf

**Pond PDMH5:** Peak Elev=7.94' Inflow=0.96 cfs 2,916 cf  
 12.0" Round Culvert n=0.013 L=2.0' S=0.0000 '/' Outflow=0.96 cfs 2,916 cf

**Pond POND 1: 310 STORMTECH CHAMBERS** Peak Elev=7.64' Storage=526 cf Inflow=0.96 cfs 2,916 cf  
 Outflow=0.62 cfs 2,915 cf

**Pond POND 2: POROUS PAVEMENT** Peak Elev=6.53' Storage=800 cf Inflow=0.40 cfs 1,259 cf  
 Outflow=0.02 cfs 575 cf

**Link PA-1: POINT OF ANALYSIS 1** Inflow=3.37 cfs 14,029 cf  
 Primary=3.37 cfs 14,029 cf

**Total Runoff Area = 77,311 sf Runoff Volume = 14,714 cf Average Runoff Depth = 2.28"**  
**38.75% Pervious = 29,955 sf 61.25% Impervious = 47,356 sf**

**Summary for Subcatchment 1.1:**

Runoff = 1.62 cfs @ 12.07 hrs, Volume= 5,071 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
Type III 24-hr 10 Year Storm Rainfall=5.59"

Area (sf)	CN	Description
10,313	98	Paved parking, HSG B
4,066	61	>75% Grass cover, Good, HSG B
14,379	88	Weighted Average
4,066		28.28% Pervious Area
10,313		71.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Subcatchment 1.2: Building**

Runoff = 3.78 cfs @ 12.07 hrs, Volume= 13,152 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
Type III 24-hr 10 Year Storm Rainfall=5.59"

Area (sf)	CN	Description
29,486	98	Roofs, HSG B
29,486		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Subcatchment 1.3:**

Runoff = 0.45 cfs @ 12.08 hrs, Volume= 1,362 cf, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
Type III 24-hr 10 Year Storm Rainfall=5.59"

Area (sf)	CN	Description
2,409	98	Paved parking, HSG B
2,379	61	>75% Grass cover, Good, HSG B
4,788	80	Weighted Average
2,379		49.69% Pervious Area
2,409		50.31% Impervious Area

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Type III 24-hr 10 Year Storm Rainfall=5.59"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Subcatchment 1.4:**

Runoff = 0.79 cfs @ 12.08 hrs, Volume= 2,484 cf, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
Type III 24-hr 10 Year Storm Rainfall=5.59"

Area (sf)	CN	Description
11,646	61	>75% Grass cover, Good, HSG B
1,427	55	Woods, Good, HSG B
2,659	74	>75% Grass cover, Good, HSG C
15,732	63	Weighted Average
15,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Subcatchment 1.5:**

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 589 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
Type III 24-hr 10 Year Storm Rainfall=5.59"

Area (sf)	CN	Description
1,321	98	Paved parking, HSG B
1,321		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Subcatchment 1.6:**

Runoff = 0.88 cfs @ 12.08 hrs, Volume= 2,661 cf, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs  
Type III 24-hr 10 Year Storm Rainfall=5.59"

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Type III 24-hr 10 Year Storm Rainfall=5.59"

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Area (sf)	CN	Description
435	98	Paved parking, HSG B
7,778	61	>75% Grass cover, Good, HSG B
* 3,392	98	Porous Paved Path, HSG B
11,605	73	Weighted Average
7,778		67.02% Pervious Area
3,827		32.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond JF-1: JELLYFISH FILTER**

Inflow Area = 48,653 sf, 86.75% Impervious, Inflow Depth = 4.83" for 10 Year Storm event  
 Inflow = 4.72 cfs @ 12.08 hrs, Volume= 19,584 cf  
 Outflow = 4.72 cfs @ 12.08 hrs, Volume= 19,584 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 4.72 cfs @ 12.08 hrs, Volume= 19,584 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs / 2  
 Peak Elev= 7.70' @ 12.08 hrs  
 Flood Elev= 12.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	6.45'	<b>24.0" Round Culvert</b> L= 70.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.45' / 6.15' S= 0.0043 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

**Primary OutFlow** Max=4.72 cfs @ 12.08 hrs HW=7.69' TW=7.29' (Dynamic Tailwater)  
 ↑**1=Culvert** (Outlet Controls 4.72 cfs @ 3.28 fps)

**Summary for Pond PDMH1:**

[80] Warning: Exceeded Pond POND 2 by 0.84' @ 12.04 hrs (0.69 cfs 1,142 cf)

Inflow Area = 60,258 sf, 76.40% Impervious, Inflow Depth = 4.29" for 10 Year Storm event  
 Inflow = 4.72 cfs @ 12.08 hrs, Volume= 21,561 cf  
 Outflow = 4.72 cfs @ 12.08 hrs, Volume= 21,561 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 4.72 cfs @ 12.08 hrs, Volume= 21,561 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs / 2  
 Peak Elev= 7.29' @ 12.08 hrs  
 Flood Elev= 10.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	6.15'	<b>24.0" Round Culvert</b> L= 7.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.15' / 6.10' S= 0.0071 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

**Primary OutFlow** Max=4.70 cfs @ 12.08 hrs HW=7.29' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Barrel Controls 4.70 cfs @ 3.67 fps)

**Summary for Pond PDMH5:**

Inflow Area = 14,379 sf, 71.72% Impervious, Inflow Depth = 4.23" for 10 Year Storm event  
 Inflow = 1.62 cfs @ 12.07 hrs, Volume= 5,071 cf  
 Outflow = 1.62 cfs @ 12.07 hrs, Volume= 5,071 cf, Atten= 0%, Lag= 0.0 min  
 Primary = 1.62 cfs @ 12.07 hrs, Volume= 5,071 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs / 2

Peak Elev= 8.30' @ 12.14 hrs

Flood Elev= 11.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	7.30'	<b>12.0" Round Culvert</b> L= 2.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.30' / 7.30' S= 0.0000 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.60 cfs @ 12.07 hrs HW=8.16' TW=7.92' (Dynamic Tailwater)

↳ **1=Culvert** (Barrel Controls 1.60 cfs @ 2.99 fps)

**Summary for Pond POND 1: 310 STORMTECH CHAMBERS**

Exfiltration Rate derived from Site Specific Soil Survey report which compares existing soil classification to Sutton Soil HSG-B, which has a low Hydraulic conductivity rate of 0.6 in/hr, per NHDES regulations shall be modeling as 0.3 in/hr.

Inflow Area = 14,379 sf, 71.72% Impervious, Inflow Depth = 4.23" for 10 Year Storm event  
 Inflow = 1.62 cfs @ 12.07 hrs, Volume= 5,071 cf  
 Outflow = 1.19 cfs @ 12.17 hrs, Volume= 5,070 cf, Atten= 27%, Lag= 5.6 min  
 Primary = 1.19 cfs @ 12.17 hrs, Volume= 5,070 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs / 2

Peak Elev= 8.21' @ 12.16 hrs Surf.Area= 998 sf Storage= 898 cf

Flood Elev= 9.36' Surf.Area= 998 sf Storage= 1,250 cf

Plug-Flow detention time= 16.0 min calculated for 5,066 cf (100% of inflow)

Center-of-Mass det. time= 16.3 min ( 809.3 - 793.0 )

Volume	Invert	Avail.Storage	Storage Description
#1A	6.70'	719 cf	<b>14.83'W x 67.28'L x 2.33'H Field A</b> 2,329 cf Overall - 531 cf Embedded = 1,798 cf x 40.0% Voids
#2A	7.20'	531 cf	<b>ADS_StormTech SC-310 +Cap</b> x 36 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 4 Rows of 9 Chambers
		1,250 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	6.40'	<b>15.0" Round Culvert</b> L= 12.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.40' / 6.30' S= 0.0083 '/ Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	6.70'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	8.10'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#4	Device 3	7.20'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.17 cfs @ 12.17 hrs HW=8.20' TW=7.53' (Dynamic Tailwater)

- ↑ **1=Culvert** (Passes 1.17 cfs of 4.82 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.77 cfs @ 3.93 fps)
- ↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 0.40 cfs @ 1.02 fps)
- ↑ **4=Orifice/Grate** (Passes 0.40 cfs of 1.18 cfs potential flow)

**Summary for Pond POND 2: POROUS PAVEMENT**

Inflow Area = 11,605 sf, 32.98% Impervious, Inflow Depth = 2.75" for 10 Year Storm event  
 Inflow = 0.88 cfs @ 12.08 hrs, Volume= 2,661 cf  
 Outflow = 0.30 cfs @ 12.57 hrs, Volume= 1,977 cf, Atten= 66%, Lag= 29.6 min  
 Primary = 0.30 cfs @ 12.57 hrs, Volume= 1,977 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs / 2  
 Peak Elev= 6.89' @ 12.46 hrs Surf.Area= 3,392 sf Storage= 1,295 cf  
 Flood Elev= 9.35' Surf.Area= 3,392 sf Storage= 2,992 cf

Plug-Flow detention time= 202.2 min calculated for 1,977 cf (74% of inflow)  
 Center-of-Mass det. time= 111.5 min ( 945.1 - 833.6 )

Volume	Invert	Avail.Storage	Storage Description	
#1	5.94'	2,992 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.94	3,392	0.0	0	0
7.52	3,392	40.0	2,144	2,144
8.52	3,392	10.0	339	2,483
9.02	3,392	30.0	509	2,992
9.35	3,392	0.0	0	2,992

Device	Routing	Invert	Outlet Devices
#1	Primary	6.44'	<b>6.0" Vert. Underdrain</b> C= 0.600
#2	Device 1	5.94'	<b>10.000 in/hr Filter Media Infiltration over Surface area</b>

**Primary OutFlow** Max=0.27 cfs @ 12.57 hrs HW=6.87' TW=6.77' (Dynamic Tailwater)

- ↑ **1=Underdrain** (Orifice Controls 0.27 cfs @ 1.52 fps)
- ↑ **2=Filter Media Infiltration** (Passes 0.27 cfs of 0.79 cfs potential flow)



**Summary for Link PA-1: POINT OF ANALYSIS 1**

Inflow Area = 77,311 sf, 61.25% Impervious, Inflow Depth = 3.82" for 10 Year Storm event  
Inflow = 5.68 cfs @ 12.08 hrs, Volume= 24,634 cf  
Primary = 5.68 cfs @ 12.08 hrs, Volume= 24,634 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.04 hrs

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Type III 24-hr 25 Year Storm Rainfall=7.08"

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Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1.1:** Runoff Area=14,379 sf 71.72% Impervious Runoff Depth=5.67"  
 Tc=5.0 min CN=88 Runoff=2.14 cfs 6,796 cf

**Subcatchment 1.2: Building** Runoff Area=29,486 sf 100.00% Impervious Runoff Depth=6.84"  
 Tc=5.0 min CN=98 Runoff=4.80 cfs 16,809 cf

**Subcatchment 1.3:** Runoff Area=4,788 sf 50.31% Impervious Runoff Depth=4.77"  
 Tc=5.0 min CN=80 Runoff=0.62 cfs 1,903 cf

**Subcatchment 1.4:** Runoff Area=15,732 sf 0.00% Impervious Runoff Depth=2.96"  
 Tc=5.0 min CN=63 Runoff=1.27 cfs 3,882 cf

**Subcatchment 1.5:** Runoff Area=1,321 sf 100.00% Impervious Runoff Depth=6.84"  
 Tc=5.0 min CN=98 Runoff=0.21 cfs 753 cf

**Subcatchment 1.6:** Runoff Area=11,605 sf 32.98% Impervious Runoff Depth=4.00"  
 Tc=5.0 min CN=73 Runoff=1.28 cfs 3,873 cf

**Pond JF-1: JELLYFISH FILTER** Peak Elev=8.06' Inflow=7.14 cfs 25,507 cf  
 24.0" Round Culvert n=0.013 L=70.0' S=0.0043 '/' Outflow=7.14 cfs 25,507 cf

**Pond PDMH1:** Peak Elev=7.60' Inflow=7.14 cfs 28,695 cf  
 24.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=7.14 cfs 28,695 cf

**Pond PDMH5:** Peak Elev=8.63' Inflow=2.14 cfs 6,796 cf  
 12.0" Round Culvert n=0.013 L=2.0' S=0.0000 '/' Outflow=2.14 cfs 6,796 cf

**Pond POND 1: 310 STORMTECH CHAMBERS** Peak Elev=8.34' Storage=965 cf Inflow=2.14 cfs 6,796 cf  
 Outflow=2.01 cfs 6,795 cf

**Pond POND 2: POROUS PAVEMENT** Peak Elev=7.24' Storage=1,759 cf Inflow=1.28 cfs 3,873 cf  
 Outflow=0.51 cfs 3,188 cf

**Link PA-1: POINT OF ANALYSIS 1** Inflow=8.61 cfs 33,329 cf  
 Primary=8.61 cfs 33,329 cf

**Total Runoff Area = 77,311 sf Runoff Volume = 34,014 cf Average Runoff Depth = 5.28"**  
**38.75% Pervious = 29,955 sf 61.25% Impervious = 47,356 sf**

**C0960-011 POST**

Type III 24-hr 50 Year Storm Rainfall=8.48"

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Time span=0.00-48.00 hrs, dt=0.04 hrs, 1201 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1.1:** Runoff Area=14,379 sf 71.72% Impervious Runoff Depth=7.04"  
 Tc=5.0 min CN=88 Runoff=2.63 cfs 8,433 cf

**Subcatchment 1.2: Building** Runoff Area=29,486 sf 100.00% Impervious Runoff Depth=8.24"  
 Tc=5.0 min CN=98 Runoff=5.75 cfs 20,247 cf

**Subcatchment 1.3:** Runoff Area=4,788 sf 50.31% Impervious Runoff Depth=6.08"  
 Tc=5.0 min CN=80 Runoff=0.79 cfs 2,424 cf

**Subcatchment 1.4:** Runoff Area=15,732 sf 0.00% Impervious Runoff Depth=4.05"  
 Tc=5.0 min CN=63 Runoff=1.75 cfs 5,309 cf

**Subcatchment 1.5:** Runoff Area=1,321 sf 100.00% Impervious Runoff Depth=8.24"  
 Tc=5.0 min CN=98 Runoff=0.26 cfs 907 cf

**Subcatchment 1.6:** Runoff Area=11,605 sf 32.98% Impervious Runoff Depth=5.24"  
 Tc=5.0 min CN=73 Runoff=1.67 cfs 5,065 cf

**Pond JF-1: JELLYFISH FILTER** Peak Elev=8.30' Inflow=8.80 cfs 31,104 cf  
 24.0" Round Culvert n=0.013 L=70.0' S=0.0043 '/' Outflow=8.80 cfs 31,104 cf

**Pond PDMH1:** Peak Elev=7.79' Inflow=8.80 cfs 35,484 cf  
 24.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=8.80 cfs 35,484 cf

**Pond PDMH5:** Peak Elev=8.92' Inflow=2.63 cfs 8,433 cf  
 12.0" Round Culvert n=0.013 L=2.0' S=0.0000 '/' Outflow=2.63 cfs 8,433 cf

**Pond POND 1: 310 STORMTECH CHAMBERS** Peak Elev=8.49' Storage=1,034 cf Inflow=2.63 cfs 8,433 cf  
 Outflow=2.46 cfs 8,433 cf

**Pond POND 2: POROUS PAVEMENT** Peak Elev=7.78' Storage=2,231 cf Inflow=1.67 cfs 5,065 cf  
 Outflow=0.72 cfs 4,380 cf

**Link PA-1: POINT OF ANALYSIS 1** Inflow=10.81 cfs 41,701 cf  
 Primary=10.81 cfs 41,701 cf

**Total Runoff Area = 77,311 sf Runoff Volume = 42,386 cf Average Runoff Depth = 6.58"**  
**38.75% Pervious = 29,955 sf 61.25% Impervious = 47,356 sf**





**Proposed  
Mixed Use  
Development**

CPI  
Management,  
LLC

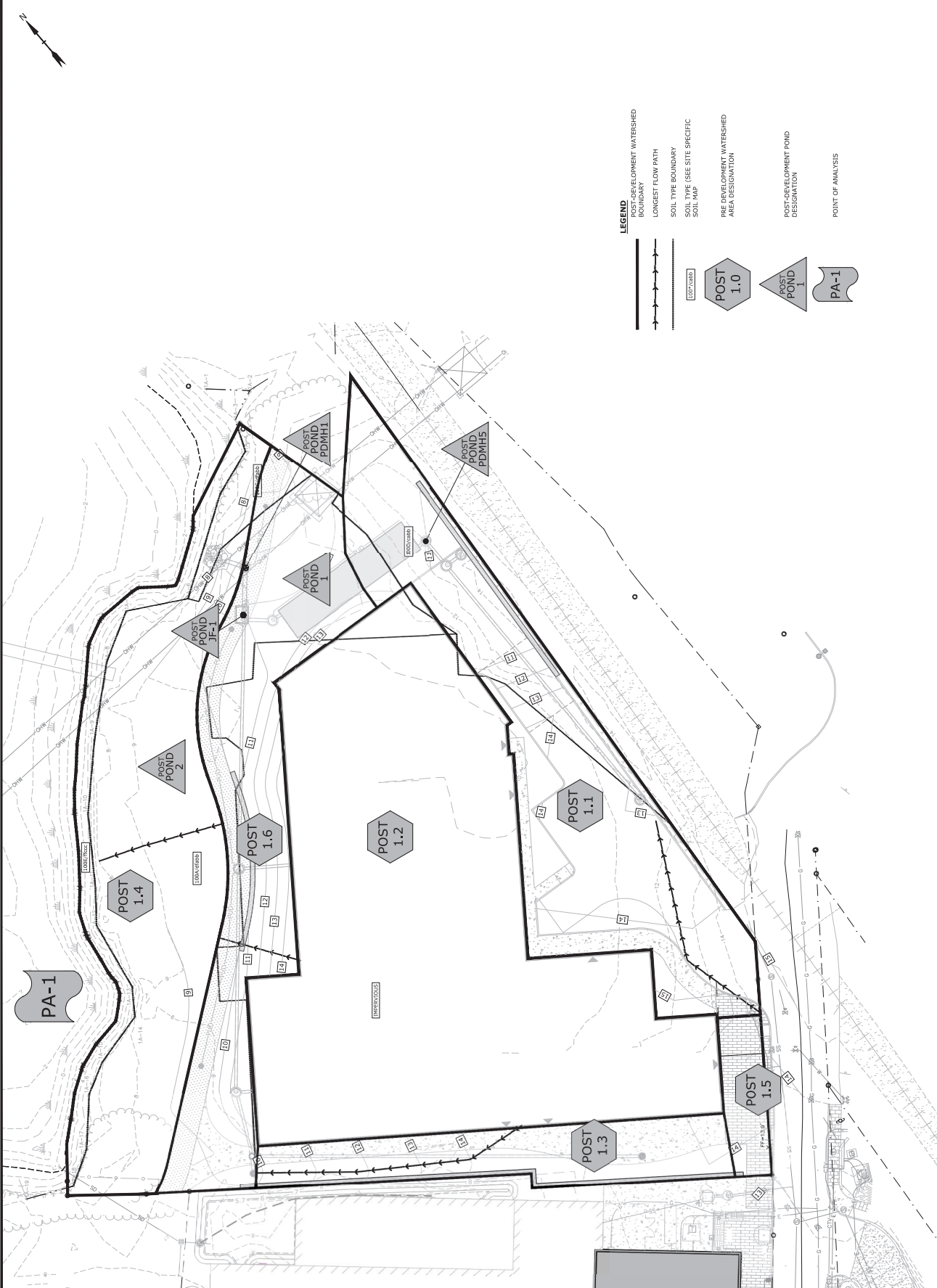
53 Green Street  
Portsmouth, NH

PROJECT NO.	05060211
DATE	January 22, 2021
FILE	0506011_C05060211
CREATED	NAV/DAC
APPROVED	BLM

POST-DEVELOPMENT  
WATERSHED  
PLAN

SCALE: AS SHOWN

C-802



**LEGEND**

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- SOIL TYPE BOUNDARY
- SOIL TYPE (SEE SITE SPECIFIC SOIL MAP)
- PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST-DEVELOPMENT POND DESIGNATION
- POINT OF ANALYSIS



## Section 4

# Stormwater Treatment

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).

### 4.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater that is collected on-site is pretreated through use of offline deep-sump and hooded catch basins .

### 4.2 Treatment Methods for Protecting Water Quality

The runoff from proposed impervious areas will be treated by a Contech Jellyfish stormwater filtration system. The Jellyfish system is sized to treat the Water Quality Flow from the contributing subcatchment areas. The system is outfitted with an internal bypass that diverts peak flows away from treatment. The BMP worksheet for this practice has been included in Section 5 of this report.

The multiuse path along the North Mill Pond will be constructed as porous pavement with and underdrain. The underdrain will discharge to the onsite closed drainage system prior to discharging to the Pond.

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment <sup>1</sup>	91%	53%	61%
Porous Pavement w/Underdrain <sup>2</sup>	90%	10%	45%

1. Pollutant removal calculations for Jellyfish Filter with deep sump catch basin pretreatment shown in Table 4.2.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix B.

<b>Table 4.2 – 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.



## **Section 5**

# **BMP Worksheet and Sizing Memo**





## GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

### Water Quality Volume (WQV)

1.12	ac	A = Area draining to the practice
0.97	ac	$A_i$ = Impervious area draining to the practice
0.87	decimal	I = Percent impervious area draining to the practice, in decimal form
0.83	unitless	$R_v$ = Runoff coefficient = $0.05 + (0.9 \times I)$
0.93	ac-in	$WQV = 1'' \times R_v \times A$
3,372	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

### Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.83	inches	Q = Water quality depth. $Q = WQV/A$
98	unitless	CN = Unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 * [Q^2 + 1.25 * Q * P]^{0.5})$
0.2	inches	S = Potential maximum retention. $S = (1000/CN) - 10$
0.032	inches	$I_a$ = Initial abstraction. $I_a = 0.2S$
5.0	minutes	$T_c$ = Time of Concentration
655.0	cfs/mi <sup>2</sup> /in	$q_u$ is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.951	cfs	$WQF = q_u \times WQV$ . Conversion: to convert "cfs/mi <sup>2</sup> /in * ac-in" to "cfs" multiply by 1mi <sup>2</sup> /640ac.

Designer's Notes:

This calculation represents the treatment train directed to the Contech Jellyfish Filter (JF-1).

Full Treatment in compliance with Env-Wq 1508.10 shall be achieved by use of a proprietary flow-through device. A Contech Jellyfish Filter model JFPD0806-5-1 will be used to treat the WQF as calculated in the above spreadsheet. The specified device is designed to treat up to 0.80 cfs of flow.

See attached sizing calculation sheet from manufacturer.





CONTECH Stormwater Solutions Inc. Engineer:  
Date Prepared:

DRA  
3/17/2021

### Site Information

Project Name **53 Green Street**  
Project State **NH**  
Project City **Portsmouth**

Total Drainage Area, Ad **1.12** ac  
Post Development Impervious Area, Ai **0.97** ac  
Pervious Area, Ap **0.15** ac  
% Impervious **87%**  
Runoff Coefficient, Rc **0.83**

### Mass Loading Calculations

Mean Annual Rainfall, P **50** in  
Agency Required % Removal **80%**  
Percent Runoff Capture **90%**  
Mean Annual Runoff, Vt **151752** ft<sup>3</sup>  
Event Mean Concentration of Pollutant, EMC **75** mg/l  
Annual Mass Load, M total **710.10** lbs

### Filter System

Filtration Brand **Jelly Fish**  
Cartridge Length **54** in

### Jelly Fish Sizing

Mass to be Captured by System **568.08** lbs  
Water Quality Flow **0.95** cfs

### Method to Use

**FLOW BASED**

### Summary

<b>Flow</b>	Treatment Flow Rate	0.98 cfs
	Required Size	<b>JFPD0806-5-1</b>





## GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

### Water Quality Volume (WQV)

0.31	ac	A = Area draining to the practice
0.23	ac	$A_i$ = Impervious area draining to the practice
0.74	decimal	I = Percent impervious area draining to the practice, in decimal form
0.72	unitless	$R_v$ = Runoff coefficient = $0.05 + (0.9 \times I)$
0.22	ac-in	$WQV = 1'' \times R_v \times A$
815	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

### Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.72	inches	Q = Water quality depth. $Q = WQV/A$
97	unitless	CN = Unit peak discharge curve number. $CN = 1000 / (10 + 5P + 10Q - 10 * [Q^2 + 1.25 * Q * P]^{0.5})$
0.3	inches	S = Potential maximum retention. $S = (1000/CN) - 10$
0.059	inches	$I_a$ = Initial abstraction. $I_a = 0.2S$
5.0	minutes	$T_c$ = Time of Concentration
655.0	cfs/mi <sup>2</sup> /in	$q_u$ is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.230	cfs	$WQF = q_u \times WQV$ . Conversion: to convert "cfs/mi <sup>2</sup> /in * ac-in" to "cfs" multiply by 1mi <sup>2</sup> /640ac.

Designer's Notes: \_\_\_\_\_

This calculation represents the treatment train directed to the underground detention pond.

Pretreatment is accomplished by use a offline deep sump/hooded catch basins prior to entering the underground detention structure.

Treatment is achieved by use of the Jellyfish filter structure (JF-1). This treatment is represented

Temperature mitigation is achieved by detaining WQV and dispersing through stone and underdrain.





**C0960-011 POST**

Prepared by Tighe &amp; Bond

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

Type III 24-hr 50 Year Storm Rainfall=8.48"

Printed 5/18/2021

**Stage-Area-Storage for Pond POND 1: 310 STORMTECH CHAMBERS**

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
6.70	0	7.74	600	8.78	1,149
6.72	8	7.76	614	8.80	1,157
6.74	16	7.78	628	8.82	1,165
6.76	24	7.80	642	8.84	1,173
6.78	32	7.82	655	8.86	1,181
6.80	40	7.84	669	8.88	1,189
6.82	48	7.86	683	8.90	1,197
6.84	56	7.88	696	8.92	1,205
6.86	64	7.90	709	8.94	1,213
6.88	72	7.92	723	8.96	1,221
6.90	80	7.94	736	8.98	1,229
6.92	88	7.96	749	9.00	1,237
6.94	96	7.98	762	9.02	1,245
6.96	104	8.00	774	9.04	<b>1,250</b>
6.98	112	8.02	787	9.06	1,250
7.00	120	8.04	800	9.08	1,250
7.02	128	8.06	812	9.10	1,250
7.04	136	8.08	824	9.12	1,250
7.06	144	<b>8.10</b>	<b>836</b>	9.14	1,250
7.08	152	8.12	848	9.16	1,250
7.10	160	8.14	860	9.18	1,250
7.12	168	8.16	872	9.20	1,250
7.14	176	8.18	883	9.22	1,250
7.16	184	8.20	895	9.24	1,250
7.18	192	8.22	906	9.26	1,250
7.20	200	8.24	917	9.28	1,250
7.22	215	8.26	927	9.30	1,250
7.24	230	8.28	937	9.32	1,250
7.26	246	8.30	948	9.34	1,250
7.28	261	8.32	957	9.36	1,250
7.30	276	8.34	967		
7.32	292	8.36	976		
7.34	307	8.38	985		
7.36	322	8.40	994		
7.38	337	8.42	1,003		
7.40	352	8.44	1,012		
7.42	367	8.46	1,020		
7.44	382	8.48	1,028		
7.46	397	8.50	1,037		
7.48	412	8.52	1,045		
7.50	427	8.54	1,053		
7.52	442	8.56	1,061		
7.54	457	8.58	1,069		
7.56	471	8.60	1,077		
7.58	486	8.62	1,085		
7.60	500	8.64	1,093		
7.62	515	8.66	1,101		
7.64	529	8.68	1,109		
7.66	544	8.70	1,117		
7.68	558	8.72	1,125		
7.70	572	8.74	1,133		
7.72	586	8.76	1,141		





**APPENDIX A**





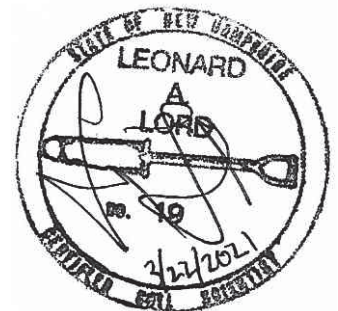


Proposed Mixed Use Development  
53 Green Street, Portsmouth, NH

## **SITE SPECIFIC SOIL MAP REPORT**

CPI Management, LLC

March 2021



**Tighe&Bond**

## 1.0 Introduction

This report is provided in conjunction with a 1.81 +/- acre Site Specific Soil Map (SSSM) prepared by Tighe & Bond for a parcel at 53 Green Street in Portsmouth, NH. The purpose of the mapping was to assist in the evaluation of drainage and other soil-related uses associated with site improvements, and may be used as part of an Alteration of Terrain (AoT) permit application.

## 2.0 Methods

Fieldwork for the soil mapping was completed October 22 and December 2, 2019 based on *Site-Specific Soil Mapping Standards for New Hampshire and Vermont, Version 5.0*, (Society of Soil Scientists of Northern New England [SSSNNE] Special Publication No. 3, December 2017). The poorly and very poorly drained soil types under this system are based on the most recent version of *Field Indicators for Identifying Hydric Soils in New England, Version 4* (New England Interstate Water Pollution Control Commission, 2018).

The soil legend for this map is based on the soil series currently mapped in the State of New Hampshire as published in the *New Hampshire State-Wide Numerical Soils Legend* (USDA Natural Resources Conservation Service, Issue #10, 2011). Since this soil map includes disturbed soils and may be used for an AoT application, the map symbols are composed of two major parts separated by a forward slash (/). The first part of the soil symbol includes a numerical identifier from the state-wide soil legend, followed by a letter indicating the slope class (e.g., 299A). Slope class identifiers are as follows:

A	0-3%	D	15-25%
B	3-8%	E	25-50%
C	8-15%	F	>50%

The second part of the symbol is based on the SSSNNE Disturbed Soil Supplemental Symbols, which are included within the Site Specific Soil Map (SSSM) standards. This portion of the symbol translates as follows:

### **Character 1: Drainage Class**

- a-Excessively Drained
- b-Somewhat Excessively Drained
- c-Well Drained
- d-Moderately Well Drained
- e-Somewhat Poorly Drained
- f-Poorly Drained
- g-Very Poorly Drained
- h-Not Determined

**Character 2: Parent Material** (of naturally formed soil only, if present)

- a-No natural soil within 60 inches
- b-Glaciofluvial deposits (outwash/terraces of sand or sand and gravel)
- c-Glacial till material (active ice)
- d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)
- e-Loamy/sandy over silt/clay deposits
- f-Marine silt and clay deposits (ocean waters)
- g-Alluvial deposits (floodplains)
- h-Organic materials-fresh water wetlands
- i-Organic materials-tidal wetlands

**Character 3: Restrictive Properties**

- a-None
- b-Bouldery surface with more than 15% of the surface covered with boulders
- c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hard pan, platy structure or clayey texture with consistence of at least firm (i.e. more than 20 newtons).
- d-Bedrock in the soil profile; 0-20 inches
- e-Bedrock in the soil profile; 20-60 inches
- f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types
- g-Subject to flooding
- h-Manufactured impervious surface including pavement, concrete, or built-up surfaces (e.g. buildings) with no morphological restrictive layer within control section

**Character 4: Estimated Ksat** (most limiting layer excluding symbol 3h above)

- a-High
- b-Moderate
- c-Low
- d-Not determined \*See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

**Character 5: Hydrologic Soil Group**

- a-Group A
- b-Group B
- c-Group C
- d-Group D
- e-Not determined

SSSM report standards require estimates of the maximum size of *limiting* inclusions for the entire soil map and an estimate of the percentage of *dissimilar* inclusions within each map unit. *Limiting* inclusions are soils "...that differ appreciably in one or more soil properties from the named soil in a map unit. The difference in soil properties is more restrictive and may affect use and management." *Dissimilar* inclusions are "...soils that either do not share limits of some important diagnostic properties of the named taxon, or, in the professional judgment of the soil scientist, have different use or management requirements." The maximum size of any limiting inclusions in this soil map is estimated to be less than 2,000 square feet. Any dissimilar inclusions noted during the mapping are listed below within the map unit descriptions.

### **3.0 Site Features**

The parcel is a highly disturbed site along the North Mill Pond. The property shows evidence of what appears to be very old filling and grading associated with the existing development.

### **4.0 Soil Map Unit Descriptions**

Below are descriptions for the map unit found on the accompanying SSSM. The "\*" after the numerical map unit symbol represents a placeholder for the slope class indicators described above.

#### **100\*/cfabb—Udorthents, wet substratum**

Landscape Setting: Soils that have been filled over what was originally hydric soils

Drainage Class: Well drained

Parent Material: Fill over marine silts and clays at <60 inches.

Typical Textures: Gravelly sandy loam fill

Hydrologic Soil Group: B

Dissimilar Inclusions: None noted

Limiting Inclusions: Upper slopes along the shore are steeper than the mapped unit and are affected by tidal inundation. These areas comprise less than 10% of the unit

Additional Notes: Soils in these areas have properties that are similar to the Charlton soil series for Hydrologic Soil Group determination



**100\*/dfabb—Udorthents, wet substratum**

Landscape Setting: Soils that have been filled and leveled over what was originally hydric soils

Drainage Class: Moderately well drained

Parent Material: Fill over marine silts and clays at <60 inches.

Typical Textures: Very gravelly sandy loam fill

Hydrologic Soil Group: B

Dissimilar Inclusions: None noted

Limiting Inclusions: Slopes along the shore are steeper than the mapped unit and are affected by tidal inundation. These areas comprise less than 10% of the unit

Additional Notes: Soils in these areas have properties that are similar to the Sutton soil series for Hydrologic Soil Group determination

**100\*/ffccc—Udorthents, wet substratum**

Landscape Setting: Soils that have been filled over what was originally hydric soils

Drainage Class: Poorly drained

Parent Material: Fill over marine silts and clays at <60 inches.

Typical Textures: Gravelly and cobbly sandy loam fill with some anthropogenic debris, such as bricks, over silt loam

Hydrologic Soil Group: C

Dissimilar Inclusions: None noted

Limiting Inclusions: None noted

Additional Notes: Soils in these areas have properties that are similar to the Shaker soil series for Hydrologic Soil Group determination. These soils are regularly inundated by the tides.

## Site Specific Soil Map Legend

### 53 Green Street, Portsmouth, NH

#### Slope Class Identifiers

A 0-3%	D 15-25%
B 3-8%	E 25-50%
C 8-15%	F >50%

#### Map Unit Symbols

<u>Map Number* /Disturbed Soil Numerator**</u>	<u>Soil Map Unit Name</u>	<u>Hydrologic Soil Group</u>
100*/cfabb	Udorthents, wet substratum / well drained, fill over marine silts and clays, no restrictive layer within 40 inches, moderate Ksat, Hydrologic Soil Group B	B
100*/dfabb	Udorthents, wet substratum, 0-3% slopes / moderately well drained, fill over marine silts and clays, no restrictive layer within 40 inches, moderate Ksat, Hydrologic Soil Group B	B
100*/ffccc	Udorthents, wet substratum, 0-3% slopes / poorly drained, fill over marine silts and clays, restrictive layer is present within 40 inches, low Ksat, Hydrologic Soil Group C	C

\*Indicates the location of the slope class identifier (A-F)

\*\*Supplemental symbols are used to further characterize disturbed soils for Alteration of Terrain permits

#### **Soil Mapping Notes:**

1. Hydrologic soil groups for disturbed soils were based on most similar soil series listed in *Ksat Values for NH Soils*, SSSNNE Special Publication No. 5, 2009.
2. Fieldwork for this map was conducted by Leonard A. Lord, PhD, NHCSS #19 on October 22 and December 2, 2019.
3. This detailed Site Specific Soil Map conforms to the standards of SSSNNE Publication No. 3, as amended, *Site Specific Soil Mapping Standards for NH and VT*.
4. This map has been prepared to comply with soil mapping requirements of RSA 485 A:17 and NHDES Env-Wq, Alteration of Terrain.
5. See accompanying narrative report for methodology, map symbol legend, and interpretations.



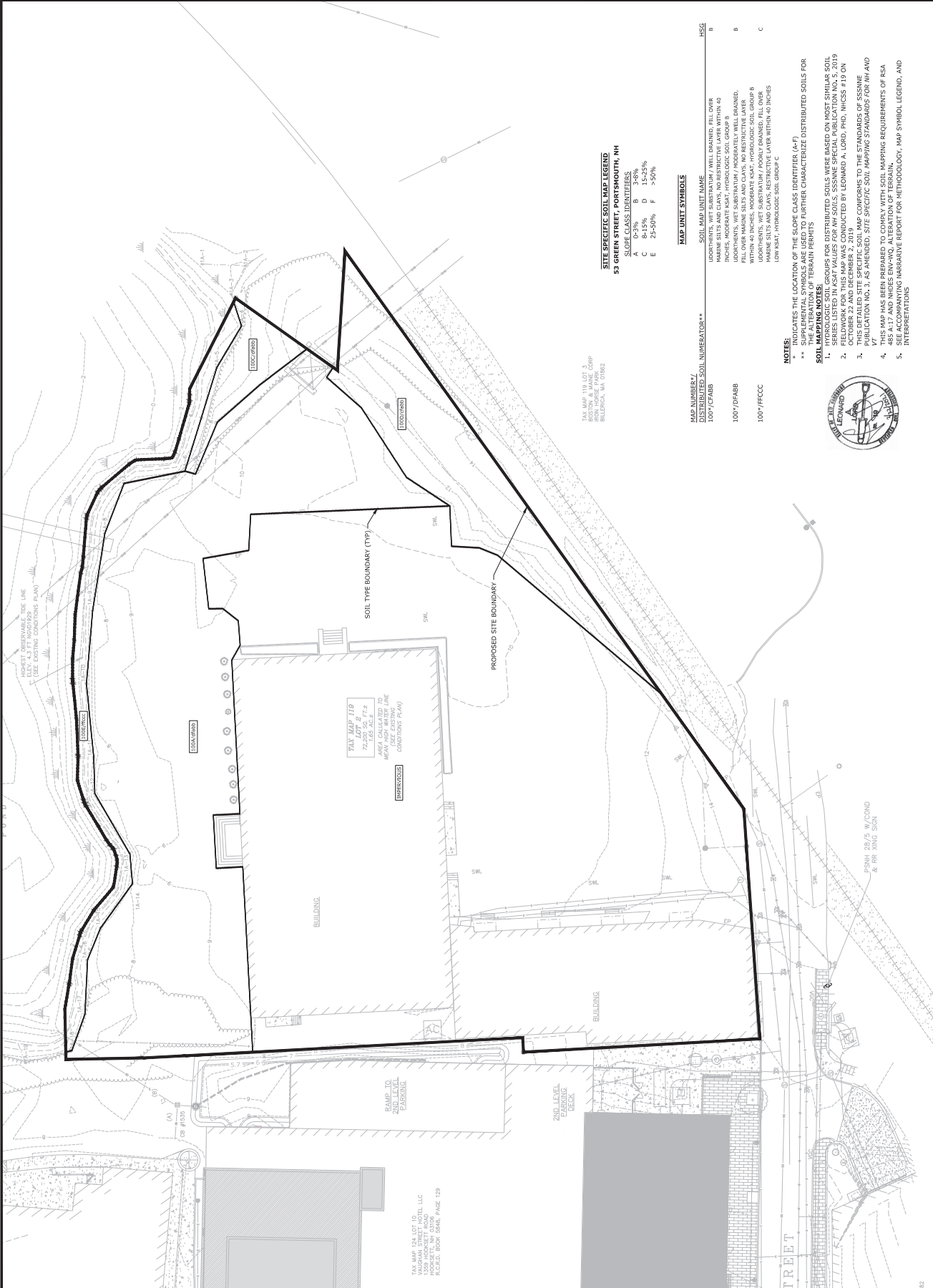
# Proposed Mixed Use Development

CPI Management, LLC

53 Green Street  
Portsmouth, NH

MARK	DATE	DESCRIPTION	CORRECT
PROJECT NO.			02062011
DATE			MARCH 22, 2021
FILE			020609011-53SR02001
CLIENT			CPI
DESIGNED			
CHECKED			
APPROVED			

**SITE SPECIFIC SOIL MAP**  
SCALE: AS SHOWN



**SITE SPECIFIC SOIL MAP LEGEND**  
**53 GREEN STREET, PORTSMOUTH, NH**  
SLOPE CLASS IDENTIFIERS:  
A 0-2% B 3-8%  
C 8-15% D 15-25%  
E 25-50% F >50%

**MAP UNIT SYMBOLES**

MAP NUMBER / DISTRIBUTED SOIL NUMERATOR**	SOIL MAP UNIT NAME	HSS
1001/CFAB8	URBORNS; WET SUBSTRATUM / WELL DRAINED; FILL OVER INCHES; MODERATE KSAT; HYDROLOGIC SOIL GROUP B	B
1001/DFAB8	URBORNS; WET SUBSTRATUM / MODERATELY WELL DRAINED; WITHIN 40 INCHES; MODERATE KSAT; HYDROLOGIC SOIL GROUP B	B
1001/FFCC0	URBORNS; WET SUBSTRATUM / POORLY DRAINED; FILL OVER MARINE SILTS AND CLAYS; RESTRICTIVE LAYER WITHIN 40 INCHES; LOW KSAT; HYDROLOGIC SOIL GROUP C	C

- NOTES:**
- \* INDICATES THE LOCATION OF THE SLOPE CLASS IDENTIFIER (A-F)
  - \*\* SUPPLEMENTAL SYMBOLS ARE USED TO FURTHER CHARACTERIZE DISTRIBUTED SOILS FOR TERRAIN PERCENTS
- SOIL MAPPING NOTES:**
- HYDROLOGIC SOIL GROUPS FOR DISTRIBUTED SOILS WERE BASED ON MOST SIMILAR SOIL MAPPING FOR THIS MAP WAS CONDUCTED BY LEONARD A. LEONARD, PH.D., NHCSS #19 ON OCTOBER 22 AND DECEMBER 2, 2019
  - FIELDWORK FOR THIS MAP WAS CONDUCTED BY LEONARD A. LEONARD, PH.D., NHCSS #19 ON OCTOBER 22 AND DECEMBER 2, 2019
  - THIS MAP WAS PREPARED TO COMPLETE THE NECESSARY REGULATORY REQUIREMENTS FOR THE PUBLICATION AND AS A REFERENCE TO THE LATEST STANDARDS FOR SOIL MAPPING
  - THIS MAP HAS BEEN PREPARED TO COMPLY WITH THE NECESSARY REGULATORY REQUIREMENTS OF RSA 287:102
  - SEE ACCOMPANYING NARRATIVE REPORT FOR METHODOLOGY, MAP SYMBOL LEGEND, AND INTERPRETATIONS





**APPENDIX B**

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# Extreme Precipitation Tables

## Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

<b>Smoothing</b>	Yes
<b>State</b>	New Hampshire
<b>Location</b>	
<b>Longitude</b>	70.764 degrees West
<b>Latitude</b>	43.080 degrees North
<b>Elevation</b>	0 feet
<b>Date/Time</b>	Fri, 24 Jul 2020 12:23:19 -0400

## 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>





**APPENDIX C**

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# Examination of Thermal Impacts from Stormwater BMPs



In a study in Durham, New Hampshire, four years of runoff temperature data were examined for a range of stormwater best management practices (BMPs) in relation to established environmental indicators.

## The stormwater BMPs examined included:

<b>Conventional</b>	<b>Low Impact Development</b>	<b>Manufactured Treatment Devices</b>
<ul style="list-style-type: none"> <li>• Vegetated Swale</li> <li>• Detention Pond</li> <li>• Retention Pond</li> </ul>	<ul style="list-style-type: none"> <li>• Bioretention</li> <li>• Gravel Wetland</li> </ul>	<ul style="list-style-type: none"> <li>• Storm Tech Isolator Row</li> <li>• ADS Infiltration System</li> <li>• Hydrodynamic Separator</li> </ul>



Surface systems that are exposed to direct sunlight have been shown to increase already elevated summer runoff temperatures, while systems that provide treatment by infiltration and filtration can moderate runoff temperatures by thermal exchange with cool subsurface materials.

The storm drain system in this study had an annual average event mean temperature (EMT) greater than the mean groundwater temperature of 47°F that commonly feeds coldwater streams.

The examination of BMPs indicates that outflow from the larger surface systems is warmer and more variable than from parking lots. The filtration and infiltration systems cooled stormwater runoff to temperatures close to groundwater temperature.



*Top: A view of a healthy coldwater fishery. Center: Large parking areas store tremendous amounts of heat which is transferred into stormwater runoff. Bottom: Subsurface treatment systems such as gravel wetlands can buffer temperature impacts for stormwater runoff.*

## SURFACE SYSTEMS: Thermal Extremes

The summer temperatures of the two stormwater ponds, vegetated swale, and HDS (Hydrodynamic Separators) systems, indicate that they **provide little to no reduction of high runoff temperatures.**

The Retention and Detention ponds have the largest variation in temperature. The Retention Pond is the only system to exceed both the Upper Optimum Limit (UOL) and the Lethal Limit of 80°F, however, the Detention Pond with a maximum temperature of 79.4°F comes very close.

The permanent pool of water in the Retention Pond appears to act as a heat sink during periods of extreme heat.

## FILTRATION & INFILTRATION SYSTEMS: Thermal Buffers

Filtration and infiltration systems **showed the strongest ability to reduce temperature variations.** The gravel wetland, the ADS (Advanced Drainage Systems™) Infiltration System, and the StormTech Isolator Row have a strong capacity to reduce temperatures of runoff.

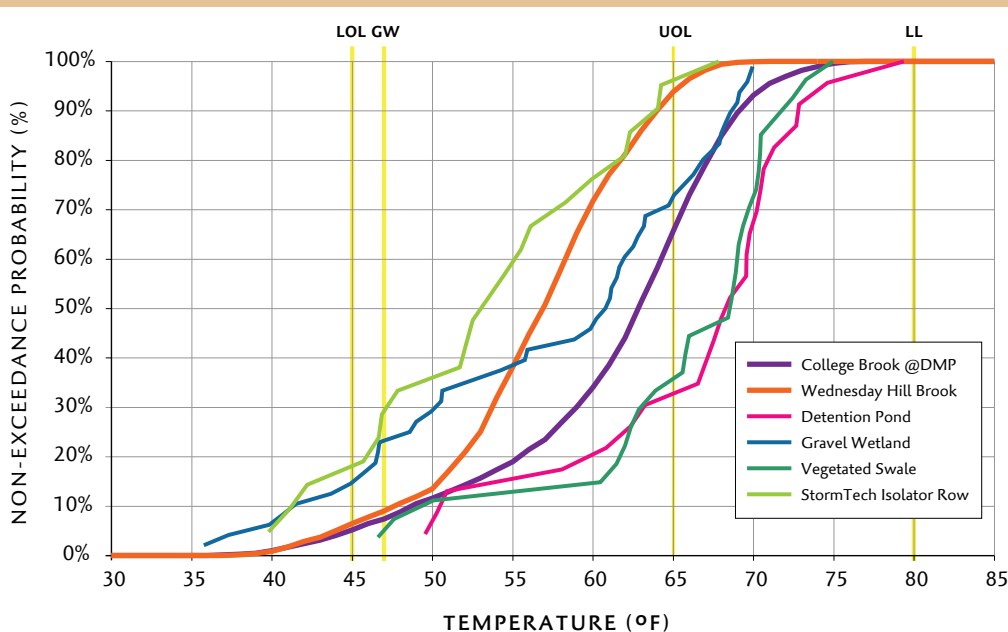
The Bioretention system showed minor buffering capacity and was consistently cooler in the summer and warmer in the winter than the runoff. These filtration and infiltration systems are, on average, reducing the summer temperatures and increasing the winter temperatures of the runoff to near the average groundwater temperature of 47°F.

The two subsurface infiltration systems, ADS and STIR, are the only systems with mean July temperatures within the optimum zone of 45°F to 65°F for coldwater aquatic species. All other systems result in runoff within the stress zone for aquatic species, between 65°F and 80°F.

The Gravel Wetland, the ADS infiltration system, and the Isolator Row systems have the lowest exceedance values of the UOL at 13.0%, 5.0%, 1.5% respectively.



*StormTech Isolator Row.*



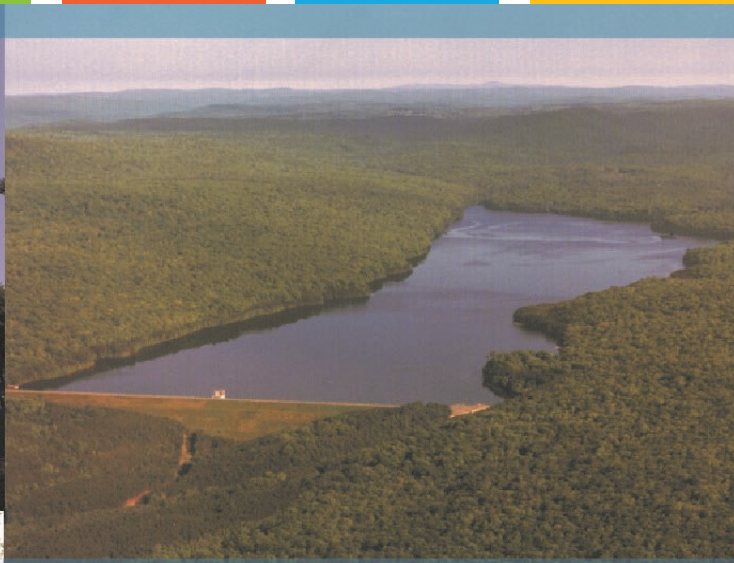
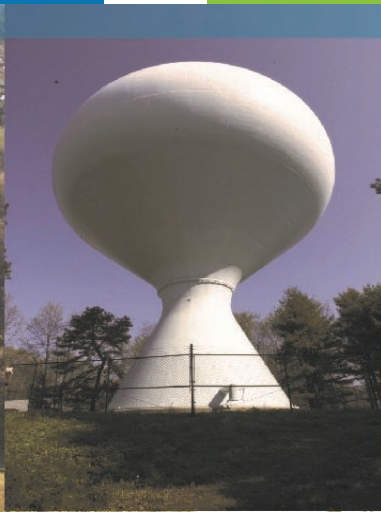
Comparison of summer temperatures for two streams: Wednesday Hill Brook (unimpacted) and College Brook (impacted); a wet and dry pond, a gravel wetland, and subsurface infiltration (Stormtech Isolator Row) with environmental indicators for cold water fisheries:

**Average Annual Groundwater Temperature (GW) = 47°F**

**Lower Optimum Limit (LOL) = 45°F**

**Upper Optimum Limit (UOL) = 65°F**

**Lethal Limit (LL) = 80°F**



Proposed Mixed Use Development  
53 Green Street  
Portsmouth, NH

## Long-Term Operation & Maintenance Plan

CPI Management, LLC

May 19, 2021

**Tighe&Bond**



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# Section 1

## Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

### 1.1 Contact/Responsible Party

Maintenance Area	Contact/Responsible Party
Map 119 Lot 2	CPI Management, LLC 100 Summer Street, Suite 1600 Boston, MA 02110
North Mill Pond Trail (City Easement)	City of Portsmouth DPW 680 Peverly Hill Road 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
- ADS Stormtech System with Isolator Row
- Contech Jellyfish Filtration System
- Porous Pavement

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	Responsible Party
Litter/Debris Removal	Weekly	CPI Management, LLC
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Bi-annually	CPI Management, LLC
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring	CPI Management, LLC
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually	CPI Management, LLC
Jelly Fish Units	In accordance with Manufacturer's Recommendations	CPI Management, LLC
ADS Stormtech System with Isolator Row - Visual observation of sediment levels within system	In accordance with Manufacturer's Recommendations	CPI Management, LLC
Porous Pavement - Clean using a vacuum sweeper	Bi-Annually	City of Portsmouth DPW

#### 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 ADS Stormtech System with Isolator Row

ADS Stormtech System w/Isolator Row Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	<ul style="list-style-type: none"> <li>- Trash, debris and sediment to be removed</li> <li>- Any required maintenance shall be addressed</li> </ul>
Inspect Isolator Row for sediment	6 months for the first year, then adjust based on previous observations	- Inspect inside the isolator row through inspection ports (if provided) or through the upstream structure.
Jetting and Vacuuming	Annually or as required by inspection.	<ul style="list-style-type: none"> <li>- If sediment is 3" or above, then clean out isolator row using the jetvac process.</li> <li>- Vacuum structure sump as required.</li> </ul>



# Isolator<sup>®</sup> Row O&M Manual



SC-740



MC-3500



MC-4500

## THE ISOLATOR<sup>®</sup> ROW

### INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

### THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC-310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the overflow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

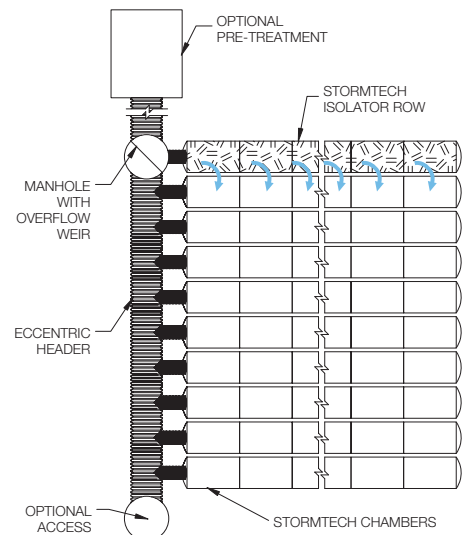
*Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.*

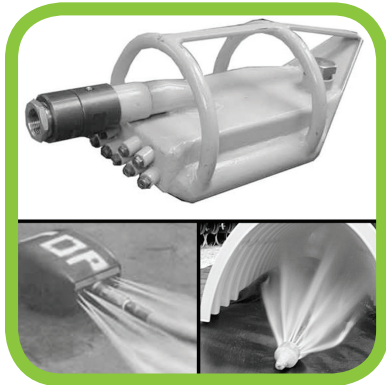


Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.



StormTech Isolator Row with Overflow Spillway (not to scale)





## ISOLATOR ROW INSPECTION/MAINTENANCE

### INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

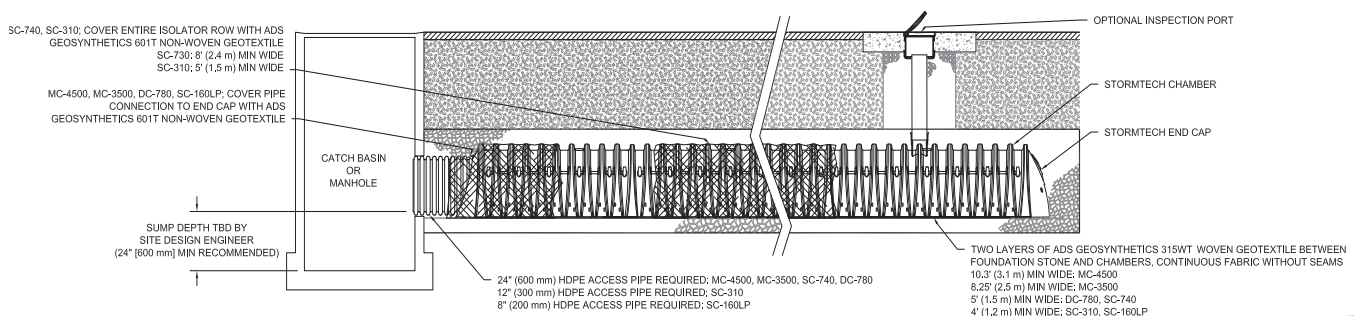
### MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

### StormTech Isolator Row (not to scale)

*Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.*



# ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

## STEP 1

Inspect Isolator Row for sediment.

- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
  - i. Remove cover from manhole at upstream end of Isolator Row
  - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    - 1. Mirrors on poles or cameras may be used to avoid a confined space entry
    - 2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

## STEP 2

Clean out Isolator Row using the JetVac process.

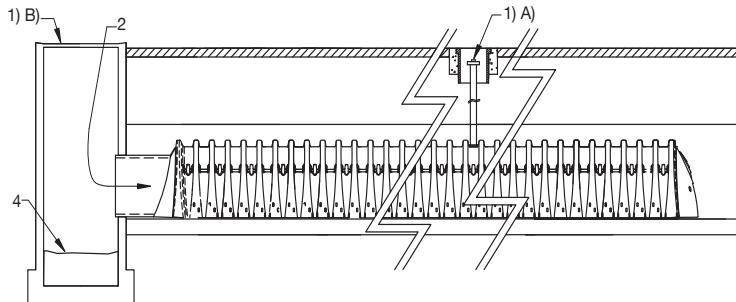
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

## STEP 3

Replace all caps, lids and covers, record observations and actions.

## STEP 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



## SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM



## 1.5 Contech Jellyfish Filter System Maintenance Requirements

Contech Jellyfish Filter System Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Inspect vault for sediment build up, static water, plugged media and bypass condition	One (1) time annually and after any rainfall event exceeding 2.5" in a 24-hr period	Maintenance required for any of the following: - >4" of sediment on the vault floor - >1/4" of sediment on top of the cartridge - .4" of static water above the cartridge bottom more than 24 hours after a rain event - If pore space between media is absent. - If vault is in bypass condition during an average rainfall event.
Replace Cartridges	As required by inspection, 1-5 years.	- Remove filter cartridges per manufacturer methods. - Vacuum sediment from vault. - Install new cartridges per manufacturer methods



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



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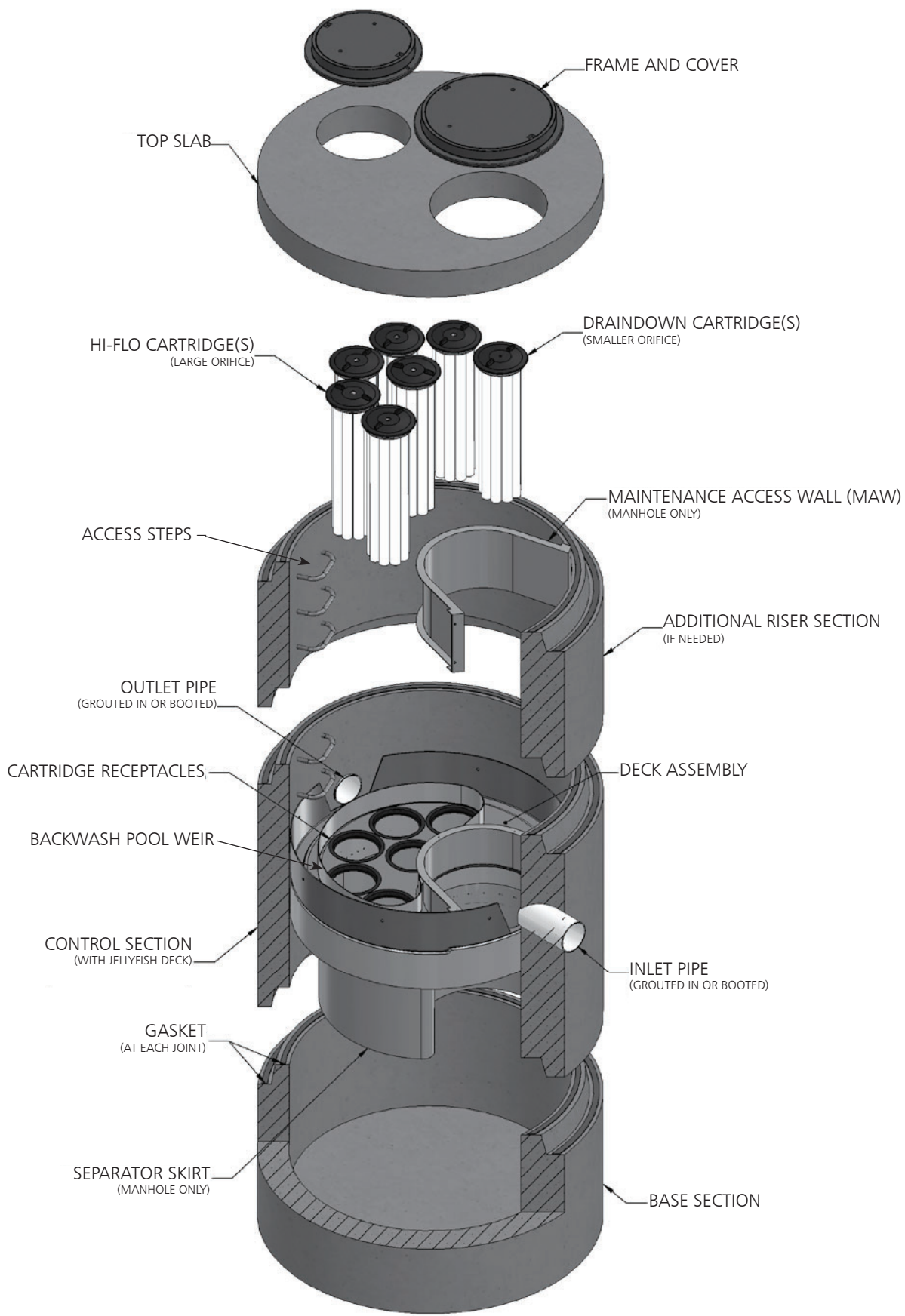
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## THANK YOU FOR PURCHASING THE JELLYFISH® FILTER!

Contech Engineered Solutions would like to thank you for selecting the Jellyfish Filter to meet your project's stormwater treatment needs. With proper inspection and maintenance, the Jellyfish Filter is designed to deliver ongoing, high levels of stormwater pollutant removal.

If you have any questions, please feel free to call us or e-mail us:

**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:

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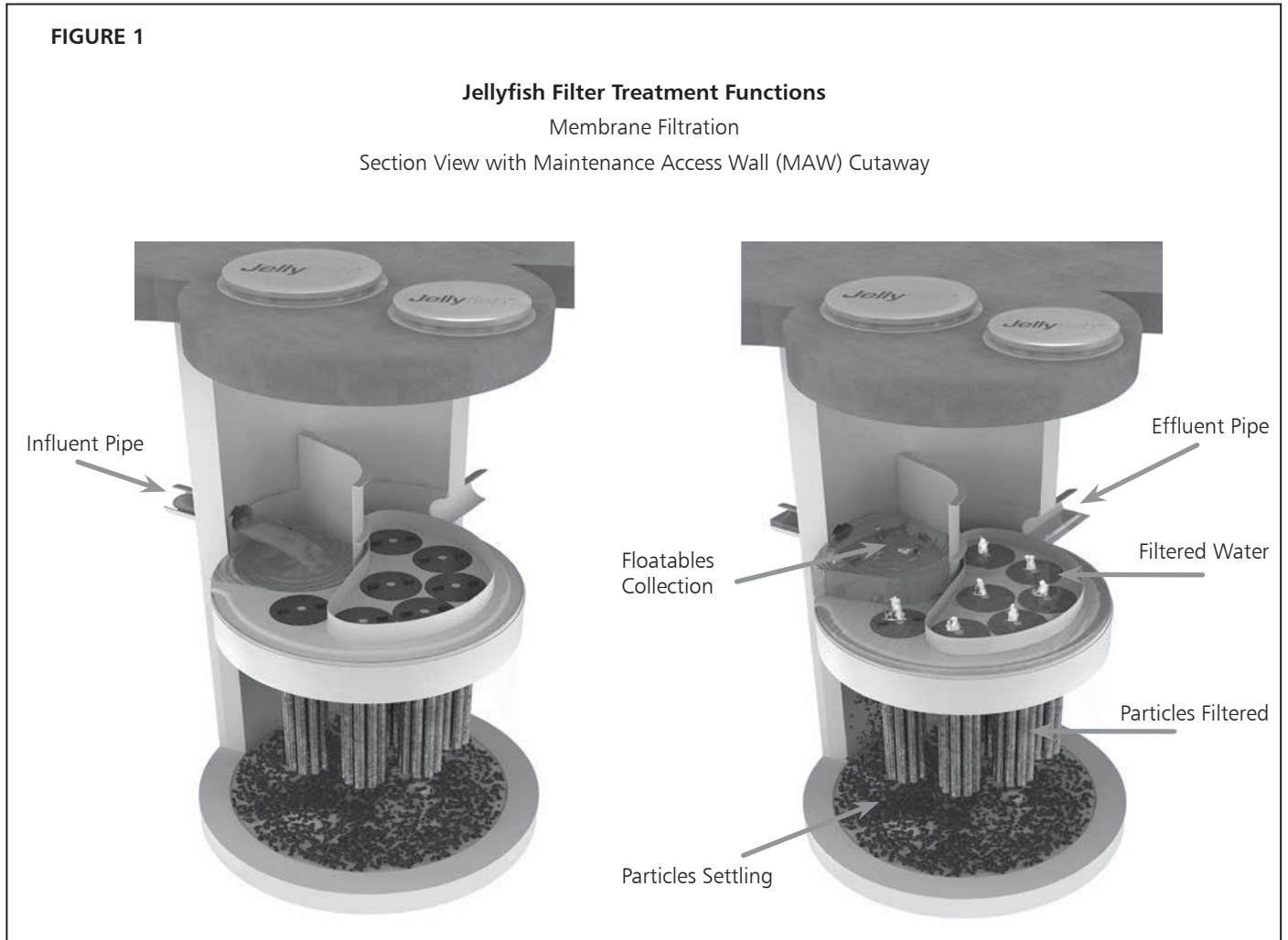
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## Chapter 2

### 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.

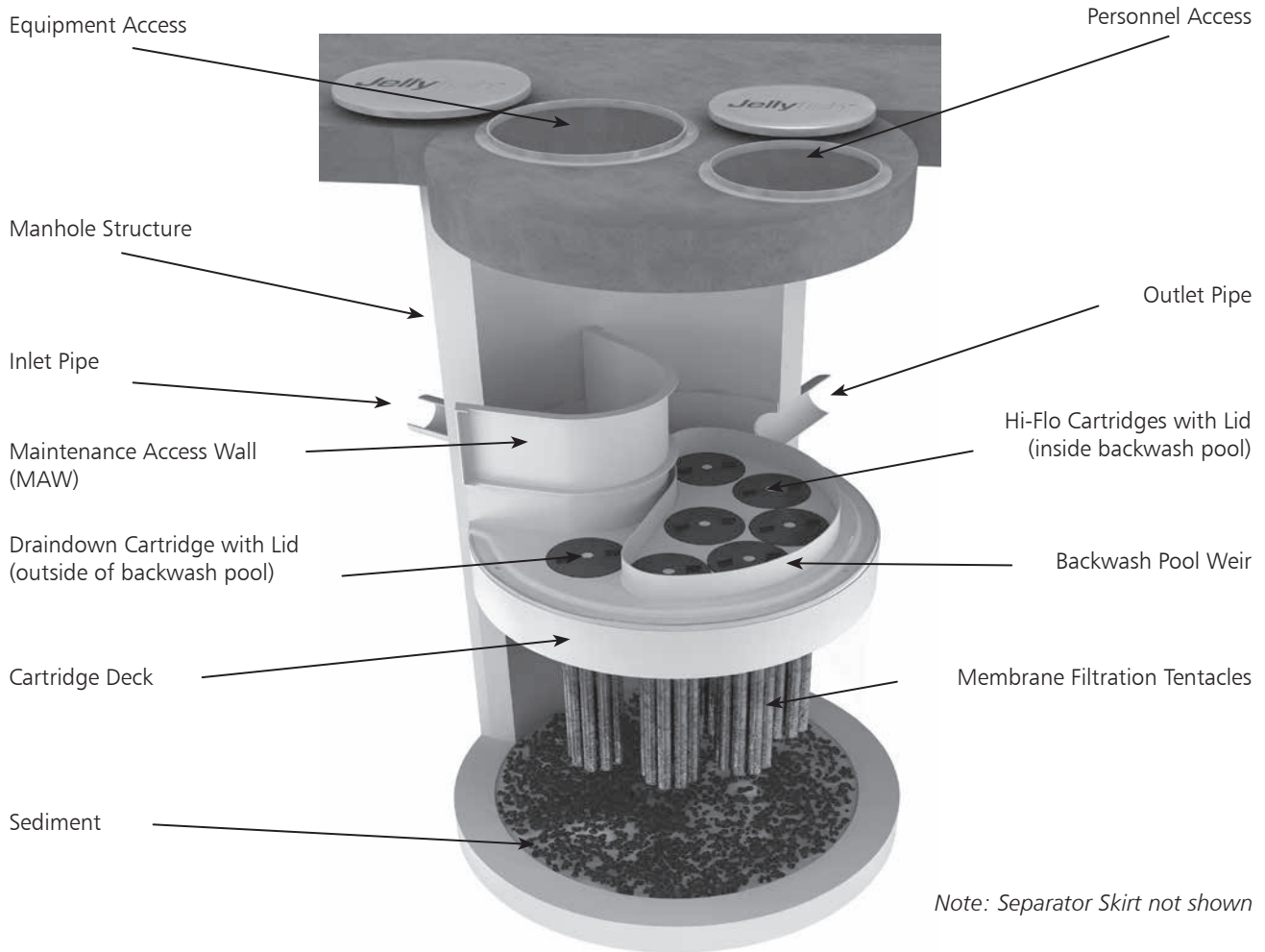
For additional details on the operation and pollutant capabilities of the Jellyfish Filter please refer to additional details on our website at [www.ContechES.com](http://www.ContechES.com).

## 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

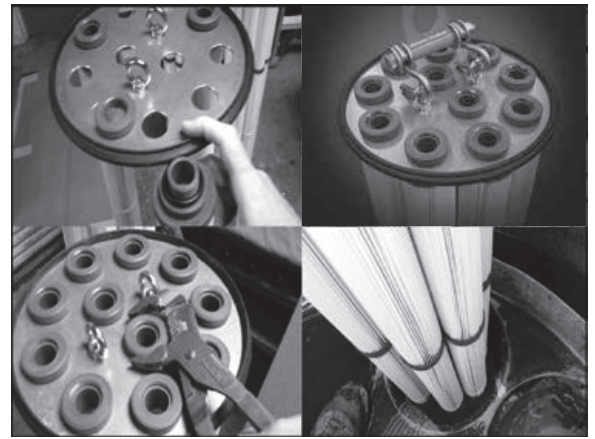


## 2.2 – Jellyfish Membrane Filtration Cartridge Assembly

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:

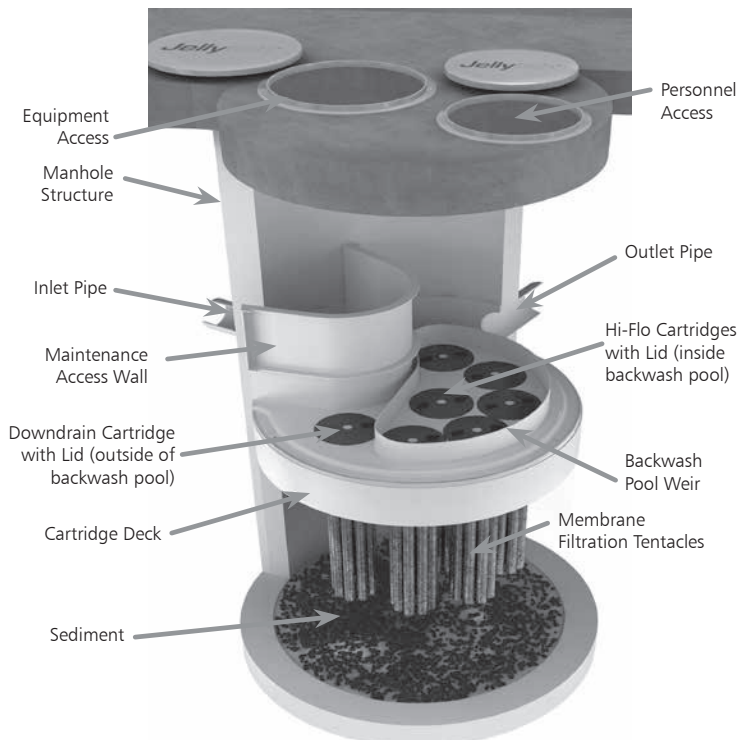
- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

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.

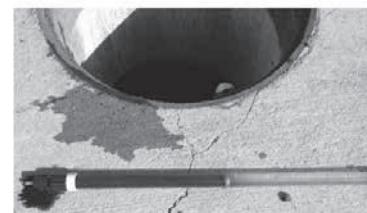
### 5.0 Inspection Procedure

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

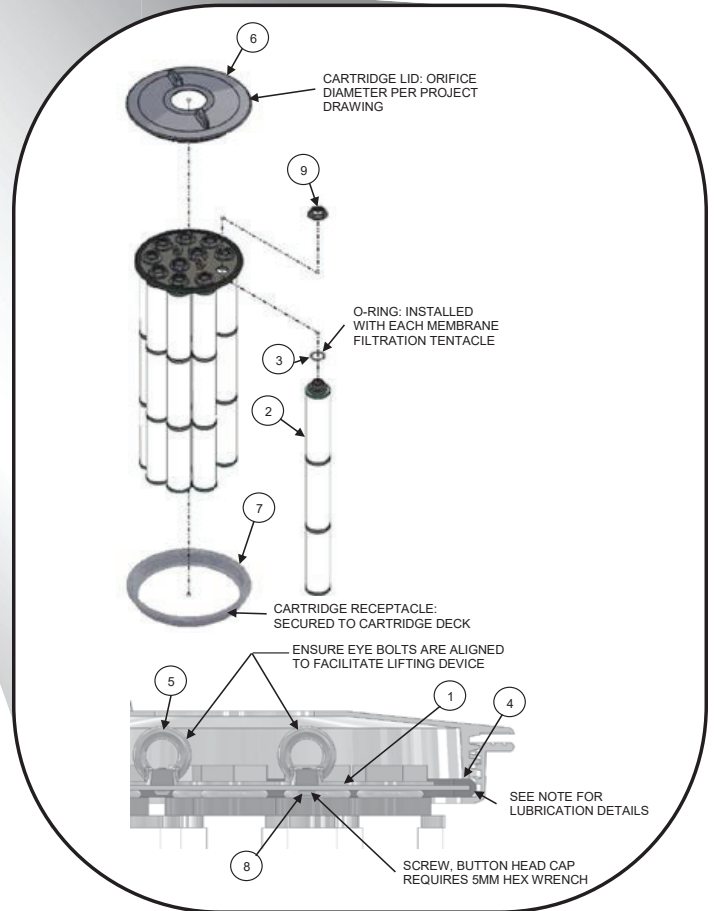
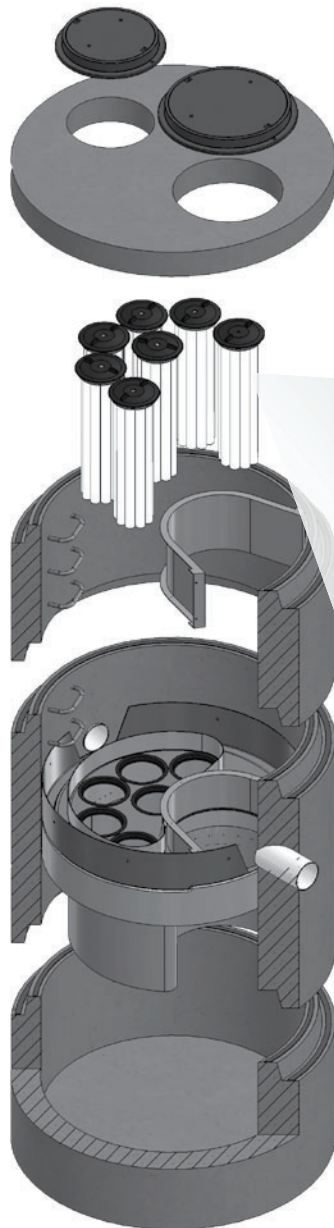


TABLE 1: BOM

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 Porous Asphalt Maintenance Requirements

Porous Asphalt Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Monitor for sediment build up, particularly in the winter.	Two (2) – Four (4) Times Annually.	- Clean with vacuum sweeper, bi-annually - Loose debris such as leaves or can be removed using a power/leaf blower or gutter broom. Fall and spring cleanup should be accompanied by pavement vacuuming.
Inspect Adjacent Vegetation	Two (2) – Four (4) Times Annually.	- Repair or replace any eroded areas.
Inspect for standing water -Within 30 minutes following a rain event.	One (1) – Two (2) Times Annually	- Use of a power washer or compressed air blower at an angle of 30 degrees or less can be effective, vacuum or vacuum sweeper if necessary.
Damage to pavement	As needed	- Repairs should be made as identified.

### **Porous Asphalt Winter Maintenance Guidelines:**

- ***No winter sanding or salting of porous pavements is permitted***
- Porous surfaces are commonly not treated and plowed until 2 or more inches of snow accumulation.
- Plow after every storm. If possible, plow with a slightly raised blade, this will help prevent pavement scarring.

### **Additional Porous Asphalt Operation and Maintenance Requirements:**

- Never reseal or repave with impermeable materials.
- Inspect annually for pavement deterioration or spalling.
- Monitor periodically to ensure the pavement surface drains effectively after storms.

## **1.7 Snow & Ice Management for Standard Asphalt and Walkways**

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Snow removal will be hauled off-site and legally disposed of when snowbanks exceed 3 feet in height. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt storage is not permitted within the 100' wetland buffer. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume,).



## **Section 2**

# **Chloride Management Plan**

### **Winter Operational Guidelines**

The following Chloride Management Plan is for the 53 Green Street, Mixed Use Development in Portsmouth, New Hampshire. The Plan includes operational guidelines including winter operator certification requirements, weather monitoring, equipment calibration requirements, mechanical removal, and salt usage evaluation and monitoring. Due to the evolving nature of chloride management efforts, the Chlorides Management Plan will be reviewed annually, in advance of the winter season, to reflect the current management standards.

#### **2.1 Background Information**

The 53 Green Street, Mixed Use Development is located along the North Mill Pond in Portsmouth, New Hampshire.

#### **2.2 Operational Guidelines – Chloride Management**

All private contractors engaged at the development site for the purposes of winter operational snow removal and surface maintenance, are responsible for assisting in meeting compliance for the following protocols. Private contractors are expected to minimize the effects of the use of de-icing, anti-icing and pretreatment materials by adhering to the strict guidelines outlined below.

The winter operational de-icing, anti-icing and pretreatment materials will adhere to the following protocols:

##### **2.2.1 Winter Operator Certification Requirements**

All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance must be current UNHT2 Green SnowPro Certified operators or equivalent and will use only pre-approved methods for spreading abrasives on private roadways and parking lots. All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance shall provide to the property management two copies of the annual UNHT2 Green SnowPro certificate or equivalent for each operator utilized on the premises. The annual UNHT2 Green SnowPro certificate or equivalent for each operator will be available on file in the Facilities Management office and be present in the vehicle/carrier at all times.

##### **2.2.2 Improved Weather Monitoring**

The property manager will coordinate weather information for use by winter maintenance contractors. This information in conjunction with site specific

air/ground surface temperature monitoring will ensure that private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance will make more informed decisions as to when and to what extent de-icing, anti-icing and pretreatment materials are applied to private roadways, sidewalks, and parking lots.

### **2.2.3 Equipment Calibration Requirements**

All equipment utilized on the premises for the purpose of winter operational snow removal and surface maintenance will conform to the following calibration requirements.

#### **2.2.3.1 Annual Calibration Requirements**

All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of the annual calibration report for each piece of equipment utilized on the premises. Each calibration report shall include the vehicle/carrier VIN number and the serial numbers for each component including, but not limited to, spreader control units, salt aggregate spreader equipment, brining/pre-wetting equipment, ground speed orientation unit, and air/ground surface temperature monitor. Annual calibration reports will be available on file in the Facilities Management office and be present in the vehicle/carrier at all times.

Prior to each use, each vehicle/carrier operator will perform a systems check to verify that unit settings remain within the guidelines established by the Management Team in order to accurately dispense material. All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance will be subject to spot inspections by members of the Property Management Team to ensure that each vehicle/carrier is operating in a manner consistent with the guidelines set herein or State and Municipal regulations. All units will be recalibrated, and the updated calibration reports will be provided each time repairs or maintenance procedures affect the hydraulic system of the vehicle/carrier.

### **2.2.4 Increased Mechanical Removal Capabilities**

All private contractors engaged at the premises will endeavor to use mechanical removal means on a more frequent basis for roadways, parking lots and sidewalks. Dedicating more manpower and equipment to increase snow removal frequencies prevents the buildup of snow and the corresponding need for de-icing, anti-icing and pretreatment materials. Shortened maintenance routes, with shorter service intervals, will be used to stay ahead of snowfall. Minimized snow and ice packing will reduce the need for abrasives, salt aggregates, and/or brining solution to restore surfaces back to bare surface states after winter precipitation events.

After storm events the management team will be responsible for having the streets swept to recapture un-melted de-icing materials, when practical.

## **2.3 Salt Usage Evaluation and Monitoring**

All private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance shall provide two copies of a storm report, which includes detailed information regarding treatment areas and the use of de-icing, anti-icing and pretreatment materials applied for the removal of snow and surface maintenance on the premises. The property manager will maintain copies of Summary Documents, including copies of the Storm Reports, operator certifications, equipment used for roadway and sidewalk winter maintenance, calibration reports and amount of de-icing materials used.

## **2.4 Summary**

The above-described methodologies are incorporated into the Operational Manual and are to be used to qualify and retain all private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance. This section of the Manual is intended to be an adaptive management document that is modified as required based on experience gained from past practices and technological advancements that reflect chloride BMP standards. All employees directly involved with winter operational activities are required to review this document and the current standard Best Management Practices published by the UNH Technology Transfer (T2) program annually. All employees directly involved with winter operational activities, and all private contractors engaged at the premises for the purposes of winter operational snow removal and surface maintenance, must be current UNHT2 Green SnowPro Certified operators or equivalent and undergo the necessary requirements to maintain this certification annually.



### Deicing Application Rate Guidelines

24' of pavement (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 3**

# **Invasive Species**

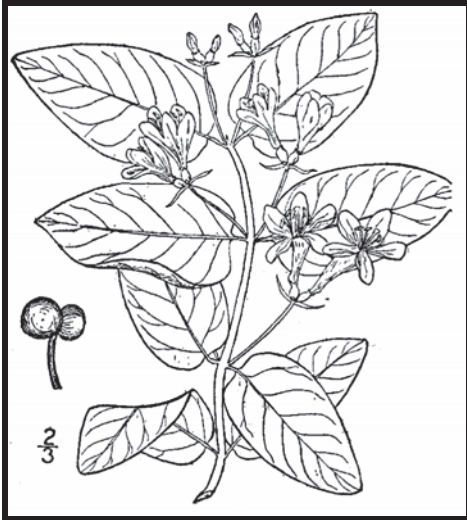
With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem is classified as an invasive species. Refer to the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plants for recommended methods to dispose of invasive plant species.







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>	<b>Fruit and Seeds</b> 	<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> <hr/> <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>	<b>Fruits, Seeds, Plant Fragments</b> 	<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> <hr/> <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

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# Managing Invasive Plants

## Methods of Control

by Christopher Mattrick

### They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time ... but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

### PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment



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 4**

# **Annual Updates and Log Requirements**

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth on an annual basis.




Stormwater Management Report						
Mixed Use Development		53 Green Street – Map 119 Lot 2				
BMP Description	Date of Inspection	Inspector	BMP Installed and Operating Properly?	Cleaning / Corrective Action Needed	Date of Cleaning / Repair	Performed By
Deep Sump CB's			<input type="checkbox"/> Yes <input type="checkbox"/> No			
ADS Stormtech System with Isolator Row			<input type="checkbox"/> Yes <input type="checkbox"/> No			
Jellyfish Filter 1			<input type="checkbox"/> Yes <input type="checkbox"/> No			



Stormwater Management Report						
City of Portsmouth		North Mill Pond Trail				
BMP Description	Date of Inspection	Inspector	BMP Installed and Operating Properly?	Cleaning / Corrective Action Needed	Date of Cleaning / Repair	Performed By
Porous Pavement			<input type="checkbox"/> Yes <input type="checkbox"/> No			





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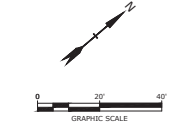
PROPOSED MIXED USE DEVELOPMENT  
53 GREEN STREET  
PORTSMOUTH, NEW HAMPSHIRE

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SITE OVERLAY EXHIBIT



Drawn: May 19, 2021 9:43 AM By: NEWHAMPSHIRE  
Title Location: 53 GREEN ST, PORTSMOUTH, NH DRAWING: Figures\Misc\056-011\_C-FIGS.dwg Layer: THIS SITE AREA



**Tighe & Bond**

May 19, 2021  
C0960-011\_C-FIGS.dwg

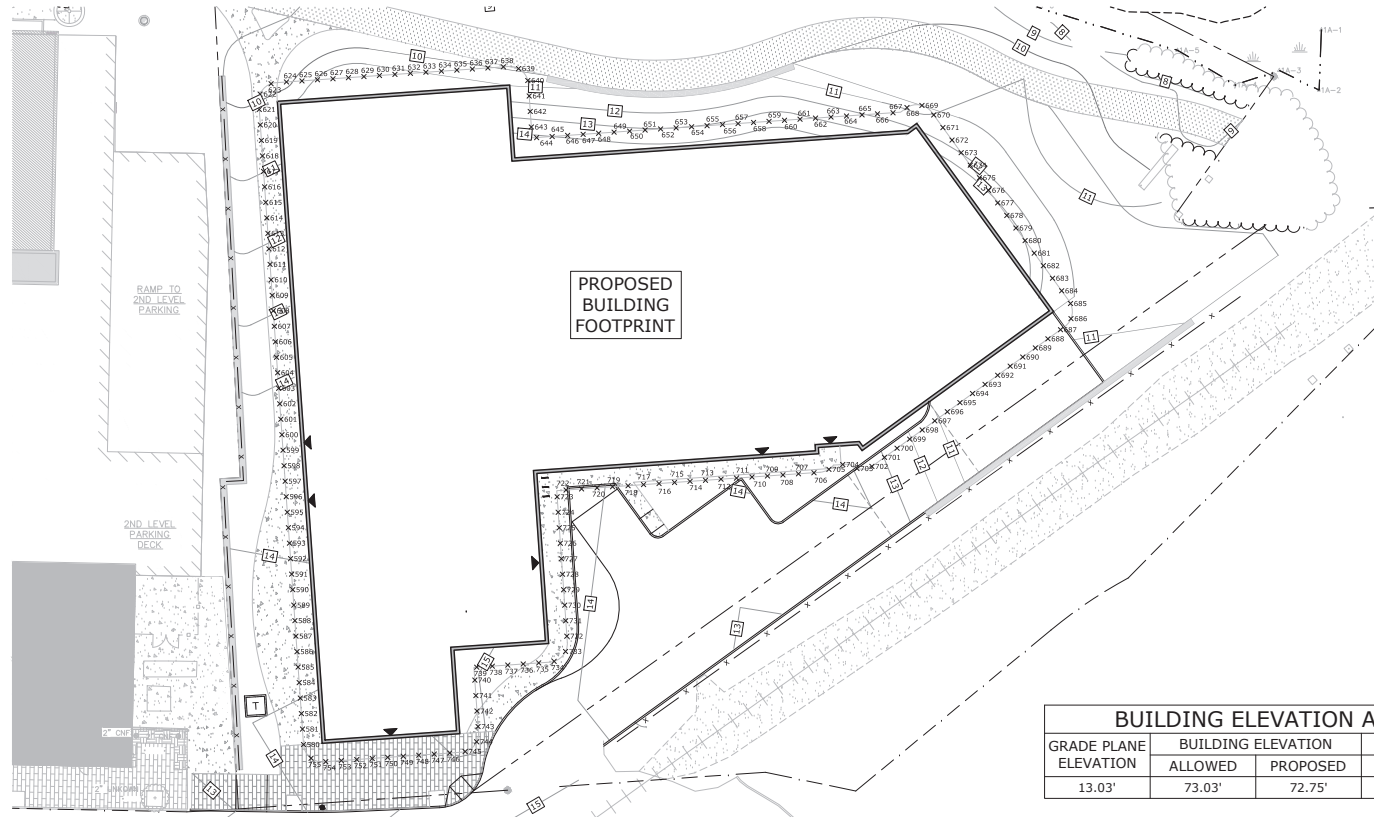


PROPOSED MIXED USE DEVELOPMENT  
53 GREEN STREET  
PORTSMOUTH, NEW HAMPSHIRE

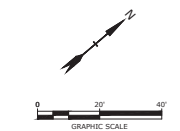
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GRADE PLANE EXHIBIT

Point Table		Point Table		Point Table		Point Table		Point Table		Point Table		Point Table		Point Table		
Point #	Elevation	Point #	Elevation	Point #	Elevation	Point #	Elevation	Point #	Elevation	Point #	Elevation	Point #	Elevation	Point #	Elevation	
588	13.750	599	14.400	619	10.650	639	9.950	660	13.800	680	13.000	700	12.600	720	14.050	
644	14.100	600	14.300	620	10.400	640	10.750	661	13.500	681	12.750	701	13.100	721	14.100	
580	13.950	601	14.200	621	10.150	641	11.600	662	13.200	682	12.000	702	13.600	722	14.600	
581	13.950	602	14.100	622	9.900	642	12.600	663	12.900	683	11.750	703	14.000	723	14.650	
582	13.900	603	14.000	623	9.850	643	13.600	664	12.600	684	11.400	704	14.600	724	14.650	
583	13.850	604	13.800	624	9.950	645	14.100	665	12.300	685	11.100	705	14.600	725	14.650	
584	13.800	605	13.600	625	10.400	646	13.950	666	12.000	686	11.100	706	14.600	726	14.650	
585	13.750	606	13.400	626	11.000	647	13.800	667	11.750	687	10.650	707	14.600	727	14.650	
586	13.700	607	13.200	627	11.200	648	13.700	668	11.100	688	10.650	708	14.600	728	14.650	
587	13.700	608	12.900	628	11.200	649	13.500	669	10.900	689	10.650	709	14.600	729	14.650	
589	13.850	609	12.700	629	11.200	650	13.350	670	11.250	690	10.650	710	14.600	730	14.650	
590	13.900	610	12.550	630	11.200	651	13.250	671	11.600	691	10.650	711	14.100	731	14.650	
591	13.950	611	12.350	631	11.100	652	13.100	672	11.950	692	10.650	712	14.100	732	14.650	
592	14.000	612	12.100	632	11.000	653	13.100	673	12.250	693	10.900	713	14.000	733	14.600	
593	14.150	613	11.850	633	11.000	654	13.100	674	12.600	694	10.900	714	14.000	734	14.600	
594	14.300	614	11.650	634	10.750	655	13.200	675	12.950	695	10.900	715	13.950	735	14.600	
595	14.450	615	11.450	635	10.500	656	13.300	676	13.100	696	10.950	716	13.950	736	14.700	
596	14.500	616	11.200	636	10.350	657	13.500	677	13.100	697	11.250	717	13.900	737	14.800	
597	14.500	617	10.950	637	10.100	658	13.750	678	13.100	698	11.750	718	13.950	738	15.000	
598	14.500	618	10.800	638	9.950	659	13.800	679	13.100	699	12.200	719	13.950	739	15.100	
															AVERAGE GRADE PLANE	13.03



BUILDING ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING ELEVATION		BUILDING HEIGHT	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
13.03'	73.03'	72.75'	60.00'	59.55



**Tighe & Bond**

May 19, 2021  
C0960-011\_C-DSGN.dwg

User: Dave; Date: May 18, 2021, 12:12 PM; By: ABE/LAR  
 Title: 53 Green Street, Portsmouth, NH; Drawing: Figures/0960-011\_C-DSGN.dwg; Layer: Title; Grade Plane

## 53 Green Street, Portsmouth, NH: Wetland & Buffer Report

**To:** Patrick Crimmins, PE  
**FROM:** Leonard A. Lord, PhD, CSS, CWS  
**DATE:** January 6, 2020  
**PROJECT:** P-0595-007

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On October 29 and December 2, 2019, Tighe & Bond delineated and assessed tidal wetlands and their 100-foot buffers at 53 Green Street, Portsmouth, NH. This 1.81-acre parcel lies along the northwestern end of North Mill Pond.

### Methods

The wetland delineation was based on criteria specified in the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (January 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (January 2012). The Highest Observable Tide Line (HOTL) was delineated based on the definition found in the NH Department of Environmental Services (NHDES) Wetland Rules, Env-Wt 101.49/Env-Wt 602.23. Wetlands were classified based on the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). The only wetlands located on the parcel are tidal wetlands (HOTL), which were delineated with sequentially-numbered flagging labelled 1A-1 to 1A-19.

Important wetland functions and values were also assessed and summarized in the vicinity of the parcel. The assessment was based on the *Maine Citizens Guide to Evaluating, Restoring, and Managing Tidal Marshes* (Bryan et al., 1997) and *The Highway Methodology Workbook Supplement—Wetland Functions and Values: A Descriptive Approach*, NAEPP-360-1-30a, US Army Corps of Engineers, New England Division, (September 1999).

### Wetlands

Wetlands on this site were classified as estuarine intertidal rocky shore, rubble, and regularly flooded (E2RS2N). The wetland edge slopes sharply and is predominantly covered with angular stones and cobbles. Sparse halophytic vegetation along the upper portion of the tidal wetland edge includes seaside plantain (*Plantago maritima*), sea lavender (*Limonium carolinianum*), salt meadow grass (*Spartina patens*), and seaside goldenrod (*Solidago sempervirens*). Lower portions of the slopes were covered with rockweed (*Ascophyllum nodosum*) within the intertidal zone. Important wetland functions and values in this portion of North Mill Pond include recreation potential and aesthetic quality, though both are impacted by the density and character of the surrounding urban development.

### Tidal Buffer

The 100-foot tidal buffer on this parcel consists primarily of maintained lawn, a commercial building, and a parking lot. There are small patches of shrubby vegetation and small trees at the tops of the slopes between the lawn and tidal wetlands, particularly near both ends of the wetland delineation. Species in these areas include black locust (*Robinia pseudoacacia*),

eastern red cedar (*Juniperus virginiana*), staghorn sumac (*Rhus typhina*), and black cherry (*Prunus serotina*). The highly-developed tidal buffer provides some vegetated permeable surfaces to help reduce and filter runoff but otherwise does little to enhance and protect the downgradient tidal wetland.

\\tighebond.com\data\Data\Projects\P\0595 Pro Con General Proposals\0595-007 Raynes Ave Hotel\Raynes+Green Wetlands+Soils\Green St Wetland-Buffer Rept- 2020-1-9.pdf

# Photographic Log

**Client:** ProCon

**Job Number:** P-0595-007

**Site:** 53 Green Street, Portsmouth, NH

<b>Photograph No.:</b> 1	<b>Date:</b> 10/29/2019	<b>Direction Taken:</b> Northeast
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**Description:** Intertidal rocky shore and tidal buffer viewed from the southwest end of the site.



<b>Photograph No.:</b> 2	<b>Date:</b> 10/29/2019	<b>Direction Taken:</b> Northeast
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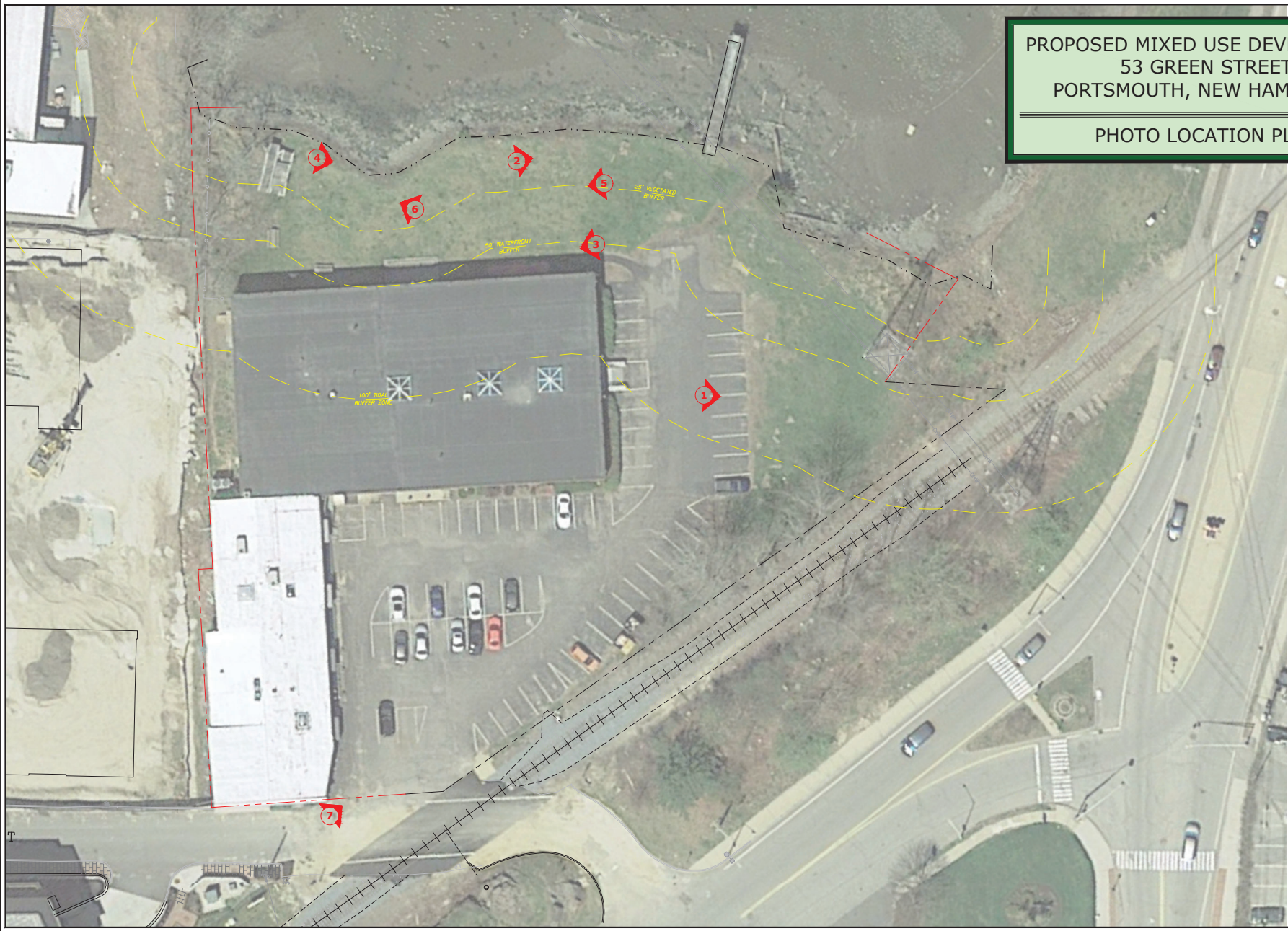
**Description:** Intertidal rocky shore and narrow shrubby portion of the tidal buffer at the northeastern end of the site.



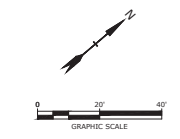
PROPOSED MIXED USE DEVELOPMENT  
53 GREEN STREET  
PORTSMOUTH, NEW HAMPSHIRE

---

PHOTO LOCATION PLAN



Plot Size: 100' x 100' Date: January 27, 2021 11:55AM By: CML  
Title: 53 Green Street, Portsmouth, NH  
File Location: \\C:\Users\CML\Documents\C0960-011\_53 Green St, Portsmouth, NH\Drawings\Figures\Misc\011\_C\_Photo Location.dwg Layer: Title Photo Location



**Tighe & Bond**

January 27, 2021  
C0960-011\_C\_Photo Location.dwg



Photo #1: Looking northeast at existing utility towers and parking located in 100-foot tidal wetland buffer.



Photo #2: Looking northeast towards Market Street across existing maintained lawn area located in 100-foot tidal wetland buffer.



Photo #3: Looking southwest along existing building within 100-foot tidal wetland buffer.



Photo #4: Looking northeast toward existing building and parking located in 100-foot tidal wetland buffer.



Photo #5: Looking southwest towards existing building and maintained lawn area located in 100-foot tidal wetland buffer.



Photo #6: Looking west across existing maintained lawn area and North Mill Pond toward location of future City park.



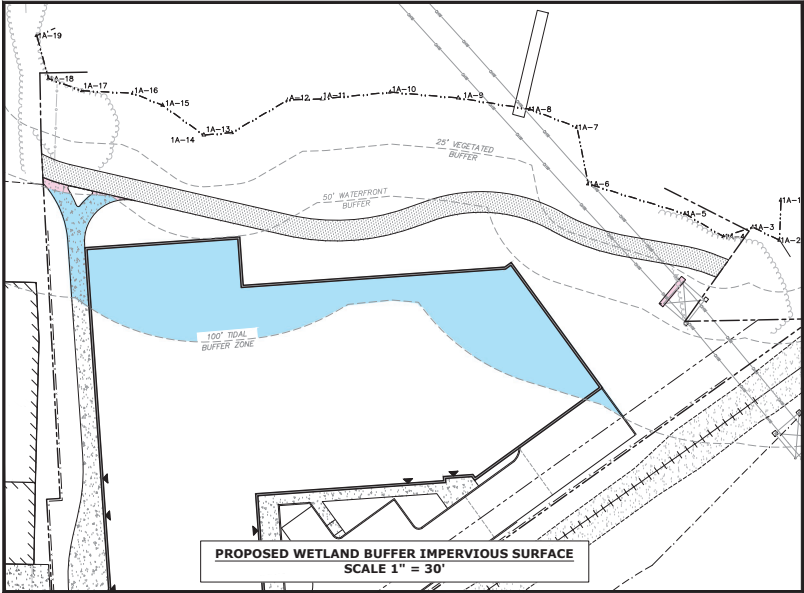
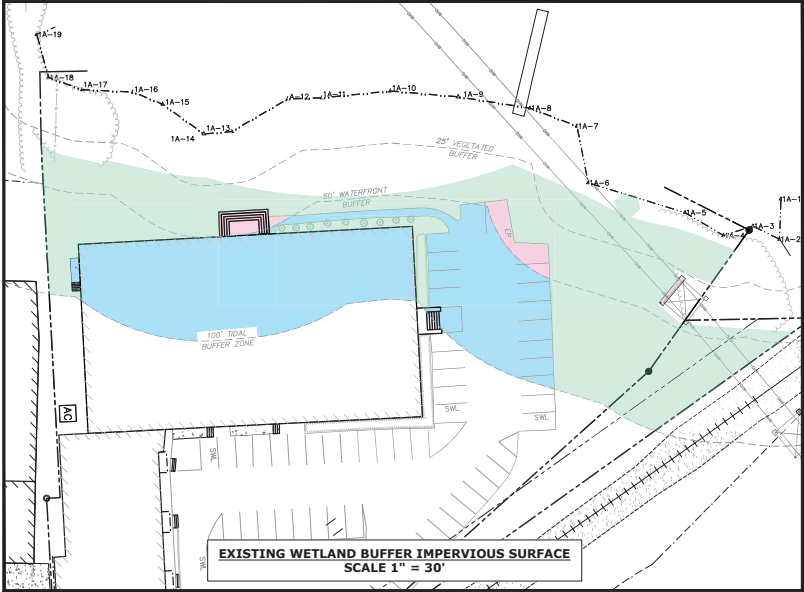


Photo #7: Looking north toward existing parking lot.

**PROPOSED MIXED USE DEVELOPMENT  
53 GREEN STREET**

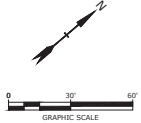
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**WETLAND BUFFER IMPERVIOUS  
SURFACE EXHIBIT**



Local Wetland Buffer Setback	Impervious Surface	
	Existing Condition	Proposed Development
0 - 25 FT	0 SF	0 SF
25 - 50 FT	745 SF	110 SF
50 - 100 FT	10,836 SF	8,513 SF
<b>Total Impervious Surface</b>	<b>11,581 SF</b>	<b>8,623 SF</b>
<b>Net Impervious Surface</b>	<b>-2,958 SF</b>	

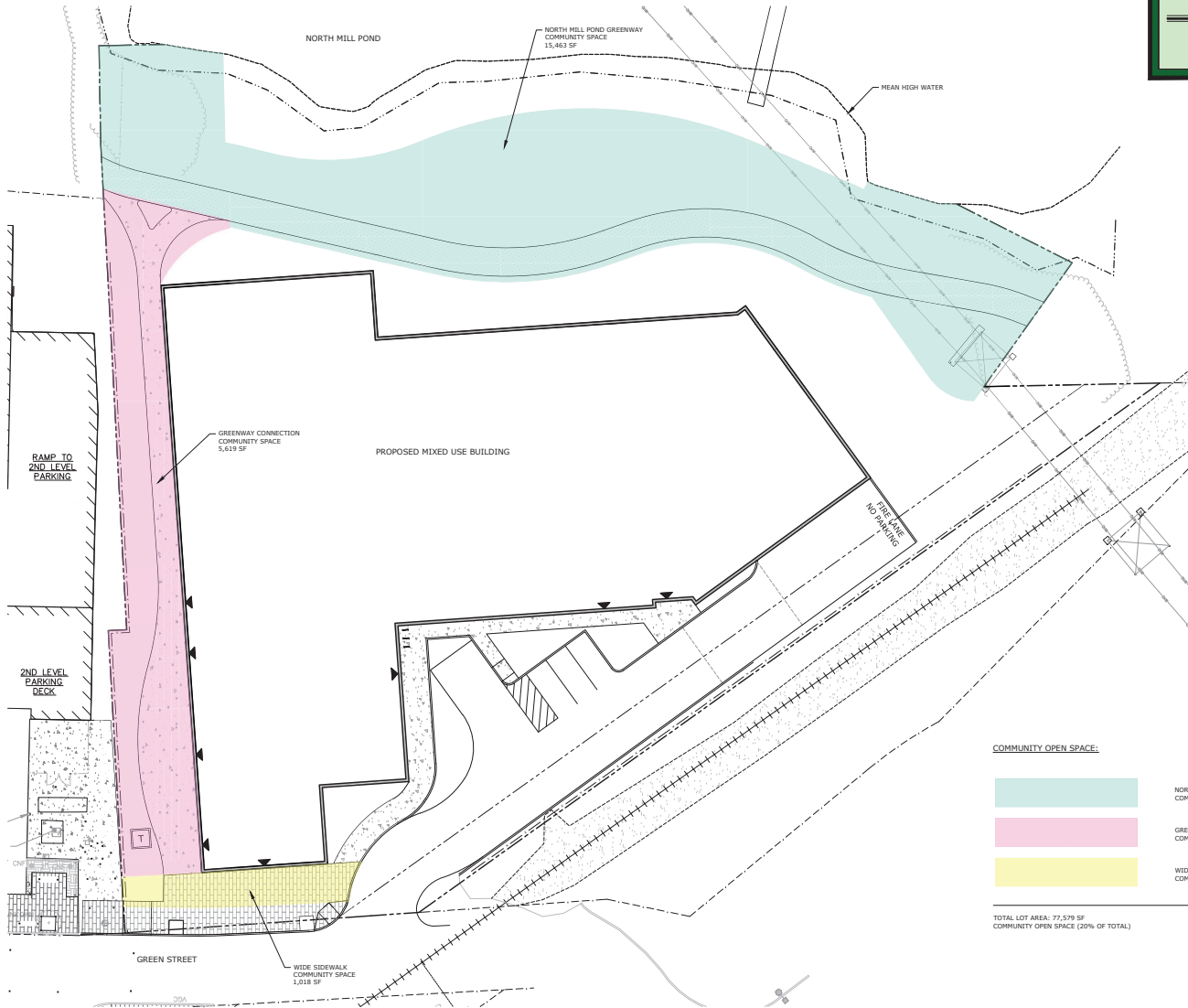
AREA OF TEMPORARY WETLAND BUFFER IMPACTS FOR CONSTRUCTION






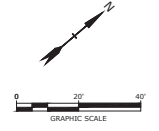
PROPOSED MIXED USE DEVELOPMENT  
 53 GREEN STREET  
 PORTSMOUTH, NEW HAMPSHIRE

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COMMUNITY SPACE EXHIBIT



COMMUNITY OPEN SPACE:		REQUIRED	PROVIDED
	NORTH MILL POND GREENWAY COMMUNITY SPACE		15,463 SF
	GREENWAY CONNECTION COMMUNITY SPACE		5,619 SF
	WIDE SIDEWALK COMMUNITY SPACE		1,018 SF
TOTAL LOT AREA: 77,579 SF COMMUNITY OPEN SPACE (20% OF TOTAL)		15,516 SF	22,100 SF



**Tighe & Bond**

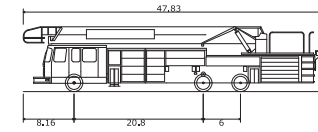
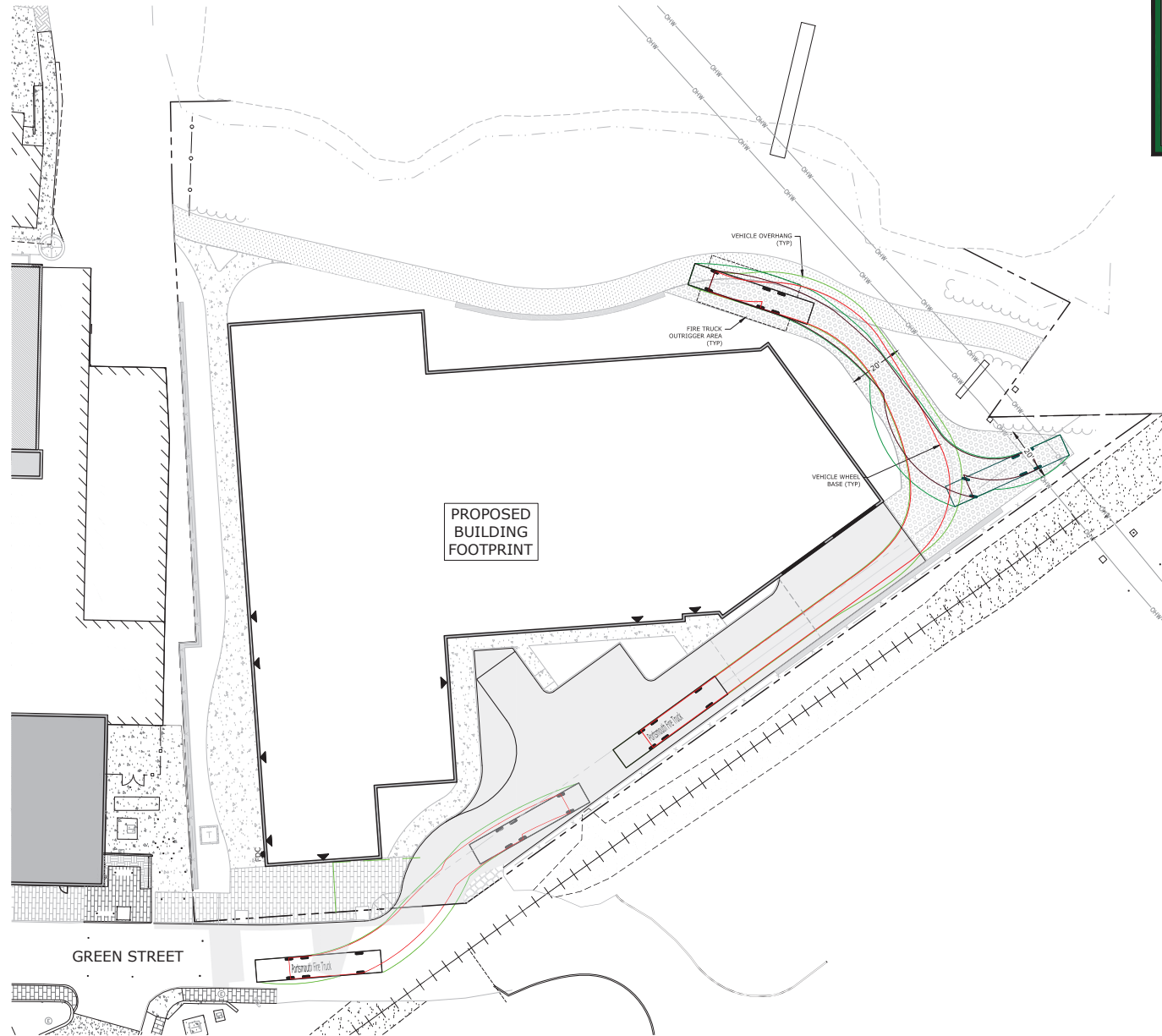
May 19, 2021  
 C0960-011\_C-FIGS.dwg

Date: May 19, 2021 10:07 AM By: BHANSEN  
 User: bhansen  
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**PROPOSED MIXED USE DEVELOPMENT  
53 GREEN STREET  
PORTSMOUTH, NEW HAMPSHIRE**

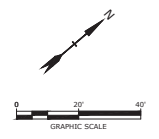
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**FIRE TRUCK TURNING EXHIBIT**



Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

- LEGEND**
- VEHICLE WHEEL BASE
  - VEHICLE OVERHANG
  - VEHICLE WHEEL BASE (REVERSE)
  - VEHICLE OVERHANG (REVERSE)



**Tighe & Bond**

May 19, 2021  
C0960-011\_C-DSGN.dwg

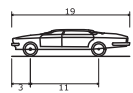
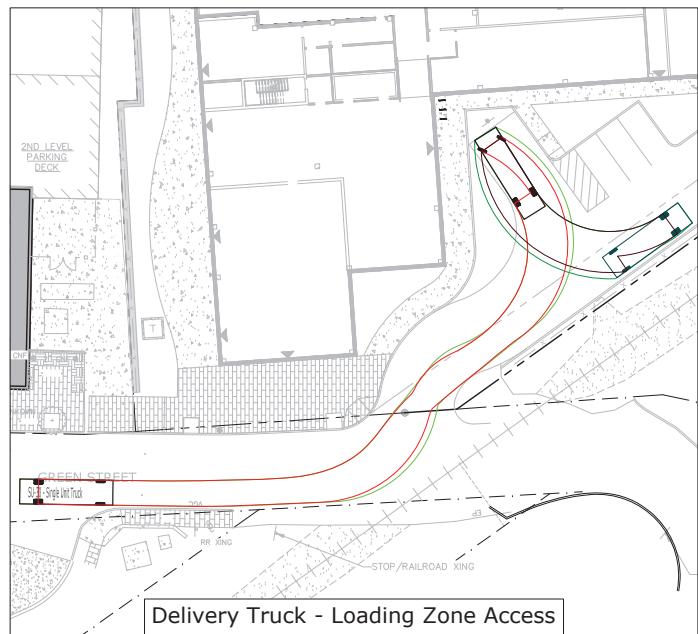
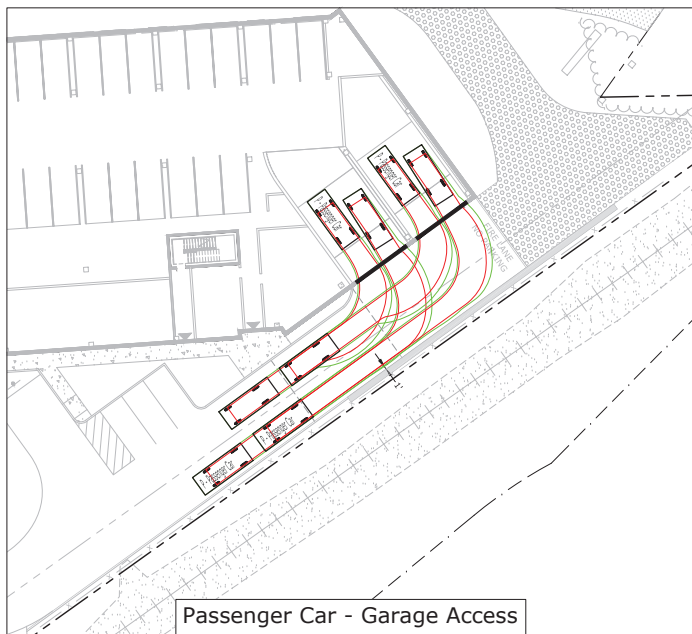
Date: May 19, 2021 9:40 AM by: NAWANSEN  
 User: NAWANSEN  
 File Location: U:\CADD\CONTRACTS\0960-011\_53 Green St, Portsmouth, NH Drawings\Figures\Misc\0960-011\_C-DSGN.dwg Layout Title: FIRE TRUCK

**PROPOSED MIXED USE DEVELOPMENT  
53 GREEN STREET  
PORTSMOUTH, NEW HAMPSHIRE**

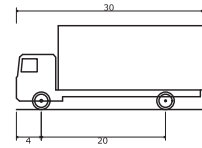
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**SITE TRAFFIC EXHIBIT**

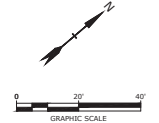
- LEGEND**
- VEHICLE WHEEL BASE
  - VEHICLE OVERHANG
  - VEHICLE WHEEL BASE (REVERSE)
  - VEHICLE OVERHANG (REVERSE)



P - Passenger Car  
 Overall Length 19.000ft  
 Overall Width 7.000ft  
 Overall Body Height 4.300ft  
 Min Body Ground Clearance 1.115ft  
 Track Width 6.000ft  
 Lock-to-lock time 4.00s  
 Max Steering Angle (Virtual) 31.60°



SU-30 - Single Unit Truck  
 Overall Length 30.000ft  
 Overall Width 8.000ft  
 Overall Body Height 13.500ft  
 Min Body Ground Clearance 1.367ft  
 Track Width 8.000ft  
 Lock-to-lock time 5.00s  
 Max Steering Angle (Virtual) 31.80°



**Tighe & Bond**

Date: May 19, 2021 9:40 AM By: NAWANSEN  
 User: NAWANSEN  
 File Location: U:\CADD\0960-011\_53 Green St, Portsmouth, NH\Drawings\Figures\MIXED\0960-011\_C-DSGN.dwg (Layout Tab - SITE TRAFFIC)

C0960-011  
 May 19, 2021

Mr. Eric Eby, City Traffic Engineer  
 City of Portsmouth  
 Department of Public Works  
 680 Peverly Hill Road  
 Portsmouth New Hampshire

Re: **Trip Generation Analysis**  
**Proposed Mixed Use Development – 53 Green Street, Portsmouth, NH**

Dear Eric:

Tighe & Bond has performed a trip generation analysis for traffic related to a proposed mixed-use development on a parcel of land located at 53 Green Street that is identified as Map 119 Lot 2 on the City of Portsmouth Tax Maps.

This analysis was performed utilizing Institute of Transportation Engineers (ITE) Trip Generation Manual, latest edition. For purposes of analysis, we have compared the existing and proposed uses for the parcel. The parcel’s existing uses consists of 14,600 SF of office, 3,000 SF of medical office and 4,070 SF of spa with on-site parking. These buildings will be demolished. The proposed building consists 48 dwelling units with associated on-site parking. The proposed building also includes ±2,300 SF of first floor commercial space along Green Street but there are no on-site parking spaces required for this use, however it was included as part of this Trip Generation Analysis to provide a more conservative analysis.

	Existing			Proposed		Net Trips
	Office	Spa	Medical Office	Multifamily Housing	Commercial	
<b>Weekday AM Peak Hour</b>						
Trips Entering	15	5	6	4	3	-19
Trips Exiting	2	0	2	13	1	+10
<b>Total Vehicle Trips</b>	<b>17</b>	<b>5</b>	<b>8</b>	<b>17</b>	<b>4</b>	<b>-9</b>
<b>Weekday PM Peak Hour</b>						
Trips Entering	3	1	3	13	2	+8
Trips Exiting	15	5	7	8	4	-15
<b>Total Vehicle Trips</b>	<b>18</b>	<b>6</b>	<b>10</b>	<b>21</b>	<b>6</b>	<b>-7</b>
<b>Saturday Peak Hour</b>						
Trips Entering	4	8	5	10	0	-7
Trips Exiting	4	13	4	11	1	-9
<b>Total Vehicle Trips</b>	<b>8</b>	<b>21</b>	<b>9</b>	<b>21</b>	<b>1</b>	<b>-16</b>

**Source:** Institute of Transportation Engineering, Trip Generation, 10<sup>th</sup> Edition  
 Land Uses – 221 Multifamily Housing (Mid-Rise), 710 General Office, 712 Small Office Building, 720 Medical Office, 918 Hair Salon



As depicted above, the proposed 48 residential units and 2,300 SF of small office space in place of the existing 14,600 SF of office use, 3,000 SF of medical office use and 4,070 SF of spa use will result in a reduction of 9 vehicle trips during the Weekday AM Peak Hour, 7 vehicle trips during the Weekday PM Peak Hour and 16 vehicle trips during the Saturday Peak Hour. It is anticipated there will be a reduced number of vehicle trips associated with this project resulting in no additional impact to the surrounding roadway network during peak hour times.

Please feel free to contact us if you have any questions or need any additional information.

Sincerely,

**TIGHE & BOND, INC.**



Neil A. Hansen, PE  
Project Engineer



Patrick M. Crimmins, PE  
Senior Project Manager



February 22, 2021

Rob Simmons  
CPI Management, LLC  
100 Summer Street, Ste 1600  
Boston, MA 02109

RE: Natural Gas Availability to 53 Green St Portsmouth NH Project

Dear Rob,

Unitil's natural gas division has reviewed the requested site for natural gas service.

Unitil hereby confirms natural gas service will be available to 53 Green St Portsmouth NH Project.

Installation is pending an authorized installation agreement with CPI Management, LLC and street opening approval from the City of Portsmouth DPW.

Let me know if you have any questions. You can email me at [oliver@unitil.com](mailto:oliver@unitil.com). My phone number is 603-294-5174.

Sincerely,

Janet Oliver  
Senior Business Development Representative



# EMBARC

---

March 22, 2021

Portsmouth Planning Board  
53 Green Street  
Portsmouth, NH 03801

## Green Building Statement

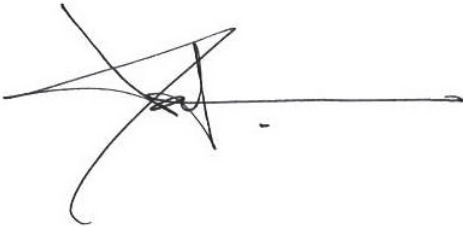
### 53 Green Street Proposed Mixed-Use Building

- **Site/Landscape:** In its current condition, the site consists of the existing building, parking to the south and east, and a mown lawn to the top of the bank by the North Mill Pond. The building has a foundation planting of mature Rhododendron. A small area of trees is found at the northwest and southeast corners of the property. The proposed landscape plan provides a pedestrian connector from Green Street to the North Mill Pond Greenway along the west side of the building. This pathway is buffered from the AC Hotel with a green wall of Arborvitae and ornamental grasses creating a garden connector to the greenway beyond. The north side of the building will be faced with a mixed evergreen screen of native shrubs (Inkberry, Rhododendron, Eastern Red Cedar) and the 25' buffer will be enhanced with the addition of Red Oaks and a fescue grass mix for disturbed areas that will be left long, mowed once a year to discourage the incursion of invasive plant material. Between the building and the greenway path will be a mown fescue lawn. The south side of the building will be reserved for vehicular access to the entry and parking garage.
- **Exterior Wall Systems:** The exterior wall systems will meet or exceed the 2015 IECC standards for energy efficiency and will include a continuous air barrier and continuous insulation on all exterior wall enclosing heated spaces as well as insulation within the stud cavities. The exterior cladding materials will include a combination of masonry and metal panel rain screen systems that utilize an air space outboard of the insulation layer for efficient moisture management.
- **Window Systems:** All window systems in the project will meet or exceed 2015 IECC standards for u-value, shading coefficient and solar heat gain coefficient, including a thermally-broken frame and insulated, high-performance, low-E glazing to reduce

thermal transfer. Large window expanses provide plenty of natural daylight to all building occupants.

- **Roofing Systems:** The roofing system will include a light-colored, reflective “cool roof” over continuous, sloped rigid insulation that meets or exceeds code requirements.
- **HVAC Systems:** The dwelling units will be provided with individualized systems providing either heating and cooling or both. System may include electric heat pumps or a hydronic gas fired heating system with gas fired domestic hot water heaters.
- **Plumbing Systems:** All plumbing fixtures in the proposed project will be low-flow fixtures. Individual EnergyStar rated instantaneous hot water heaters will be used for domestic hot water and heating.
- **Lighting Systems:** Interior lighting systems will use LED fixtures throughout the building, including the use of occupancy sensors. Exterior lighting design will include energy-efficient LED cutoff fixtures to minimize light pollution.
- **Appliances:** All appliances for the project will be EnergyStar rated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Dartagnan Brown', with a horizontal line extending to the right from the end of the signature.

Dartagnan Brown | Founder + CEO

Fixture Type: \_\_\_\_\_

Catalog Number: \_\_\_\_\_

Project: \_\_\_\_\_

Location: \_\_\_\_\_

## Icon

### Outdoor Wall Sconce 3000K

Model & Size	Color Temp & CRI	Finish	Watt	LED Lumens	Delivered Lumens
<input type="radio"/> WS-W54614 14"	3000K 90	<input type="radio"/> AL Brushed Aluminum <input type="radio"/> BK Black <input type="radio"/> BZ Bronze	10.9W	845	458

Example: **WS-W54614-BZ**

For custom requests please contact [customs@wacighting.com](mailto:customs@wacighting.com)

#### DESCRIPTION

Like a simple reference to something greater, the up and down lights accentuate linear architectural forms. A simple shape, with infinite applications, the Icon features a shielded light source for great low-glare illumination. Constructed with a solid die-cast aluminum and powder coated finish. The light engine is factory sealed for maximum protection against the

#### FEATURES

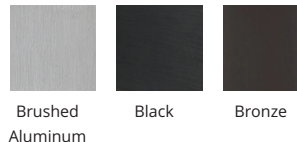
- Weather resistant powder coat finish
- Simple shape, simple idea, infinite applications
- Up & down light
- Shielded light source for great low-glare illumination
- Driver concealed within the fixture
- 5 year warranty

#### SPECIFICATIONS

Color Temp:	3000K
Input:	120-277 VAC, 50/60Hz
CRI:	90
Dimming:	ELV: 100-10%
Rated Life:	54000 Hours
Mounting:	Can be mounted on wall in all orientations
Standards:	ETL, cETL, IP65
	Wet Location Listed
Construction:	Aluminum hardware with glass diffuser

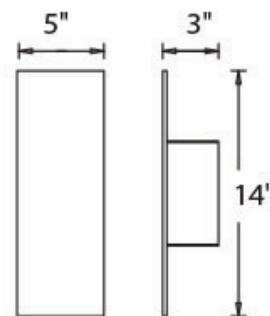


#### FINISHES:



Brushed Aluminum    Black    Bronze

#### LINE DRAWING:



Fixture Type: \_\_\_\_\_

Catalog Number: \_\_\_\_\_

Project: \_\_\_\_\_

Location: \_\_\_\_\_

## Icon

### Outdoor Wall Sconce 3000K

Model & Size	Color Temp & CRI	Finish	Watt	LED Lumens	Delivered Lumens
<input type="radio"/> WS-W54620 20"	3000K 90	<input type="radio"/> AL Brushed Aluminum <input type="radio"/> BK Black <input type="radio"/> BZ Bronze	11.1W	847	478

Example: **WS-W54620-BZ**

For custom requests please contact [customs@wacighting.com](mailto:customs@wacighting.com)

#### DESCRIPTION

Like a simple reference to something greater, the up and down lights accentuate linear architectural forms. A simple shape, with infinite applications, the Icon features a shielded light source for great low-glare illumination. Constructed with a solid die-cast aluminum and powder coated finish. The light engine is factory sealed for maximum protection against the

#### FEATURES

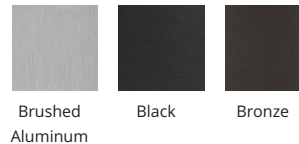
- Weather resistant powder coat finish
- Simple shape, simple idea, infinite applications
- Up & down light
- Shielded light source for great low-glare illumination
- Driver concealed within the fixture
- 5 year warranty

#### SPECIFICATIONS

Color Temp:	3000K
Input:	120-277 VAC, 50/60Hz
CRI:	90
Dimming:	ELV: 100-10%
Rated Life:	54000 Hours
Mounting:	Can be mounted on wall in all orientations
Standards:	ETL, cETL, IP65
	Wet Location Listed
Construction:	Aluminum hardware with glass diffuser

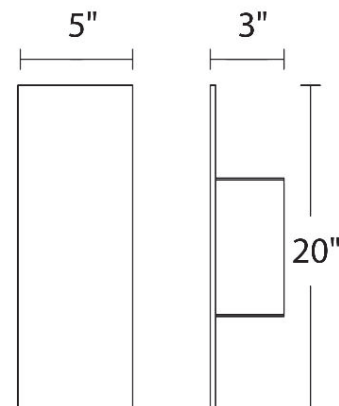


#### FINISHES:



Brushed Aluminum    Black    Bronze

#### LINE DRAWING:



WS-W54620

# FIN - model: WP-LED1

## Endurance Wallpack

# WAC LIGHTING

Responsible Lighting®



Fixture Type:

Catalog Number:

Project: \_\_\_\_\_

Location: \_\_\_\_\_

### PRODUCT DESCRIPTION

Die cast aluminum factory sealed housings with patent pending design for a water and dust proof IP66 rated outdoor luminaire

### FEATURES

- Factory-Sealed LED Light Engine
- 20° Forward Throw Illumination
- Photo/Motion Sensor Compatible (Sold Separately)
- Built-in Level For Easy Adjustment
- Suitable to install in all directions
- Multi-Function Dimming: ELV (120V) or 0-10V
- 85 CRI
- 100,000 hour rated life

### ORDER NUMBER

	Power	Comparable	Color Temp	Delivered Lumens	CBCP	Finish
	<b>WP-LED119</b>	19W	39W HID	30 3000K	1390	1030
				50 5000K	1460	1048
	<b>WP-LED127</b>	27W	70W HID	30 3000K	2075	1461
				50 5000K	2135	1467
	<b>WP-LED135</b>	35W	100W HID	30 3000K	2750	1930
				50 5000K	2825	1921
						<b>aBZ</b> Architectural Bronze <b>aGH</b> Architectural Graphite <b>aWT</b> Architectural White

-  -

Example: **WP-LED119-50-BZ**

### ACCESSORIES

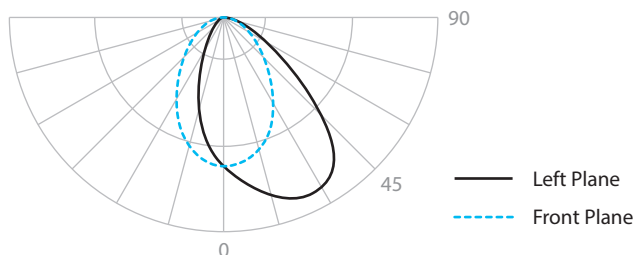
Motion Sensor (120V) **MS-120-BZ** Bronze  
**MS-120-GY** Gray  
**MS-120-WT** White

Photo Sensor (120V) **PC-120-BZ** Bronze  
**PC-120-GY** Gray  
**PC-120-WT** White

### SPECIFICATIONS

- Construction:** Die-cast aluminum
- Power:** Integral driver in luminaire. Universal voltage input (120V-277V)
- Dimming:** 100% - 30% with 0 - 10V dimmer (120V - 277V)  
 100% - 15% with Electronic Low Voltage (ELV) dimmer (120V only)
- Finish:** Architectural Bronze, Graphite, and White
- Standards:** IP66, Wet Location, ETL & cETL Listed
- Total Harmonic Distortion:** 35%
- Operating Temperature:** -40°C (-40°F) to 40°C (104°F)

### PHOTOMETRY



WAC Lighting  
 www.waclighting.com  
 Phone (800) 526.2588 • Fax (800) 526.2585

Headquarters/Eastern Distribution Center  
 44 Harbor Park Drive • Port Washington, NY 11050  
 Phone (516) 515.5000 • Fax (516) 515.5050

Western Distribution Center  
 1750 Archibald Avenue • Ontario, CA 91760  
 Phone (800) 526.2588 • Fax (800) 526.2585