Tighe&Bond
Engineers | Environmental Specialists

C0960-006
April 20, 2020

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

Re: Site Review Permit & Conditional Use Permit for Parking Applications
Proposed Multi-Family Development, 105 Bartlett Street, Portsmouth, NH

Dear Juliet:

On behalf of Iron Horse Properties, LLC, we are pleased to submit via the City of Portsmouth online permitting system the following information to support a request for a Site Review Permit and Conditional Use Permit for Shared Parking for the above referenced project:

- Site Plan Set last revised April 20, 2020;
- Owner Authorizations dated April 15, 2020
- Applicant Authorization dated April 15, 2020;
- Site Review Checklist dated April 20, 2020;
- Trip Generation Update Memorandum prepared by Pernaw & Co. dated February 21, 2020
- Building Renderings prepared by Pro Con, Inc. last revised March 12, 2020
- Subdivision Exhibit last revised April 20, 2020
- Wetland Buffer Impact Exhibit dated April 20, 2020
- Drainage Analysis Memorandum dated April 20, 2020;
- Truck Turning Exhibit dated April 20, 2020;
- Unitil Will Service Letter dated April 17, 2020
- Application fee calculation form for the Site Review Permit;

The proposed project consists of two (2) multi-family apartment buildings with basement level parking and one (1) mixed used building with first floor office and amenity space, and upper story apartments. The project will include a total of 174 dwelling units. The project will include associated site improvements that consist of a private road with cul-de-sac, parking, utilities, stormwater management and treatment, landscaping and lighting. The project will also include community space along the North Mill Pond. The land from North Mill Pond's mean high water (MHW) line to the 50ft wetland buffer will be designated as community space for the City's North Mill Pond Trail project. In addition, the project will construct a greenway park between the proposed buildings and North Mill Pond trail.

The project will include lot line revisions to the latest recorded Subdivision Plans that included a private road with cul-de-sac for the Clipper Trader subdivision approval granted in 2018. Enclosed is a Lot Line Revision Exhibit to depict the proposed lot line revisions. The applicant intends to file a Lot Line Revision application with the Planning Board. The proposed cul-de-sac will be relocated to the existing parking area that is located in front of the brewery and doggy daycare. The lot lines are reconfigured so the development as currently proposed would meet the dimensional requirements for the Character District 4-W. There are 10 proposed parking spaces located on along the cul-de-sac that are provided to meet the parking requirements for the development lot. Because these spaces are located on the separate private road lot, the project is requesting a Conditional Use Permit for shared parking on a separate lot.

The applicant will also be submitting a Conditional Use Permit application to the for work within the 100-foot wetland buffer by the next Conservation Commission filing deadline of April 29th. The proposed development lot is providing 48% open space which includes a greenway park between the Proposed Building A & B and community space designated for the City's North Mill Pond Trail. Enclosed is Wetland Impact Buffer exhibit that shows the overall improvement in the 100-foot wetland buffer for the project.

Under separate cover, a Site Plan Review application fee in the amount of $8,330 and a Conditional Use Permit for Shared Parking application fee in the amount of $200 have been mailed to the Planning Department by the applicant. A copy of the application fee calculation form is enclosed.

We respectfully request to be placed on the Technical Advisory Committee meeting agenda for May 5, 2020. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at pmcrimmins@tighebond.com.

Sincerely,
TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Senior Project Manager

Neil A. Hansen, PE
Project Engineer

Cc: Clipper Traders, LLC
Iron Horse Properties, LLC
Portsmouth Lumber & Hardware, LLC

PROPOSED MULTI-FAMILY DEVELOPMENT

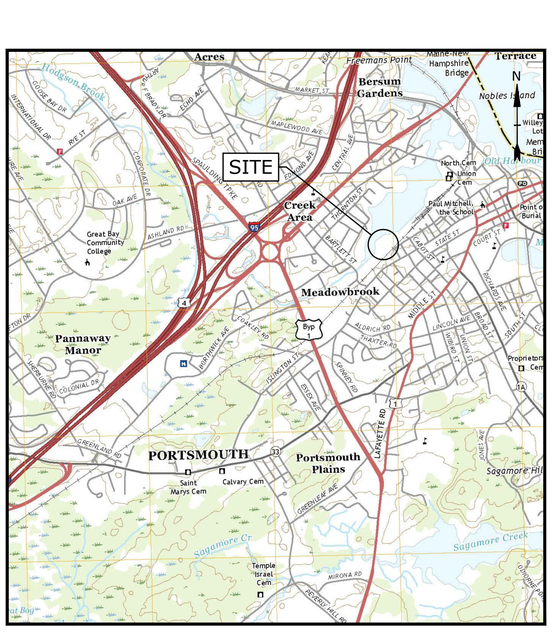
105 BARTLETT STREET
PORTSMOUTH, NEW HAMPSHIRE

JANUARY 2, 2020

LAST REVISED: APRIL 20, 2020

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	04/20/2020
C-101	OVERALL EXISTING CONDITIONS AND DEMOLITION PLAN	04/20/2020
C-101.1	EXISTING CONDITIONS AND DEMOLITION PLAN	04/20/2020
C-101.2	EXISTING CONDITIONS AND DEMOLITION PLAN	04/20/2020
C-102	OVERALL SITE PLAN	04/20/2020
C-102.1	SITE PLAN	04/20/2020
C-102.2	SITE PLAN	04/20/2020
C-102.3	BASEMENT LEVEL SITE PLAN	04/20/2020
C-103.1	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	04/20/2020
C-103.2	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	04/20/2020
C-104.1	UTILITIES PLAN	04/20/2020
C-104.2	UTILITIES PLAN	04/20/2020
C-301.1	EASEMENT PLAN	04/20/2020
C-301.2	EASEMENT PLAN	04/20/2020
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	04/20/2020
C-502	DETAILS SHEET	04/20/2020
C-503	DETAILS SHEET	04/20/2020
C-504	DETAILS SHEET	04/20/2020
C-505	DETAILS SHEET	04/20/2020
C-506	DETAILS SHEET	04/20/2020
L-1	LANDSCAPE PLAN	02/20/2020

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	PENDING	
LOT LINE REVISION PERMIT	PENDING	
CONDITIONAL USE PERMIT - SHARED PARKING	PENDING	
CONDITIONAL USE PERMIT - WETLAND BUFFER	PENDING	
STATE		
NHDES - ALTERATION OF TERRAIN PERMIT	PENDING	
NHDES - WETLAND PERMIT	PENDING	
NHDES - SHORELAND PERMIT	PENDING	
NHDES - SEWER CONNECTION PERMIT	PENDING	
FEDERAL		
EPA - NPDES CGP	PENDING	



LOCATION MAP
SCALE: 1" = 2000'

PREPARED BY:

Tighe&Bond
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801
603-433-8818

APPLICANT:

IRON HORSE PROPERTIES, LLC
105 BARTLETT STREET
PORTSMOUTH, NEW HAMPSHIRE 03801

OWNERS:

TAX MAP 157, LOT 1
CLIPPER TRADERS, LLC
105 BARTLETT STREET
PORTSMOUTH, NEW HAMPSHIRE 03801

TAX MAP 164, LOT 4-2
IRON HORSE PROPERTIES, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801

TAX MAP 157 LOT 2
TAX MAP 164, LOT 1
PORTSMOUTH HARDWARE & LUMBER, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801

T&B PROJECT NO: C0960-006

TAC REVIEW SUBMISSION
COMPLETE SET 21 SHEETS

Last Saved: 4/19/2020
Plotted On: Apr 20, 2020-12:35pm By: BCurcio
Tighe & Bond: J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings, Figures\AutoCAD\Sheet\C-0960-006 C-CS.dwg

LEGEND

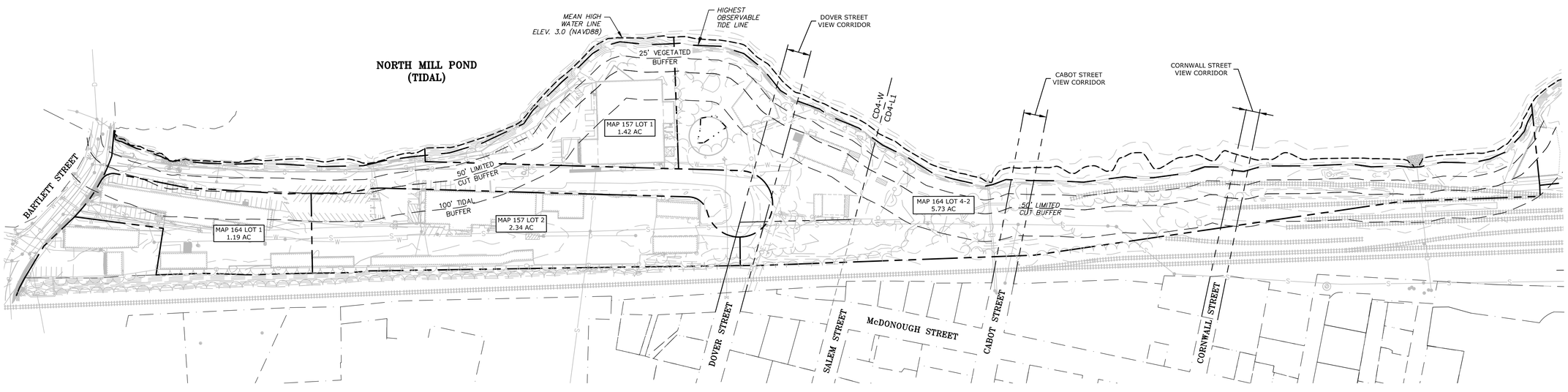
- BUILDING
- BUILDING OVERHANG
- BUILDING NO. 50 — BUILDING HATCH/TEXT
- CURB
- EDGE OF PAVEMENT
- RETAINING WALL
- STONE WALL
- CHAIN LINK FENCE
- FENCE LINE
- TREELINE
- PAVEMENT MARKING
- TRAFFIC SIGN
- 200 — MAJOR CONTOURS
- MINOR CONTOURS
- D — STORM DRAIN LINE
- S — SANITARY SEWER LINE
- W — WATER LINE
- E — UNDERGROUND ELECTRIC LINE
- OE — OVERHEAD ELECTRIC LINE
- G — UNDERGROUND GAS LINE
- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- HYDRANT
- WGV — WATER GATE VALVE
- UTILITY POLE
- TELEPHONE STRUCTURE
- GGV — GAS GATE VALVE
- BOLLARD
- GAS SHUTOFF
- WATER SHUTOFF

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY AMBIT ENGINEERING, INC., DATED 3/5/2018.
2. WETLAND DELINEATION BY STEVEN D. RIKER, CWS, ON 8/8/2017, AND FIELD LOCATED BY AMBIT ENGINEERING, INC. ON 8/9/2017
3. FLOOD HAZARD ZONES: "AE ELEV. 9" (SPECIAL FLOOD HAZARD AREA) AND "X" (NOT A SPECIAL FLOOD HAZARD AREA), PER FIRM MAP #33015C0259E, DATED 5/17/05.

REFERENCE PLANS:

1. "PROPOSED SUBDIVISION PLANS, CLIPPER TRADERS, LLC" PREPARED BY AMBIT ENGINEERING, INC., DATED DECEMBER 14, 2018.



Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MCZEAN No. 00350 — LICENSED PROFESSIONAL ENGINEER — 4-20-2020

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 19579 — LICENSED PROFESSIONAL ENGINEER — 4-20-2020

0 100' 200'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

OVERALL EXISTING CONDITIONS PLAN

SCALE: AS SHOWN

C-101

Last Saved: 4/20/2020
Plotted: Monday, April 20, 2020 - 4:33pm By: BGurcio
Tighe & Bond: J:\C\C0960 Catharles\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
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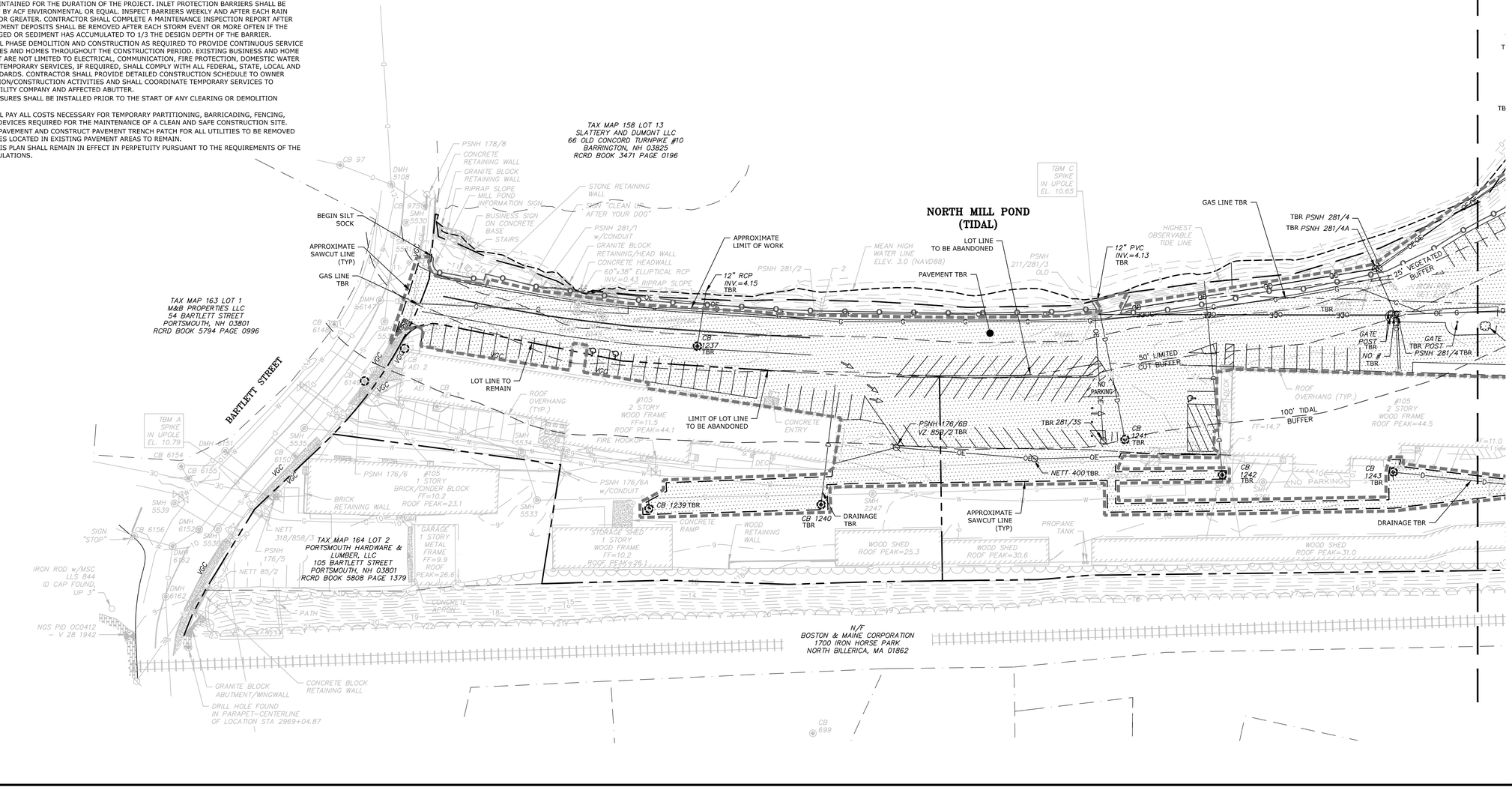
22. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

- APPROXIMATE LIMIT OF PROPOSED SAW CUT
- LIMIT OF WORK
- PROPOSED SILT SOCK
- APPROXIMATE LIMIT OF PAVEMENT TO BE REMOVED
- PROPOSED CONSTRUCTION EXIT
- BUILDING / FOUNDATION TO BE REMOVED
- LOCATION OF PROPOSED BUILDING
- INLET PROTECTION SILT SACK
- TBR — TO BE REMOVED
- BLDG — BUILDING
- TYP — TYPICAL
- COORD — COORDINATE



0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
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DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

C-101.1

Last Saved: 4/20/2020
Plotted: Apr 20, 2020 – 4:57pm By: BGurcio
Tighe & Bond: J:\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings, Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

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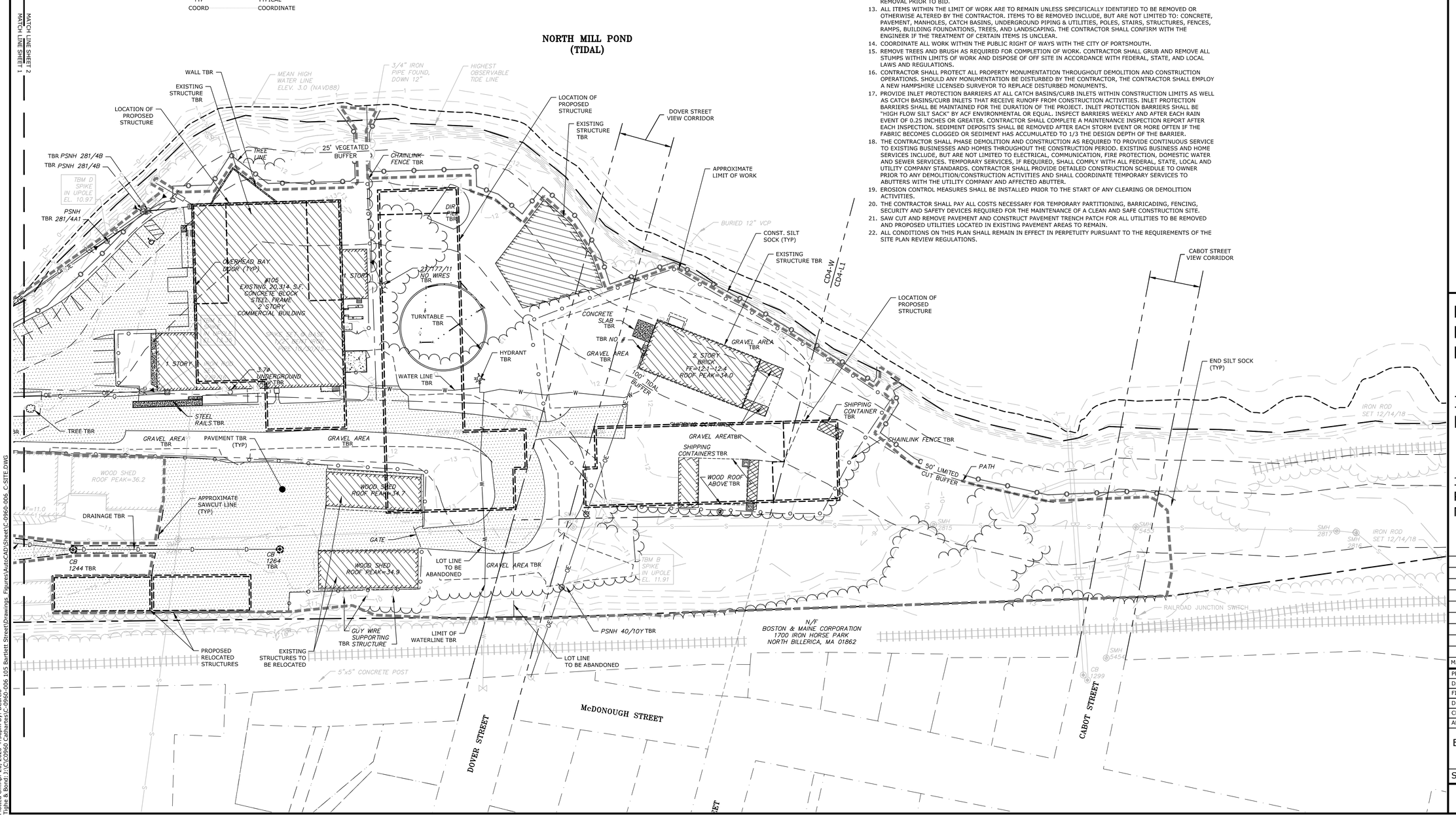

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCCRACKEN No. 20350 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 19579 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

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SCALE: AS SHOWN

C-101.2

Last Saved: 4/20/2020
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Tighe & Bond: J:\C\C0960 Cabtartes\C-0960-006 105 Bartlett Street\Drawings, Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

SITE DATA:

PROJECT LOCATION: TAX MAP 157, LOT 1
TAX MAP 157, LOT 2
TAX MAP 164, LOT 1
TAX MAP 164, LOT 4-2

105 BARTLETT STREET
PORTSMOUTH, NEW HAMPSHIRE

SITE ZONING DISTRICT: CHARACTER DISTRICT 4 (CD4-W)
CHARACTER DISTRICT 4 (CD4-L1)
WEST END INCENTIVE OVERLAY DISTRICT

ALLOWED USE ON SITE: PROFESSIONAL OFFICE, BUSINESS OFFICE, MULTIFAMILY DWELLING

DEVELOPMENT STANDARDS

BUILDING PLACEMENT (PRINCIPAL BUILDING):	REQUIRED (CD4-W)	PROPOSED (CD4-W)	REQUIRED (CD4-L1)	PROPOSED (CD4-L1)
MAX PRINCIPAL FRONT YARD:	10 FT	0 FT	15 FT	N/A
MINIMUM SIDE YARD:	15 FT(1)	<6 FT(2)	15 FT(1)	86 FT
MINIMUM REAR YARD:	5 FT	269 FT	5 FT	269 FT
FRONT LOT LINE BUILDOUT:	50% MIN	69%	60% MIN, 80% MAX	N/A

BUILDING AND LOT OCCUPATION:	REQUIRED (CD4-W)	PROPOSED (CD4-W)	REQUIRED (CD4-L1)	PROPOSED (CD4-L1)
MAXIMUM BUILDING BLOCK LENGTH:	200 FT	196 FT	100 FT(3)	34 FT
MAXIMUM FAÇADE MODULATION LENGTH:	80 FT	<80 FT	50 FT	<50 FT
MAXIMUM ENTRANCE SPACING:	50 FT	<50 FT	NR	NR
MAXIMUM BUILDING COVERAGE:	80%(4)	±24.0%	80%(4)	±1.3%
MAXIMUM BUILDING FOOTPRINT:	20,000 SF(5)	20,000 SF	3,500 SF(6)	2,852 SF
MINIMUM LOT AREA:	5,000 SF	220,768 SF	3,000 SF	220,768 SF
MINIMUM LOT AREA PER DWELLING UNIT:	NR(7)		NR(7)	
MINIMUM OPEN SPACE:	15%	48%	25%	48%
MAXIMUM GROUND FLOOR GFA PER USE:	15,000 SF	10,300 SF	NR	

(1) - PER 10.516.20, MINIMUM SIDE YARD SETBACK ADJOINING A RAILROAD RIGHT OF WAY SHALL BE 15FT
(2) - VARIANCE GRANTED BY ZONING BOARD OF ADJUSTMENT ON JANUARY 22, 2020
(3) - MAXIMUM BLOCK LENGTH ALLOWED IN WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(4) - MAXIMUM BUILDING COVERAGE ALLOWED IN THE WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(5) - ADDITIONAL 5,000 SF OF GFA (INCREASED FROM 15,000 SF) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(6) - ADDITIONAL 1,000 SF OF GFA (INCREASED FROM 2,500 SF) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(7) - NO MINIMUM LOT AREA PER DWELLING UNIT REQUIRED IN THE WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.

BUILDING FORM (PRINCIPAL BUILDING):	REQUIRED (CD4-W)	PROPOSED (CD4-W)	REQUIRED (CD4-L1)	PROPOSED (CD4-L1)
BUILDING HEIGHT:	4 STORIES (1) 50' MAX (2)	54 STORY, 50' (BLDG B & C)	2 STORIES (1) 30' MAX (2)	2 STORY, 30' (BLDG A)
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	<36 IN	36 IN	<36 IN
MINIMUM GROUND STORY HEIGHT:	9 FT(3)	12 FT	9 FT(3)	11 FT
MINIMUM SECOND STORY HEIGHT:	N/A		N/A	
FAÇADE GLAZING:				
SHOPFRONT FAÇADE:	70% MIN	>70%	70% MIN	>70%
OTHER FAÇADE TYPES:	20% TO 50%		20% TO 40%	
ALLOWED ROOF TYPES:	FLAT, GABLE, HIP, GAMBREL, OR MANSARD	FLAT	FLAT, GABLE, HIP, GAMBREL, OR MANSARD	FLAT
ROOF PITCH, IF ANY:				
GABLE	6:12 - 12:12		6:12 - 12:12	
HIP	3:12 MIN		3:12 MIN	
MANSARD/GAMBREL	6:12 - 30:12		6:12 - 30:12	
ALLOWED BUILDING TYPES:	APARTMENT BUILDING	APARTMENT BUILDING		

(1) - ADDITIONAL 1 STORY (INCREASED FROM 1 AND 3 RESPECTIVELY) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(2) - ADDITIONAL 10' OF BUILDING HEIGHT (INCREASED FROM 20' AND 40' RESPECTIVELY) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(3) - MINIMUM GROUND STORY HEIGHT ALLOWED IN WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.

COMMUNITY SPACE:	44,154 SF 20%	55,192 SF 25%
MAXIMUM EFFECTIVE IMPERVIOUS COVER:	63.3%	68.3%

ZONING VARIANCES:

REQUIREMENT:	SECTION:	GRANTED:
(1) - MINIMUM SIDE YARD SETBACK FROM RAILROAD:	10.516.20	1/22/2020

OFF-STREET PARKING REQUIREMENTS:

PARKING SPACES REQUIRED:

DWELLING UNITS:		
0 SF TO 500 SF 0.5 SPACES PER UNIT	BUILDING A, 1 UNITS	0.5 SPACES
	BUILDING B, 1 UNITS	0.5 SPACES
	BUILDING C, 3 UNITS	1.5 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		3 SPACES
500 SF TO 750 SF 1.0 SPACES PER UNIT	BUILDING A, 24 UNITS	24 SPACES
	BUILDING B, 41 UNITS	41 SPACES
	BUILDING C, 26 UNITS	26 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		91 SPACES
OVER 750 SF 1.3 SPACES PER UNIT	BUILDING A, 21 UNITS	27.3 SPACES
	BUILDING B, 36 UNITS	46.8 SPACES
	BUILDING C, 21 UNITS	27.3 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		102 SPACES

OFFICE:		
1 SPACE PER 350 SF	10,300 SF	
MINUS 25% FOR WEST END INCENTIVE		23 SPACES
VISITORS:		
1 SPACE FOR EVERY 5 DWELLING UNITS	174 UNITS	35 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		254 SPACES

TOTAL PARKING SPACES PROVIDED:
TOTAL PARKING SPACES PROVIDED = 134 SPACES (SURFACE PARKING)
66 SPACES (BUILDING A, UNDERGROUND)
44 SPACES (BUILDING B, UNDERGROUND)
10 SPACES (CUL-DE-SAC)(1)
254 SPACES

ADA SPACES REQUIRED= 7 SPACES (FOR 201-300 FACILITY TOTAL)
ADA SPACES PROVIDED= 7 SPACES (INCLUDED IN SURFACE PARKING COUNT OF 134)

(1) - CONDITIONAL USE PERMIT REQUIRED FOR SHARED PARKING ON SEPARATE LOT

	REQUIRED	PROPOSED
PARKING STALL LAYOUT:	8.5' X 19'	8.5' X 19'
DRIVE AISLE WIDTH:	24 FT	24 FT

BIKE SPACES REQUIRED:		
1 BIKE SPACE / 5 DWELLING UNITS, MAXIMUM OF 30 SPACES	30 SPACES	30 SPACES*

*INDOOR BIKE STORAGE WILL BE PROVIDED THAT MEETS OR EXCEEDS THE REQUIREMENT.

LEGEND

- PROPERTY LINE
- PROPOSED PROPERTY LINE
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- PROPOSED CURB
- PROPOSED BUILDING
- PROPOSED PAVEMENT SECTION
- PROPOSED CONCRETE SIDEWALK
- PROPOSED BOLLARD
- BLDG BUILDING
- TYP TYPICAL
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- 30'R PROPOSED CURB RADIUS
- VGC PROPOSED VERTICAL GRANITE CURB
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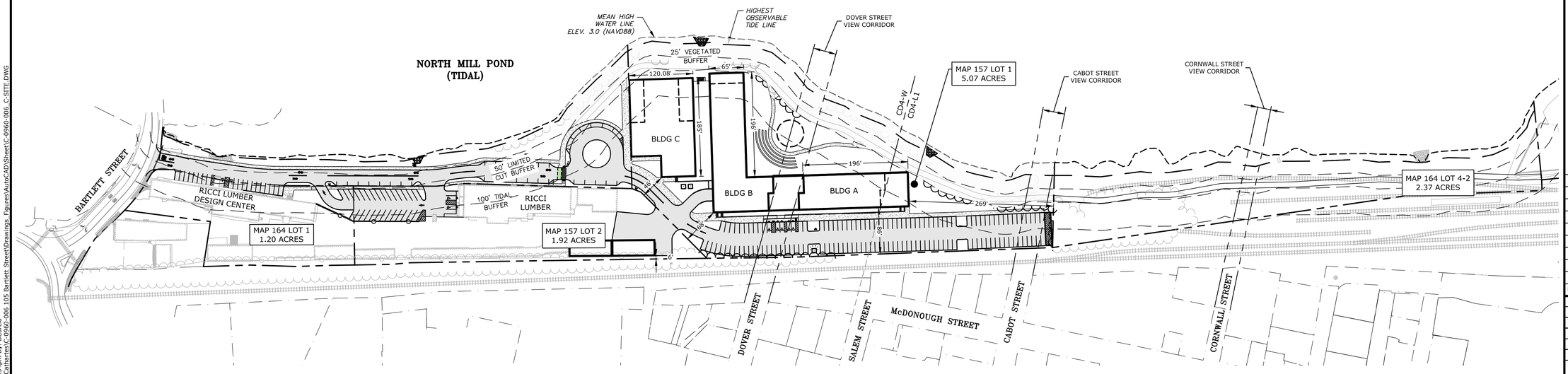

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0 100' 200'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCCRACKEN No. 00350 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 18179 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

Last Saved: 4/20/2020
Printed: Apr 20, 2020 - 4:34pm By: BGurcio
Tighe & Bond: J:\C\C0960 Catharines\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

SITE NOTES:

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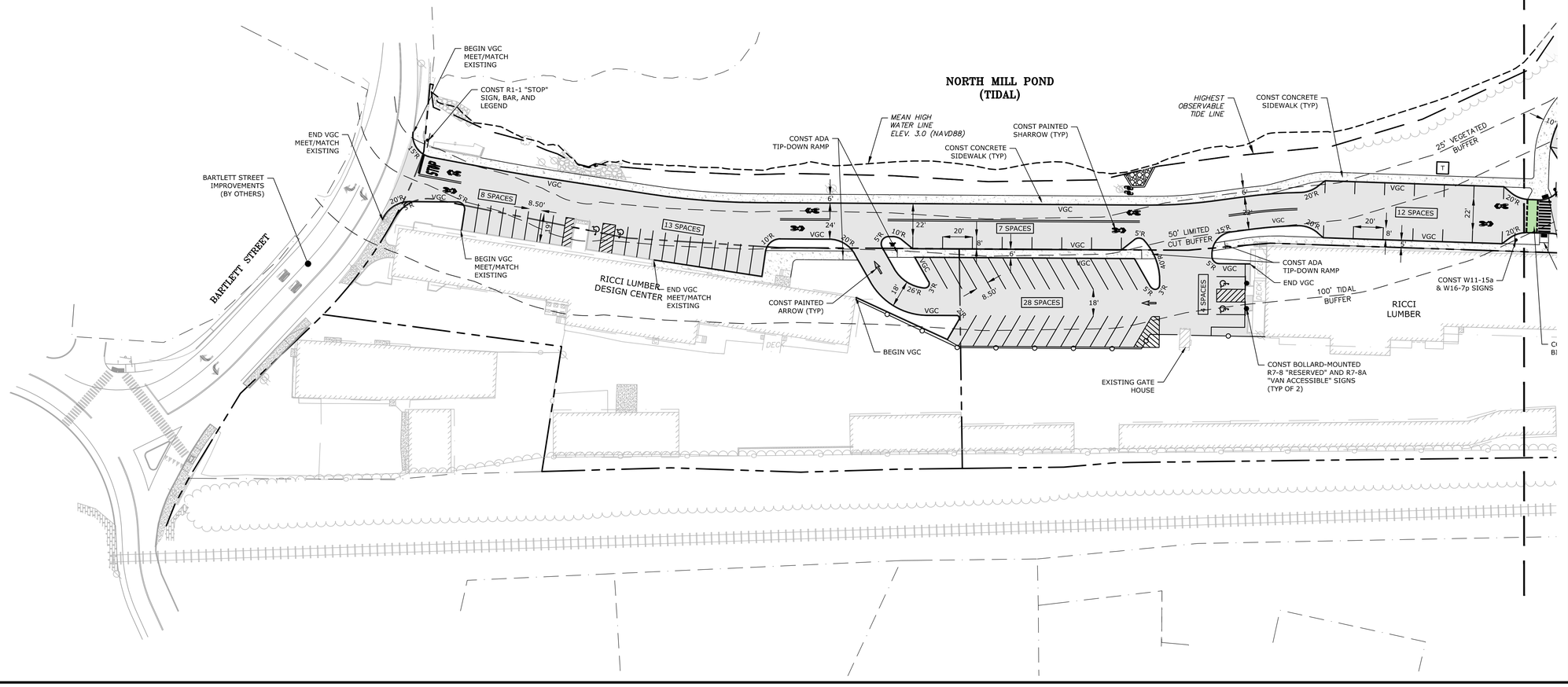

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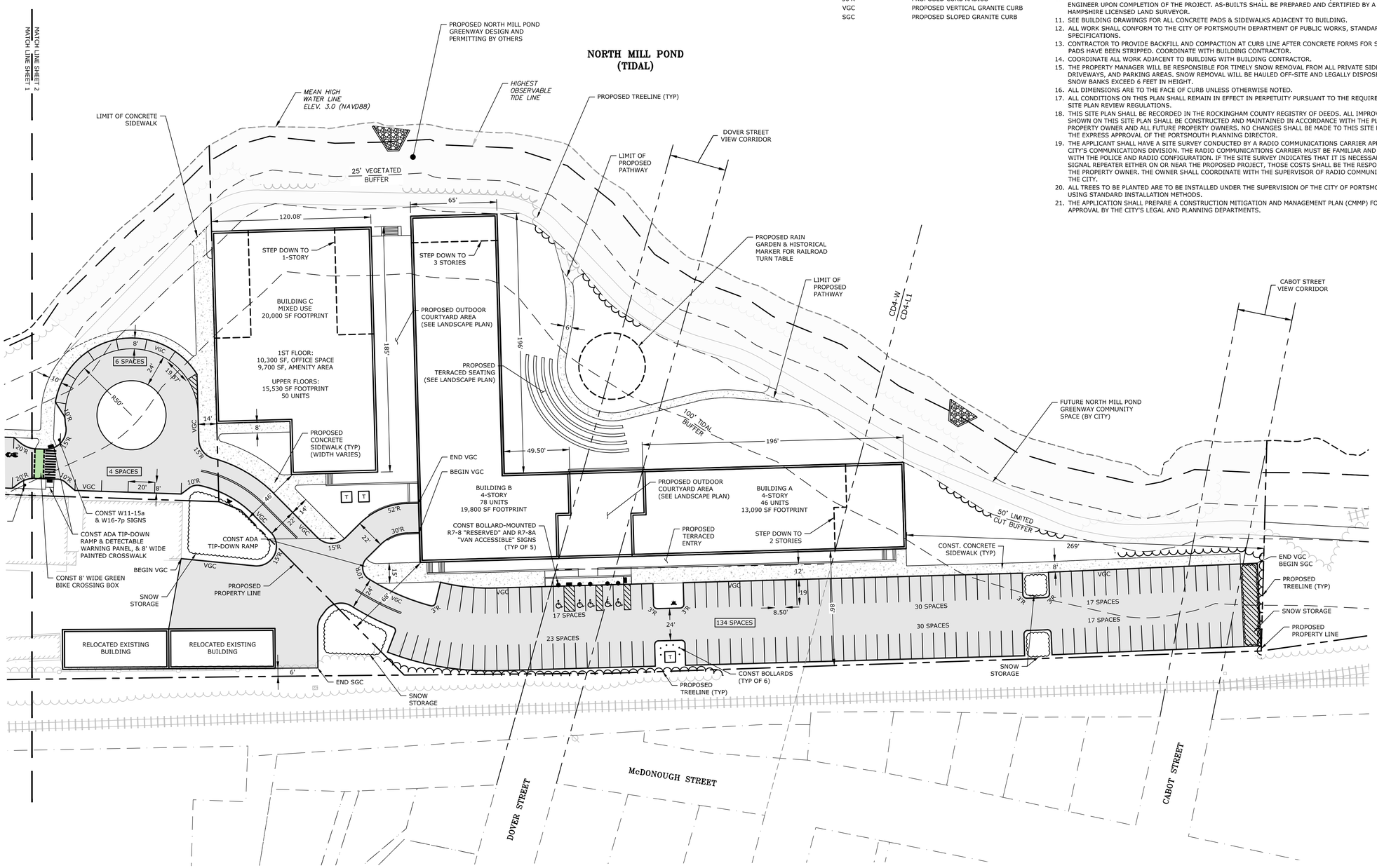
SITE PLAN

SCALE: AS SHOWN

C-102.1



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Tighe&Bond

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GRAPHIC SCALE

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SITE PLAN

SCALE: AS SHOWN

C-102.2

Last Saved: 4/20/2020
Printed: 4/20/2020 4:35pm By: BCurcio
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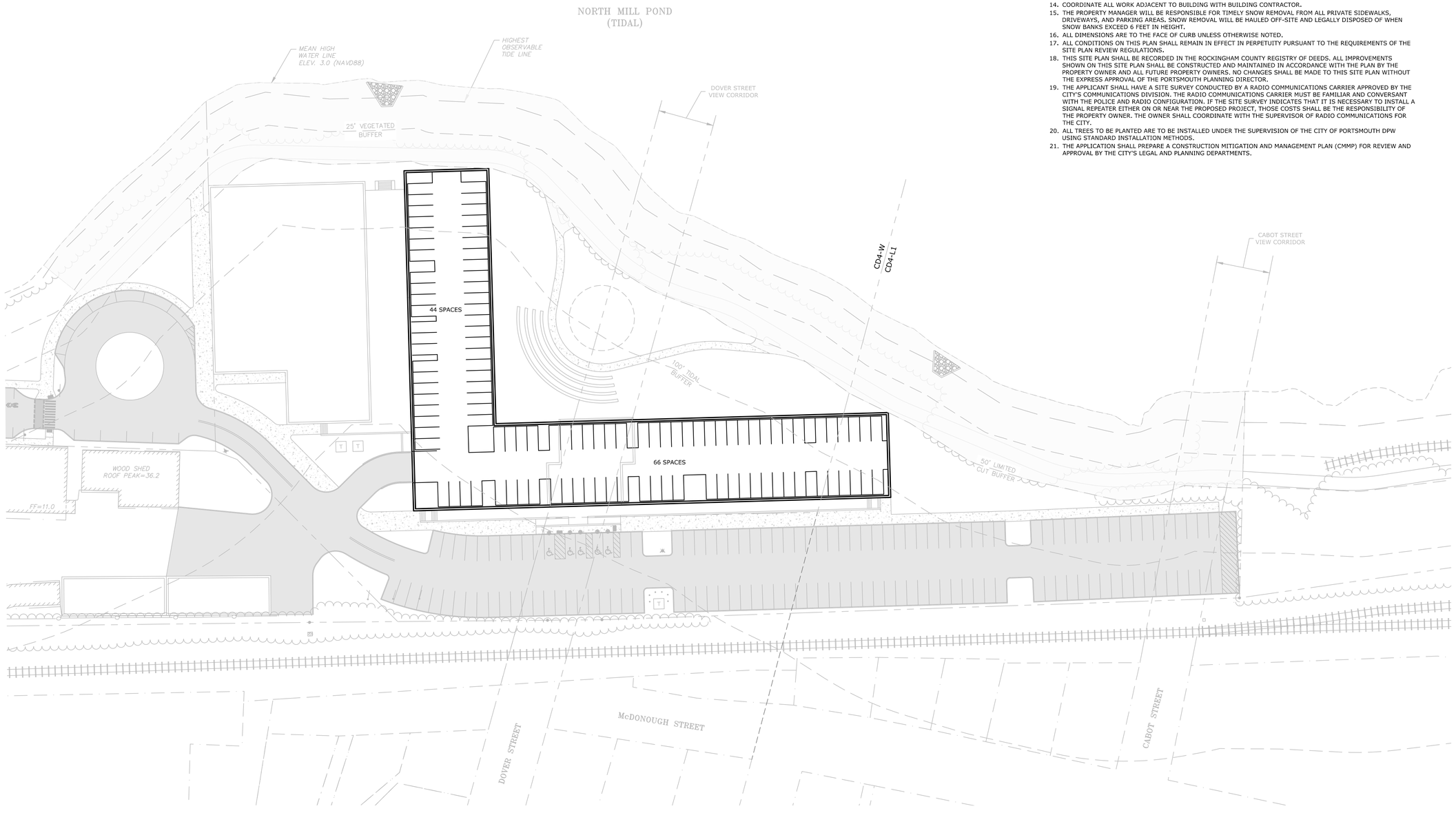

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Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

BASEMENT LEVEL SITE PLAN

SCALE: AS SHOWN

C-102.3

Last Saved: 4/20/2020
Plotted: Date=20200420 Time=0800-4:35pm By: BCurcio
Tighe & Bond: J:\CD\0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

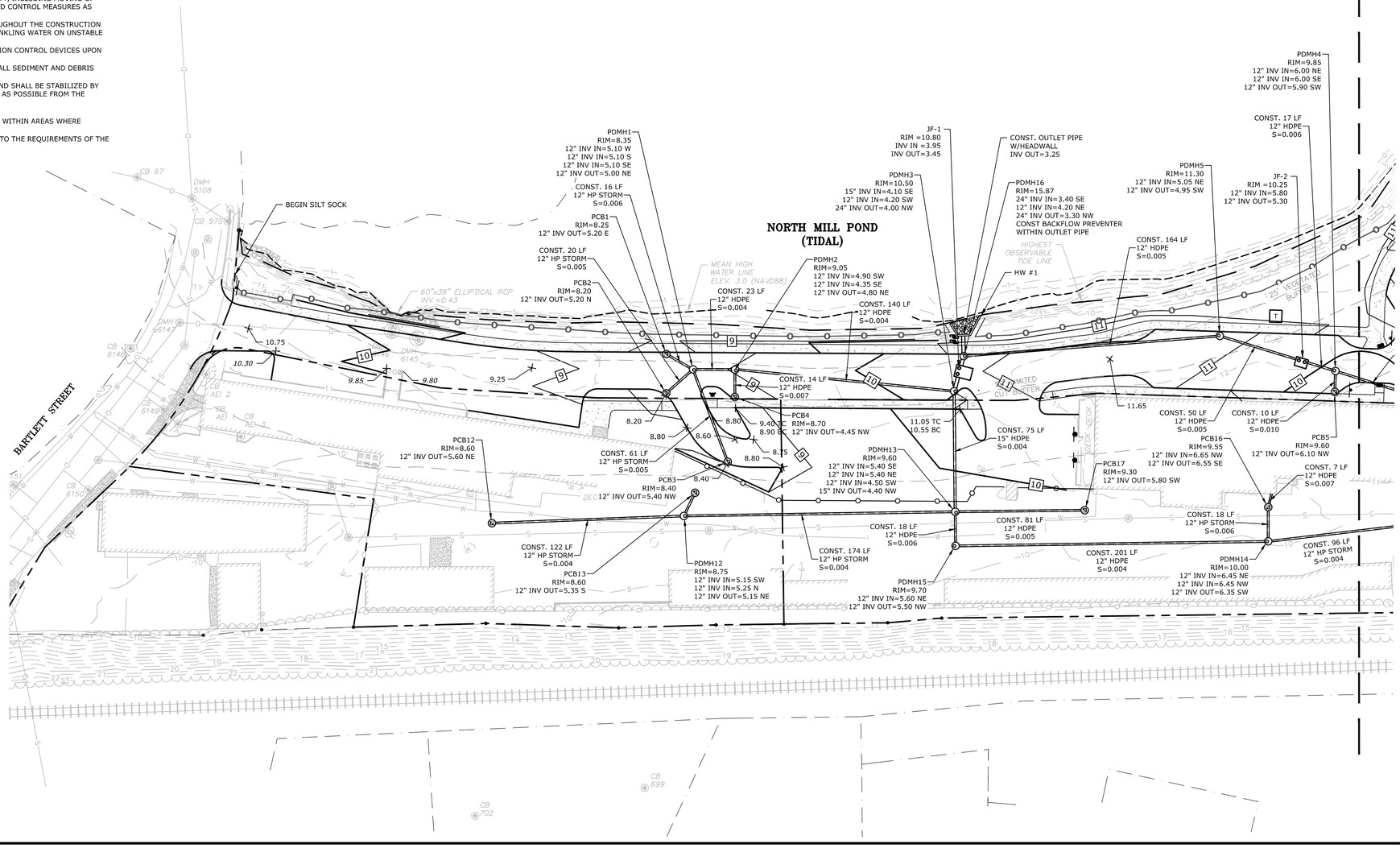
   * ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
12. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
13. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.

EROSION CONTROL NOTES:

1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
2. SEE GENERAL EROSION CONTROL NOTES ON "EROSION CONTROL NOTES & DETAILS SHEET".
3. PROVIDE INLET PROTECTION AROUND ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. MAINTAIN FOR THE DURATION OF THE PROJECT.
4. INSTALL STABILIZED CONSTRUCTION EXIT(S).
5. INSPECT INLET PROTECTION AND PERIMETER EROSION CONTROL MEASURES DAILY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
6. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
7. CONSTRUCT EROSION CONTROL BLANKET ON ALL SLOPES STEEPER THAN 3:1.
8. PRIOR TO ANY WORK OR SOIL DISTURBANCE COMMENCING ON THE SUBJECT PROPERTY, INCLUDING MOVING OF EARTH, THE APPLICANT SHALL INSTALL ALL EROSION AND SILTATION MITIGATION AND CONTROL MEASURES AS REQUIRED BY STATE AND LOCAL PERMITS AND APPROVALS.
9. CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST AND WIND EROSION THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, SPRINKLING WATER ON UNSTABLE SOILS SUBJECT TO ARID CONDITIONS.
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
11. ALL CATCH BASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN FULLY PAVED.
12. TEMPORARY SOIL STOCKPILE SHALL BE SURROUNDED WITH PERIMETER CONTROLS AND SHALL BE STABILIZED BY TEMPORARY EROSION CONTROL SEEDING. STOCKPILE AREAS TO BE LOCATED AS FAR AS POSSIBLE FROM THE DELINEATED EDGE OF WETLANDS.
13. SAFETY FENCING SHALL BE PROVIDED AROUND STOCKPILES OVER 10 FT.
14. CONCRETE TRUCKS WILL BE REQUIRED TO WASH OUT (IF NECESSARY) SHOOTS ONLY WITHIN AREAS WHERE CONCRETE HAS BEEN PLACED. NO OTHER WASH OUT WILL BE ALLOWED.
15. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

10	PROPOSED MAJOR CONTOUR LINE
9	PROPOSED MINOR CONTOUR LINE
	PROPOSED DRAIN LINE (TYP)
	PROPOSED SILT SOCK
	INLET PROTECTION SILT SACK
	PROPOSED CATCHBASIN
	PROPOSED DOUBLE GRATE CATCHBASIN
	PROPOSED DRAIN MANHOLE
	PROPOSED YARD DRAIN
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
TC	TOP OF CURB
BC	BOTTOM OF CURB
HW	HEADWALL



0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE M. CURCIO No. 20350 LICENSED PROFESSIONAL ENGINEER — 4-20-2020

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 19579 LICENSED PROFESSIONAL ENGINEER — 4-20-2020

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GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103.1

Last Saved: 4/20/2020
Printed: Apr 20, 2020 - 4:35pm By: BCurcio
Tighe & Bond: J:\C\C0960 Catharines\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

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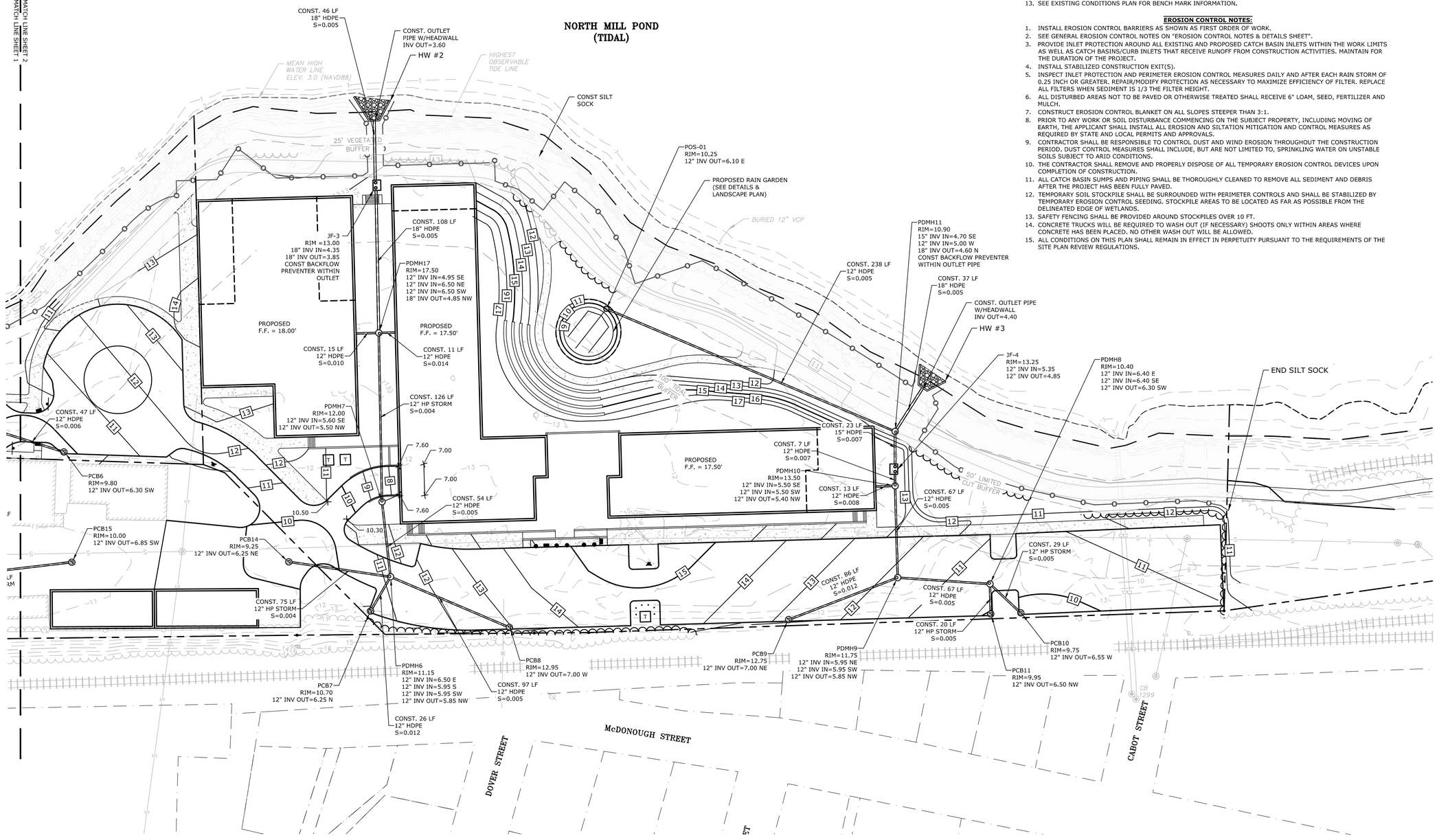

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0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCCOURT No. 00350 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 19579 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

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GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103.2

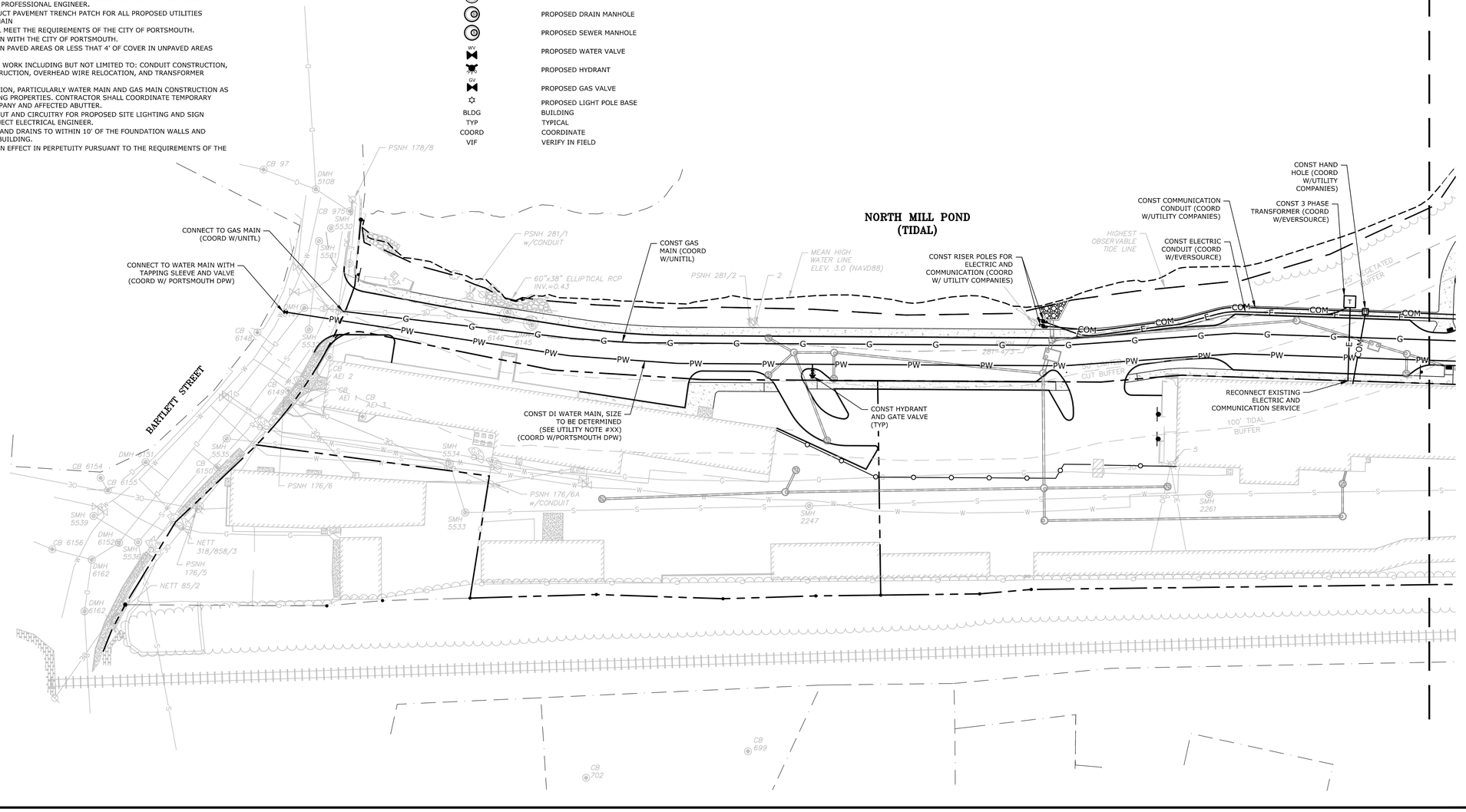
Last Saved: 4/20/2020
Plotted: Monday, April 20, 2020 9:43:36am By: BCurcio
Tighe & Bond: J:\C\C0960 Catharines\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER/SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS & COMCAST
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. THE APPLICANT SHALL COORDINATE WITH THE CITY'S CONSULTANT TO COMPLETE A WATER CAPACITY ANALYSIS USING THE CITY'S CAPACITY MODELING AND SHALL MODIFY THE WATER SERVICE DESIGN AS REQUIRED. THE PRIVATE WATER LINE THAT CURRENTLY FEEDS THE DEVELOPMENT LOT SHALL BE EITHER REPLACED OR ABANDONED DEPENDING ON THE OUTCOME OF THE STUDY. ALL MODIFICATIONS SHALL BE REVIEWED AND APPROVED BY THE DPW AND THE FIRE DEPARTMENT.
6. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
7. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
8. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
10. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
11. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
12. 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.
13. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
14. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
15. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
16. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
17. 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.
18. 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.
19. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
20. 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.
21. 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.
22. 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.
23. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
24. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
25. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
26. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
27. 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.
28. 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.
29. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
30. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
31. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

D	EXISTING STORM DRAIN
S	EXISTING SANITARY SEWER
W	EXISTING WATER
G	EXISTING GAS
E	EXISTING UNDERGROUND ELECTRIC
OE	EXISTING OVERHEAD UTILITY
	PROPOSED STORM DRAIN
SS	PROPOSED SANITARY SEWER
PW	PROPOSED WATER
G	PROPOSED GAS
E	PROPOSED UNDERGROUND ELECTRIC
COM	PROPOSED UNDERGROUND TELECOMMUNICATION
	EXISTING CATCHBASIN
D	EXISTING DRAIN MANHOLE
S	EXISTING SEWER MANHOLE
	EXISTING HYDRANT
WV	EXISTING WATER VALVE
	EXISTING WATER SHUT OFF
GV	EXISTING GAS VALVE
	EXISTING GAS SHUT OFF
	EXISTING UTILITY POLE
E	EXISTING ELECTRIC MANHOLE
T	EXISTING TELEPHONE MANHOLE
	PROPOSED CATCHBASIN
	PROPOSED DRAIN MANHOLE
	PROPOSED SEWER MANHOLE
WV	PROPOSED WATER VALVE
	PROPOSED HYDRANT
GV	PROPOSED GAS VALVE
	PROPOSED LIGHT POLE BASE
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VIF	VERIFY IN FIELD



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UTILITIES PLAN

SCALE: AS SHOWN

C-104.1

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LEGEND

D	EXISTING STORM DRAIN
S	EXISTING SANITARY SEWER
W	EXISTING WATER
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	EXISTING WATER SHUT OFF
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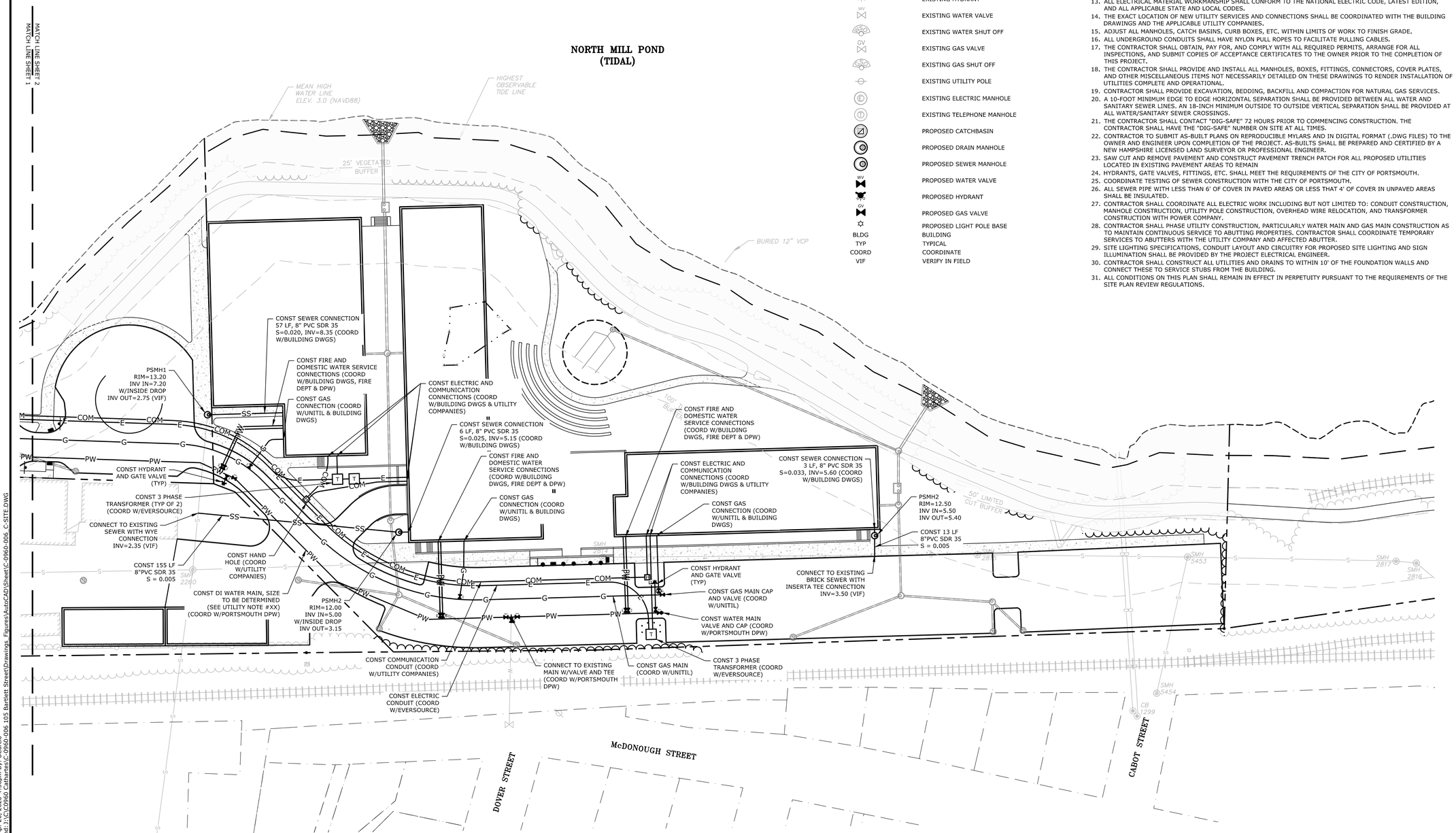
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
10. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
11. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
12. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
13. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
14. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
15. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
16. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
17. 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.
18. 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.
19. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
20. 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.
21. 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.
22. 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.
23. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
24. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
25. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
26. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
27. 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.
28. 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.
29. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
30. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
31. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.



0 40' 80'

GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

UTILITIES PLAN

SCALE: AS SHOWN

C-104.2

Last Saved: 4/20/2020
Printed: Monday, April 20, 2020 9:43:36am By: BGurcio
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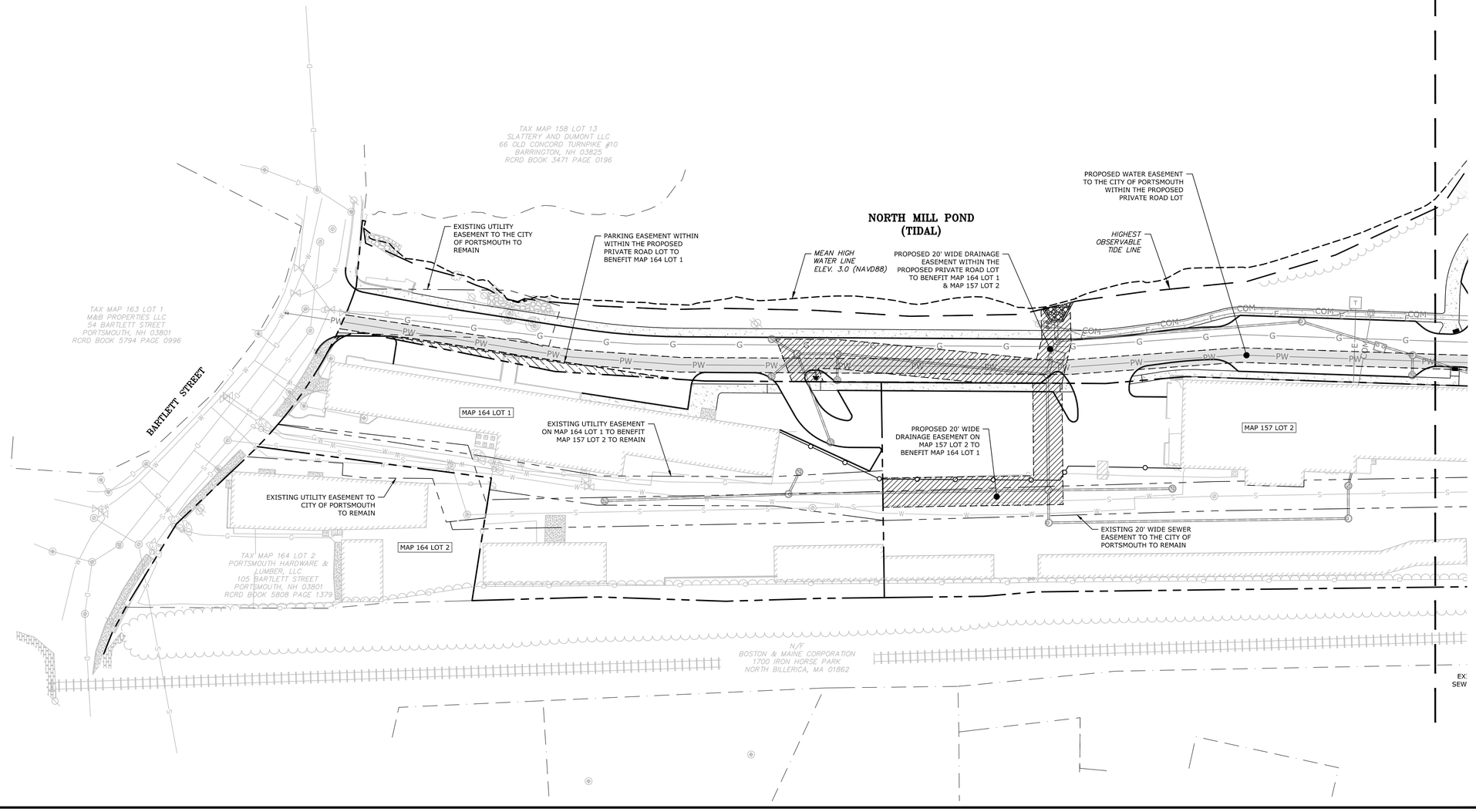
LEGEND

- PROPOSED SEWER EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED PARKING EASEMENT
- PROPOSED WATER EASEMENT

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



0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCZEROV No. 00350 – LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 13579 – LICENSED PROFESSIONAL ENGINEER – 4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
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DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

EASEMENT PLAN

SCALE: AS SHOWN

C-301.1

Last Saved: 4/20/2020
Plotted: Monday, April 20, 2020 - 4:42pm By: BCurcio
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MATCH LINE SHEET 2
MATCH LINE SHEET 1

NORTH MILL POND
(TIDAL)

MEAN HIGH WATER LINE ELEV. 3.0 (NAVD88)

HIGHEST OBSERVABLE TIDE LINE

PROPOSED 50' BUFFER EASEMENT ON THE PROPOSED DEVELOPMENT LOT ASSIGNED AS COMMUNITY SPACE TO BENEFIT THE CITY OF PORTSMOUTH FOR THE FUTURE NORTH MILL POND TRAIL

PROPOSED 20' WIDE SEWER EASEMENT WITHIN THE PROPOSED PRIVATE ROAD LOT TO BENEFIT PROPOSED TAX MAP 157 LOT 1

PROPOSED TAX MAP 157 LOT 1

PROPOSED 20' WIDE SEWER EASEMENT ON MAP 157 LOT 2 TO BENEFIT PROPOSED TAX MAP 157 LOT 1

PROPOSED 20' WIDE DRAINAGE EASEMENT TO BENEFIT MAP 157 LOT 2

EXISTING 30' WIDE DRAINAGE EASEMENT TO THE CITY OF PORSTMOUTH TO REMAIN

EXISTING 25' WIDE SEWER EASEMENT TO THE CITY OF PORTSMOUTH TO REMAIN

EXISTING 20' WIDE SEWER EASEMENT TO BENEFIT THE PROPOSED LOT TO REMAIN

PROPOSED WATER EASEMENT TO THE CITY OF PORTSMOUTH WITHIN PROPOSED MAP 157 LOT 1

N/F
BOSTON & MAINE CORPORATION
1700 IRON HORSE PARK
NORTH BILLERICA, MA 01862

EXISTING 20' WIDE PRIVATE SEWER EASEMENT TO REMAIN

EXISTING 20' WIDE WATER LINE EASEMENT TO BENEFIT THE PROPOSED LOT TO REMAIN

McDONOUGH STREET

DOVER STREET

CABOT STREET

LEGEND

- PROPOSED SEWER EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED PARKING EASEMENT
- PROPOSED WATER EASEMENT

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

Tighe&Bond

STATE OF NEW HAMPSHIRE
BRADLEE MCELROY
No. 00350
LICENSED
PROFESSIONAL ENGINEER
4-20-2020

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
No. 19579
LICENSED
PROFESSIONAL ENGINEER
4-20-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

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Portsmouth,
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DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

EASEMENT PLAN

SCALE: AS SHOWN

C-301.2

Last Saved: 4/20/2020
Plotted: Oct 21, 2020 - 4:44pm By: BGurcio
Tighe & Bond: J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

GENERAL PROJECT INFORMATION

PROJECT APPLICANT: IRON HORSE PROPERTIES, LLC
105 BARTLETT STREET
PORTSMOUTH, NH 03801
PROJECT NAME: PROPOSED MULTI-FAMILY DEVELOPMENT
PROJECT ADDRESS: 105 BARTLETT STREET
PORTSMOUTH, NH 03801
PROJECT LATITUDE/LONGITUDE: 43°-04'-20" N / 70°-46'-15" W

PROJECT MAP/LOT:
MAP 157 / LOT 1
MAP 157 / LOT 2
MAP 164 / LOT 1
MAP 164 / LOT 4-2

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF CONSTRUCTING TWO (2) MULTI-FAMILY APARTMENT BUILDINGS WITH BASEMENT LEVEL PARKING, ONE (1) MIXED-USE BUILDING WITH FIRST FLOOR OFFICE AND AMENITY SPACE, AS WELL AS UPPER STORY APARTMENTS.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 6.5 ACRES.

SOIL CHARACTERISTICS

BASED ON THE SITE SPECIFIC SOIL SURVEY CONDUCTED BY LEONARD LORD, PHD, CSS, CSW ON OCTOBER 29 AND DECEMBER 2, 2019, THE SOILS ON SITE CONSIST OF __WITH A HYDROLOGIC SOIL GROUP RATING OF A TO D.

NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA SUBSURFACE DRAINAGE WHICH ULTIMATELY FLOWS TO NORTH MILL POND.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

1. CUT AND CLEAR TREES.
2. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - CONTROL OF DUST
   - NEARNESS OF CONSTRUCTION SITE TO RECEIVING WATERS
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR AND DISPOSE OF DEBRIS.
5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:

1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:

1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:

1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:

1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
TALL FESCUE	20 LBS/ACRE
CREEPING RED FESCUE	20 LBS/ACRE
BIRDSFOOT TREFOIL	8 LBS/ACRE

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.

3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

CONCRETE WASHOUT AREA:

1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:

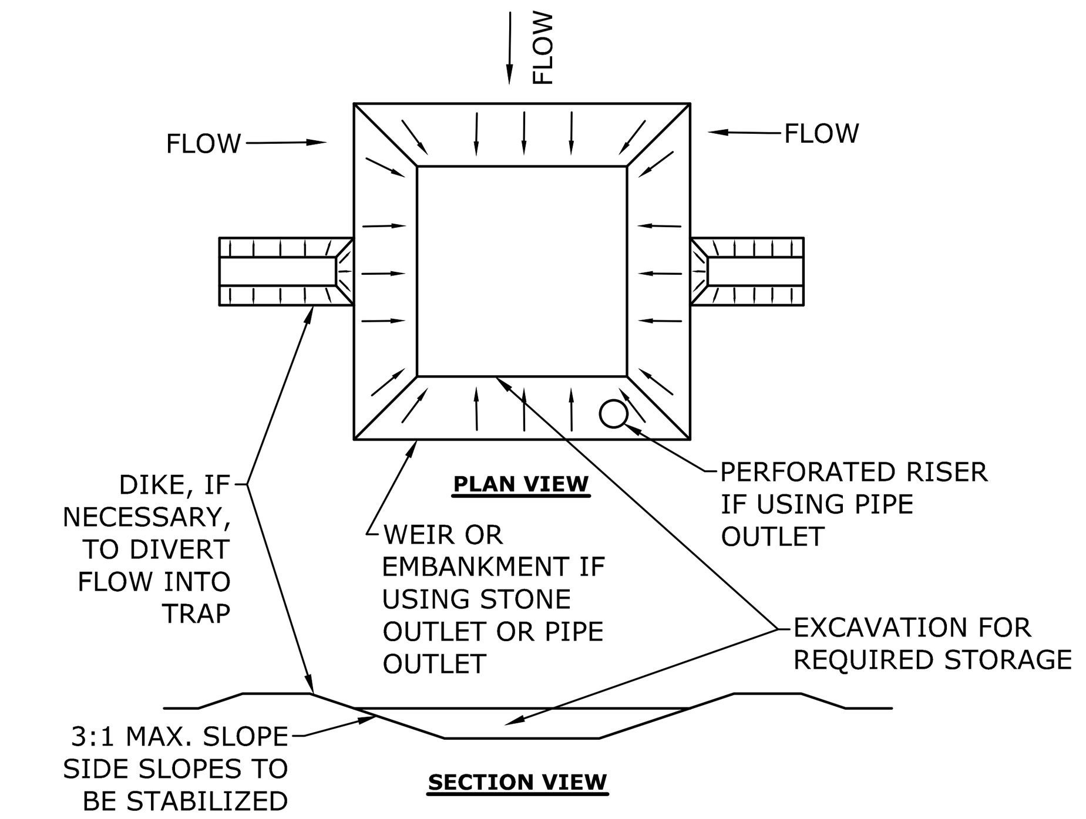
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION:

1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
      i. ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
      ii. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      iii. SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
      iv. INSPECT FUEL STORAGE AREAS WEEKLY;
      v. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
      vi. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
      vii. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
      viii. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
         (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
         (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
         (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
         (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
         (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
      ix. FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
      HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF
      b. FERTILIZERS:
      i. FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
      ii. ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
      iii. STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
      i. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
      ii. EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
      iii. EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

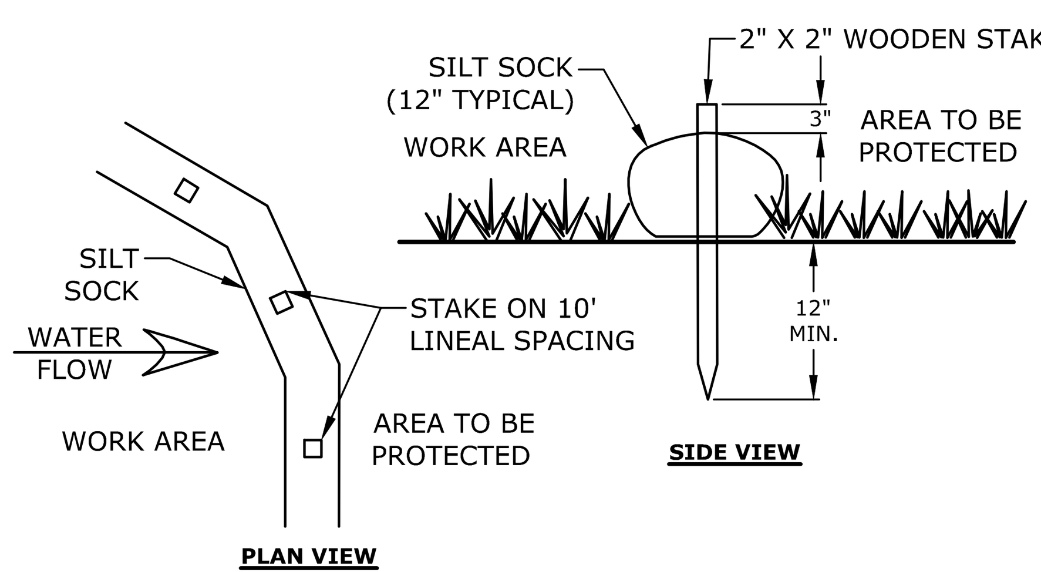
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
   A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
   B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
   C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
   D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.



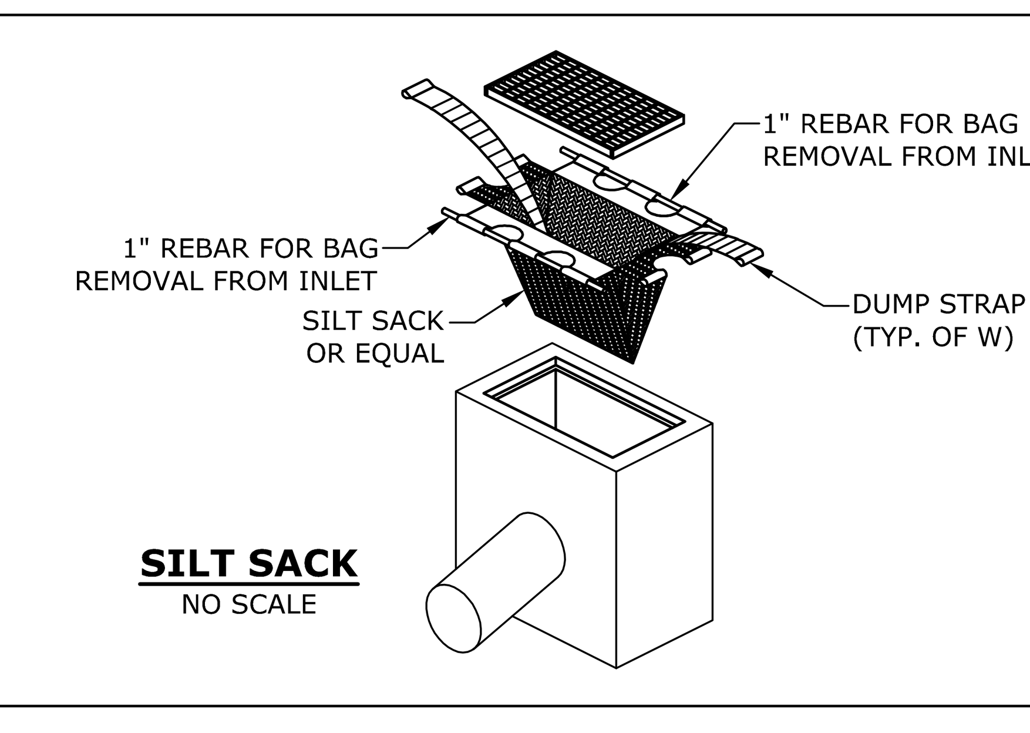
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP.
5. TRAP SHALL DISCHARGE TO A STABILIZED AREA.
6. TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
8. SEDIMENT TRAPS MUST BE USED AS NEEDED TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.

SEDIMENT TRAP
NO SCALE

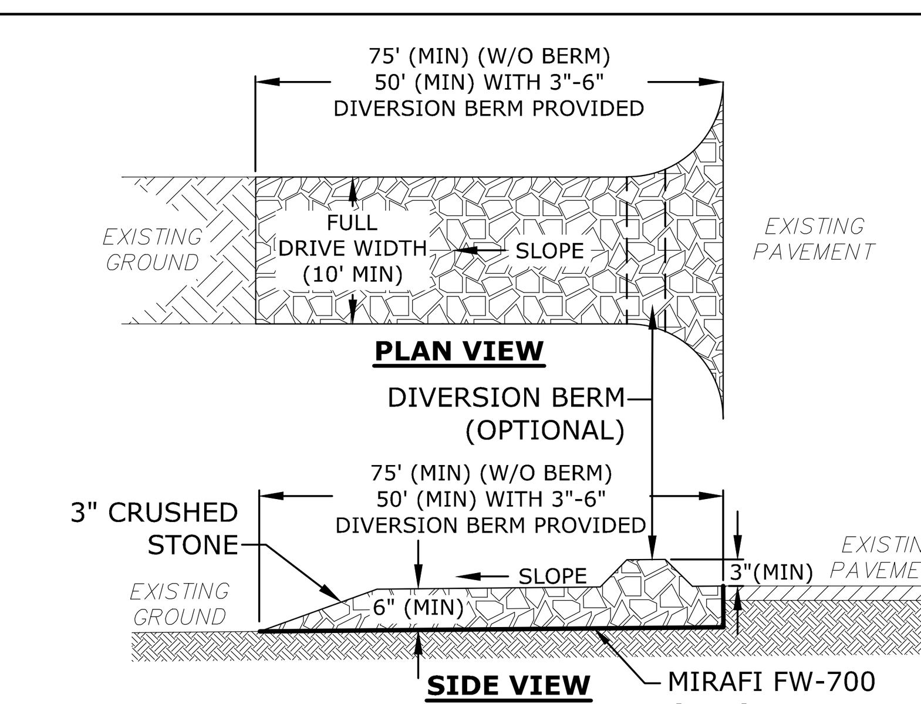


NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL
2. INSTALL SILT SOCK IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS

SILT SOCK
NO SCALE



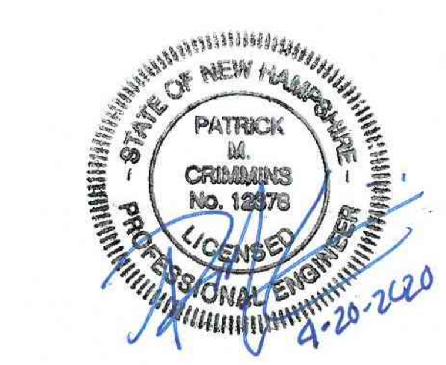
SILT SACK
NO SCALE



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

STABILIZED CONSTRUCTION EXIT
NO SCALE

Tighe&Bond



Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

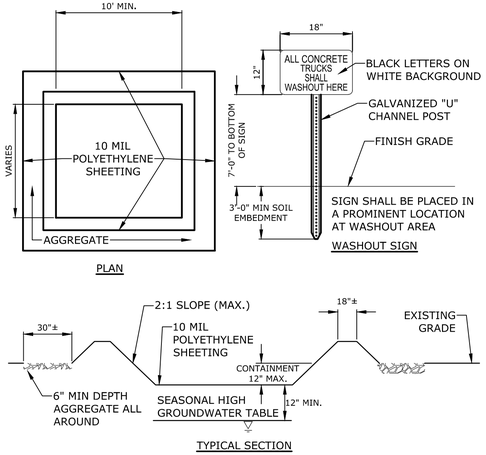
SCALE: AS SHOWN

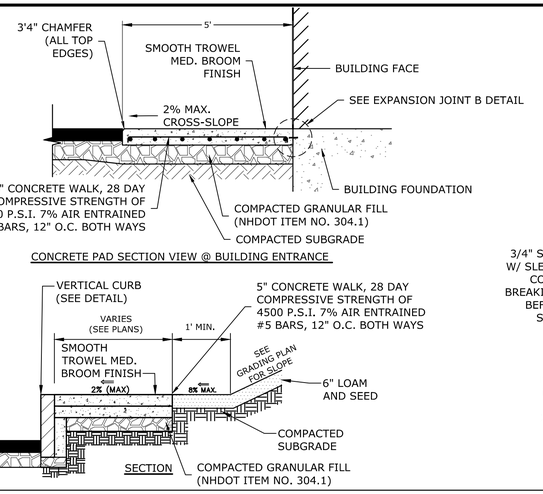
C-501

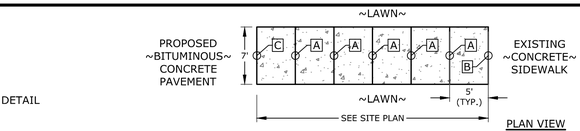
Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-12:33pm By: BCurcio
Tighe & Bond:J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg

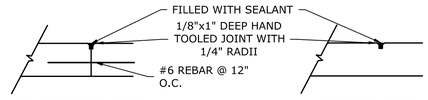
NOTES:
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75%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

CONCRETE WASHOUT AREA
NO SCALE







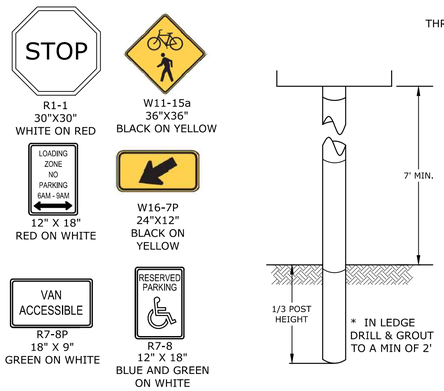


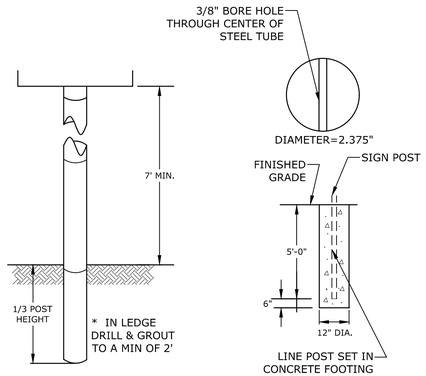
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.

NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12

CONCRETE SIDEWALK
NO SCALE





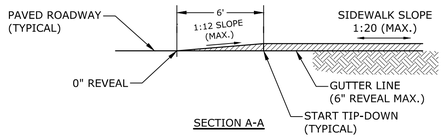
NOTES:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
FINISH: POST TO BE POWDER COATED GLOSS BLACK
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER (AS REQUIRED)
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070-1080)

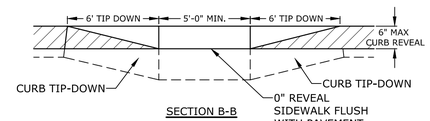
SIGN LEGEND & SIGN POST
NO SCALE

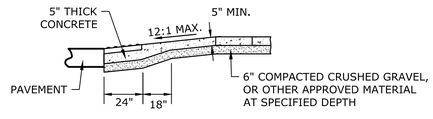
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
4. PROVIDE DETECTABLE WARNING SURFACES ANYTIME THAT A CURB RAMP, BLENDED TRANSITION, OR LANDING CONNECTS TO A STREET.
5. LOCATE THE DETECTABLE WARNING SURFACES AT THE BACK OF THE CURB ALONG THE EDGE OF THE LANDING.
6. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
7. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURBLINE.
8. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
9. DETECTABLE WARNING PANELS SHALL BE A MINIMUM OF 2 FEET IN DEPTH. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP, BLENDED TRANSITION, OR LANDING AND THE STREET.
10. THE TEXTURE OF THE DETECTABLE WARNING FEATURE MUST CONTRAST VISUALLY WITH THE SURROUNDING SURFACES (EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT).

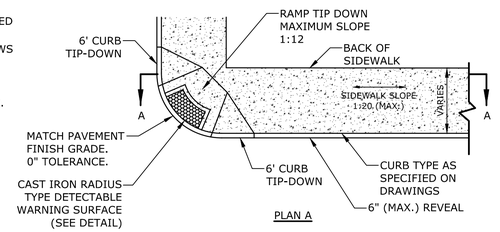
CONCRETE WHEELCHAIR ACCESSIBLE RAMP
NO SCALE

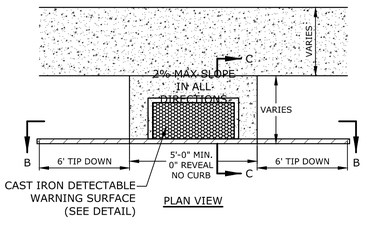
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12





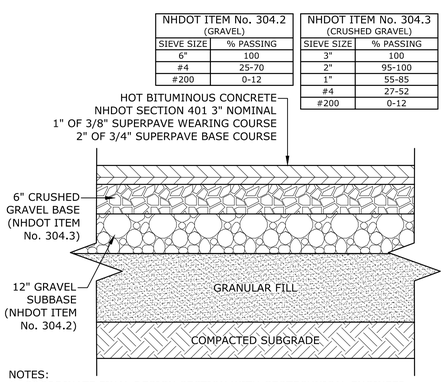






NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12

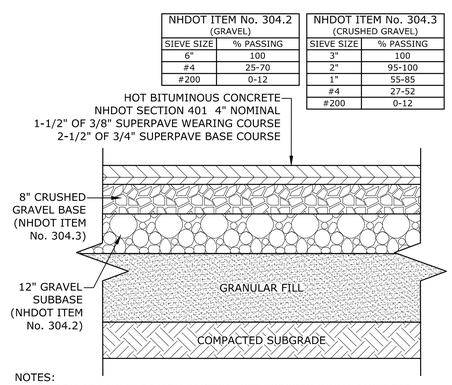


NOTES:
1. COORDINATE FINAL DESIGN SECTION WITH GEOTECHNICAL ENGINEER.
2. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
4. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
5. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.

PARKING LOT PAVEMENT SECTION
NO SCALE

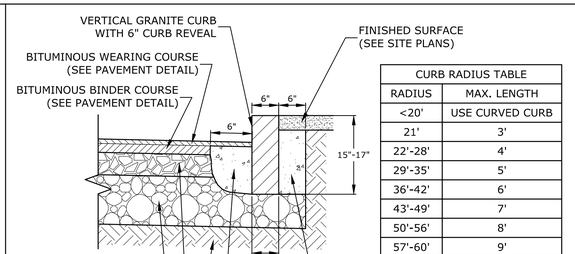
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



NOTES:
1. COORDINATE FINAL DESIGN SECTION WITH GEOTECHNICAL ENGINEER.
2. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
4. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.
5. REFER TO CITY SPECIFICATIONS FOR ASPHALT MIX DESIGN.

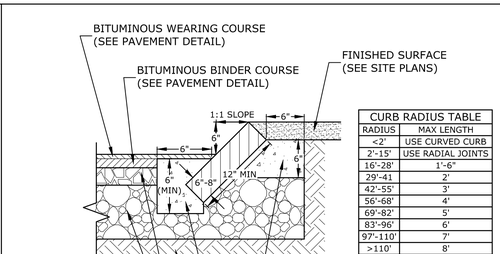
ROADWAY PAVEMENT SECTION
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX. LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

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

VERTICAL GRANITE CURB
NO SCALE



CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

SLOPED GRANITE CURB
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEY M. CROWELL No. 00350 – LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 19579 – LICENSED PROFESSIONAL ENGINEER – 4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

C-502

Last Saved: 4/20/2020
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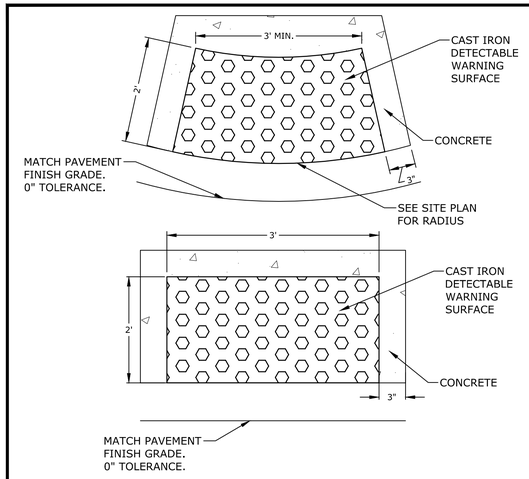
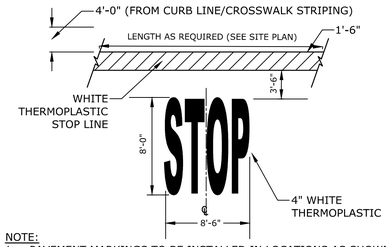
Tighe & Bond: J:\C\C0960 Cathertse\C-0960-006 105 Bartlett Street\Drawings, Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg



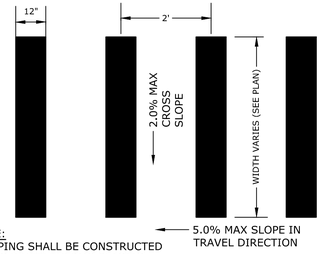
NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

RADIUS TYPE CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



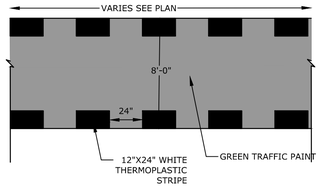
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR AND LEGEND
NO SCALE



NOTE:
STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

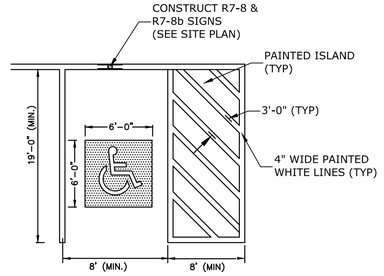
CROSSWALK STRIPING
NO SCALE



NOTE:
1. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505.

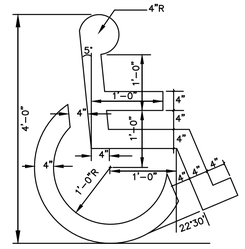
2. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.

BIKE CROSSING BOX
NO SCALE



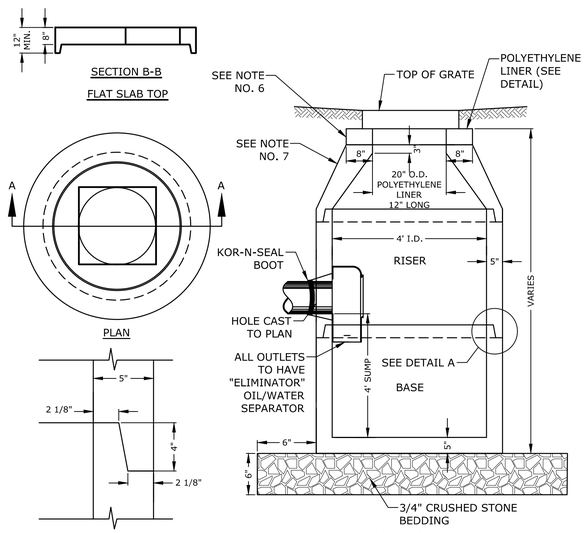
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN W/DISABILITIES ACT.

ACCESSIBLE PARKING STALL
NO SCALE



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

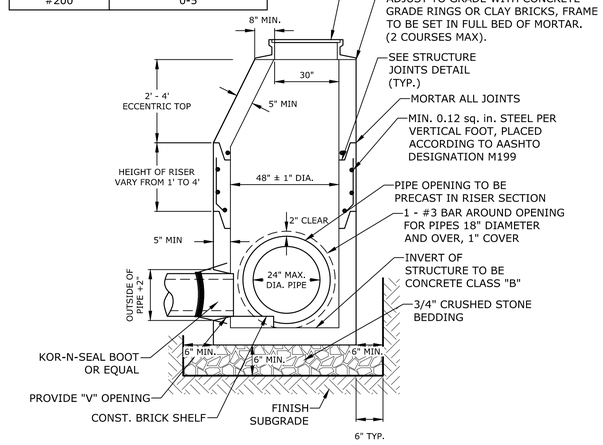
ACCESSIBLE SYMBOL
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

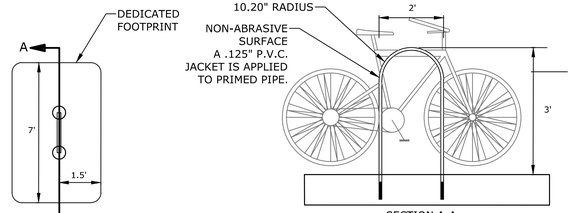
4' DIAMETER CATCHBASIN
NO SCALE

NHDOT ITEM No. 304.4 (CRUSHED STONE - FINE)	
SIEVE SIZE	% PASSING
2"	100
1-1/2"	85-100
3/4"	45-75
#4	10-45
#200	0-5

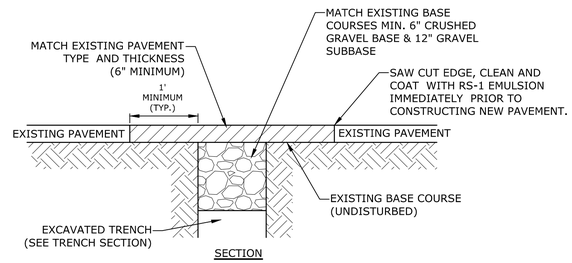


NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
9. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

4' DIAMETER DRAIN MANHOLE
NO SCALE



BIKE RACK
NO SCALE



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

ROADWAY TRENCH PATCH
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCDONOUGH No. 20350 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 18579 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
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APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

C-503

Last Saved: 4/20/2020
Plotted: Apr 20, 2020 - 12:34pm By: BCurcio
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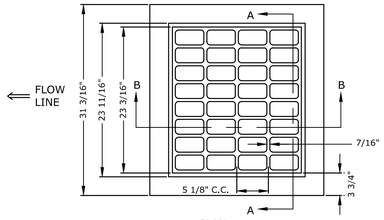
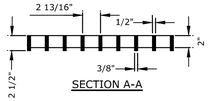
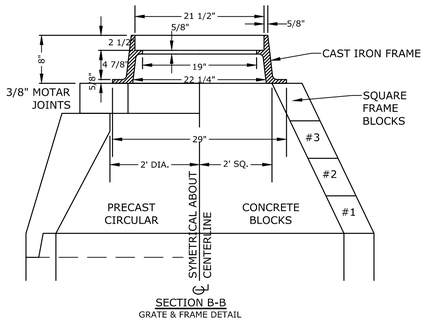


PLAN

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

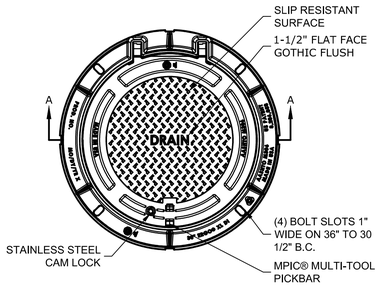


SECTION A-A



SECTION B-B
GRATE & FRAME DETAIL

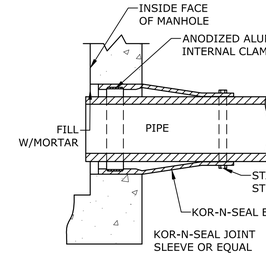
CATCH BASIN FRAME & GRATE
NO SCALE



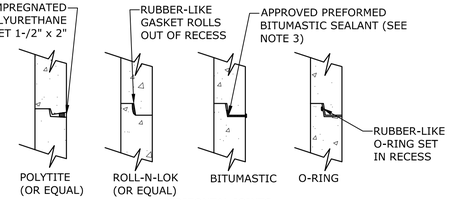
SECTION A-A

NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



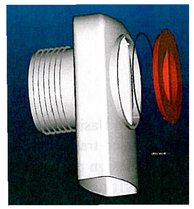
PIPE TO MANHOLE JOINTS



HORIZONTAL JOINTS

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

MANHOLE JOINTS
NO SCALE

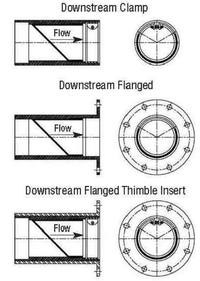


NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE

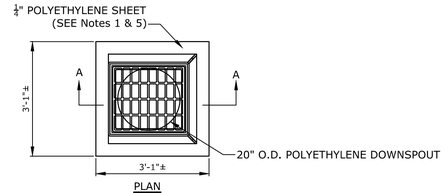
NOMINAL PIPE SIZE I.D.*		OVERALL LENGTH**		NUMBER OF CLAMPS	CUFF DEPTH		BACK PRESSURE RATING	
Inches	Millimeters	Inches	Millimeters		Inches	Millimeters	Feet	Meters
12	300	23	584	1	2	51	40	12

Mounting Styles and Configurations

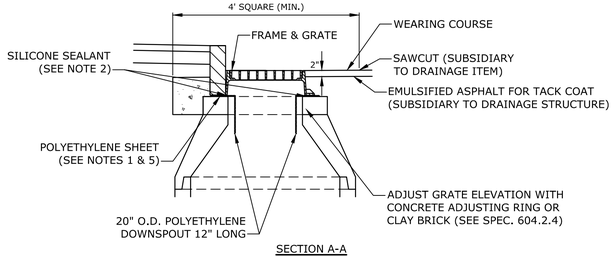


Flange shape and bolt pattern can be customized.
Flangeless thimble inserts are available.

TYPICAL BACK FLOW PREVENTER
NO SCALE



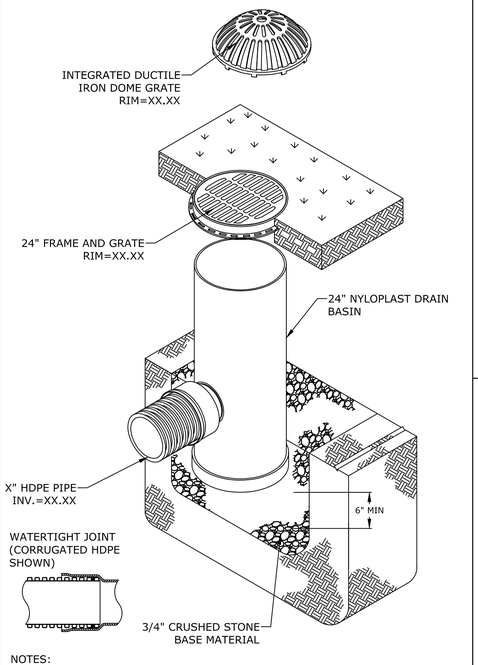
PLAN



SECTION A-A

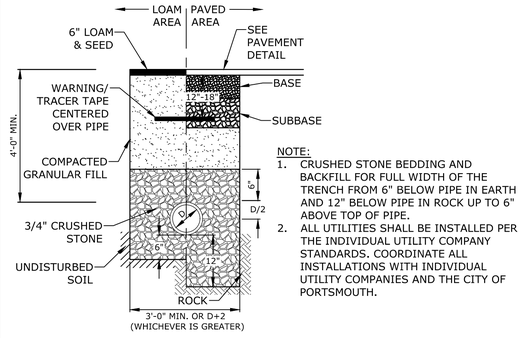
NOTES:
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE).
4. USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
5. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3-FLANGE FRAME AND CURB).
6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
7. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.
8. SEE NHDOT DR-04, "DI-DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.
9. CATCHBASINS WITHIN CITY RIGHT OF WAY SHALL HAVE A POLYETHYLENE LINER

POLYETHYLENE LINER
NO SCALE



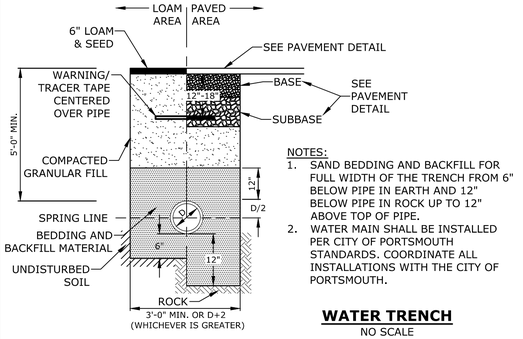
NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE, AND EROSION CONTROL PLAN FOR LOCATIONS.

YARD DRAIN
NO SCALE



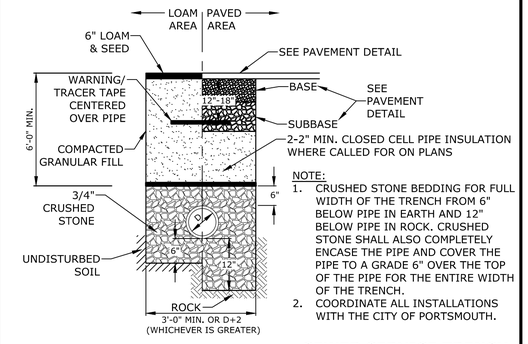
NOTE:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES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

STORM DRAIN TRENCH
NO SCALE



NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

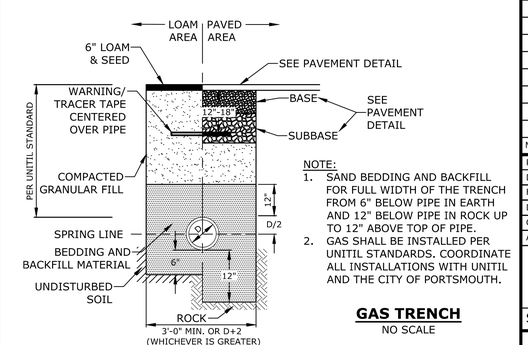
WATER TRENCH
NO SCALE



2-2" MIN. CLOSED CELL PIPE INSULATION WHERE CALLED FOR ON PLANS

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



NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCZOLOFT No. 00350 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 19579 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

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SCALE: AS SHOWN

C-504

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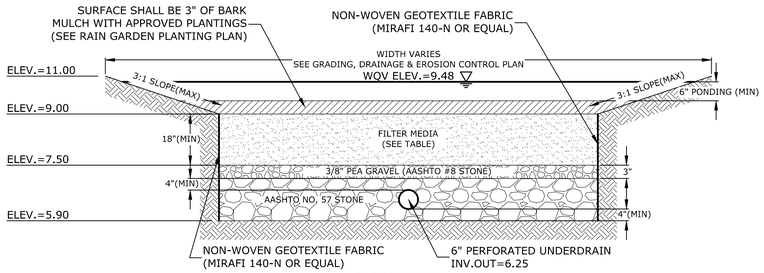


SECTION VIEW

FILTER MEDIA COMPOSITION:			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL SIEVE NO.	PERCENT PASSING
ASTM C-33 CONCRETE SAND	50-55	SEE NOTE #5	
LOAMY SAND TOPSOIL	20-30	200	15-25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH	20-30	200	5 MAX

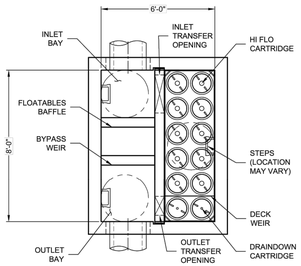
NOTES:
1. BARK MULCH SHALL BE AGED A MINIMUM OF 12 MONTHS AND SHALL NOT FLOAT.
2. RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL KEEP ALL EXCAVATION EQUIPMENT OUTSIDE OF THE LIMIT OF THE RAIN GARDEN.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR LOCATIONS, LAYOUTS, AND ELEVATIONS.
5. THE SAND PORTION OF THE FILTER MEDIA SHALL MEET THE FOLLOWING GRADATION (ASTM C-33):

SIEVE SIZE	PERCENT PASSING
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#50	5-30
#100	0-10

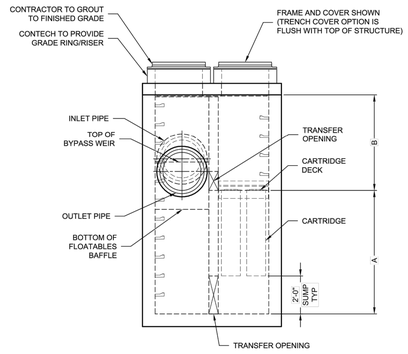
AASHTO #8 STONE (#8 to 3/8")	
SIEVE SIZE	% PASSING
1/2"	100
3/8"	85-100
#4	10-30
#8	0-10
#16	0-5

AASHTO #57 STONE (#4 to 1")	
SIEVE SIZE	% PASSING
1-1/2"	100
1"	95-100
1/2"	25-60
#4	0-10
#8	0-5

RAIN GARDEN
NO SCALE



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

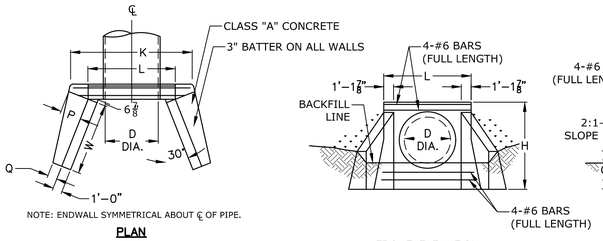
JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD				
CARTRIDGE SELECTION				
CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

SYSTEM	JF-1	JF-2	JF-3	JF-4
WQF (CFS)	2.940	0.614	1.021	0.869
PEAK FLOW (CFS)	30.26	5.11	15.82	9.16
MODEL SIZE	JFPD0811-15-4	JFPD0806-3-1	JFPD0806-9-2	JFPD0806-5-1

NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-858, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

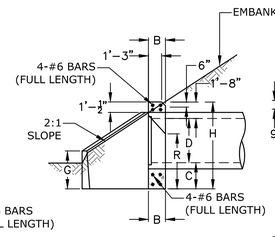
CONTECH JELLYFISH STORMWATER FILTER
NO SCALE



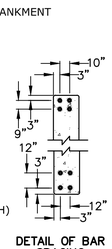
NOTE: ENDWALL SYMMETRICAL ABOUT ℄ OF PIPE.

PLAN

FRONT ELEVATION



SIDE ELEVATION

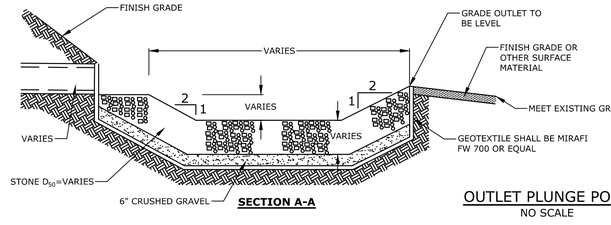


DETAIL OF BAR SPACING

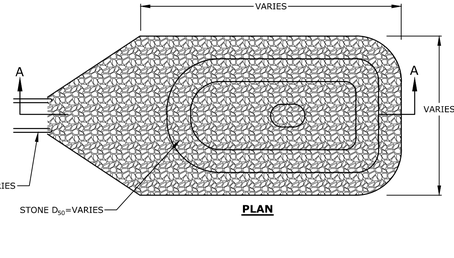
HEADWALL WITH WINGWALLS
NO SCALE

DIMENSIONS AND QUANTITIES FOR ONE WING TYPE ENDWALL												
D	B	C	G	H	K	L	P	Q	R	W	VOL.
IN.*	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	CY
24	1'-6"	2'-0"	3'-3"	6'-9"	9'-1 1/2"	7'-3 3/8"	1'-4 5/8"	0'-9 3/8"	3'-4 5/8"	5'-5 3/8"	5.87
36	1'-6"	2'-0"	3'-3"	6'-8"	9'-1 1/2"	7'-3 3/8"	1'-4 5/8"	0'-9 3/8"	3'-4 5/8"	5'-5 3/8"	5.87
42	1'-6"	2'-0"	3'-3"	7'-2"	9'-10 1/2"	7'-9 3/8"	1'-6 1/8"	0'-9 3/8"	3'-10 5/8"	6'-7 3/8"	6.67
48	1'-7"	2'-6"	3'-9"	8'-2"	10'-10"	8'-3 3/8"	1'-9 3/8"	0'-11 3/8"	4'-9"	7'-9 3/8"	9.11
60	1'-7"	2'-6"	3'-9"	9'-2"	12'-4 1/2"	9'-3 3/8"	2'-0 3/8"	0'-11 3/8"	5'-9"	10'-1 3/8"	12.43
72	1'-7"	2'-6"	3'-9"	10'-2"	13'-10 1/2"	10'-3 3/8"	2'-3 3/8"	0'-11 3/8"	6'-9"	12'-5"	16.30

* FOR D<36" USE DIMENSIONS LISTED FOR D=36"

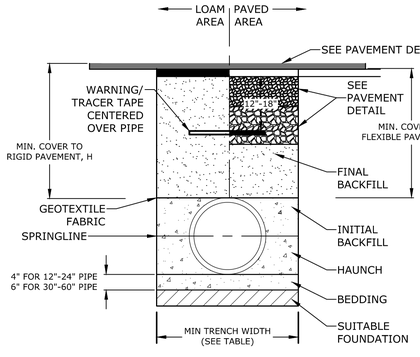


SECTION A-A



PLAN

OUTLET PLUNGE POOL
NO SCALE



PIPE DIAM.	MIN. TRENCH WIDTH
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

	SURFACE LIVE LOADING CONDITION	
PIPE DIAM.	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12" - 48"	12"	48"
60"	24"	60"

TABLE 2, MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITION
* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

	CLASS I	CLASS II			CLASS III		CLASS IV
PIPE DIA.	COMPACTED	95%	90%	85%	95%	90%	95%
12"	41'	28'	21'	16'	20'	16'	16'
15"	42'	29'	21'	16'	21'	16'	16'
18"	44'	30'	21'	16'	22'	17'	16'
24"	37'	26'	18'	14'	19'	14'	14'

TABLE 3, MAXIMUM COVER FOR ADS HP STORM PIPE
FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
NO HYDROSTATIC PRESSURE
UNIT WEIGHT OF SOIL (γs) = 120 PCF

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION, WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND TO THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS ARE PER THE LATEST VERSION OF ASTM D2321. CLASS IVB MATERIALS (MH, CH) AS DEFINED IN PREVIOUS VERSIONS OF ASTM D2321 ARE NOT APPROPRIATE BACKFILL MATERIALS.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE AS JUDGED BY THE ENGINEER, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL. REFER TO SPECIFICATION 310000 EARTHWORK - SITE.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II, III, OR IV. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 12"-24" (300mm-600mm) DIAMETER PIPE; 6" (150mm) FOR 30"-60" (750mm-1500mm) DIAMETER PIPE. THE MIDDLE 1/3 BENEATH THE PIPE INVERT SHALL BE LOOSELY PLACED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF THE GEOTECHNICAL ENGINEER.
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, III, OR IV IN THE PIPE ZONE EXTENDING TO THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF THE GEOTECHNICAL ENGINEER.
6. MINIMUM COVER: FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (300mm) UP TO 48" (1200mm) DIAMETER PIPE AND 24" (600mm) OF COVER FOR 60" (1500mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.
7. FOR ADDITIONAL INFORMATION SEE TECHNICAL NOTE 2.04.

HP STORM TRENCH INSTALLATION DETAIL
NO SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

C-505

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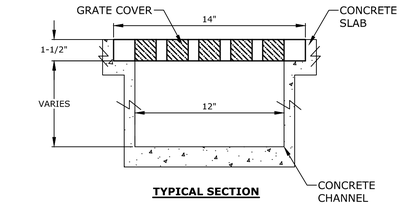
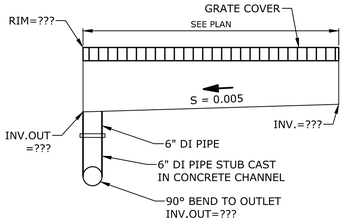


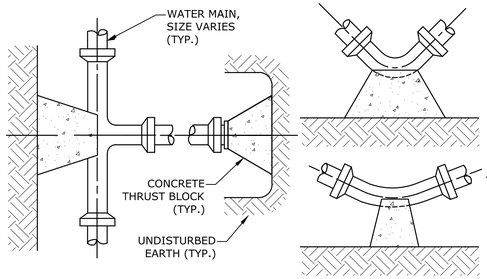
TYPICAL SECTION



TRENCH DRAIN PROFILE

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

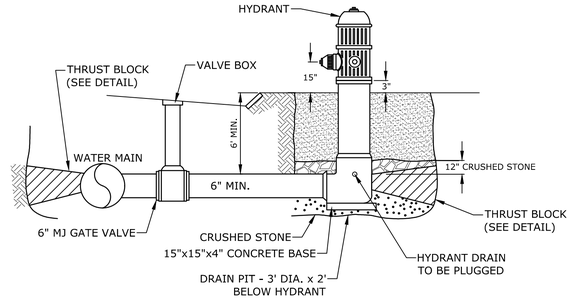
TRENCH DRAIN DETAIL
NO SCALE



TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL				
REACTION TYPE	PIPE SIZE				
	4"	6"	8"	10"	12"
A 90°	0.89	2.19	3.82	11.14	17.24
B 180°	0.65	1.55	2.78	8.38	12.00
C 45°	0.48	1.19	2.12	6.02	9.32
D 22-1/2°	0.25	0.60	1.06	3.08	4.74
E 11-1/4°	0.13	0.30	0.54	1.54	2.38

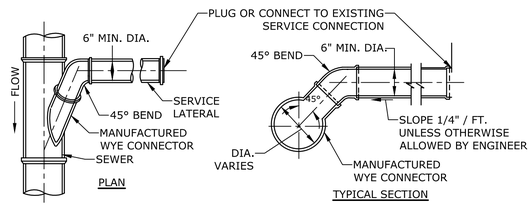
NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT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

THRUST BLOCKING DETAIL
NO SCALE

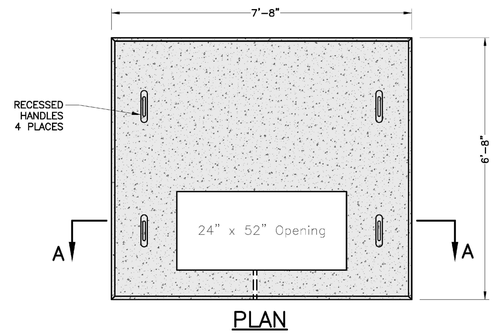


NOTE:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

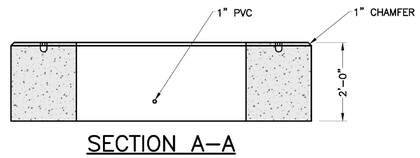
FIRE HYDRANT
NO SCALE



STANDARD SERVICE LATERAL CONNECTION
NO SCALE



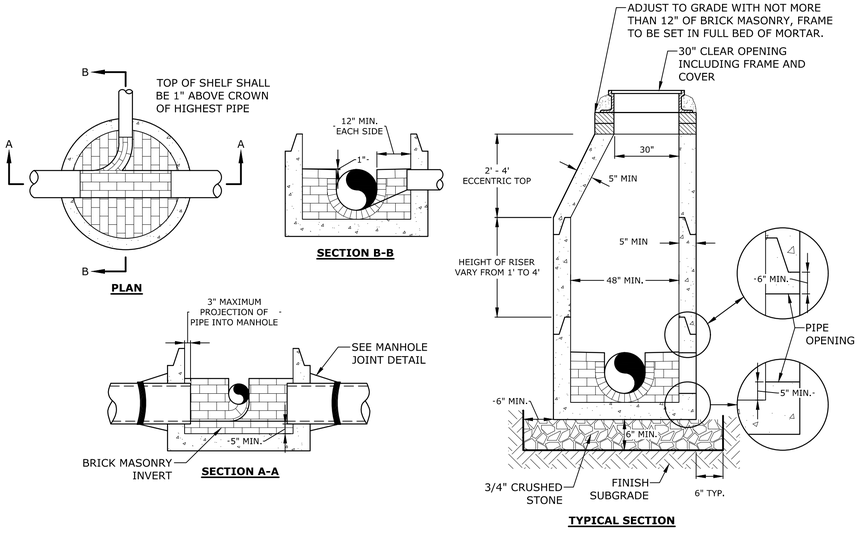
PLAN



SECTION A–A

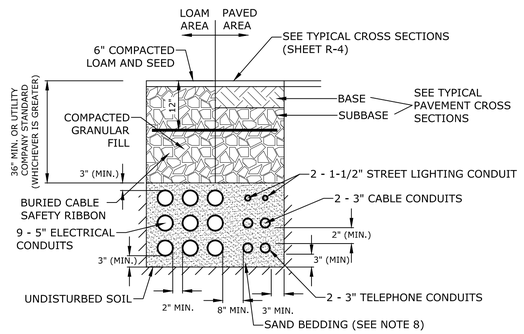
3-PHASE TRANSFORMER PAD
NO SCALE

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



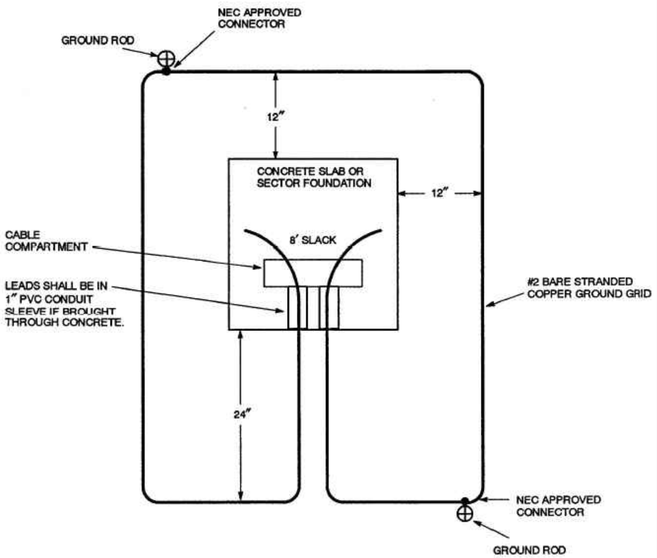
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. BITUMINOUS WATERPROOF COATING TO BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: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

SEWER MANHOLE
NO SCALE



NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.
8. SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.

ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE



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

PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MCDONOUGH No. 00350 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS No. 19579 LICENSED PROFESSIONAL ENGINEER – 4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

C-506

Last Saved: 4/20/2020
Printed: Oct 29, 2020 - 12:34pm By: BCorcio
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woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Proposed Multi-Family Development

LANDSCAPE CONCEPT

105 Barlett Street Portsmouth, NH

Drawn By:	RW
Checked By:	RW
Scale:	scale
Date:	2020-02-20
Revisions:	

L-1

Sheet x of X

Stephen G. Pernaw & Company, Inc.

P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com

Transportation: Engineering • Planning • Design

M E M O R A N D U M

Ref: 1955A

To: Jeff Johnston
Cathartes

From: Stephen G. Pernaw, P.E., PTOE

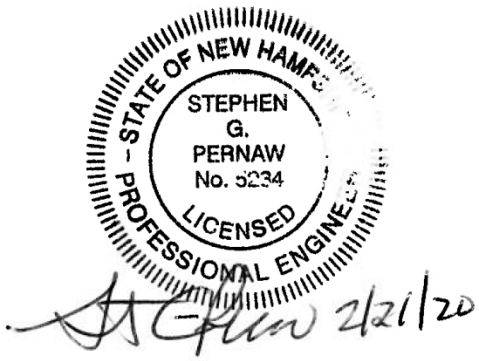
Subject: Trip Generation Update

Date: February 21, 2020

As you know, our office prepared the *"Traffic Impact & Site Access Study – Proposed Residential Subdivision"* report dated June 18, 2019 for the 120-unit multi-family low/mid-rise residential development located on the south side of North Mill Pond in Portsmouth, New Hampshire. The development proposal has changed and it now involves: 1) acquiring the property associated with Great Rhythm Brewing Company and the Play All Day Doggy Daycare facility and razing these buildings, 2) increasing the number of dwellings to 174 units, and 3) providing 9,000 sf of office space (see Attachment 1). Similar to our previous traffic report, all site vehicles will travel to/from the development via Bartlett Street. The purpose of this memorandum is to compare the trip generating characteristics of the former and current development proposals.

Table 1 summarizes the updated trip generation analyses and shows that the proposed residences and office space will generate a total of approximately 69 (AM) and 87 (PM) vehicle-trips during the peak hour periods (see Attachments 2-5). Driveway counts conducted at the brewery/dog daycare parking lot in October 2018 revealed that these two uses generated 68 (AM) and 85 (PM) vehicle-trips on a typical weekday (see Attachment 6). The removal of the brewery and daycare uses cancel out the impact of the proposed residential/commercial development.

The previous development proposal was expected to generate approximately 41 (AM) and 53 (PM) vehicle trips (see Attachment 7). Table 1 (Page 2) combines these findings and demonstrates that the current development proposal will generate -40 (AM) and -51 (PM) fewer vehicle-trips during the peak hour periods than the previous development proposal. Accordingly, the traffic projections contained in the previous traffic study are now considered to be quite conservative on the "high side." This means that the study findings and conclusions remain valid for the new development proposal.



Attachments

Stephen G. Pernaw & Company, Inc.

Table 1 — Trip Generation Summary (2/20/20)

	Current Development Proposal						
	Apartments [1] (174 units)	Office [2] (9,000 sf)	Subtotal	Less Brewery & Dog Daycare [3]	Net Trips Generated	Previous Development Proposal [4]	Net Change
Weekday AM Peak Hour							
Entering	15 veh	9 veh	24 veh	-34 veh	-10 veh	11 veh	-21 veh
Exiting	44 veh	1 veh	45 veh	-34 veh	11 veh	30 veh	-19 veh
Total	59 trips	10 trips	69 trips	-68 trips	1 trips	41 trips	-40 trips
Weekday PM Peak Hour							
Entering	46 veh	2 veh	48 veh	-43 veh	5 veh	32 veh	-27 veh
Exiting	29 veh	10 veh	39 veh	-42 veh	-3 veh	21 veh	-24 veh
Total	75 trips	12 trips	87 trips	-85 trips	2 trips	53 trips	-51 trips

[1] ITE Land Use Code 221 - Multifamily Housing (Mid-Rise) - See Attachment 2 & 3
[2] ITE Land Use Code 710 - Office - See Attachment 4 & 5
[3] October 2018 Driveway Counts - See Attachment 6
[4] "Traffic Impact and Site Access Study-Proposed Residential Subdivision" Table 1, by Stephen G. Pernaw & Co., Inc. dated June 18, 2018 - See Attachment 7)

SITE DATA:

PROJECT LOCATION:	TAX MAP 157, LOT 1 TAX MAP 157, LOT 2 TAX MAP 164, LOT 3 TAX MAP 164, LOT 4 TAX MAP 164, LOT 4-2
	105 BAPTIFTT STREET PORTSMOUTH, NEW HAMPSHIRE
SITE ZONING DISTRICT	CHARACTER DISTRICT 4 (CD4-W) CHARACTER DISTRICT 4 (CD4-L1) WEST END INCENTIVE OVERLAY DISTRICT
ALLOWED USE ON SITE	PROFESSIONAL OFFICE, BUSINESS OFFICE, RETAIL SALES, RESTAURANT, MULTIFAMILY DWELLING

DEVELOPMENT STANDARDS

BUILDING PLACEMENT (PRINCIPAL BUILDING):	REQUIRED (CD4-W)	PROPOSED (CD4-W)	REQUIRED (CD4-L1)	PROPOSED (CD4-L1)
MAX PRINCIPAL FRONT YARD:	10 FT	0 FT	15 FT	N/A
MINIMUM SIDE YARD:	15 FT(1)	<6 FT(2)	15 FT(1)	86 FT
MINIMUM REAR YARD	5 FT	769 FT	5 FT	269 FT
FRONT LOT LINE BUILDOUT:	50% MIN	69%	60% MIN, 80% MAX	N/A

BUILDING AND LOT OCCUPATION:	REQUIRED (CD4-W)	PROPOSED (CD4-W)	REQUIRED (CD4-L1)	PROPOSED (CD4-L1)
MAXIMUM BUILDING BLOCK LENGTH:	200 FT	196 FT	100 FT(3)	34 FT
MAXIMUM FAÇADE MODULATION LENGTH:	80 FT	<80 FT	50 FT	<50 FT
MAXIMUM ENTRANCE SPACING:	50 FT	<50 FT	NR	NR
MAXIMUM BUILDING COVERAGE:	80%(4)	124.0%	80%(4)	11.3%
MAXIMUM BUILDING FOOTPRINT	20,000 SF(5)	20,000 SF	3,500 SF(6)	2,852 SF
MINIMUM LOT AREA:	5,000 SF	220,768 SF	3,000 SF	220,768 SF
MINIMUM LOT AREA PER DWELLING UNIT	NR(7)		NR(7)	
MINIMUM OPEN SPACE:	15%	48%	25%	48%
MAXIMUM GROUND FLOOR GFA PER USE	15,000 SF	10,300 SF	NR	

(1) - PER 10.516.20, MINIMUM SIDE YARD SETBACK ADJOINING A RAILROAD RIGHT OF WAY SHALL BE 15FT
(2) - VARIANCE GRANTED BY ZONING BOARD OF ADJUSTMENT ON JANUARY 22, 2020
(3) - MAXIMUM BLOCK LENGTH ALLOWED IN WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(4) - MAXIMUM BUILDING COVERAGE ALLOWED IN THE WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(5) - ADDITIONAL 5,000 SF OF GFA (INCREASED FROM 15,000 SF) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(6) - ADDITIONAL 1,000 SF OF GFA (INCREASED FROM 2,500 SF) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(7) - NO MINIMUM LOT AREA PER DWELLING UNIT REQUIRED IN THE WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.

BUILDING FORM (PRINCIPAL BUILDING):	REQUIRED (CD4-W)	PROPOSED (CD4-W)	REQUIRED (CD4-L1)	PROPOSED (CD4-L1)
BUILDING HEIGHT:	4 STORIES(1) 50' MAX(2)	5† STORY, 50' (BLDG B & C)	2 STORIES(1) 30' MAX(2)	2 STORY, 30' (BLDG A)
MAXIMUM FINISHED FLOOR SURFACE OF GROUND FLOOR ABOVE SIDEWALK GRADE:	36 IN	<36 IN	36 IN	<36 IN
MINIMUM GROUND STORY HEIGHT	9 FT(3)	12 FT	9 FT(3)	11 FT
MINIMUM SECOND STORY HEIGHT	N/A		N/A	
FAÇADE GLAZING:				
SHOPFRONT FAÇADE:	70% MIN	>70%	70% MIN	>70%
OTHER FAÇADE TYPES:	20% TO 50%		20% TO 40%	
ALLOWED ROOF TYPES	FLAT, GABLE, HIP, GAMBREL, OR MANSARD	FLAT	FLAT, GABLE, HIP, GAMBREL, OR MANSARD	FLAT
ROOF PITCH, IF ANY:				
GABLE	6:12 - 12:12		6:12 - 12:12	
HIP	3:12 MIN		3:12 MIN	
MANSARD/GAMBREL	6:12 - 30:12		6:12 - 30:12	
ALLOWED BUILDING TYPES:	APARTMENT BUILDING	APARTMENT BUILDING		
ALLOWED FAÇADE TYPES:		TBD		TBD

(1) - ADDITIONAL 1 STORY (INCREASED FROM 1 AND 3 RESPECTIVELY) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(2) - ADDITIONAL 10' OF BUILDING HEIGHT (INCREASED FROM 20' AND 40' RESPECTIVELY) ALLOWED FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.
(3) - MINIMUM GROUND STORY HEIGHT ALLOWED IN WEST END INCENTIVE OVERLAY DISTRICT FOR PROVIDING AT LEAST 20% OF THE SITE TO BE ASSIGNED AS COMMUNITY SPACE.

COMMUNITY SPACE:	REQUIRED	PROPOSED
	44,154 SF 20%	55,192 SF 25%

ZONING VARIANCES:

REQUIREMENT:	SECTION:	GRANTED:
(1) - MINIMUM SIDE YARD SETBACK FROM RAILROAD	10.516.20	1/22/2020

OFF-STREET PARKING REQUIREMENTS:

PARKING SPACES REQUIRED:
DWELLING UNITS

0 SF TO 500 SF 0.5 SPACES PER UNIT	BUILDING A, 1 UNITS	0.5 SPACES
	[illegible]	0.5 SPACES
	[illegible]	[illegible]
TOTAL MINIMUM PARKING SPACES REQUIRED =		[illegible]
500 SF TO 750 SF 1.0 SPACES PER UNIT	BUILDING A, 24 UNITS	24 SPACES
	BUILDING B, 41 UNITS	41 SPACES
	BUILDING C, 26 UNITS	26 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		91 SPACES
OVER 750 SF 1.3 SPACES PER UNIT	BUILDING A, 21 UNITS	27.3 SPACES
	BUILDING B, 36 UNITS	46.8 SPACES
	BUILDING C, 21 UNITS	27.3 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED		102 SPACES
OFFICE: 1 SPACE PER 250 SF MINUS 75% FOR WEST END INCENTIVE	10,300 SF	23 SPACES
VISITORS 1 SPACE FOR EVERY 5 DWELLING UNITS	174 UNITS	35 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		254 SPACES

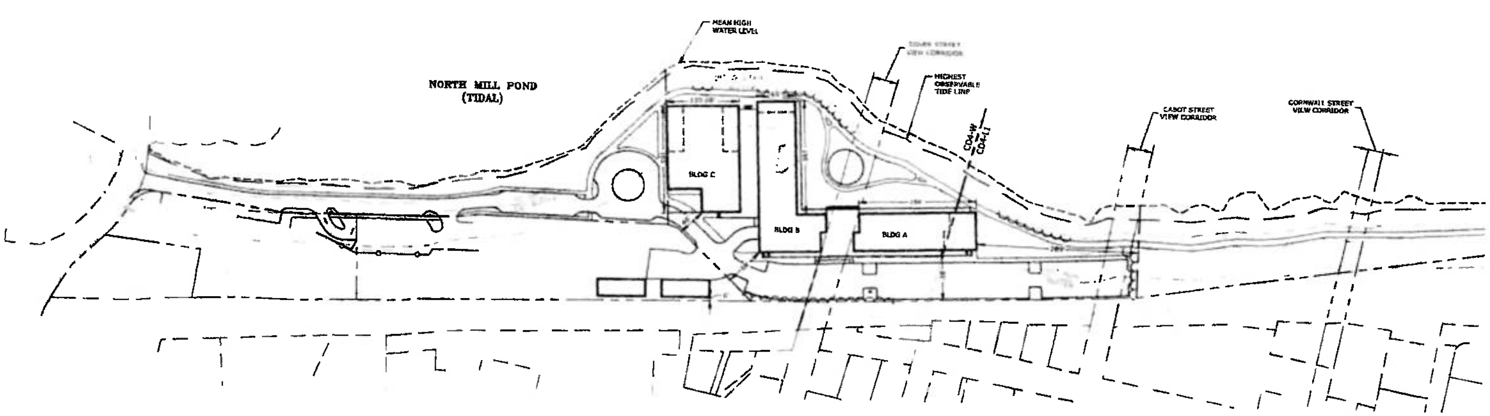
TOTAL PARKING SPACES PROVIDED:
TOTAL PARKING SPACES PROVIDED = 134 SPACES (SURFACE PARKING)
66 SPACES (BUILDING A UNDERGROUND)
44 SPACES (BUILDING B, UNDERGROUND)
244 SPACES(1)

(1) - CONDITIONAL USE PERMIT REQUIRED FOR SHARED PARKING

	REQUIRED	PROPOSED
PARKING STALL LAYOUT:	8.5' X 19'	8.5' X 19'
DRIVE AISLE WIDTH:	24 FT	24 FT
BIKE SPACES REQUIRED: 1 BIKE SPACE / 5 DWELLING UNITS, MAXIMUM OF 30 SPACES	30 SPACES	30 SPACES

LEGEND

	PROPERTY LINE
	PROPOSED PROPERTY LINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED PAVEMENT SECTION
	PROPOSED CONCRETE SIDEWALK
•	PROPOSED BOLLARD
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
30'R	PROPOSED CURB RADIUS
VGC	PROPOSED VERTICAL GRANITE CURB
SGC	PROPOSED SLOPED GRANITE CURB



0 100' 200'
GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	January 2, 2020
FILE:	C-0960-006, C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

Attachment 1

Graph Look Up

DATA SOURCE:
Trip Gen Manual, 10th Ed
New data edition is available. Click here to upgrade.

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Dwelling Units

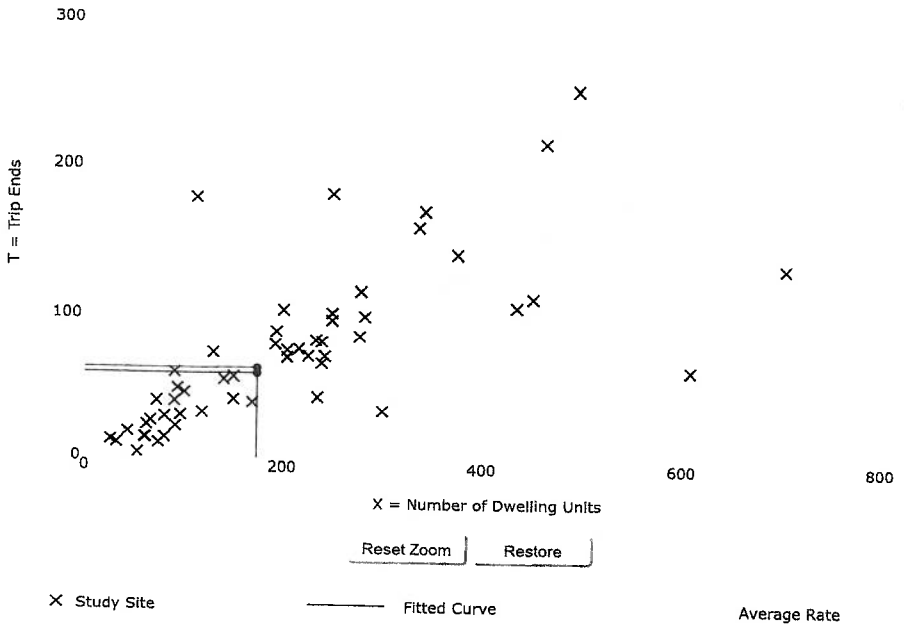
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
174 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
53

Avg. Num. of Dwelling Units:
207

Average Rate:
0.36

Range of Rates:
0.06 - 1.61

Standard Deviation:
0.19

Fitted Curve Equation:
Ln(T) = 0.98 Ln(X) - 0.98

R^2:
0.67

Directional Distribution:
26% entering, 74% exiting

Calculated Trip Ends:
Average Rate: 63 (Total), 16 (Entry), 47 (E
Fitted Curve: 59 (Total), 15 (Entry), 44 (Ex

Attachment 2

Graph Look Up

DATA SOURCE:
Trip Gen Manual, 10th Ed
New data edition is available. Click here to upgrade.

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Dwelling Units

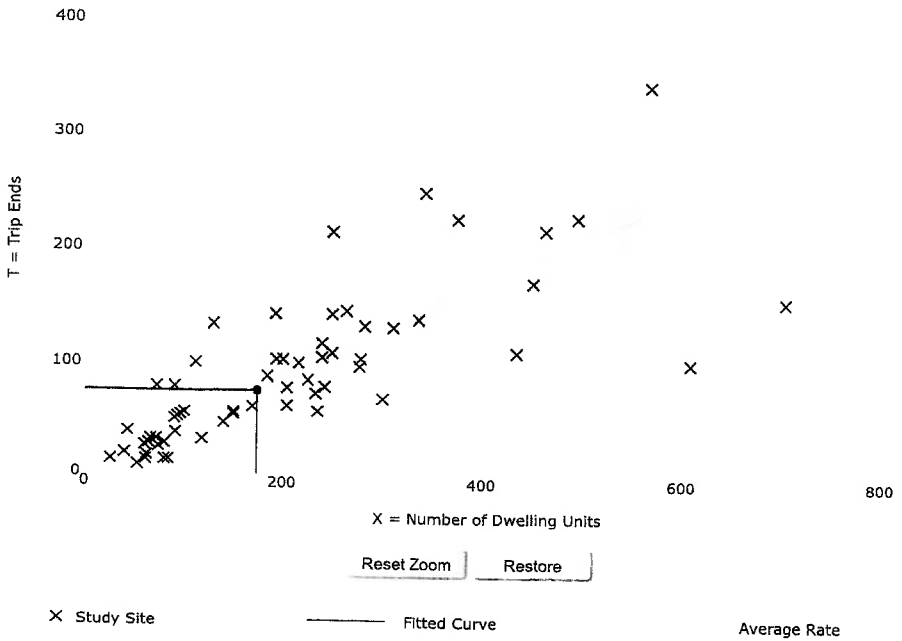
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
174 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Clic
details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
60

Avg. Num. of Dwelling Units:
208

Average Rate:
0.44

Range of Rates:
0.15 - 1.11

Standard Deviation:
0.19

Fitted Curve Equation:
Ln(T) = 0.96 Ln(X) - 0.63

R^2:
0.72

Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 77 (Total), 47 (Entry), 30 (
Fitted Curve: 75 (Total), 46 (Entry), 29 (E

Attachment 3

Graph Look Up

DATA SOURCE:
Trip Gen Manual, 10th Ed
New data edition is available. Click here to upgrade.

SEARCH BY LAND USE CODE:
710

LAND USE GROUP:
(700-799) Office

LAND USE :
710 - General Office Building

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

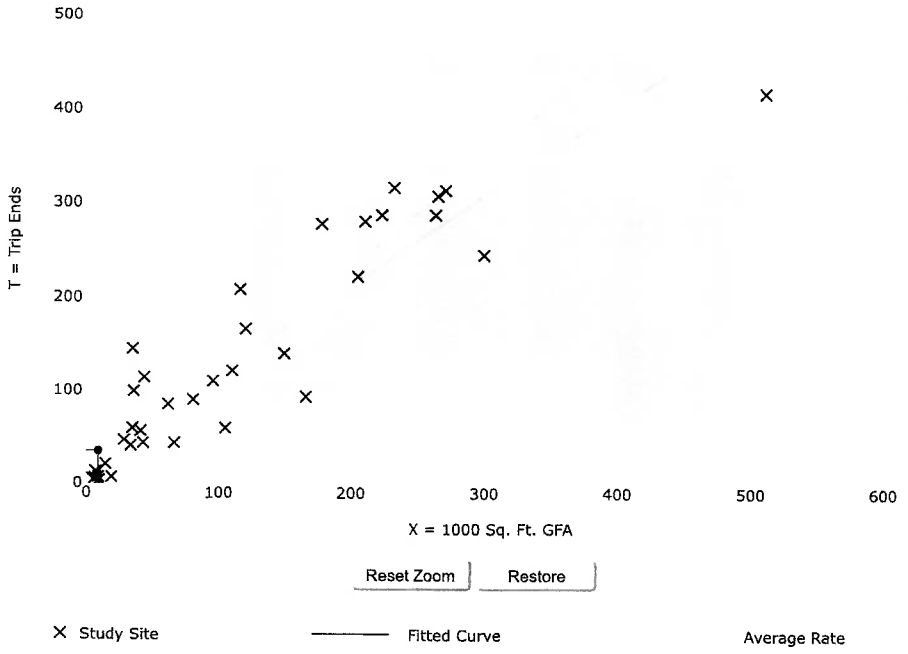
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
9 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Office Building (710) Click for mo

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
35

Avg. 1000 Sq. Ft. GFA:
117

Average Rate:
1.16

Range of Rates:
0.37 - 4.23

Standard Deviation:
0.47

Fitted Curve Equation:
T = 0.94(X) + 26.49

R^2:
0.85

Directional Distribution:
86% entering, 14% exiting

Calculated Trip Ends:
Average Rate: 10 (Total), 9 (Entry), 1 (Exi
Fitted Curve: 35 (Total), 30 (Entry), 5 (Exi

Attachment 4

Graph Look Up

DATA SOURCE:
Trip Gen Manual, 10th Ed
New data edition is available. Click here to upgrade.

SEARCH BY LAND USE CODE:
710

LAND USE GROUP:
(700-799) Office

LAND USE :
710 - General Office Building

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

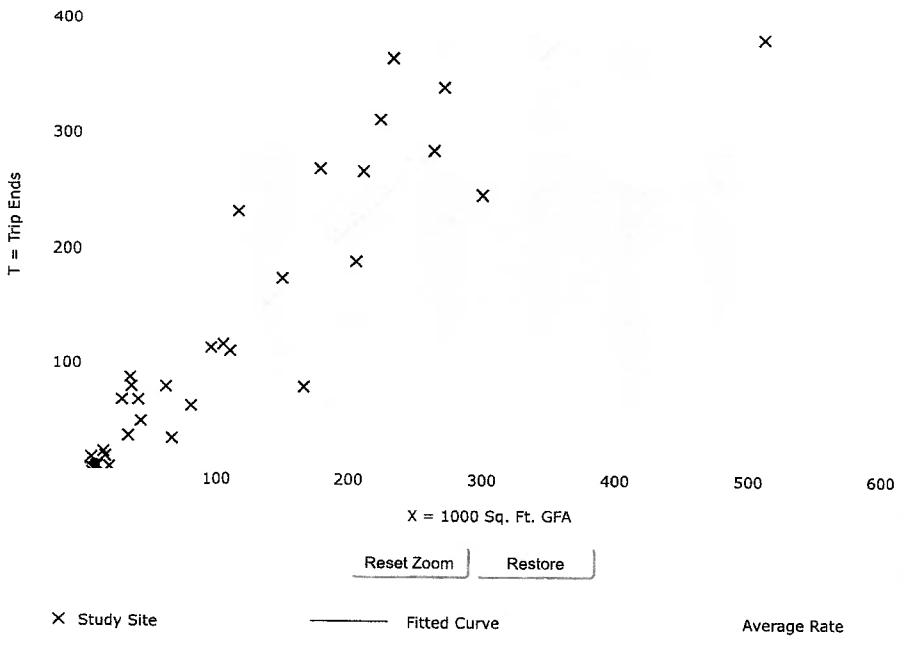
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
9 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Office Building (710) Click for mo

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
32

Avg. 1000 Sq. Ft. GFA:
114

Average Rate:
1.15

Range of Rates:
0.47 - 3.23

Standard Deviation:
0.42

Fitted Curve Equation:
Ln(T) = 0.95 Ln(X) + 0.36

R^2:
0.88

Directional Distribution:
16% entering, 84% exiting

Calculated Trip Ends:
Average Rate: 10 (Total), 1 (Entry), 9 (Exi
Fitted Curve: 12 (Total), 2 (Entry), 10 (Exi

Attachment 5

Stephen G. Pernaw & Company, Inc.

P.O. Box 1721 • Concord, NH 03302
tel: (603) 731-8500 • fax: (866) 929-6094 • sgp@ pernaw.com

Transportation: Engineering • Planning • Design

MEMORANDUM

Ref: 1821A

To: Juliet T. H. Walker, AICP
Planning Director
City of Portsmouth Planning Department

From: Stephen G. Pernaw, P.E., PTOE

Subject: Clipper Traders – Supplemental Traffic Counts
Portsmouth, New Hampshire

Date: October 9, 2018

On October 2, 2018 the Technical Advisory Committee requested that traffic counts be conducted at the Great Rhythm Brewing Company & Play All Day dog day care center parking lot to determine when the busiest traffic periods occur. These traffic counts were conducted on Thursday, October 4, 2018 during the morning and evening commuter periods:

Hourly Volumes

	Arrivals	Departures	Trips
7:00 - 8:00	32	29	61
8:00 - 9:00	35	33	68
2-Hour Total	67	62	129
3:00 - 4:00	22	14	36
4:00 - 5:00	34	37	71
5:00 - 6:00	38	41	79
3-Hour Total	94	92	186

AM Peak Hour Volumes

7:30 - 8:30	34	34	**68**
8:00 - 9:00	35	33	68

PM Peak Hour Volumes

4:15 - 5:15	43	42	**85**

The highest hourly traffic volume that was generated by this parking lot occurred from 4:15 to 5:15 PM with 43 arrivals and 42 departures (85 vehicle-trips).

cc: John Chagnon, P.E. – Ambit Engineering, Inc.
Doug Pinciaro, Clipper Traders, LLC
Ed Hayes, Ricci Lumber
Eric Eby, P.E. – City of Portsmouth
Elizabeth Oltman, P.E. – The Engineering Corporation

TRIP GENERATION

To estimate the quantity of vehicle trips that will be produced by the proposed residential development, Pernaw & Company, Inc. considered the standardized trip-generation rates and equations published by the Institute of Transportation Engineers (ITE)[1]. Based upon ITE Land Use Code LUC 221 – Multi-Family Housing (Mid-Rise) the overall development is expected to generate approximately 41 vehicle-trips during the weekday AM peak hour and 53 vehicle-trips during the weekday PM peak hour, on an average weekday basis. These results are based upon consideration of both the trip "rate" and "equation" method, and 120 dwelling units as the independent variable. The following table summarizes the anticipated trip-generating characteristics of the proposed residential development.

Table 1 — Trip Generation Summary - Clipper Traders

	120 Dwelling Units [1]
Weekday Total [2]	
Entering	326 veh
Exiting	326 veh
Total	652 trips
Weekday AM Peak Hour [2]	
Entering	11 veh
Exiting	30 veh
Total	41 trips
Weekday PM Peak Hour [2]	
Entering	32 veh
Exiting	21 veh
Total	53 trips

[1] ITE LUC 221: Multi-Family Housing (Mid-Rise)
[2] Trip Equation Method
[3] Trip Rate Method

All vehicle-trips associated with the proposed residential development will be "primary" trips, or new trips to the area. Appendix F contains the trip generation computations for the proposed residential development, along with a diagram that summarizes the distribution of the primary trips at the various study area intersections.

[1] Institute of Transportation Engineers, *Trip Generation*, tenth edition (Washington, D.C., 2017).

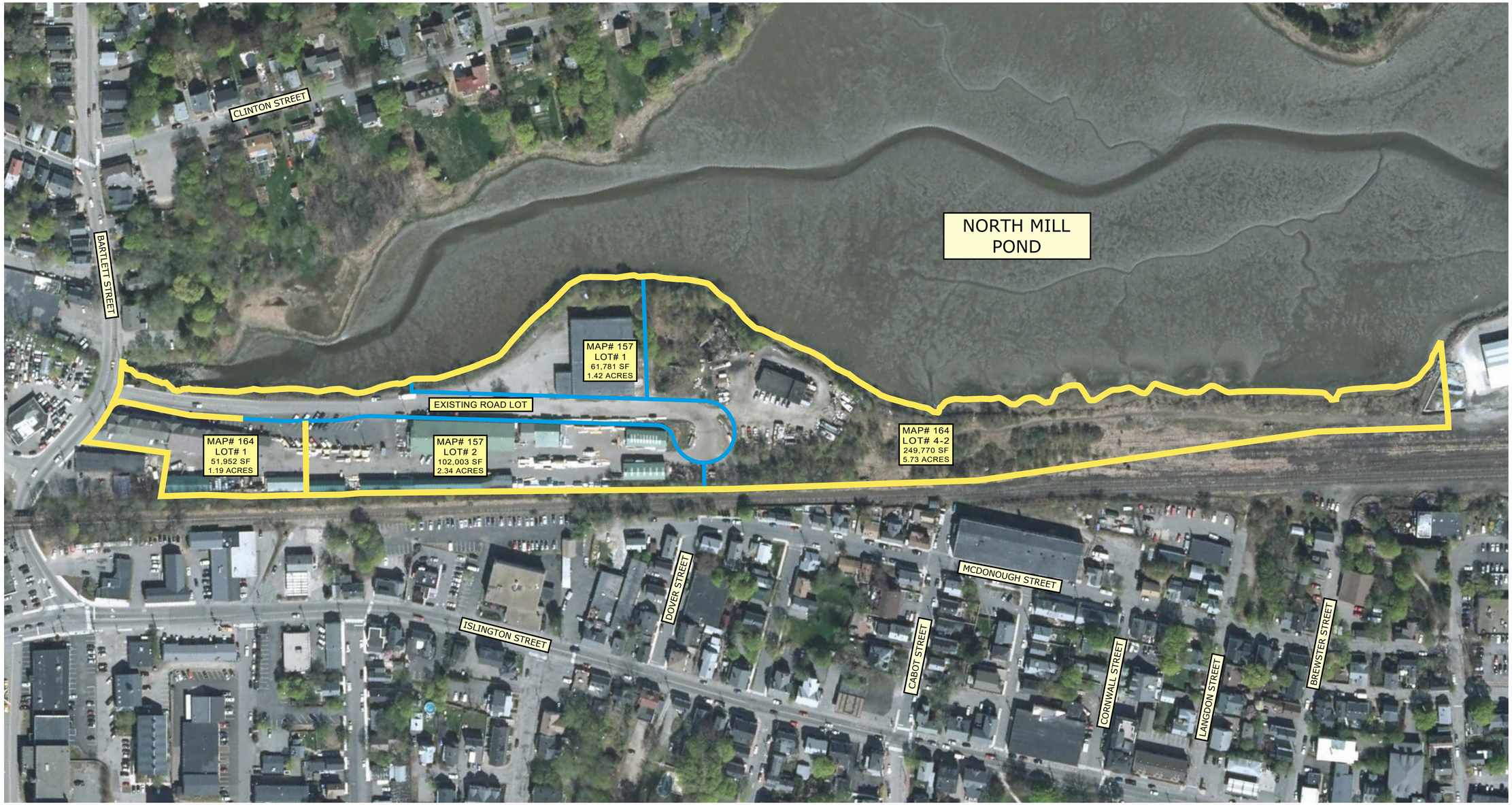

RESIDENCES AT
ISLINGTON CREEK

IRON HORSE PROPERTIES, LLC
PORTSMOUTH, NH
PROPOSED LOT LINE REVISION PLAN

LEGEND

- EXISTING PROPERTY LINE
- EXISTING PROPERTY LINE TO BE ABANDONED
- PROPOSED PROPERTY LINE

N



0 100' 200'
GRAPHIC SCALE

Tighe&Bond
Engineers | Environmental Specialists
177 Corporate Drive
Portsmouth, New Hampshire 03801
(603) 433-8818
April 20, 2020

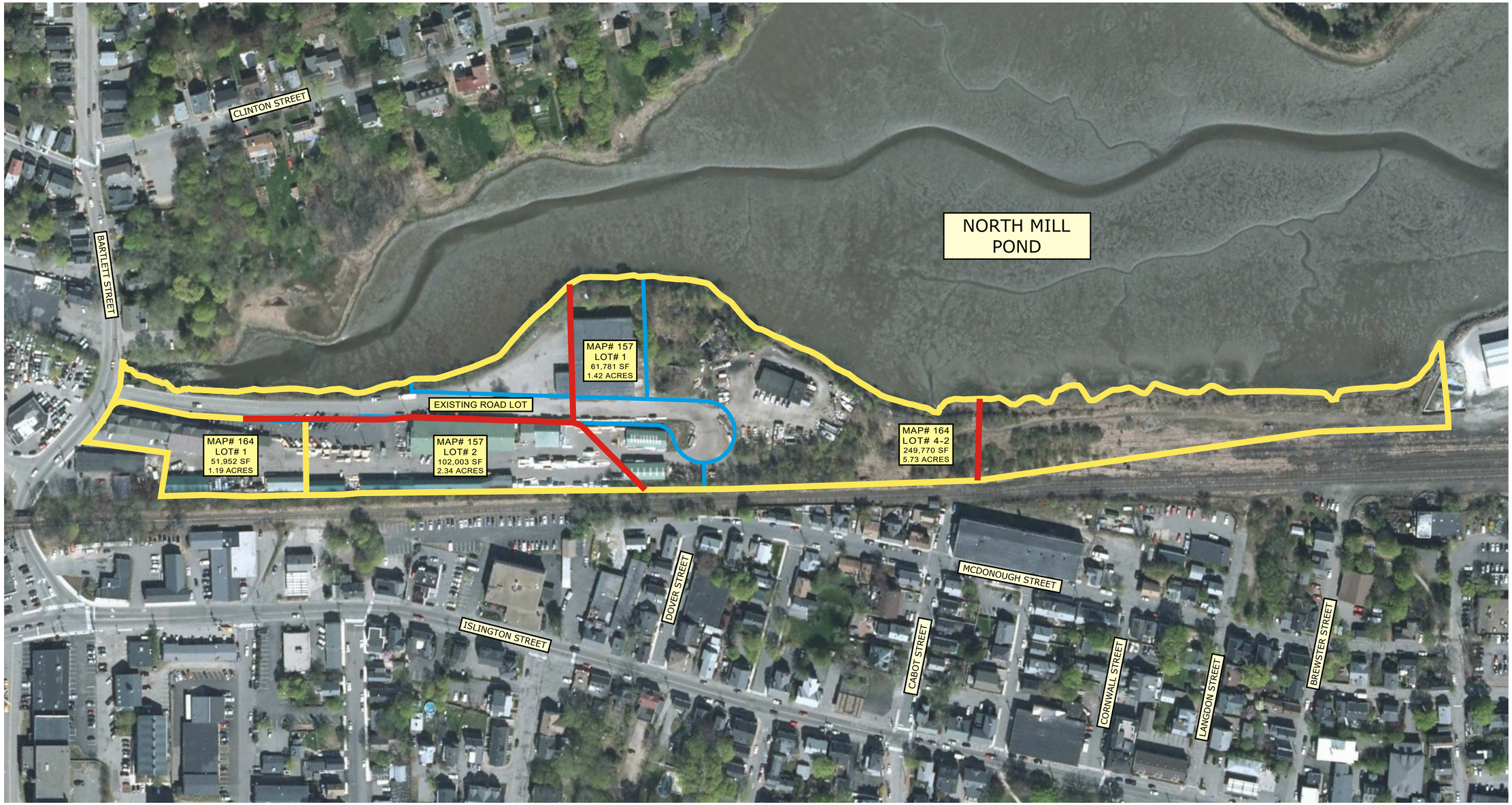
C:\960-096_C-BOUNDARY.DWG Date Plotted: Apr 20, 2020 - 3:11pm Plotted By: NHANSEN

IRON HORSE PROPERTIES, LLC
PORTSMOUTH, NH
PROPOSED LOT LINE REVISION PLAN

LEGEND

- EXISTING PROPERTY LINE
- EXISTING PROPERTY LINE TO BE ABANDONED
- PROPOSED PROPERTY LINE

N



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GRAPHIC SCALE

Tighe&Bond
Engineers | Environmental Specialists
177 Corporate Drive
Portsmouth, New Hampshire 03801
(603) 433-8818
April 20, 2020

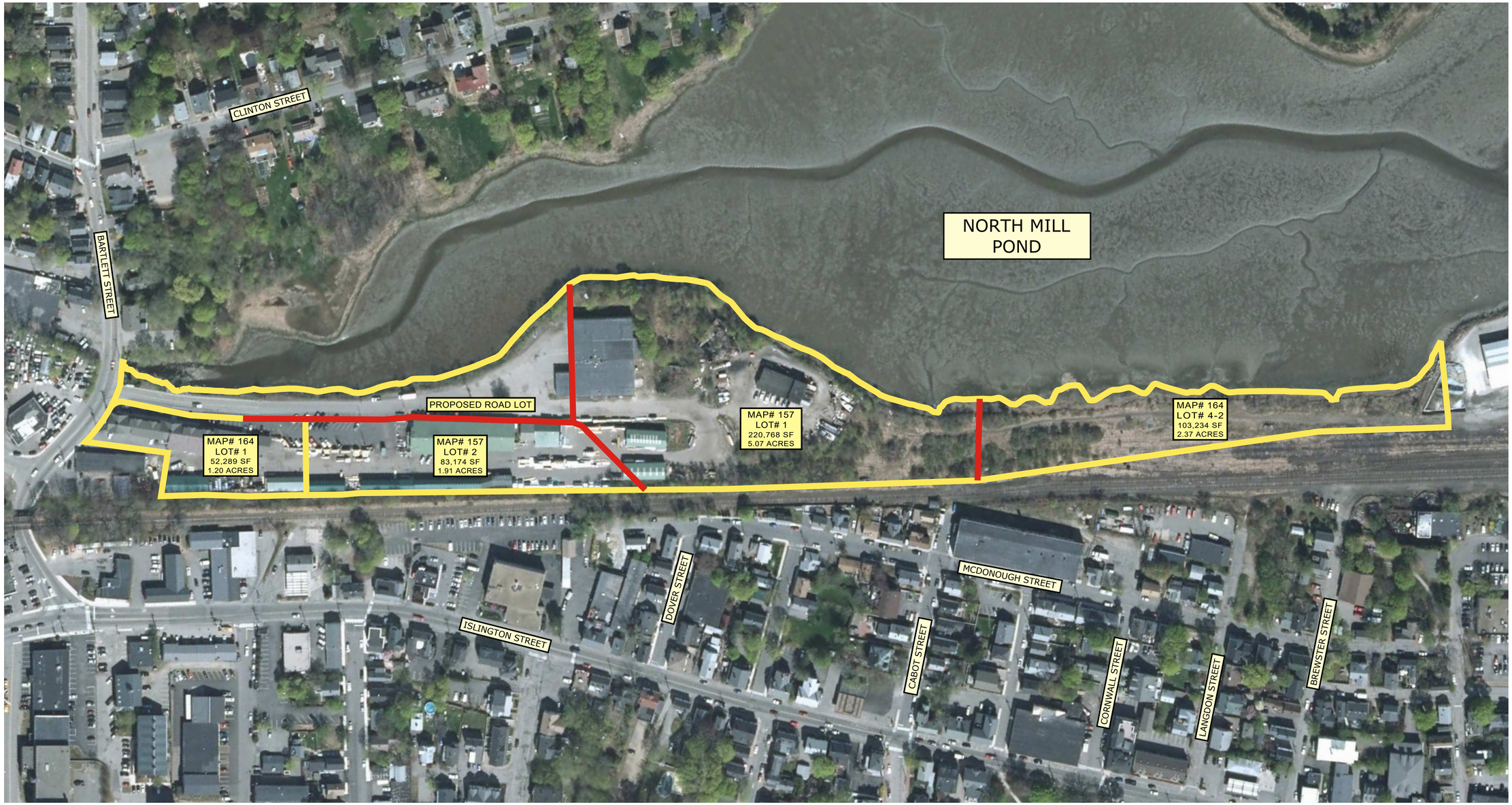
C:\960-006_C-BOUNDARY.DWG Date Plotted: Apr 20, 2020 - 3:13pm Plotted By: NAHANSEN

IRON HORSE PROPERTIES, LLC
PORTSMOUTH, NH
PROPOSED LOT LINE REVISION PLAN

LEGEND

- EXISTING PROPERTY LINE
- EXISTING PROPERTY LINE TO BE ABANDONED
- PROPOSED PROPERTY LINE

N



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Tighe&Bond
Engineers | Environmental Specialists
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Portsmouth, New Hampshire 03801
(603) 433-8818
April 20, 2020

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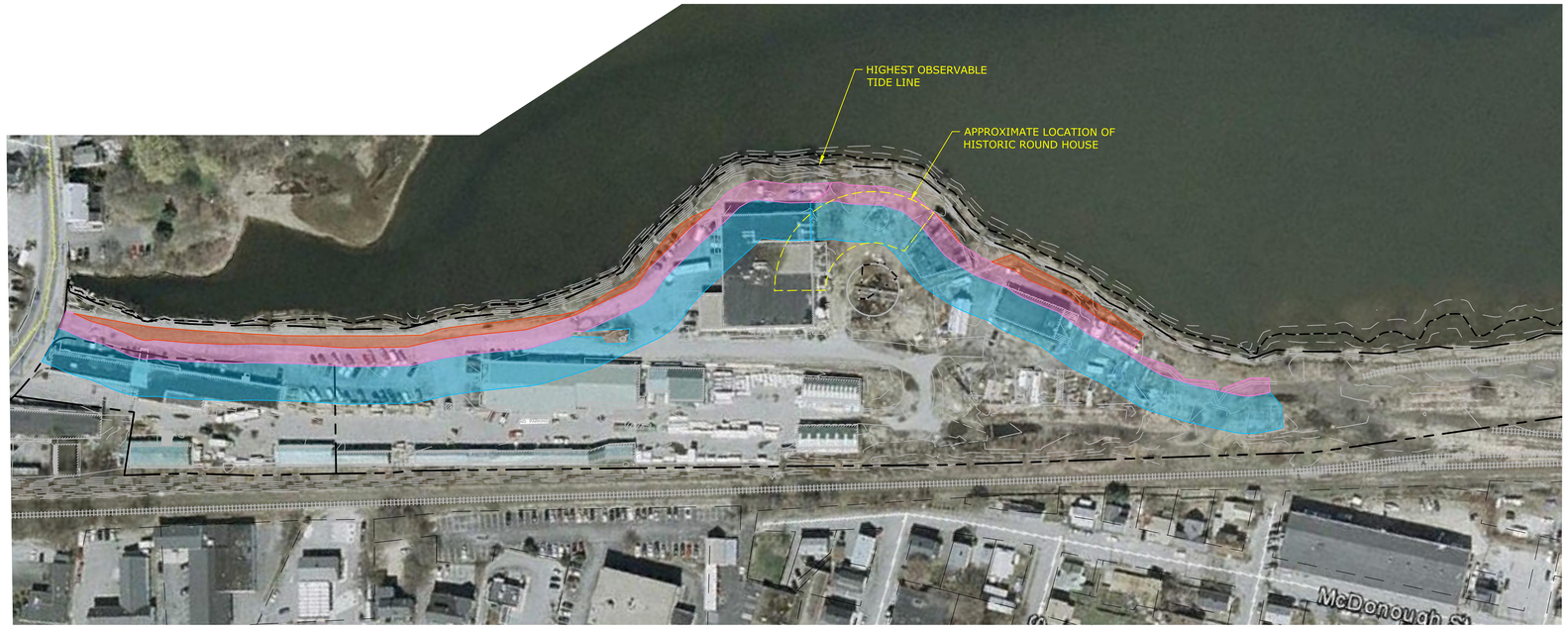

EXISTING WETLAND BUFFER IMPACTS

LEGEND

IMPACTS WITHIN 25 FT
VEGETATED BUFFER = 14,063 SF

IMPACTS WITHIN 25 FT TO 50 FT
LIMITED CUT AREA = 41,464 SF

IMPACTS WITHIN 50 FT TO 100 FT
WETLAND BUFFER = 88,501 SF

Tighe&Bond

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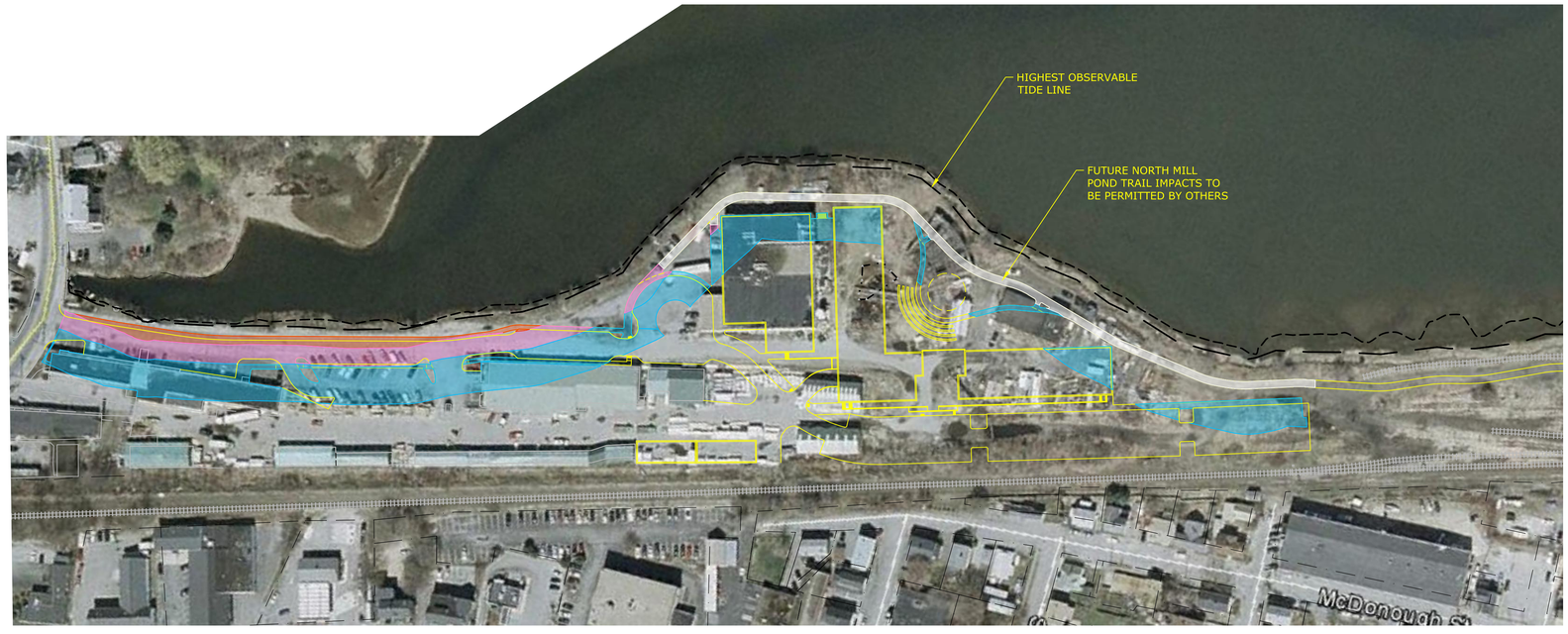
GRAPHIC SCALE



PROPOSED WETLAND BUFFER IMPACTS

LEGEND

IMPACTS WITHIN 25 FT
VEGETATED BUFFER = 6,664 SF

IMPACTS WITHIN 25 FT TO 50 FT
LIMITED CUT AREA = 17,634 SF

IMPACTS WITHIN 50 FT TO 100 FT
WETLAND BUFFER = 60,836 SF

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

WETLAND BUFFER IMPACTS EXHIBIT

SCALE: AS SHOWN

1 OF 1

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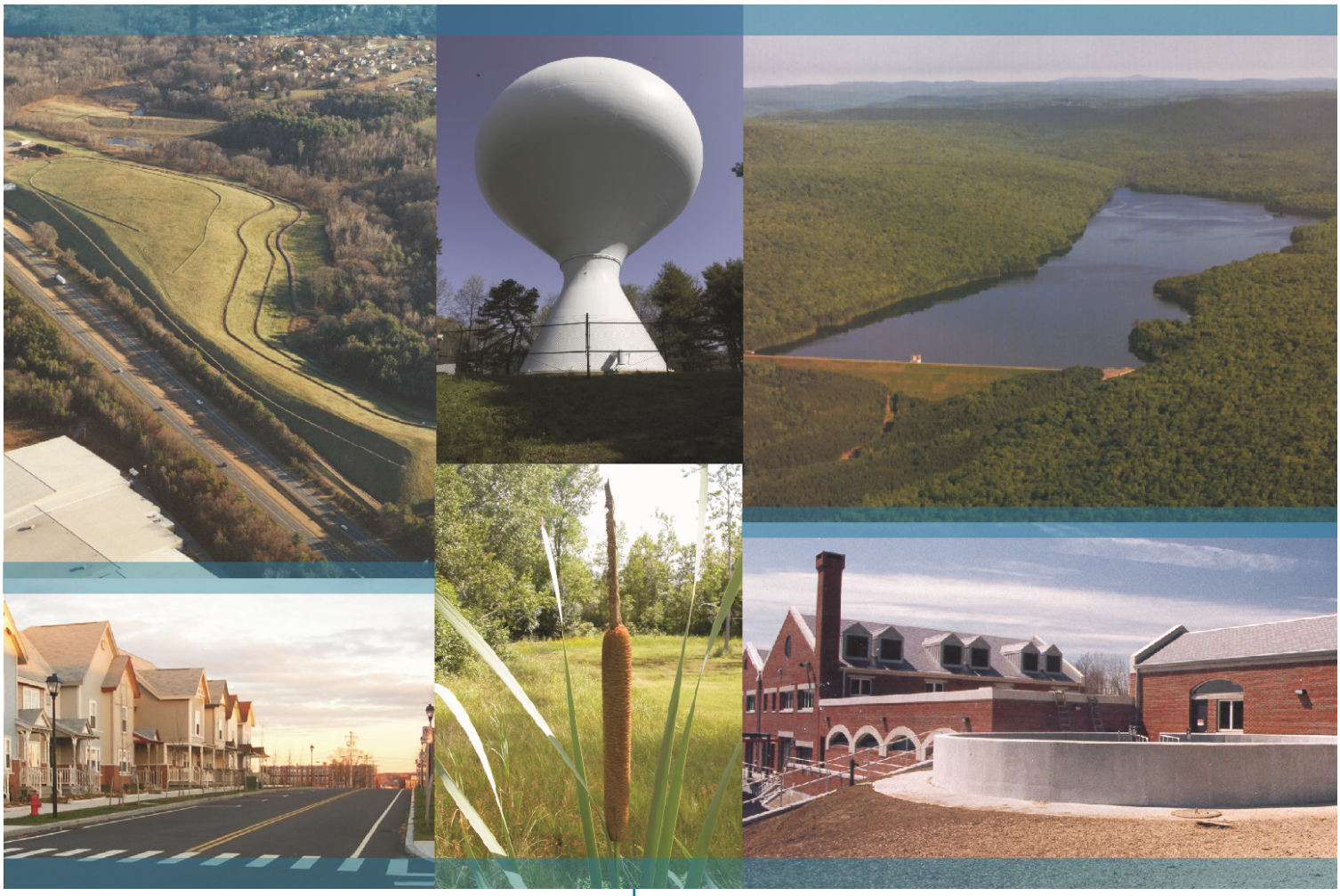
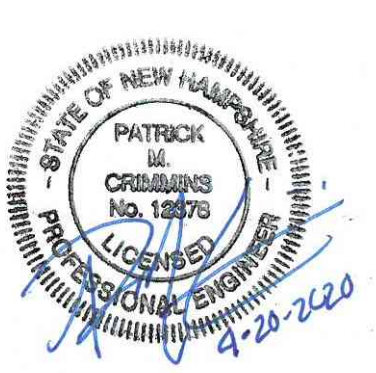




Tighe&Bond

Proposed Multi-Family Development
105 Bartlett Street
Portsmouth, NH

Drainage Analysis

Prepared For:

Iron Horse Properties LLC

April 20, 2020

Section 1
Project Description

The Bartlett Street property is comprised of a five (5) parcels that are bounded by Bartlett Street to the west and south, North Mill Pond to the north, and the Boston and Maine (B&M) railroad to the east. The existing parcels are listed below.

Tax Map/Lot No.	Area (ac)
157 / 1	1.42
157 / 2	2.34
164 / 1	1.19
164 / 4-2	5.73
R.O.W.	1.60

Lot 157-1 is currently occupied by a 20,000-square-foot, 2-story, concrete block/steel frame building and associated parking lot. Lot 157-2 contains another 20,000-square foot wood frame structure with a variety of outbuildings, such as sheds, to support an impervious lumber yard. Lot 164-1 also contains an approximately 20,000-square foot wood frame structure that hosts a variety of smaller businesses and associated parking. Lot 164-4-2 is currently occupied by a former B&M railroad turntable, a dilapidated former brick roundhouse, and an approximately 3,600-square-foot machine shop. Several shipping containers are also present throughout the lot. The northern end of the lot is comprised mostly of abandoned rail lines that run down the shoreline between North Mill Pond and the active railroad past the northern limits of the project site

The proposed project includes the demolition and relocation of the structures on Lots 157-1, 157-2, and 164-4-2 and construction of two (2) multi-family apartment buildings with basement level parking, as well as one (1) mixed used building with first floor office spaces, amenity space, and upper story apartments In order to accommodate the footprints of the new structure and site improvements, the listed lots are proposed to be revised into five (5) new lots. The project will include associated site improvements that consist of a private road with cul-de-sac, parking, utilities, stormwater management and treatment, landscaping, lighting, and a greenway park. Additionally, the land from North Mill Pond's mean high water (MHW) line to the 50ft buffer will be deeded to the City of Portsmouth and designated as community space for the City's North Mill Pond Trail project. The City will be responsible for the future design and permitting of the North Mill Pond Trail project and any of its associated work within the 50ft buffer.

The pre-development and post-development watershed areas have been analyzed at two points of analysis. While the points of analysis remained unchanged, their 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, and PA-2 assesses flows that discharge to the 36" brick sewer which runs through the development area. In the post-development condition, however, all stormwater flows have been separated from the brick sewer and are discharged to North Mill Pond after being treated. PA-2 would have no stormwater flows in the post-development condition, therefore removing the need to assess it.

Furthermore, since North Mill Pond is a tidal water, NHDES does not require peak runoff control requirements to be met (Env-Wq 1507.06 (d)). For this reason, a comparison of peak runoff rates for the various storm events has not been provided.

1.1 Calculation Methods

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

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

References:

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

Section 2
Pre-Development Conditions

In order to analyze the pre-development condition, the site has been divided into two (2) watershed areas modeled at two (2) points of analysis. These points of analysis and watersheds are depicted on the plans entitled "Pre-Development Watershed Plan", Sheets C-801.1 and C-801.2.

Each of the points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA-1)

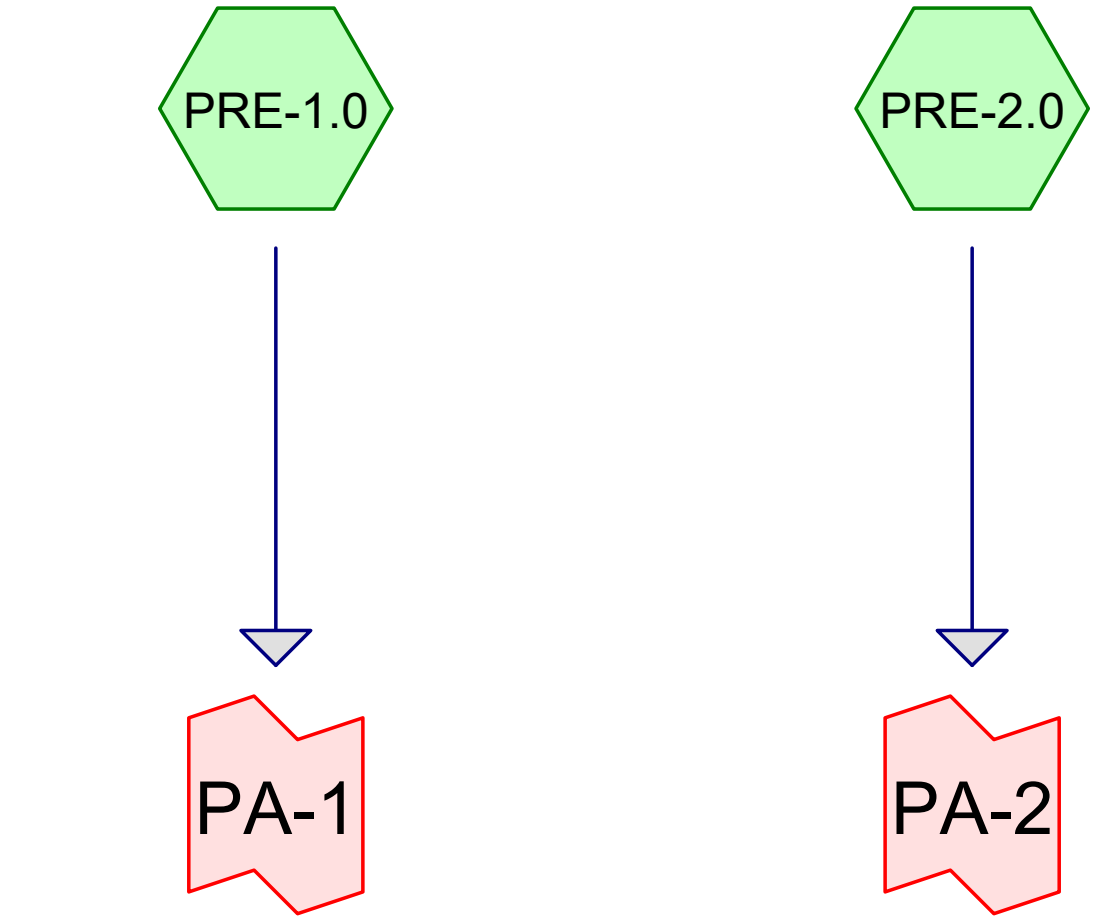
Pre-development Watershed 1.0 (PRE 1.0) is comprised of mostly impervious surfaces from paved parking and structures, as well as some disturbed forested areas to the northeast that surround a dilapidated roundhouse, former railroad turntable, and a machine shop. Banks along the shoreline of North Mill Pond consist of lawn, various species associated with disturbed sites, and rubble. Runoff from this watershed area travels via overland flow or underground drainage system to discharge into North Mill Pond. The runoff is currently untreated before discharge.

Point of Analysis (PA-2)

Pre-development Watershed 2.0 (PRE-2.0) is comprised mostly of impervious surfaces in the form of paved parking, roadway, and structures. Additional runoff comes from a grassy wooded strip that slopes down from the railroad to the east of the watershed. Runoff from this watershed drains to various catch basins that tie into an existing brick sewer.

2.2.1 Pre-Development Calculations

2.2.2 Pre-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for C0960-006 PRE
Prepared by Tighe & Bond, Printed 4/16/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.532	39	>75% Grass cover, Good, HSG A (PRE-1.0)
0.847	61	>75% Grass cover, Good, HSG B (PRE-1.0, PRE-2.0)
0.716	74	>75% Grass cover, Good, HSG C (PRE-1.0, PRE-2.0)
0.106	80	>75% Grass cover, Good, HSG D (PRE-1.0)
0.279	96	Gravel surface (PRE-1.0, PRE-2.0)
4.304	98	Paved parking (PRE-1.0, PRE-2.0)
1.689	98	Roofs (PRE-1.0, PRE-2.0)
0.550	30	Woods, Good, HSG A (PRE-1.0)
0.952	55	Woods, Good, HSG B (PRE-1.0, PRE-2.0)
0.908	70	Woods, Good, HSG C (PRE-1.0, PRE-2.0)
0.294	77	Woods, Good, HSG D (PRE-1.0)
11.177	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.082	HSG A	PRE-1.0
1.799	HSG B	PRE-1.0, PRE-2.0
1.625	HSG C	PRE-1.0, PRE-2.0
0.400	HSG D	PRE-1.0
6.272	Other	PRE-1.0, PRE-2.0
11.177		**TOTAL AREA**

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

SubcatchmentPRE-1.0: Runoff Area=294,600 sf 45.84% Impervious Runoff Depth>1.57"
Flow Length=461' Tc=12.7 min CN=77 Runoff=9.77 cfs 0.884 af

SubcatchmentPRE-2.0: Runoff Area=192,280 sf 65.54% Impervious Runoff Depth>2.27"
Flow Length=248' Tc=5.0 min CN=86 Runoff=11.70 cfs 0.833 af

Link PA-1: NORTH MILL POND Inflow=9.77 cfs 0.884 af
Primary=9.77 cfs 0.884 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=11.70 cfs 0.833 af
Primary=11.70 cfs 0.833 af

Total Runoff Area = 11.177 ac Runoff Volume = 1.718 af Average Runoff Depth = 1.84"
46.38% Pervious = 5.184 ac 53.62% Impervious = 5.993 ac

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

SubcatchmentPRE-1.0: Runoff Area=294,600 sf 45.84% Impervious Runoff Depth>3.13"
Flow Length=461' Tc=12.7 min CN=77 Runoff=19.76 cfs 1.761 af

SubcatchmentPRE-2.0: Runoff Area=192,280 sf 65.54% Impervious Runoff Depth>4.03"
Flow Length=248' Tc=5.0 min CN=86 Runoff=20.56 cfs 1.482 af

Link PA-1: NORTH MILL POND Inflow=19.76 cfs 1.761 af
Primary=19.76 cfs 1.761 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=20.56 cfs 1.482 af
Primary=20.56 cfs 1.482 af

Total Runoff Area = 11.177 ac Runoff Volume = 3.243 af Average Runoff Depth = 3.48"
46.38% Pervious = 5.184 ac 53.62% Impervious = 5.993 ac

Summary for Subcatchment PRE-1.0:

Runoff = 19.76 cfs @ 12.18 hrs, Volume= 1.761 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	23,176	39	>75% Grass cover, Good, HSG A
	23,971	30	Woods, Good, HSG A
	17,052	61	>75% Grass cover, Good, HSG B
	12,344	55	Woods, Good, HSG B
*	43,613	98	Roofs
	18,324	74	>75% Grass cover, Good, HSG C
*	91,423	98	Paved parking
	39,137	70	Woods, Good, HSG C
*	8,152	96	Gravel surface
	4,614	80	>75% Grass cover, Good, HSG D
	12,794	77	Woods, Good, HSG D
	294,600	77	Weighted Average
	159,564		54.16% Pervious Area
	135,036		45.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0400	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
5.8	361	0.0219	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.7	461	Total			

Summary for Subcatchment PRE-2.0:

Runoff = 20.56 cfs @ 12.07 hrs, Volume= 1.482 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	19,840	61	>75% Grass cover, Good, HSG B
	29,125	55	Woods, Good, HSG B
*	29,959	98	Roofs
	12,871	74	>75% Grass cover, Good, HSG C
*	96,061	98	Paved parking
	432	70	Woods, Good, HSG C
*	3,992	96	Gravel surface
	192,280	86	Weighted Average
	66,260		34.46% Pervious Area
	126,020		65.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	48	0.1875	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.69"
1.6	200	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	248	Total, Increased to minimum Tc = 5.0 min			

Summary for Link PA-1: NORTH MILL POND

Inflow Area = 6.763 ac, 45.84% Impervious, Inflow Depth > 3.13" for 10-YR event
Inflow = 19.76 cfs @ 12.18 hrs, Volume= 1.761 af
Primary = 19.76 cfs @ 12.18 hrs, Volume= 1.761 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link PA-2: COMBINED SYSTEM TO SEWER

Inflow Area = 4.414 ac, 65.54% Impervious, Inflow Depth > 4.03" for 10-YR event
Inflow = 20.56 cfs @ 12.07 hrs, Volume= 1.482 af
Primary = 20.56 cfs @ 12.07 hrs, Volume= 1.482 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPRE-1.0: Runoff Area=294,600 sf 45.84% Impervious Runoff Depth>4.45"
Flow Length=461' Tc=12.7 min CN=77 Runoff=28.19 cfs 2.506 af

SubcatchmentPRE-2.0: Runoff Area=192,280 sf 65.54% Impervious Runoff Depth>5.46"
Flow Length=248' Tc=5.0 min CN=86 Runoff=27.48 cfs 2.008 af

Link PA-1: NORTH MILL POND Inflow=28.19 cfs 2.506 af
Primary=28.19 cfs 2.506 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=27.48 cfs 2.008 af
Primary=27.48 cfs 2.008 af

Total Runoff Area = 11.177 ac Runoff Volume = 4.514 af Average Runoff Depth = 4.85"
46.38% Pervious = 5.184 ac 53.62% Impervious = 5.993 ac

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

SubcatchmentPRE-1.0: Runoff Area=294,600 sf 45.84% Impervious Runoff Depth>5.72"
Flow Length=461' Tc=12.7 min CN=77 Runoff=36.08 cfs 3.226 af

SubcatchmentPRE-2.0: Runoff Area=192,280 sf 65.54% Impervious Runoff Depth>6.81"
Flow Length=248' Tc=5.0 min CN=86 Runoff=33.90 cfs 2.506 af

Link PA-1: NORTH MILL POND Inflow=36.08 cfs 3.226 af
Primary=36.08 cfs 3.226 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=33.90 cfs 2.506 af
Primary=33.90 cfs 2.506 af

Total Runoff Area = 11.177 ac Runoff Volume = 5.732 af Average Runoff Depth = 6.15"
46.38% Pervious = 5.184 ac 53.62% Impervious = 5.993 ac

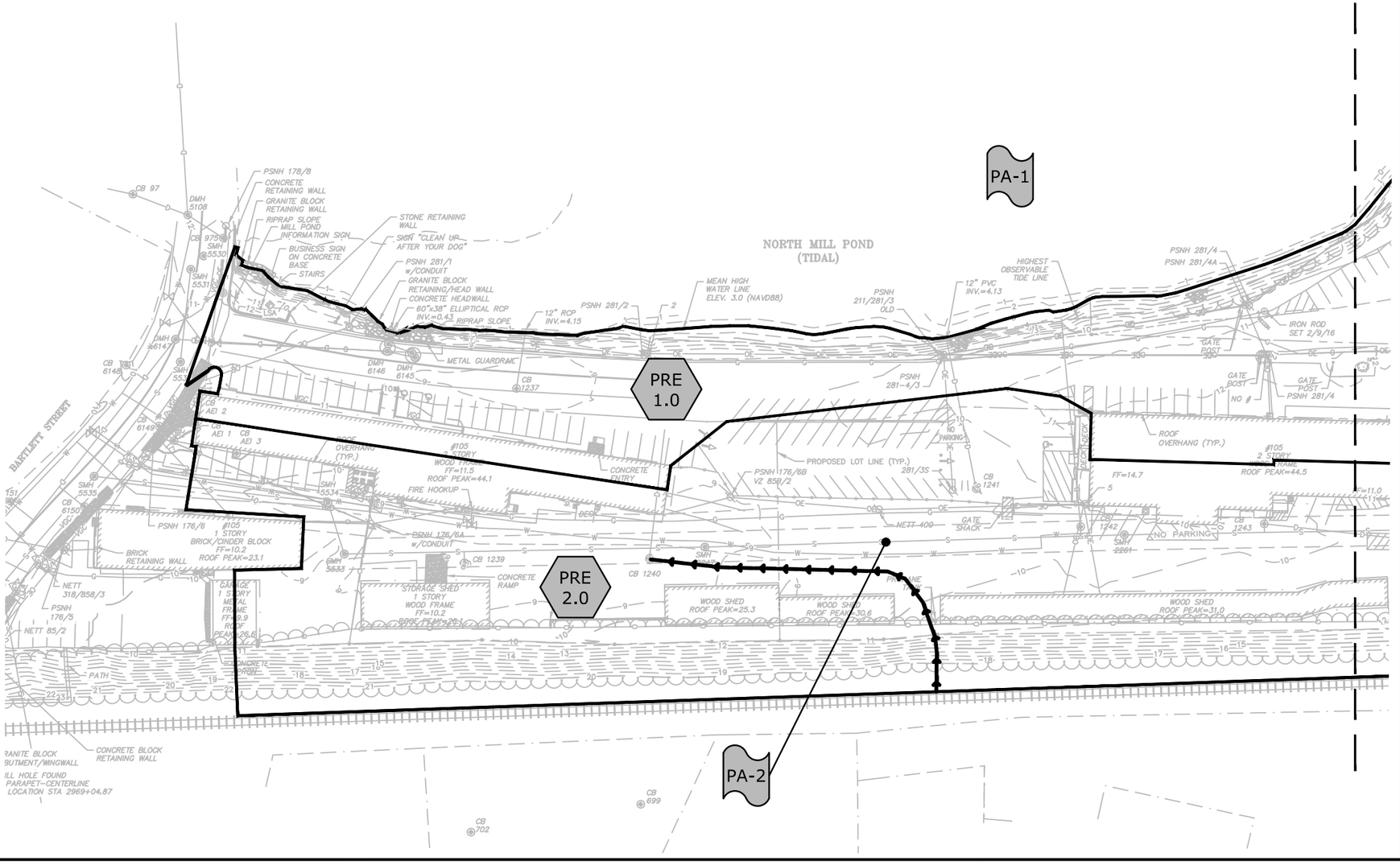
LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS



0 40' 80'

GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801.1

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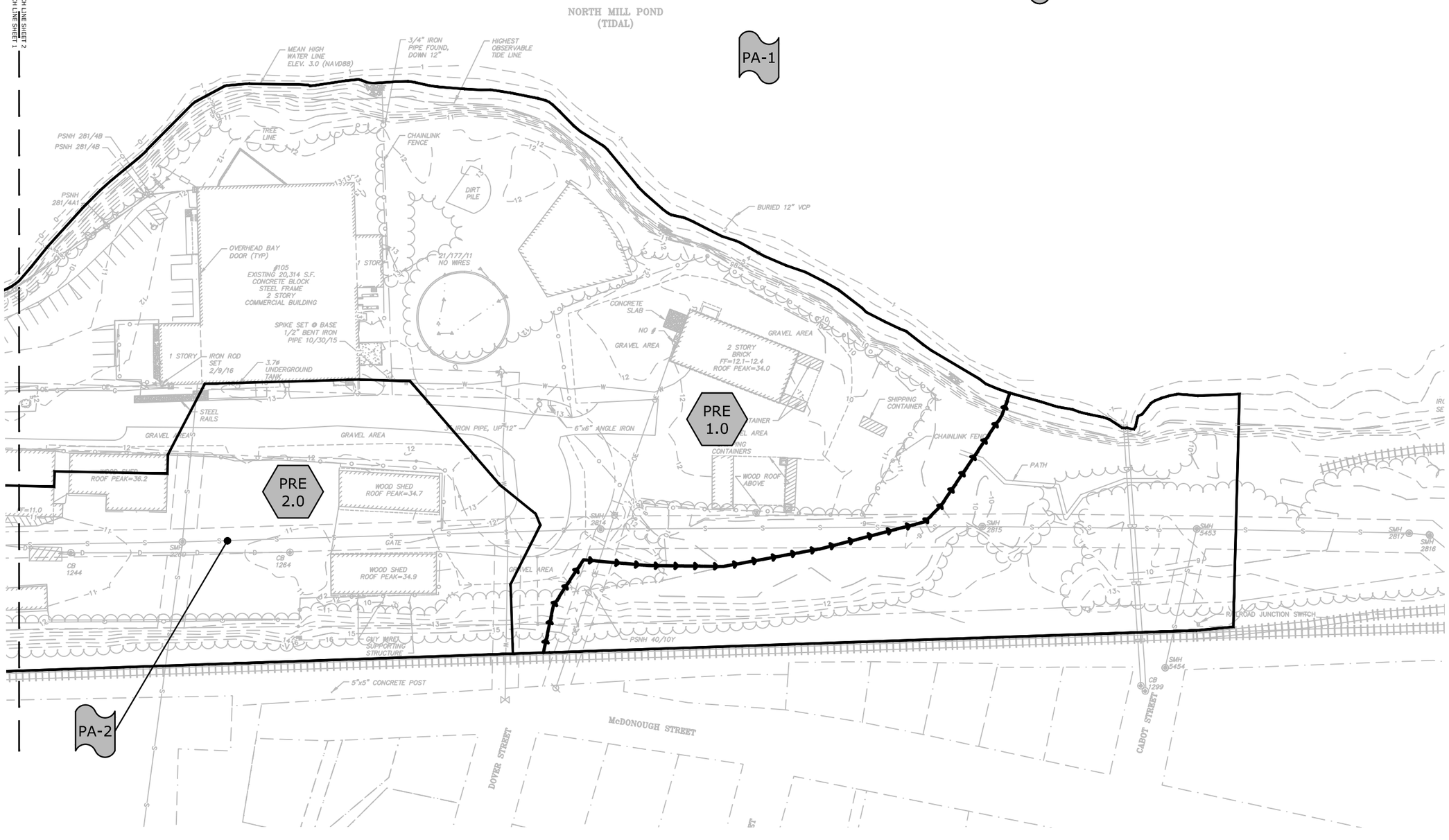
Tighe&Bond

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PA-1 — POINT OF ANALYSIS



0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801.2

Last Saved: 4/19/2020
Printed: Monday, April 20, 2020 5:34pm By: BGurcio
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Post-development Watershed 3.1 (POST-3.1) is comprised of proposed parking, pavement, and forested grassy cover from the slope up to the railroad. Runoff from this watershed area travels via overland flow to deep-sump catch basins that tie into the drainage system described in POST-3.0, where it is treated (by JF-3) and exits via an outfall at North Mill Pond (PA-1).

Post-development Watershed 4.0 (POST-4.0) collects the roof runoff from the third proposed building, paved parking, and some forested grassy slopes parallel to the existing railroad. Runoff from this watershed area travels via overland flow or roof leader to deep-sump catch basins and a Contech Jellyfish Stormwater Filter (JF-4). Flows exiting the Jellyfish Filter discharge to North Mill Pond (PA-1). Similar to Post-Development Watershed 1.0 (POST-1.0), the pipe network is protected by a backflow preventer within the outlet invert of a manhole structure at the most downstream location. A concrete winged headwall and plunge pool provide erosion control and bank stability to the outfall.

Post-development Watershed 5.0 (POST-5.0) collects the runoff from the modified roadway and parking areas at the entrance of the site. Runoff from this watershed area travels via overland flow to deep-sump catch basins that tie into a structure (PDMH3) just upstream of the Jellyfish Filter described in POST 1.0 (JF-1). Runoff is treated and discharged through manhole structure equipped with a backflow preventer before exiting to North Mill Pond (PA-1). A concrete winged headwall and plunge pool provide erosion control and bank stability to the outfall.

Post-development Watershed 5.1 (POST-5.1) is comprised mostly of grassy and slightly forested areas along the shoreline of North Mill Pond. Runoff from this watershed simply sheets toward and discharges into North Mill Pond, as in the existing condition. There are no proposed impervious surfaces that are within this watershed area that would require treatment.

Post-development Watershed 5.0 (POST-5.2) collects the runoff from the proposed greenway park area behind the proposed buildings. A circular rain garden (RG-1), paired with an outlet control structure, has been designed to provide treatment for the runoff from this park area. The outlet control structure directs flows to a manhole structure downstream that combines flows with those of POST-4.0 before exiting to North Mill Pond.

Point of Analysis (PA-2)

All runoff previously draining to the existing brick sewer (PA-2) is proposed to be diverted to underground drainage that flows to North Mill Pond, effectively eliminating all flows to this point of analysis from this site.

3.3.1 Post-Development Calculations

3.3.2 Post-Development Watershed Plans

Section 3
Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into eight (8) watershed areas. Stormwater runoff from these sub-catchment areas flow via subsurface drainage systems prior to discharging to North Mill Pond. Unlike in the pre-development condition, flows from these sub-catchment areas are modeled at only one point of analysis at North Mill Pond (PA-1). As previously described, a large portion of the site has been designed to reroute runoff to North Mill Pond instead of the existing brick sewer. This moderately increases the watershed area flowing to PA-1 compared to the pre-development condition but eliminates the site's contribution to a combined sewer system. As per Env-Wq 1507.06 (d), the resulting increased peak flows from a larger effective watershed area are not of concern since North Mill Pond is a tidal water and the peak runoff control requirements do not apply. For this reason, a comparison of peak runoff rates for the various storm events has not been provided.

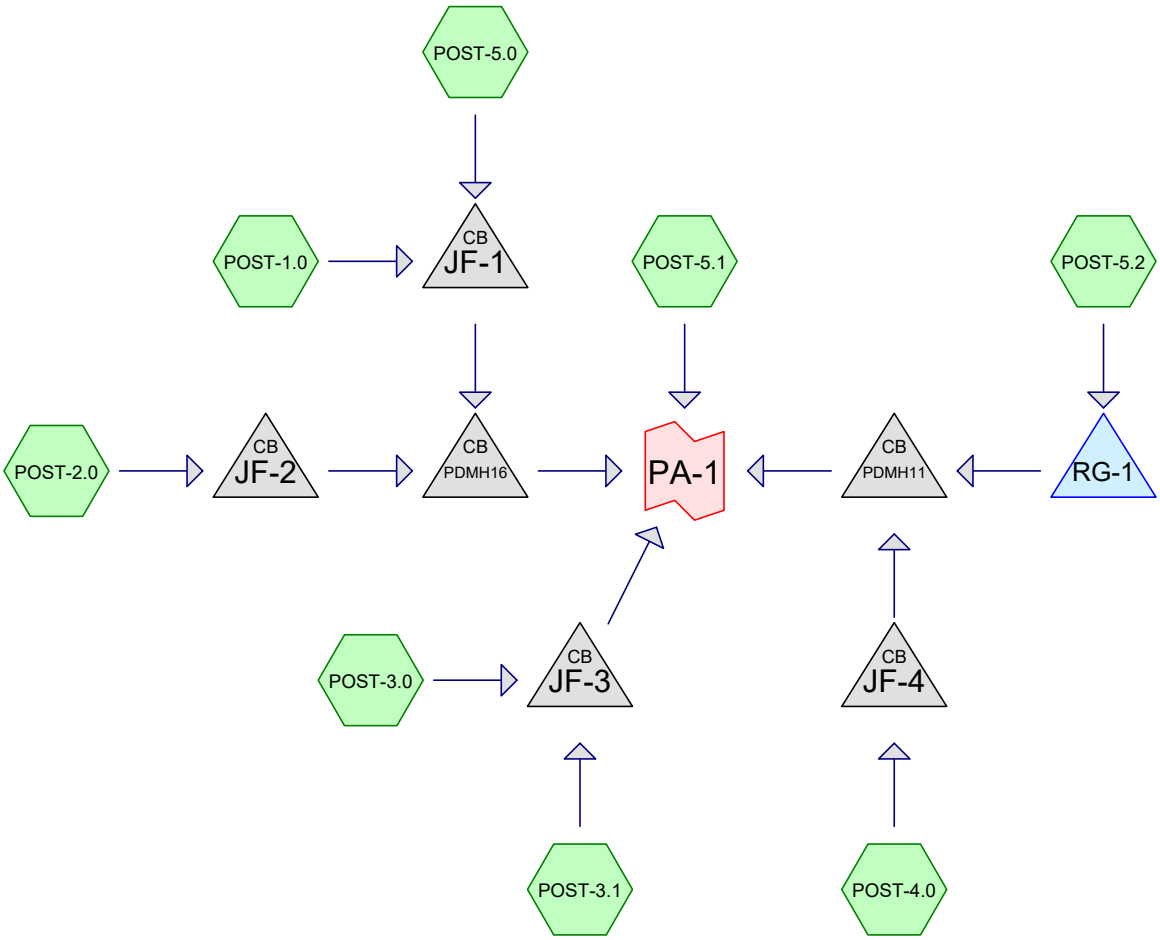
The point of analysis (PA-1) and its sub-catchment areas are depicted on the plans entitled "Post-Development Watershed Plan," Sheets C-802.1 and C-802.2. Each of the points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA-1)

Post-development Watershed 1.0 (POST-1.0) is comprised of mostly existing impervious areas on the south end of the site behind some of the existing structures. Runoff from this watershed area travels via overland flow to the modified subsurface drainage system, where it is pretreated by deep-sump catch basins and treated by a Contech Jellyfish Stormwater Filter (JF-1). The Jellyfish units proposed are Contech's Peak Diversion model, which include an internal bypass that route flows greater than the design Water Quality Flow past the internal treatment system. Flows exiting the Jellyfish Filter discharge to a manhole structure outfitted with a backflow preventer within the outlet invert to protect the drainage system from tidal backflow and flooding. Flows then directly discharge to North Mill Pond (PA-1). through an outfall protected by a concrete winged headwall and plunge pool.

Post-development Watershed 2.0 (POST-2.0) is comprised mostly of asphalt roadway and concrete sidewalks in the center of the site. Runoff from this watershed area travels via overland flow to deep-sump catch basins and a Contech Jellyfish Stormwater Filter (JF-2). Flows exiting the Jellyfish Filter tie into a manhole structure that combines the flows with those of POST-1.0 before similarly exiting to North Mill Pond.

Post-development Watershed 3.0 (POST-3.0) primarily collects the roof runoff from two (2) of the proposed buildings, as well as some additional impervious cover below. Runoff from this watershed area travels via roof leaders or a trench drain to a Contech Jellyfish Stormwater Filter (JF-3). Flows exiting the Jellyfish Filter discharge to North Mill Pond (PA-1). Similar to Post-Development Watershed 1.0 (POST-1.0), the pipe network is protected by a backflow preventer within the outlet invert of a manhole structure at the most downstream location. A concrete winged headwall and plunge pool provide erosion control and bank stability to the outfall.



Subcat Reach Pond Link

Routing Diagram for C0960-006 POST
Prepared by Tighe & Bond, Printed 4/20/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.517	39	>75% Grass cover, Good, HSG A (POST-5.1, POST-5.2)
0.769	61	>75% Grass cover, Good, HSG B (POST-1.0, POST-3.1, POST-4.0, POST-5.1)
1.623	74	>75% Grass cover, Good, HSG C (POST-1.0, POST-2.0, POST-3.0, POST-3.1, POST-4.0, POST-5.0, POST-5.1, POST-5.2)
0.108	80	>75% Grass cover, Good, HSG D (POST-5.1)
4.520	98	Paved parking (POST-1.0, POST-2.0, POST-3.0, POST-3.1, POST-4.0, POST-5.0, POST-5.1, POST-5.2)
2.174	98	Roofs (POST-1.0, POST-2.0, POST-3.0, POST-3.1, POST-4.0, POST-5.0)
0.479	30	Woods, Good, HSG A (POST-5.1)
0.667	55	Woods, Good, HSG B (POST-1.0, POST-3.1, POST-4.0, POST-5.1)
0.028	70	Woods, Good, HSG C (POST-5.1, POST-5.2)
0.292	77	Woods, Good, HSG D (POST-5.1)
11.177	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.997	HSG A	POST-5.1, POST-5.2
1.436	HSG B	POST-1.0, POST-3.1, POST-4.0, POST-5.1
1.651	HSG C	POST-1.0, POST-2.0, POST-3.0, POST-3.1, POST-4.0, POST-5.0, POST-5.1, POST-5.2
0.400	HSG D	POST-5.1
6.693	Other	POST-1.0, POST-2.0, POST-3.0, POST-3.1, POST-4.0, POST-5.0, POST-5.1, POST-5.2
11.177		**TOTAL AREA**

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

SubcatchmentPOST-1.0: Runoff Area=129,041 sf 64.77% Impervious Runoff Depth>2.10"
Tc=5.0 min CN=84 Runoff=7.30 cfs 0.518 af

SubcatchmentPOST-2.0: Runoff Area=31,757 sf 85.86% Impervious Runoff Depth>3.12"
Tc=5.0 min CN=95 Runoff=2.52 cfs 0.190 af

SubcatchmentPOST-3.0: Runoff Area=49,909 sf 94.93% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=97 Runoff=4.09 cfs 0.319 af

SubcatchmentPOST-3.1: Runoff Area=50,861 sf 65.22% Impervious Runoff Depth>2.27"
Tc=5.0 min CN=86 Runoff=3.10 cfs 0.220 af

SubcatchmentPOST-4.0: Runoff Area=57,392 sf 79.63% Impervious Runoff Depth>2.72"
Tc=5.0 min CN=91 Runoff=4.13 cfs 0.299 af

SubcatchmentPOST-5.0: Runoff Area=42,205 sf 92.18% Impervious Runoff Depth>3.23"
Tc=5.0 min CN=96 Runoff=3.41 cfs 0.261 af

SubcatchmentPOST-5.1: Runoff Area=93,820 sf 9.88% Impervious Runoff Depth>0.57"
Tc=5.0 min CN=59 Runoff=1.02 cfs 0.103 af

SubcatchmentPOST-5.2: Runoff Area=31,895 sf 19.69% Impervious Runoff Depth>1.71"
Tc=5.0 min CN=79 Runoff=1.47 cfs 0.105 af

Pond JF-1: Peak Elev=5.88' Inflow=10.74 cfs 0.779 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=10.74 cfs 0.779 af

Pond JF-2: Peak Elev=6.28' Inflow=2.52 cfs 0.190 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=2.52 cfs 0.190 af

Pond JF-3: Peak Elev=5.59' Inflow=7.20 cfs 0.540 af
18.0" Round Culvert n=0.013 L=55.0' S=0.0045 '/' Outflow=7.20 cfs 0.540 af

Pond JF-4: Peak Elev=6.23' Inflow=4.13 cfs 0.299 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=4.13 cfs 0.299 af

Pond PDMH11: Peak Elev=5.81' Inflow=4.39 cfs 0.386 af
18.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=4.39 cfs 0.386 af

Pond PDMH16: Peak Elev=5.46' Inflow=13.25 cfs 0.969 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=13.25 cfs 0.969 af

Pond RG-1: Peak Elev=9.84' Storage=1,822 cf Inflow=1.47 cfs 0.105 af
Outflow=0.26 cfs 0.088 af

Link PA-1: Inflow=25.61 cfs 1.997 af
Primary=25.61 cfs 1.997 af

Total Runoff Area = 11.177 ac Runoff Volume = 2.014 af Average Runoff Depth = 2.16"
40.12% Pervious = 4.484 ac 59.88% Impervious = 6.693 ac

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

SubcatchmentPOST-1.0: Runoff Area=129,041 sf 64.77% Impervious Runoff Depth>3.82"
Tc=5.0 min CN=84 Runoff=13.20 cfs 0.943 af

SubcatchmentPOST-2.0: Runoff Area=31,757 sf 85.86% Impervious Runoff Depth>5.01"
Tc=5.0 min CN=95 Runoff=3.93 cfs 0.304 af

SubcatchmentPOST-3.0: Runoff Area=49,909 sf 94.93% Impervious Runoff Depth>5.24"
Tc=5.0 min CN=97 Runoff=6.29 cfs 0.501 af

SubcatchmentPOST-3.1: Runoff Area=50,861 sf 65.22% Impervious Runoff Depth>4.03"
Tc=5.0 min CN=86 Runoff=5.44 cfs 0.392 af

SubcatchmentPOST-4.0: Runoff Area=57,392 sf 79.63% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=91 Runoff=6.74 cfs 0.501 af

SubcatchmentPOST-5.0: Runoff Area=42,205 sf 92.18% Impervious Runoff Depth>5.13"
Tc=5.0 min CN=96 Runoff=5.28 cfs 0.414 af

SubcatchmentPOST-5.1: Runoff Area=93,820 sf 9.88% Impervious Runoff Depth>1.59"
Tc=5.0 min CN=59 Runoff=3.72 cfs 0.285 af

SubcatchmentPOST-5.2: Runoff Area=31,895 sf 19.69% Impervious Runoff Depth>3.32"
Tc=5.0 min CN=79 Runoff=2.85 cfs 0.203 af

Pond JF-1: Peak Elev=7.83' Inflow=18.47 cfs 1.357 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=18.47 cfs 1.357 af

Pond JF-2: Peak Elev=6.86' Inflow=3.93 cfs 0.304 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=3.93 cfs 0.304 af

Pond JF-3: Peak Elev=6.80' Inflow=11.73 cfs 0.893 af
18.0" Round Culvert n=0.013 L=55.0' S=0.0045 '/' Outflow=11.73 cfs 0.893 af

Pond JF-4: Peak Elev=7.43' Inflow=6.74 cfs 0.501 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=6.74 cfs 0.501 af

Pond PDMH11: Peak Elev=6.27' Inflow=7.00 cfs 0.687 af
18.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=7.00 cfs 0.687 af

Pond PDMH16: Peak Elev=6.55' Inflow=22.40 cfs 1.662 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=22.40 cfs 1.662 af

Pond RG-1: Peak Elev=10.43' Storage=2,763 cf Inflow=2.85 cfs 0.203 af
Outflow=1.64 cfs 0.186 af

Link PA-1: Inflow=44.77 cfs 3.526 af
Primary=44.77 cfs 3.526 af

Total Runoff Area = 11.177 ac Runoff Volume = 3.543 af Average Runoff Depth = 3.80"
40.12% Pervious = 4.484 ac 59.88% Impervious = 6.693 ac

Summary for Subcatchment POST-1.0:

Runoff = 13.20 cfs @ 12.07 hrs, Volume= 0.943 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	15,556	61	>75% Grass cover, Good, HSG B
	24,181	55	Woods, Good, HSG B
*	27,528	98	Roofs
	5,719	74	>75% Grass cover, Good, HSG C
*	56,057	98	Paved parking
	129,041	84	Weighted Average
	45,456		35.23% Pervious Area
	83,585		64.77% Impervious Area

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

Summary for Subcatchment POST-2.0:

Runoff = 3.93 cfs @ 12.07 hrs, Volume= 0.304 af, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
*	6,843	98	Roofs
	4,491	74	>75% Grass cover, Good, HSG C
*	20,423	98	Paved parking
	0	70	Woods, Good, HSG C
	31,757	95	Weighted Average
	4,491		14.14% Pervious Area
	27,266		85.86% Impervious Area

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

Summary for Subcatchment POST-3.0:

Runoff = 6.29 cfs @ 12.07 hrs, Volume= 0.501 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	0	61	>75% Grass cover, Good, HSG B
	0	55	Woods, Good, HSG B
*	39,803	98	Roofs
	2,532	74	>75% Grass cover, Good, HSG C
*	7,574	98	Paved parking
	0	70	Woods, Good, HSG C
	49,909	97	Weighted Average
	2,532		5.07% Pervious Area
	47,377		94.93% Impervious Area

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

Summary for Subcatchment POST-3.1:

Runoff = 5.44 cfs @ 12.07 hrs, Volume= 0.392 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	6,684	61	>75% Grass cover, Good, HSG B
	4,601	55	Woods, Good, HSG B
*	2,400	98	Roofs
	6,403	74	>75% Grass cover, Good, HSG C
*	30,773	98	Paved parking
	0	70	Woods, Good, HSG C
	50,861	86	Weighted Average
	17,688		34.78% Pervious Area
	33,173		65.22% Impervious Area

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

Summary for Subcatchment POST-4.0:

Runoff = 6.74 cfs @ 12.07 hrs, Volume= 0.501 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	11,166	61	>75% Grass cover, Good, HSG B
	159	55	Woods, Good, HSG B
*	13,090	98	Roofs
	363	74	>75% Grass cover, Good, HSG C
*	32,614	98	Paved parking
	57,392	91	Weighted Average
	11,688		20.37% Pervious Area
	45,704		79.63% Impervious Area

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

Summary for Subcatchment POST-5.0:

Runoff = 5.28 cfs @ 12.07 hrs, Volume= 0.414 af, Depth> 5.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
*	5,020	98	Roofs
	3,301	74	>75% Grass cover, Good, HSG C
*	33,884	98	Paved parking
	42,205	96	Weighted Average
	3,301		7.82% Pervious Area
	38,904		92.18% Impervious Area

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

Summary for Subcatchment POST-5.1:

Runoff = 3.72 cfs @ 12.09 hrs, Volume= 0.285 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	22,473	39	>75% Grass cover, Good, HSG A
	20,870	30	Woods, Good, HSG A
	87	61	>75% Grass cover, Good, HSG B
	135	55	Woods, Good, HSG B
	22,413	74	>75% Grass cover, Good, HSG C
*	9,273	98	Paved parking
	1,161	70	Woods, Good, HSG C
	4,696	80	>75% Grass cover, Good, HSG D
	12,712	77	Woods, Good, HSG D
	93,820	59	Weighted Average
	84,547		90.12% Pervious Area
	9,273		9.88% Impervious Area

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

Summary for Subcatchment POST-5.2:

Runoff = 2.85 cfs @ 12.08 hrs, Volume= 0.203 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=5.60"

	Area (sf)	CN	Description
	67	39	>75% Grass cover, Good, HSG A
	25,479	74	>75% Grass cover, Good, HSG C
*	6,279	98	Paved parking
	70	70	Woods, Good, HSG C
	31,895	79	Weighted Average
	25,616		80.31% Pervious Area
	6,279		19.69% Impervious Area

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

Summary for Pond JF-1:

Inflow Area = 3.931 ac, 71.53% Impervious, Inflow Depth > 4.14" for 10-YR event
Inflow = 18.47 cfs @ 12.07 hrs, Volume= 1.357 af
Outflow = 18.47 cfs @ 12.07 hrs, Volume= 1.357 af, Atten= 0%, Lag= 0.0 min
Primary = 18.47 cfs @ 12.07 hrs, Volume= 1.357 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.83' @ 12.10 hrs
Flood Elev= 10.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	3.45'	**24.0" Round Culvert** L= 4.0' Ke= 0.500 Inlet / Outlet Invert= 3.45' / 3.40' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=15.09 cfs @ 12.07 hrs HW=7.44' TW=6.45' (Dynamic Tailwater)
1=Culvert (Inlet Controls 15.09 cfs @ 4.80 fps)

Summary for Pond JF-2:

Inflow Area = 0.729 ac, 85.86% Impervious, Inflow Depth > 5.01" for 10-YR event
Inflow = 3.93 cfs @ 12.07 hrs, Volume= 0.304 af
Outflow = 3.93 cfs @ 12.07 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
Primary = 3.93 cfs @ 12.07 hrs, Volume= 0.304 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.86' @ 12.10 hrs
Flood Elev= 10.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	5.30'	**15.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 5.30' / 5.10' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.89 cfs @ 12.07 hrs HW=6.71' TW=6.45' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.89 cfs @ 2.62 fps)

Summary for Pond JF-3:

Inflow Area = 2.313 ac, 79.93% Impervious, Inflow Depth > 4.63" for 10-YR event
Inflow = 11.73 cfs @ 12.07 hrs, Volume= 0.893 af
Outflow = 11.73 cfs @ 12.07 hrs, Volume= 0.893 af, Atten= 0%, Lag= 0.0 min
Primary = 11.73 cfs @ 12.07 hrs, Volume= 0.893 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.80' @ 12.07 hrs
Flood Elev= 13.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	3.85'	**18.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 3.85' / 3.60' S= 0.0045 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=11.29 cfs @ 12.07 hrs HW=6.69' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 11.29 cfs @ 6.39 fps)

Summary for Pond JF-4:

Inflow Area = 1.318 ac, 79.63% Impervious, Inflow Depth > 4.56" for 10-YR event
Inflow = 6.74 cfs @ 12.07 hrs, Volume= 0.501 af
Outflow = 6.74 cfs @ 12.07 hrs, Volume= 0.501 af, Atten= 0%, Lag= 0.0 min
Primary = 6.74 cfs @ 12.07 hrs, Volume= 0.501 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.43' @ 12.09 hrs
Flood Elev= 13.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	4.85'	**15.0" Round Culvert** L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 4.85' / 4.70' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.99 cfs @ 12.07 hrs HW=7.25' TW=6.22' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 5.99 cfs @ 4.88 fps)

Summary for Pond PDMH11:

Inflow Area = 2.050 ac, 58.22% Impervious, Inflow Depth > 4.02" for 10-YR event
Inflow = 7.00 cfs @ 12.07 hrs, Volume= 0.687 af
Outflow = 7.00 cfs @ 12.07 hrs, Volume= 0.687 af, Atten= 0%, Lag= 0.0 min
Primary = 7.00 cfs @ 12.07 hrs, Volume= 0.687 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.27' @ 12.07 hrs
Flood Elev= 10.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	4.60'	**18.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 4.60' / 4.40' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=6.75 cfs @ 12.07 hrs HW=6.22' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 6.75 cfs @ 4.39 fps)

Summary for Pond PDMH16:

Inflow Area = 4.660 ac, 73.77% Impervious, Inflow Depth > 4.28" for 10-YR event
Inflow = 22.40 cfs @ 12.07 hrs, Volume= 1.662 af
Outflow = 22.40 cfs @ 12.07 hrs, Volume= 1.662 af, Atten= 0%, Lag= 0.0 min
Primary = 22.40 cfs @ 12.07 hrs, Volume= 1.662 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.55' @ 12.07 hrs
Flood Elev= 10.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	3.30'	**24.0" Round Culvert** L= 11.0' Ke= 0.500

Inlet / Outlet Invert= 3.30' / 3.25' S= 0.0045 '/' Cc= 0.900
n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=21.57 cfs @ 12.07 hrs HW=6.45' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 21.57 cfs @ 6.87 fps)

Summary for Pond RG-1:

Inflow Area = 0.732 ac, 19.69% Impervious, Inflow Depth > 3.32" for 10-YR event
Inflow = 2.85 cfs @ 12.08 hrs, Volume= 0.203 af
Outflow = 1.64 cfs @ 12.21 hrs, Volume= 0.186 af, Atten= 42%, Lag= 8.3 min
Primary = 1.64 cfs @ 12.21 hrs, Volume= 0.186 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 10.43' @ 12.22 hrs Surf.Area= 1,712 sf Storage= 2,763 cf
Flood Elev= 11.00' Surf.Area= 1,964 sf Storage= 3,807 cf

Plug-Flow detention time= 106.1 min calculated for 0.185 af (91% of inflow)
Center-of-Mass det. time= 64.7 min (882.9 - 818.2)

Volume	Invert	Avail.Storage	Storage Description
#1	6.25'	3,807 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.25	1,134	0.0	0	0
7.50	1,134	40.0	567	567
9.00	1,134	10.0	170	737
10.00	1,521	100.0	1,328	2,065
11.00	1,964	100.0	1,743	3,807

Device	Routing	Invert	Outlet Devices
#1	Primary	6.10'	**12.0" Round Culvert** L= 238.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 6.10' / 5.00' S= 0.0046 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	10.25'	**16.4" x 16.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.25'	**6.0" Vert. UD** C= 0.600
#4	Device 3	9.00'	**0.26 cfs Exfiltration when above 9.00'**

Primary OutFlow Max=1.58 cfs @ 12.21 hrs HW=10.43' TW=5.89' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.58 cfs of 4.43 cfs potential flow)
├**2=Orifice/Grate** (Weir Controls 1.32 cfs @ 1.37 fps)
└**3=UD** (Passes 0.26 cfs of 1.87 cfs potential flow)
└**4=Exfiltration** (Exfiltration Controls 0.26 cfs)

Summary for Link PA-1:

Inflow Area = 11.177 ac, 59.88% Impervious, Inflow Depth > 3.79" for 10-YR event
Inflow = 44.77 cfs @ 12.07 hrs, Volume= 3.526 af
Primary = 44.77 cfs @ 12.07 hrs, Volume= 3.526 af, Atten= 0%, Lag= 0.0 min

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

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

SubcatchmentPOST-1.0: Runoff Area=129,041 sf 64.77% Impervious Runoff Depth>5.23"
Tc=5.0 min CN=84 Runoff=17.85 cfs 1.292 af

SubcatchmentPOST-2.0: Runoff Area=31,757 sf 85.86% Impervious Runoff Depth>6.50"
Tc=5.0 min CN=95 Runoff=5.04 cfs 0.395 af

SubcatchmentPOST-3.0: Runoff Area=49,909 sf 94.93% Impervious Runoff Depth>6.74"
Tc=5.0 min CN=97 Runoff=8.00 cfs 0.643 af

SubcatchmentPOST-3.1: Runoff Area=50,861 sf 65.22% Impervious Runoff Depth>5.46"
Tc=5.0 min CN=86 Runoff=7.27 cfs 0.531 af

SubcatchmentPOST-4.0: Runoff Area=57,392 sf 79.63% Impervious Runoff Depth>6.03"
Tc=5.0 min CN=91 Runoff=8.77 cfs 0.663 af

SubcatchmentPOST-5.0: Runoff Area=42,205 sf 92.18% Impervious Runoff Depth>6.62"
Tc=5.0 min CN=96 Runoff=6.73 cfs 0.535 af

SubcatchmentPOST-5.1: Runoff Area=93,820 sf 9.88% Impervious Runoff Depth>2.57"
Tc=5.0 min CN=59 Runoff=6.32 cfs 0.462 af

SubcatchmentPOST-5.2: Runoff Area=31,895 sf 19.69% Impervious Runoff Depth>4.67"
Tc=5.0 min CN=79 Runoff=4.00 cfs 0.285 af

Pond JF-1: Peak Elev=10.32' Inflow=24.58 cfs 1.826 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=24.58 cfs 1.826 af

Pond JF-2: Peak Elev=8.64' Inflow=5.04 cfs 0.395 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=5.04 cfs 0.395 af

Pond JF-3: Peak Elev=7.98' Inflow=15.27 cfs 1.175 af
18.0" Round Culvert n=0.013 L=55.0' S=0.0045 '/' Outflow=15.27 cfs 1.175 af

Pond JF-4: Peak Elev=8.86' Inflow=8.77 cfs 0.663 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=8.77 cfs 0.663 af

Pond PDMH11: Peak Elev=7.34' Inflow=11.53 cfs 0.931 af
18.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=11.53 cfs 0.931 af

Pond PDMH16: Peak Elev=8.07' Inflow=29.61 cfs 2.221 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=29.61 cfs 2.221 af

Pond RG-1: Peak Elev=10.56' Storage=2,990 cf Inflow=4.00 cfs 0.285 af
Outflow=3.38 cfs 0.268 af

Link PA-1: Inflow=61.87 cfs 4.788 af
Primary=61.87 cfs 4.788 af

Total Runoff Area = 11.177 ac Runoff Volume = 4.805 af Average Runoff Depth = 5.16"
40.12% Pervious = 4.484 ac 59.88% Impervious = 6.693 ac

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

SubcatchmentPOST-1.0: Runoff Area=129,041 sf 64.77% Impervious Runoff Depth>6.57"
Tc=5.0 min CN=84 Runoff=22.17 cfs 1.623 af

SubcatchmentPOST-2.0: Runoff Area=31,757 sf 85.86% Impervious Runoff Depth>7.90"
Tc=5.0 min CN=95 Runoff=6.06 cfs 0.480 af

SubcatchmentPOST-3.0: Runoff Area=49,909 sf 94.93% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=97 Runoff=9.60 cfs 0.777 af

SubcatchmentPOST-3.1: Runoff Area=50,861 sf 65.22% Impervious Runoff Depth>6.81"
Tc=5.0 min CN=86 Runoff=8.97 cfs 0.663 af

SubcatchmentPOST-4.0: Runoff Area=57,392 sf 79.63% Impervious Runoff Depth>7.41"
Tc=5.0 min CN=91 Runoff=10.66 cfs 0.814 af

SubcatchmentPOST-5.0: Runoff Area=42,205 sf 92.18% Impervious Runoff Depth>8.02"
Tc=5.0 min CN=96 Runoff=8.09 cfs 0.647 af

SubcatchmentPOST-5.1: Runoff Area=93,820 sf 9.88% Impervious Runoff Depth>3.59"
Tc=5.0 min CN=59 Runoff=8.98 cfs 0.645 af

SubcatchmentPOST-5.2: Runoff Area=31,895 sf 19.69% Impervious Runoff Depth>5.97"
Tc=5.0 min CN=79 Runoff=5.08 cfs 0.364 af

Pond JF-1: Peak Elev=13.39' Inflow=30.26 cfs 2.270 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=30.26 cfs 2.270 af

Pond JF-2: Peak Elev=10.83' Inflow=6.06 cfs 0.480 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=6.06 cfs 0.480 af

Pond JF-3: Peak Elev=9.35' Inflow=18.57 cfs 1.440 af
18.0" Round Culvert n=0.013 L=55.0' S=0.0045 '/' Outflow=18.57 cfs 1.440 af

Pond JF-4: Peak Elev=11.02' Inflow=10.66 cfs 0.814 af
15.0" Round Culvert n=0.013 L=23.0' S=0.0065 '/' Outflow=10.66 cfs 0.814 af

Pond PDMH11: Peak Elev=8.18' Inflow=14.52 cfs 1.161 af
18.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=14.52 cfs 1.161 af

Pond PDMH16: Peak Elev=10.01' Inflow=36.32 cfs 2.749 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=36.32 cfs 2.749 af

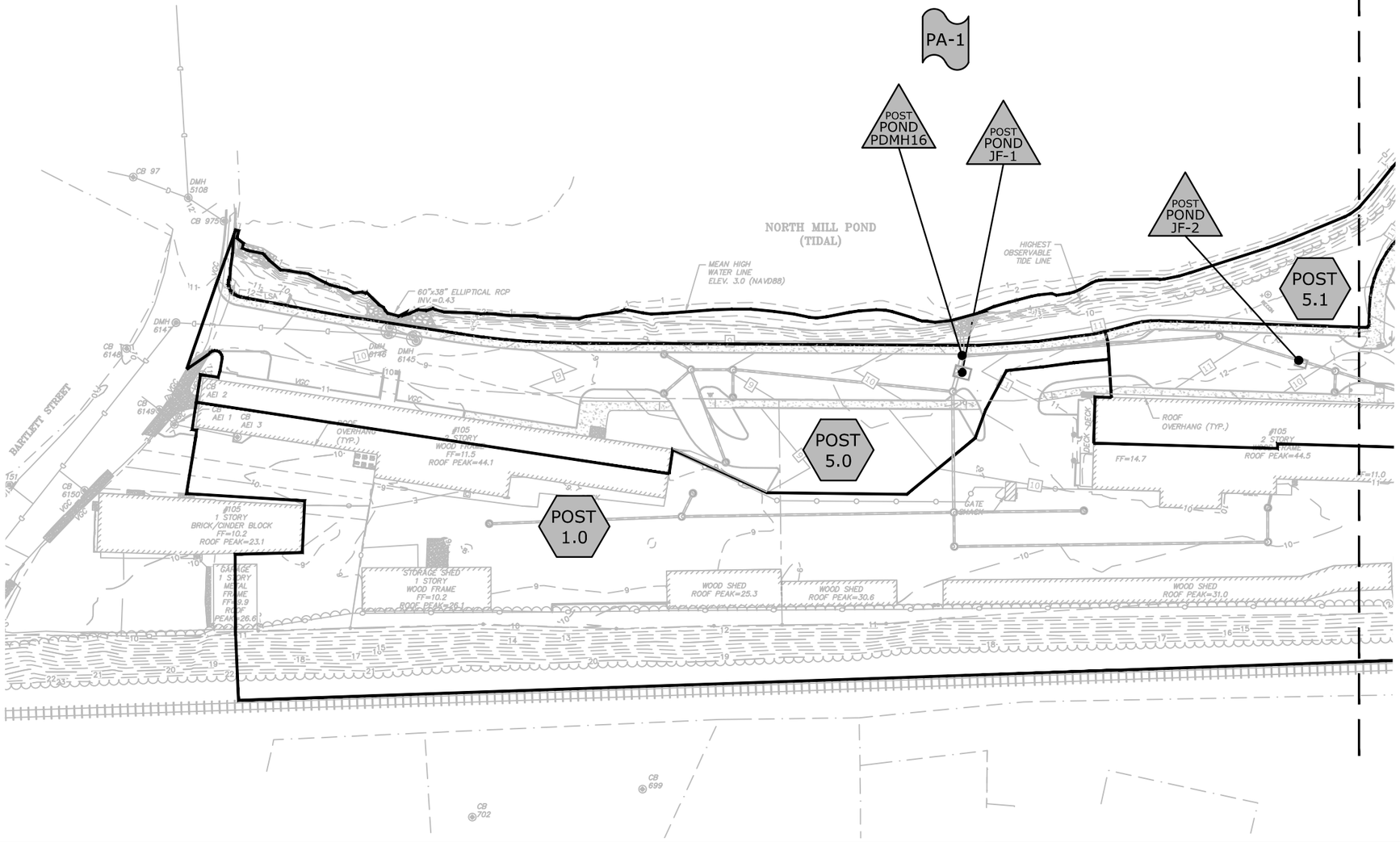
Pond RG-1: Peak Elev=10.79' Storage=3,397 cf Inflow=5.08 cfs 0.364 af
Outflow=3.96 cfs 0.347 af

Link PA-1: Inflow=78.36 cfs 5.996 af
Primary=78.36 cfs 5.996 af

Total Runoff Area = 11.177 ac Runoff Volume = 6.013 af Average Runoff Depth = 6.46"
40.12% Pervious = 4.484 ac 59.88% Impervious = 6.693 ac

LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS



0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802.1

Last Saved: 4/20/2020
Printed: Nov 20, 2020 - 4:13pm By: BCurcio
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LEGEND

POST-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

POST POND 1 — POST-DEVELOPMENT POND DESIGNATION

PA-1 — POINT OF ANALYSIS

MATCH LINE SHEET 2
MATCH LINE SHEET 1

NORTH MILL POND (TIDAL)

MEAN HIGH WATER LINE ELEV. 3.0' (NAVD88)

HIGHEST OBSERVABLE TIDE LINE

BURIED 12" VCP

ROOF PEAK=36.2

POST POND JF-3

POST POND RG-1

POST POND PDMH11

POST POND JF-4

PA-1

POST 2.0

POST 3.0

POST 3.1

POST 4.0

POST 5.2

McDONOUGH STREET

DOVER STREET

CABOT STREET

CB 1299

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
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PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802.2

Last Saved: 4/20/2020
Printed: Monday, April 20, 2020 4:15pm By: BCurcio
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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).

4.4.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consist of deep sump catch basins.

4.4.2 Treatment Methods for Protecting Water Quality.

The runoff from existing and proposed impervious areas will be treated by various Contech Jellyfish stormwater filtration systems. These Jellyfish systems are sized to treat the Water Quality Flows of their respective subcatchment areas. Each system is outfitted with an internal bypass that diverts peak flows away from treatment. The BMP worksheet for these treatment practices have been included in Section 5 of this report.

Additionally, a rain garden within the proposed greenway park is included to treat runoff from the surrounding area. The rain garden has been designed and sized to contain the 50-year storm without overtopping, as well as treat a volume of runoff greater than the WQV. Due to poor infiltration rates of the surrounding soils, the bottom of the rain garden is proposed to be lined and outfitted with underdrains to convey treated runoff to the system's outlet structure. The BMP worksheet for this treatment practice has been included in Section 5 of this report, as well.

Section 5
BMP Worksheets and Sizing Memos

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)

4.26	ac	A = Area draining to the practice
2.96	ac	A_I = Impervious area draining to the practice
0.69	decimal	I = percent impervious area draining to the practice, in decimal form
0.68	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
2.88	ac-in	WQV= 1" x Rv x A
10,444	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = amount of rainfall. For WQF in NH, P = 1".
0.68	inches	Q = water quality depth. Q = WQV/A
97	unitless	CN = unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.4	inches	S = potential maximum retention. S = (1000/CN) - 10
0.070	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
655.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
2.944	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer's Notes: POST 1.0 & 5.0 combined

PEAK FLOW = 30.26 CFS (50 year)

CONTECH Stormwater Solutions Inc. Engineer: JBS
Date Prepared: **4/17/2020**

Site Information

Project Name	**105 Bartlett Street (Post 1&5)**
Project State	**NH**
Project City	**Portsmouth**
Total Drainage Area, Ad	**4.26** ac
Post Development Impervious Area, Ai	**2.96** ac
Pervious Area, Ap	**1.30** ac
% Impervious	**69%**
Runoff Coefficient, Rc	**0.68**

Mass Loading Calculations

Mean Annual Rainfall, P	**51** in
Agency Required % Removal	**80%**
Percent Runoff Capture	**90%**
Mean Annual Runoff, Vt	**479357** ft^3
Event Mean Concentration of Pollutant, EMC	**75** mg/l
Annual Mass Load, M total	**2243.06** lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**1794.45** lbs
Water Quality Flow	**2.94** cfs

Method to Use **FLOW BASED**

Summary		
Flow	Treatment Flow Rate	3.03 cfs
	Required Size	**JFPD0811-15-4**

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)

0.73	ac	A = Area draining to the practice
0.63	ac	A_I = Impervious area draining to the practice
0.86	decimal	I = percent impervious area draining to the practice, in decimal form
0.82	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.60	ac-in	WQV= 1" x Rv x A
2,177	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".
0.82	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
0.034	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
655.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
0.614	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer's Notes: POST 2.0

PEAK FLOW = 5.11 CFS

CONTECH Stormwater Solutions Inc. Engineer: JBS
Date Prepared: **3/17/2020**

Site Information

Project Name	**105 Bartlett Street (Post 2)**
Project State	**NH**
Project City	**Portsmouth**

Total Drainage Area, Ad	**0.73**	ac
Post Development Impervious Area, Ai	**0.63**	ac
Pervious Area, Ap	**0.10**	ac
% Impervious	**86%**	
Runoff Coefficient, Rc	**0.83**	

Mass Loading Calculations

Mean Annual Rainfall, P	**51**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**100553**	ft^3
Event Mean Concentration of Pollutant, EMC	**75**	mg/l
Annual Mass Load, M total	**470.52**	lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**376.42**	lbs
Water Quality Flow	**0.61**	cfs

Method to Use **FLOW BASED**

Summary			
Flow	Treatment Flow Rate	0.62	cfs
	Required Size	**JFPD0806-3-1**	

General Calculations - WQV and WQF
(optional worksheet)

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

Water Quality Volume (WQV)

2.26	ac	A = Area draining to the practice
1.79	ac	A_I = Impervious area draining to the practice
0.79	decimal	I = percent impervious area draining to the practice, in decimal form
0.76	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.72	ac-in	WQV= 1" x Rv x A
6,258	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".
0.76	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
0.047	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
655.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
1.764	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer's Notes: POST 3.0, POST 3.1

PEAK FLOW =15.82 CFS

CONTECH Stormwater Solutions Inc. Engineer: JBS
Date Prepared: **3/17/2020**

Site Information

Project Name	**105 Bartlett Street (Post 3)**
Project State	**NH**
Project City	**Portsmouth**

Total Drainage Area, Ad	**2.26**	ac
Post Development Impervious Area, Ai	**1.79**	ac
Pervious Area, Ap	**0.47**	ac
% Impervious	**79%**	
Runoff Coefficient, Rc	**0.76**	

Mass Loading Calculations

Mean Annual Rainfall, P	**51**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**287248**	ft^3
Event Mean Concentration of Pollutant, EMC	**75**	mg/l
Annual Mass Load, M total	**1344.12**	lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**1075.30**	lbs
Water Quality Flow	**1.76**	cfs

Method to Use **FLOW BASED**

Summary			
Flow	Treatment Flow Rate	1.78	cfs
	Required Size	**JFPD0806-9-2**	

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)

1.30	ac	A = Area draining to the practice
1.04	ac	A_I = Impervious area draining to the practice
0.80	decimal	I = percent impervious area draining to the practice, in decimal form
0.77	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.00	ac-in	WQV= 1" x Rv x A
3,621	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".
0.77	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
0.046	inches	Ia = initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
655.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
1.021	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer's Notes: POST 4.0

PEAK FLOW = 9.16 CFS

CONTECH Stormwater Solutions Inc. Engineer: JBS
Date Prepared: **3/17/2020**

Site Information

Project Name	**105 Bartlett Street (Post 4)**
Project State	**NH**
Project City	**Portsmouth**

Total Drainage Area, Ad	**1.30**	ac
Post Development Impervious Area, Ai	**1.04**	ac
Pervious Area, Ap	**0.26**	ac
% Impervious	**80%**	
Runoff Coefficient, Rc	**0.77**	

Mass Loading Calculations

Mean Annual Rainfall, P	**51**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**166784**	ft^3
Event Mean Concentration of Pollutant, EMC	**75**	mg/l
Annual Mass Load, M total	**780.43**	lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**624.35**	lbs
Water Quality Flow	**1.02**	cfs

Method to Use **FLOW BASED**

Summary			
Flow	Treatment Flow Rate	1.07	cfs
	Required Size	**JFPD0806-5-2**	

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **RG-1**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
0.73	ac	A = Area draining to the practice	
0.14	ac	A_I = Impervious area draining to the practice	
0.19	decimal	I = percent impervious area draining to the practice, in decimal form	
0.22	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.16	ac-in	WQV= 1" x Rv x A	
590	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
147	cf	25% x WQV (check calc for sediment forebay volume)	
442	cf	75% x WQV (check calc for surface sand filter volume)	
Clean		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
1,134	sf	A_{SA} = surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
7.50	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
6.25	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
17.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.25	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	← ≥ 1'
7.50	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	← ≥ 1'
(9.50)	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	← ≥ 1'
10.65	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
11.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← yes

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	← < 10 ac
	cf	V = volume of storage[3] (attach a stage-storage table)	← ≥ 75%WQV
	inches	D_{FC} = filter course thickness	← 18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
1,892	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ WQV**
18.0	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet	C-506	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← **≤ 5:1**
	inches	D_{FC} = filter course thickness	← **12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Section 6
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.

6.1 Contact/Responsible Party

Iron Horse Properties, LLC
105 Bartlett Street
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.)

6.2 Maintenance Items

Maintenance of the following items shall be recorded:

- *Litter/Debris Removal*
- *Landscaping*
- *Catchbasin Cleaning*
- *Pavement Sweeping*
- *Contech Jellyfish Filtration System*

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

6.3 Overall Site Operation & Maintenance Schedule

Overall Site Operation and Maintenance Schedule		
Maintenance Item	**Frequency of Maintenance**	**Operation**
Litter/Debris Removal - Trash and debris to be removed including long the full length of the stream.	Weekly	Management Company
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually	Parking Lot Sweeper
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually	Vacuum Truck
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring	Management Company

Rain Garden Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor to ensure that Rain Gardens function effectively after storms	Two (2) times annually and after any rainfall event exceeding 2.5" in a 24-hr period	- Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	- Inspect the condition of all Rain Garden vegetation - Prune back overgrowth - Replace dead vegetation - Remove any invasive species
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	- Assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.

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

6.3.1 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.

6.3.2 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 6 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 and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

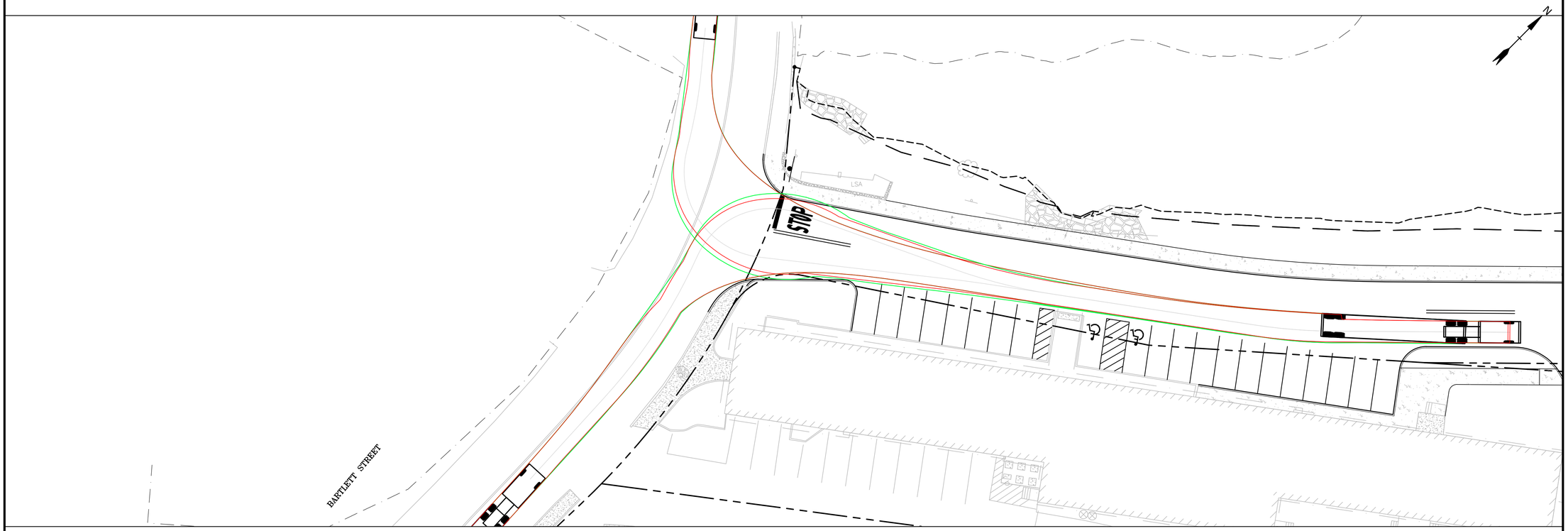
6.3.4 Annual Updates and Log Requirements

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.

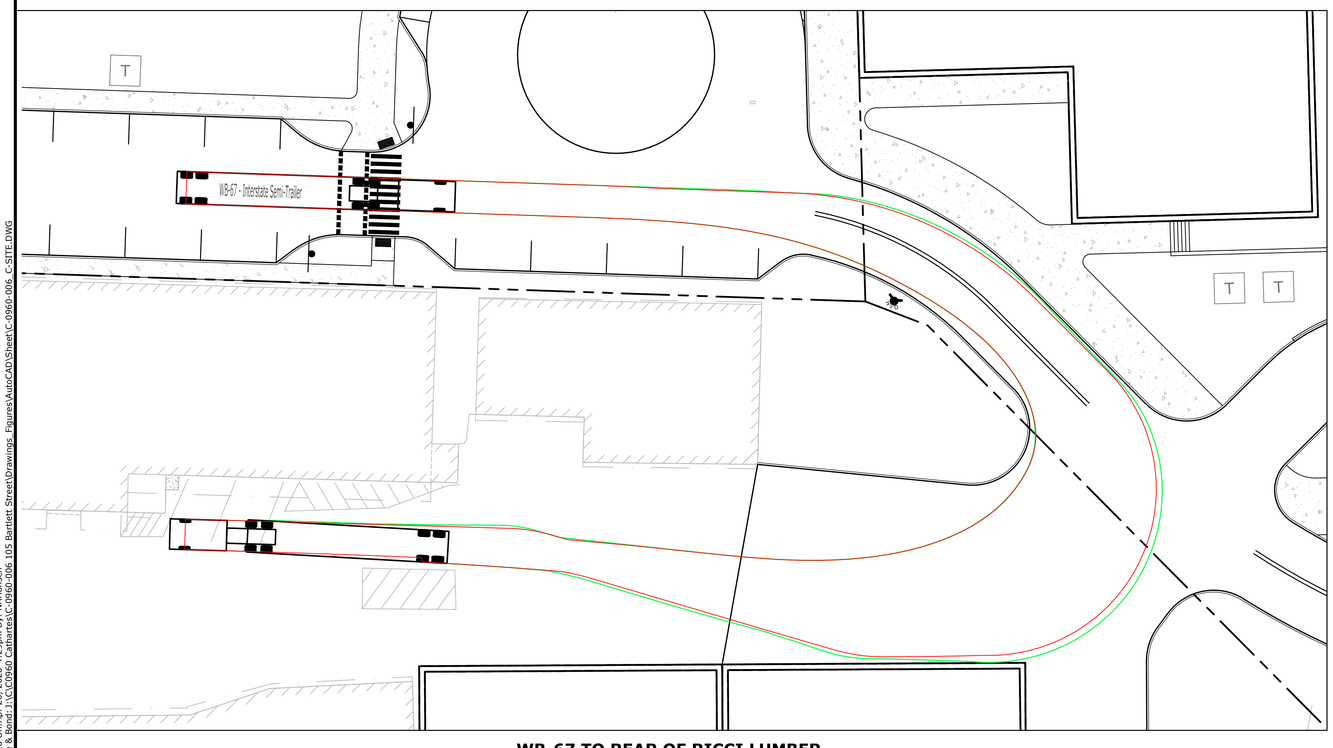
A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Stormwater Management Report						
Project Name		**105 Bartlett Street**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			

J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Report_Evaluation\Applications\City of Portsmouth\20200420_TAC Submission\C-0960-006_Drainage Report.docx



WB-67 ENTERING



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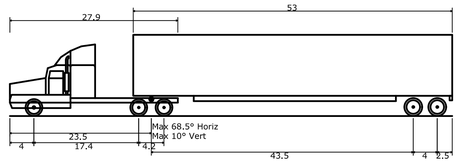

WB-67 - Interstate Semi-Trailer	
Overall Length	73.501ft
Overall Width	8.500ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.334ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	28.40°

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

TRUCK TURNING EXHIBIT

SCALE: AS SHOWN

Last Saved: 4/20/2020
Plotted: 4/20/2020 4:29pm By: NAHansen
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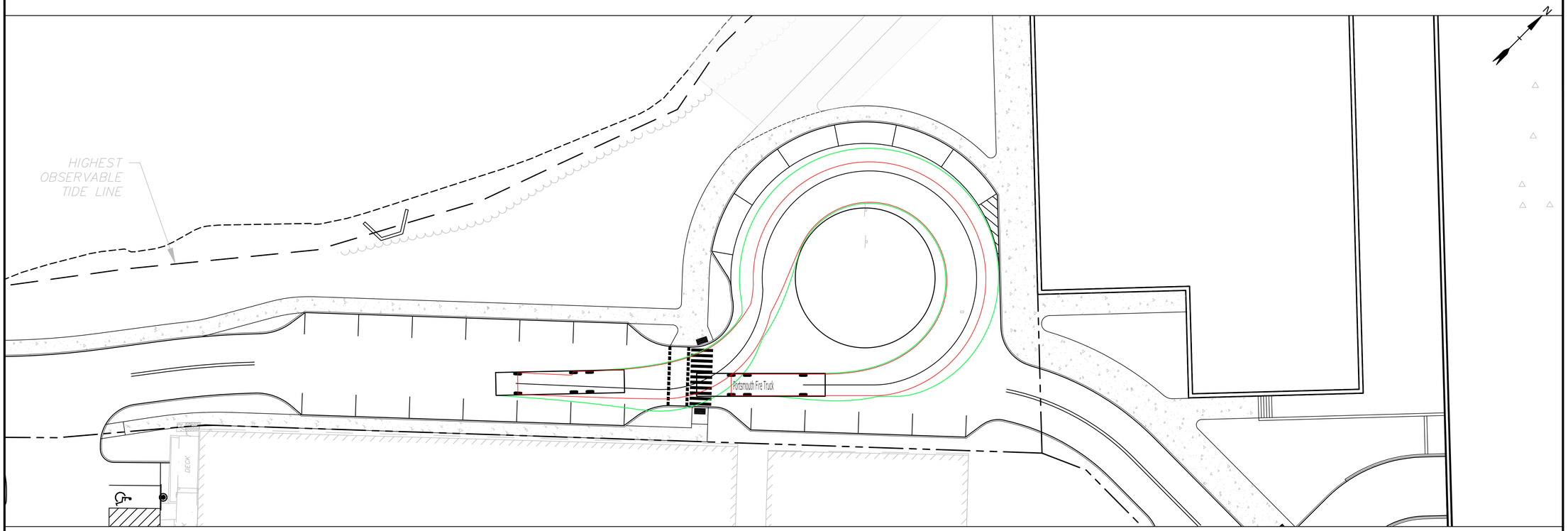
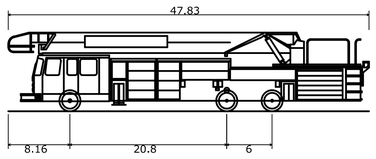


PORTSMOUTH FIRETRUCK @ CUL-DE-SAC



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°

Tighe&Bond

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE_USE THIS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

TRUCK TURNING EXHIBIT

SCALE: AS SHOWN

2 OF 2

Last Saved: 4/18/2020
Plotted On: Apr 18, 2020 - 11:54am By: BCurcio
Tighe & Bond: C:\Users\BCurcio\Desktop_LOCAL\Bartlett\C-0960-006_C-SITE_use this.DWG

April 17, 2020

Ed Hayes
Iron Horse Properties
105 Bartlett St
Portsmouth NH 03801

RE: Natural Gas Availability to 105 Bartlett St Portsmouth NH

Dear Ed,

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

Unitil hereby confirms natural gas service will be available to the 105 Bartlett St Portsmouth project to serve 174 apartments.

Installation is pending an authorized installation agreement with Iron Horse Properties 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. My phone number is 603-294-5174.

Sincerely,

Janet Oliver
Senior Business Development Representative

CUSTOMER ENERGY SOLUTIONS
325 West Road
Portsmouth, NH 03801

T 888.486.4845 www.unitil.com

Site Plan Review Application Fee

Project: 105 Bartlett Street **Map/Lot:** 164/4-2

Applicant: Iron Horse Properties, LLC

All development

Base fee $500			$500.00
Plus $5.00 per $1,000 of site costs			
Site costs	$1,000,000	+	$5,000.00
Plus $10.00 per 1,000 S.F. of site development area			
Site development area	283,000 S.F.	+	$2,830.00
		Fee	**$8,330.00**

Maximum fee: $15,000.00

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

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. 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 Owner/Applicant: Iron Horse Properties LLC Date Submitted: 04/20/2020

Phone Number: 603-436-7480 E-mail: edwardhayes@riccilumber.com

Site Address: 105 Bartlett Street Map: 157/164 Lot: 1,2 / 1, 4-2

Zoning District: CD4-2, CD4-L1, West End Incentive Overlay District Lot area: 431,885 sq. ft.

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✔	Fully executed and signed Application form. **(2.5.2.3)**	Online	N/A
✔	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(2.5.2.8)**	Online	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Statement that lists and describes "green" building components and systems. **(2.5.3.1A)**		☐
✔	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	C-102	N/A
✔	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	C-102	N/A
✔	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1D)**	Cover Sheet	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✔	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1E)**	C-101	N/A
✔	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover sheet	N/A
✔	List of reference plans. **(2.5.3.1G)**	C-101	N/A
✔	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	C-104.1 & C-104.2	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✔	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. **(2.5.4.1A)**	Required on all plan sheets	N/A
✔	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
✔	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Required on all plan sheets	N/A
✔	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
✔	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
✔	Wetlands shall be delineated by a NH certified wetlands scientist. **(2.5.4.1E)**	C-101	N/A
✔	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Required on all plan sheets	N/A
✔	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Required on all plan sheets	N/A
✔	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✔	Source and date of data displayed on the plan. **(2.5.4.2D)**	Required on all plan sheets	N/A
✔	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Required on all plan sheets	N/A
✔	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	C-102.1 & C-102.2	N/A
	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**		N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
✔	a. Surveyed plan of site showing existing natural and built features;	C-101	☐
✔	b. Zoning boundaries;	C-101	☐
✔	c. Dimensional Regulations;	C-102	☐
✔	d. Wetland delineation, wetland function and value assessment;	C-101	☐
✔	e. SFHA, 100-year flood elevation line and BFE data.	C-101	☐
	2. Buildings and Structures: (2.5.4.3B)		
✔	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	C-102	☐
✔	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	C-102	☐
✔	c. Total Floor Area;	C-102	☐
✔	d. Number of Usable Floors;	C-102	☐
✔	e. Gross floor area by floor and use.	C-102	☐
	3. Access and Circulation: (2.5.4.3C)		
✔	a. Location/width of access ways within site;	C-102.1 & C-102.2	☐
✔	b. Location of curbing, right of ways, edge of pavement and sidewalks;	C-102.1 & C-102.2	☐
✔	c. Location, type, size and design of traffic signing (pavement markings);	C-102.1 & C-102.2	☐
✔	d. Names/layout of existing abutting streets;	C-102.1 & C-102.2	☐
✔	e. Driveway curb cuts for abutting prop. and public roads;	C-102.1 & C-102.2	☐
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A	☐
✔	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Truck Turning Exhibits	☐
	4. Parking and Loading: (2.5.4.3D)		
✔	a. Location of off street parking/loading areas, landscaped areas/buffers;	C-102	☐
✔	b. Parking Calculations (# required and the # provided).	C-102	☐
	5. Water Infrastructure: (2.5.4.3E)		
✔	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	C-104.1 & C-104.2	☐
☐	b. Location of wells and monitoring wells (include protective radii).	N/A	☐
	6. Sewer Infrastructure: (2.5.4.3F)		
✔	a. Size, type and location of sanitary sewage facilities & Engineering data.	C-104.1 & C-104.2	☐
	7. Utilities: (2.5.4.3G)		
✔	a. The size, type and location of all above & below ground utilities;	C-104.1 & C-104.2	☐
✔	b. Size type and location of generator pads, transformers and other fixtures.	C-104.1 & C-104.2	☐

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	**8. Solid Waste Facilities: (2.5.4.3H)**		
☐	a. The size, type and location of solid waste facilities.		☐
	9. Storm water Management: (2.5.4.3I)		
✔	a. The location, elevation and layout of all storm-water drainage.	C-103.1 & C-103.2	☐
	10. Outdoor Lighting: (2.5.4.3J)		
☐	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.		☐
☐	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**		☐
	12. Landscaping: (2.5.4.3K)		
✔	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	L-1	☐
☐	**b.** Location of any irrigation system and water source.		☐
	13. Contours and Elevation: (2.5.4.3L)		
✔	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	C-103.1 & C-103.2	☐
	14. Open Space: (2.5.4.3M)		
✔	a. Type, extent and location of all existing/proposed open space.	C-102	☐
✔	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	C-301.1 & C-301.2	☐
✔	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	C-102.1 & C-102.2	☐
✔	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	C-102	☐
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✔	Traffic Impact Study or Trip Generation Report, as required. (*Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application*) **(3.2.1-2)**	Enclosed	☐
✔	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	C-103.1 & C-103.2	☐
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	☐
✔	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	C-103.1 & C-103.2	☐
✔	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	C-102	☐
✔	Stormwater Management and Erosion Control Plan. (*Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application*) **(7.4.4.1)**	Enclosed	☐

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✔	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. **(2.5.3.2A)**	Cover Sheet, C-102, C-301.1 & C-301.2,	☐
✔	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. **(2.5.3.2B)**	Enclosed	☐

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✔	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Enlcosed	☐
✔	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	☐

Applicant's Signature: _____ **Date:** 4/20/2020