C0960-006
November 18, 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 the following supplemental information to support a request for a Site Review Permit and Conditional Use Permit for Shared Parking for the above referenced project:

- One (1) full size copy of the Site Plan Set, last revised November 18, 2020;
- One (1) copy of the TAC Comment Response Report, dated November 18, 2020;
- One (1) copy of the Drainage Analysis, last revised November 18, 2020;
- One (1) copy of the Grade Plane Exhibit, last revised November 18, 2020;
- One (1) copy of the Truck Turning Exhibits, last revised November 18, 2020;
- One (1) copy of the Buffer Impact Exhibit, last revised November 18, 2020;
- One (1) copy of the Trip Generation Memorandum, last revised November 11, 2020;
- One (1) copy of the Environmental Summary Memo, dated November 4, 2020

The enclosed revised plans and supplemental materials have been provided to address comments received from the Technical Advisory Committee (TAC) in correspondence dated June 1, 2020 and at their meeting held on June 2, 2020.

We respectfully request to be placed on the TAC meeting agenda for December 1, 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

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

J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Report_Evaluation\Permit Applications\City of Portsmouth\20201118 TAC Resubmission\20201118_TAC Cover Letter.docx

PROPOSED MULTI-FAMILY DEVELOPMENT

105 BARTLETT STREET
PORTSMOUTH, NEW HAMPSHIRE

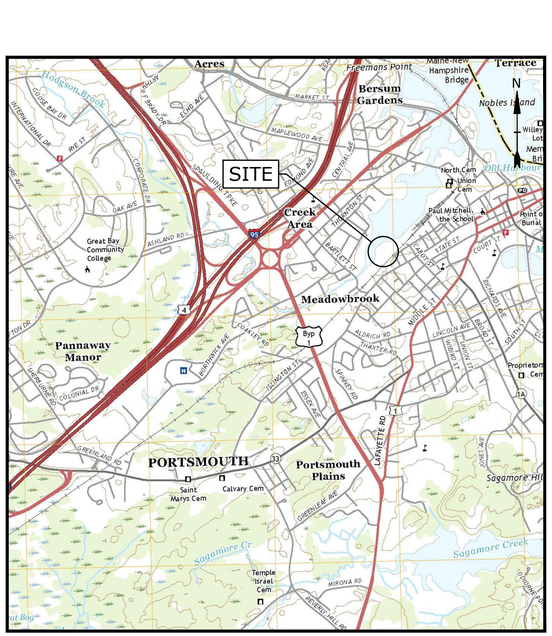
JANUARY 2, 2020

LAST REVISED: NOVEMBER 18, 2020

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	11/18/2020
C-101	OVERALL EXISTING CONDITIONS AND DEMOLITION PLAN	11/18/2020
C-101.1	EXISTING CONDITIONS AND DEMOLITION PLAN	11/18/2020
C-101.2	EXISTING CONDITIONS AND DEMOLITION PLAN	11/18/2020
C-102	OVERALL SITE PLAN	11/18/2020
C-102.1	SITE PLAN	11/18/2020
C-102.2	SITE PLAN	11/18/2020
C-102.3	BASEMENT LEVEL SITE PLAN	11/18/2020
C-103.1	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	11/18/2020
C-103.2	GRADING, DRAINAGE, AND EROSION CONTROL PLAN	11/18/2020
C-104.1	UTILITIES PLAN	11/18/2020
C-104.2	UTILITIES PLAN	11/18/2020
C-105.1	PHOTOMETRIC PLAN	11/18/2020
C-105.2	PHOTOMETRIC PLAN	11/18/2020
C-301.1	EASEMENT PLAN	11/18/2020
C-301.2	EASEMENT PLAN	11/18/2020
C-501	EROSION CONTROL NOTES AND DETAILS SHEET	11/18/2020
C-502	DETAILS SHEET	11/18/2020
C-503	DETAILS SHEET	11/18/2020
C-504	DETAILS SHEET	11/18/2020
C-505	DETAILS SHEET	11/18/2020
C-506	DETAILS SHEET	11/18/2020
C-507	DETAILS SHEET	11/18/2020
L-1	SITE LANDSCAPE PLAN	11/18/2020
L-2	FOUNDATION PLANTING PLAN	11/18/2020

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	

T&B PROJECT NO: C0960-006



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

STATE OF NEW HAMPSHIRE
BRADLEE MEZQUITA
No. 08839
LICENSED PROFESSIONAL ENGINEER
11-18-20

STATE OF NEW HAMPSHIRE
PATRICK W. CRIMMINS
No. 13970
LICENSED PROFESSIONAL ENGINEER
11-18-2020

TAC RESUBMISSION
COMPLETE SET 25 SHEETS

Last Saved: 11/16/2020
Plotted On: Nov 18, 2020 - 12:13pm By: NAHansen
Tighe & Bond: J:\C\C0960 Catharines\C-0960-006 105 Bartlett Street\Drawings Figures\AutoCAD\Sheet\C-0960-006 C-CS.dwg

LEGEND

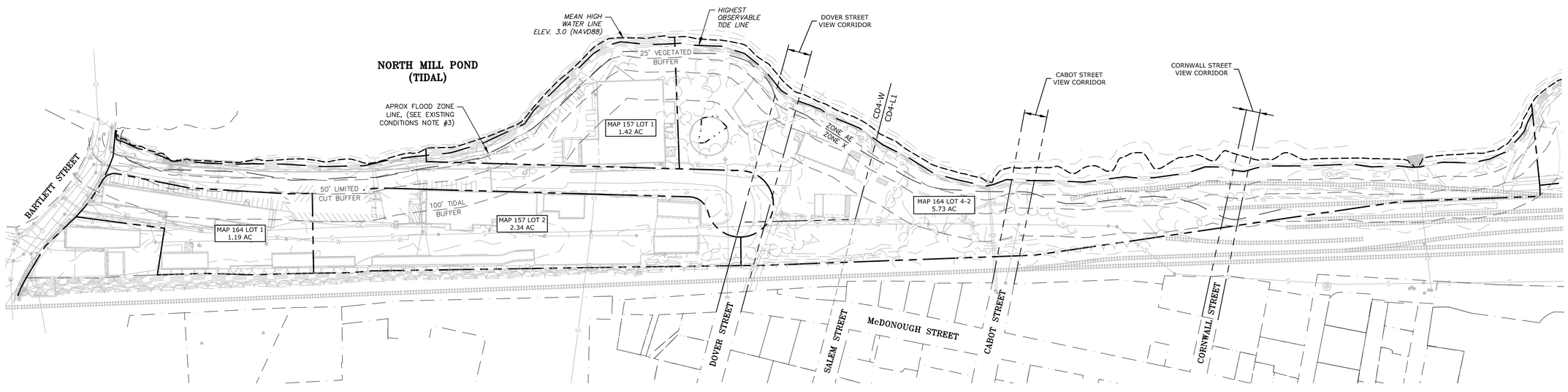
- BUILDING
- BUILDING OVERHANG
- BUILDING HATCH/TEXT (BUILDING NO. 50)
- CURB
- EDGE OF PAVEMENT
- RETAINING WALL
- STONE WALL
- CHAIN LINK FENCE
- FENCE LINE
- TREELINE
- PAVEMENT MARKING
- TRAFFIC SIGN
- MAJOR CONTOURS (200)
- MINOR CONTOURS
- STORM DRAIN LINE (D)
- SANITARY SEWER LINE (S)
- WATER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



0 100' 200'

GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MEZQUITA No. 08838 — LICENSED PROFESSIONAL ENGINEER — 11-18-20

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 15670 — LICENSED PROFESSIONAL ENGINEER — 11-18-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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: 11/16/2020
Plotted: Monday, November 16, 2020 - 3:15pm By: NAHanson
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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11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
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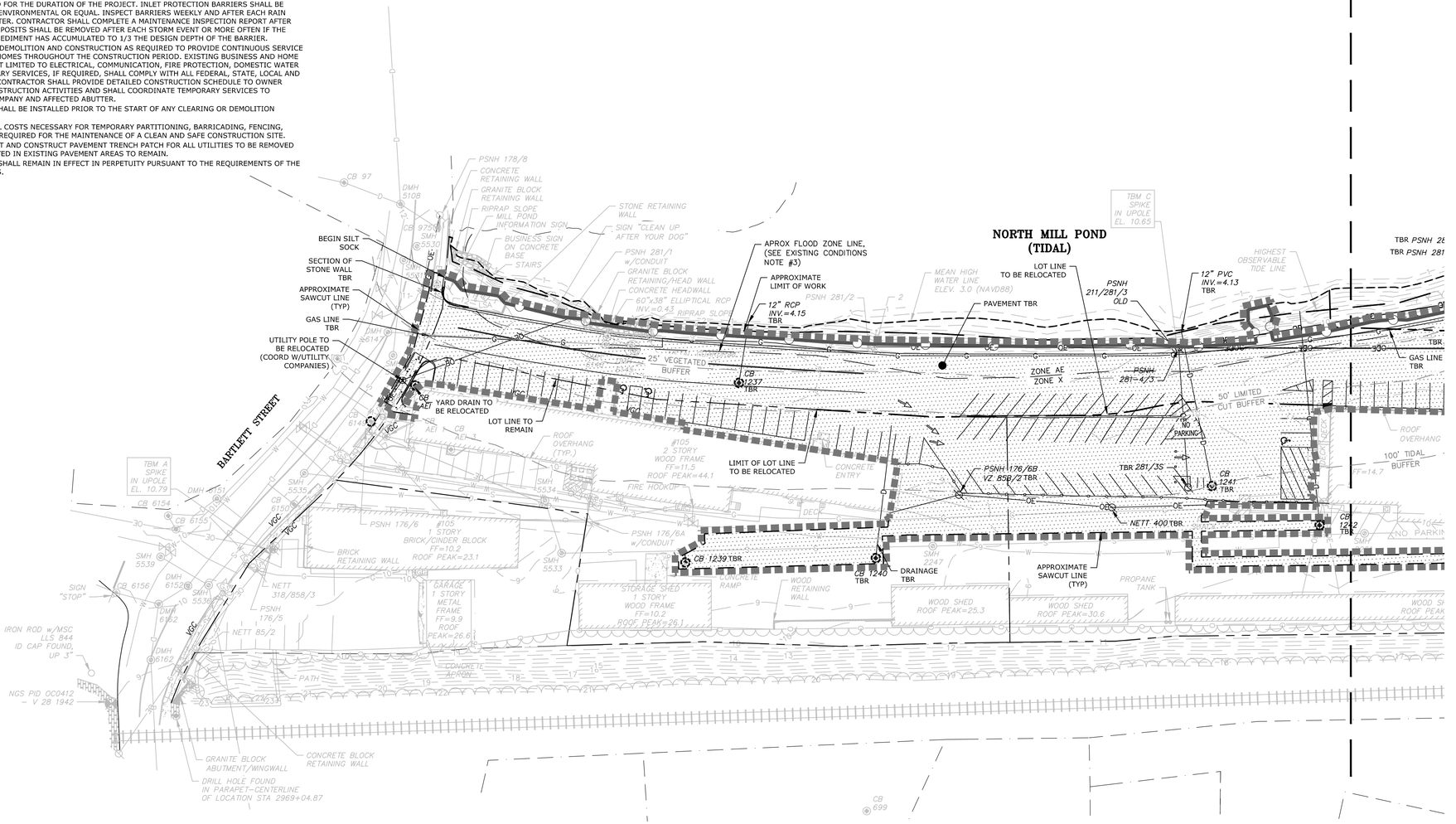
22. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

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
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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

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

C-101.1

Last Saved: 11/16/2020
Plotted: Nov 17, 2020 - 2:15pm By: NAHansen
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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MATCH LINE SHEET 2
MATCH LINE SHEET 1

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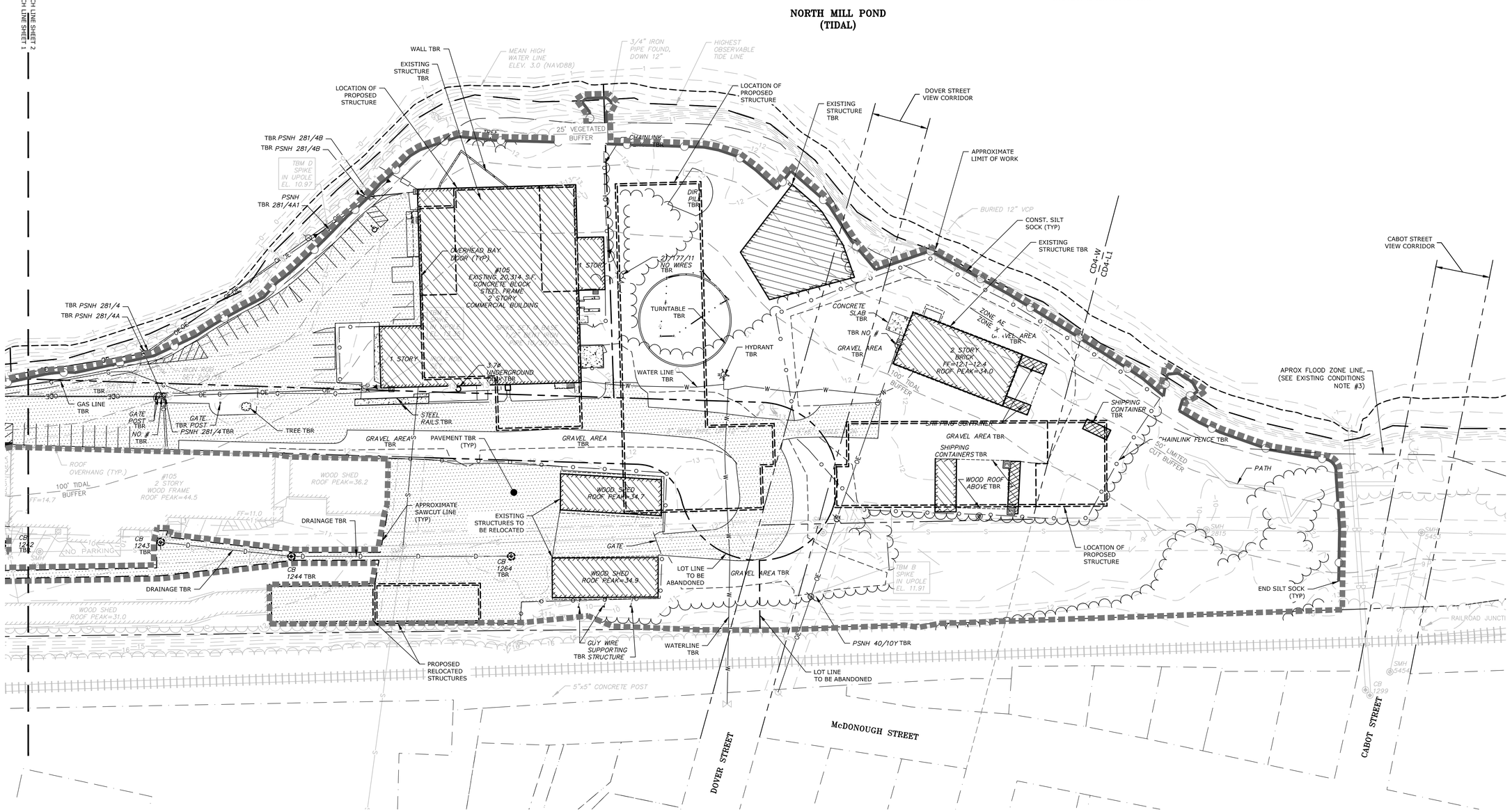

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Proposed Multi-Family Development

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DATE:	April 20, 2020
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EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

C-101.2

Last Saved: 11/16/2020
Printed: Nov 16, 2020 - 2:16pm By: NAHansen
Tighe & Bond: J:\C\C0960 Cathartes\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

PROPOSED GROUND FLOOR USES:
- BUILDING A & B: RESIDENTIAL
- BUILDING C: OFFICE & AMENITY SPACE

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)	4 STORIES, 50'	2 STORIES (1) 30' MAX (2)	2 STORIES, 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%

ZONING VARIANCES:

REQUIREMENT:	SECTION:	GRANTED:
(I) - 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, 1 UNITS	0.5 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		1.5 SPACES
500 SF TO 750 SF 1.0 SPACES PER UNIT	BUILDING A, 24 UNITS	24 SPACES
	BUILDING B, 38 UNITS	38 SPACES
	BUILDING C, 27 UNITS	27 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		89 SPACES
OVER 750 SF 1.3 SPACES PER UNIT	BUILDING A, 21 UNITS	27.3 SPACES
	BUILDING B, 35 UNITS	45.5 SPACES
	BUILDING C, 22 UNITS	28.6 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		101.4 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	170 UNITS	34 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		250 SPACES

TOTAL PARKING SPACES PROVIDED:

TOTAL PARKING SPACES PROVIDED =	103 SPACES (SURFACE PARKING) 73 SPACES (BUILDING A, UNDERGROUND) 46 SPACES (BUILDING B, UNDERGROUND) 28 SPACES (PRIVATE ROADWAY)(1) 250 SPACES
ADA SPACES REQUIRED=	7 SPACES (FOR 201-300 FACILITY TOTAL)
ADA SPACES PROVIDED=	7 SPACES (INCLUDED IN SURFACE PARKING COUNT OF 100)

(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

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	PROPOSED CURB
	PROPOSED BUILDING
	PROPOSED PAVEMENT SECTION
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•	PROPOSED BOLLARD
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TYP	TYPICAL
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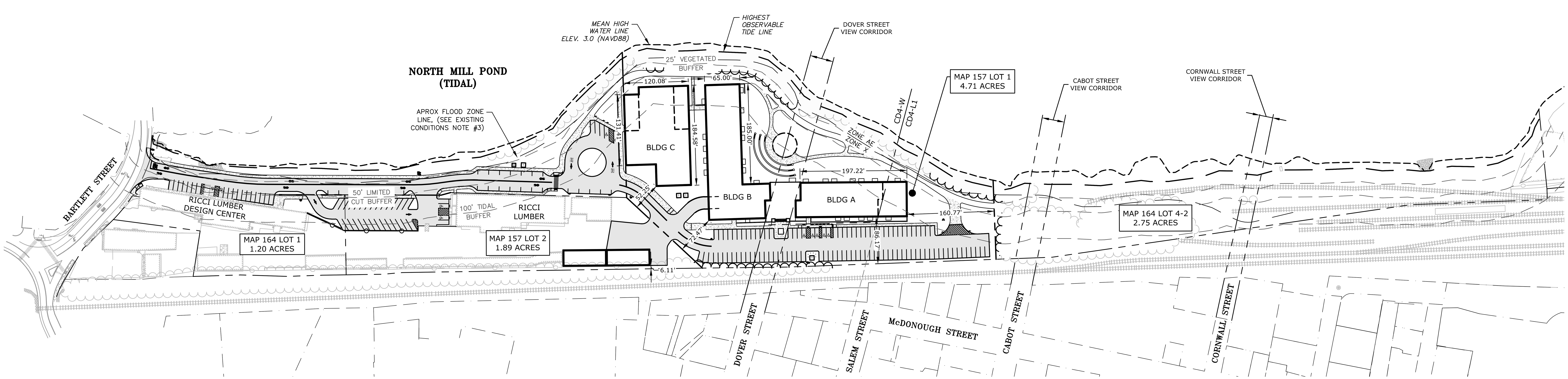
SGC	PROPOSED SLOPED GRANITE CURB
MVGC	PROPOSED MOUNTABLE VERTICAL GRANITE CURB

0 100' 200'
GRAPHIC SCALE



Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
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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

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
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5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
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17. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
18. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
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21. THE APPLICATION SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.

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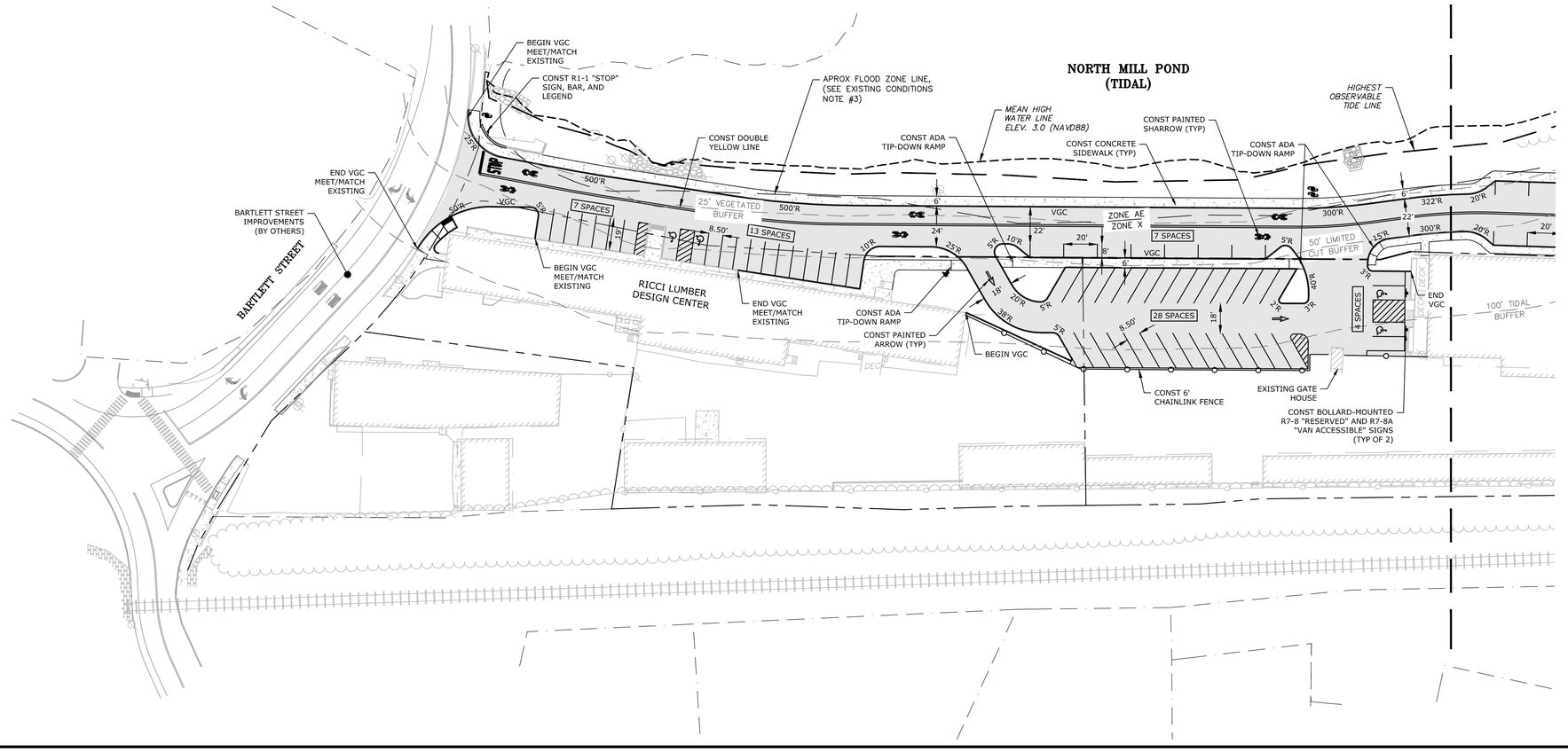

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
11-18-20

PATRICK M. CRIMMINS No. 12970 LICENSED PROFESSIONAL SURVEYOR STATE OF NEW HAMPSHIRE
11-18-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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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

SITE PLAN

SCALE: AS SHOWN

C-102.1

MATCH LINE SHEET 2
MATCH LINE SHEET 1

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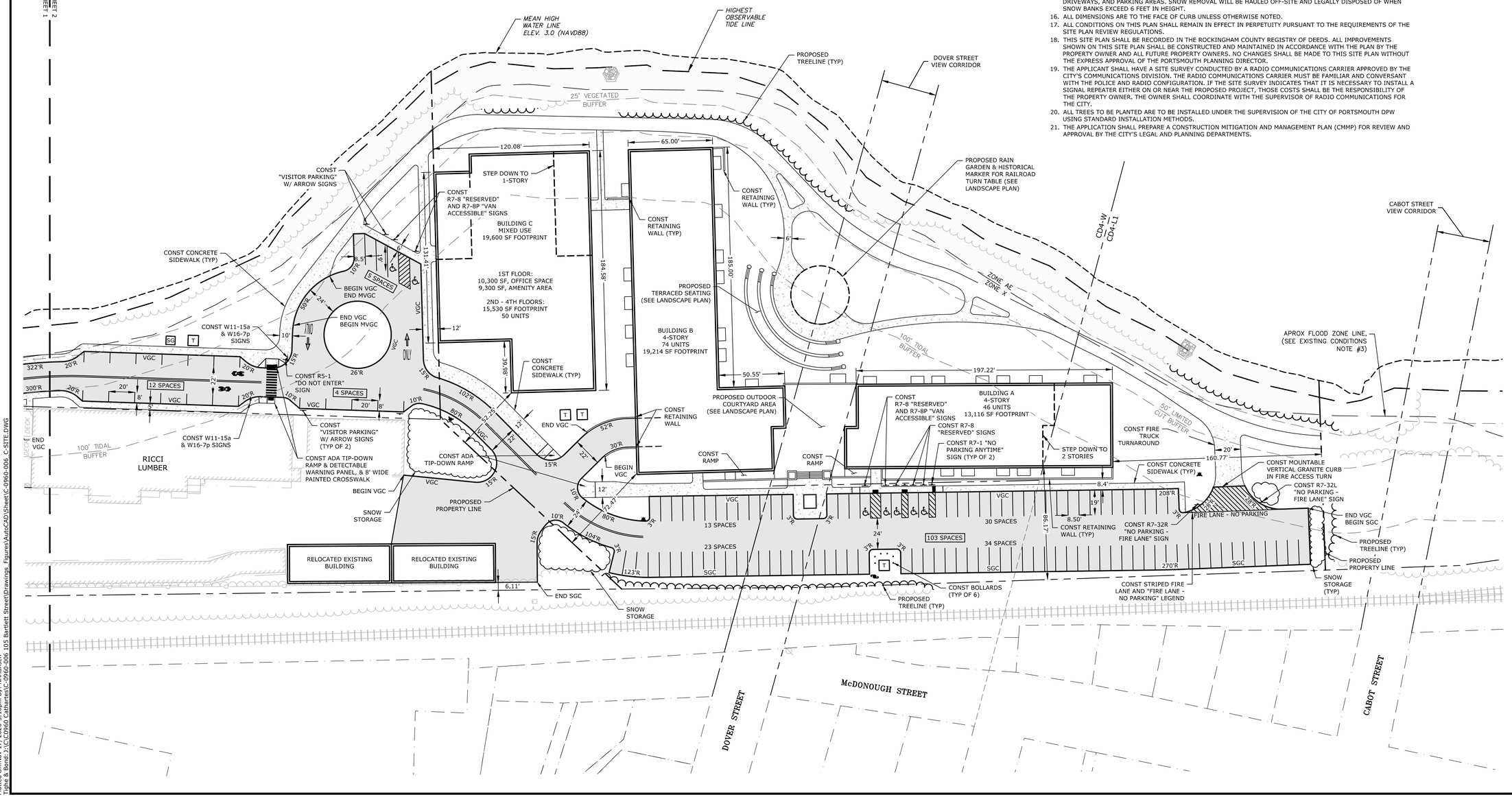

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DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

SITE PLAN

SCALE: AS SHOWN

C-102.2

Tighe&Bond

STATE OF NEW HAMPSHIRE – BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER 11-18-20

STATE OF NEW HAMPSHIRE – PATRICK M. CROMWELL No. 7970 LICENSED PROFESSIONAL SURVEYOR 11-18-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

Last Saved: 11/16/2020
Plotted: Monday, November 23, 2020, 3:16pm By: NAHanson
Tighe & Bond J:\C\C0960 Catharles\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

LEGEND

	PROPERTY LINE
	PROPOSED PROPERTY LINE
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	PROPOSED CURB
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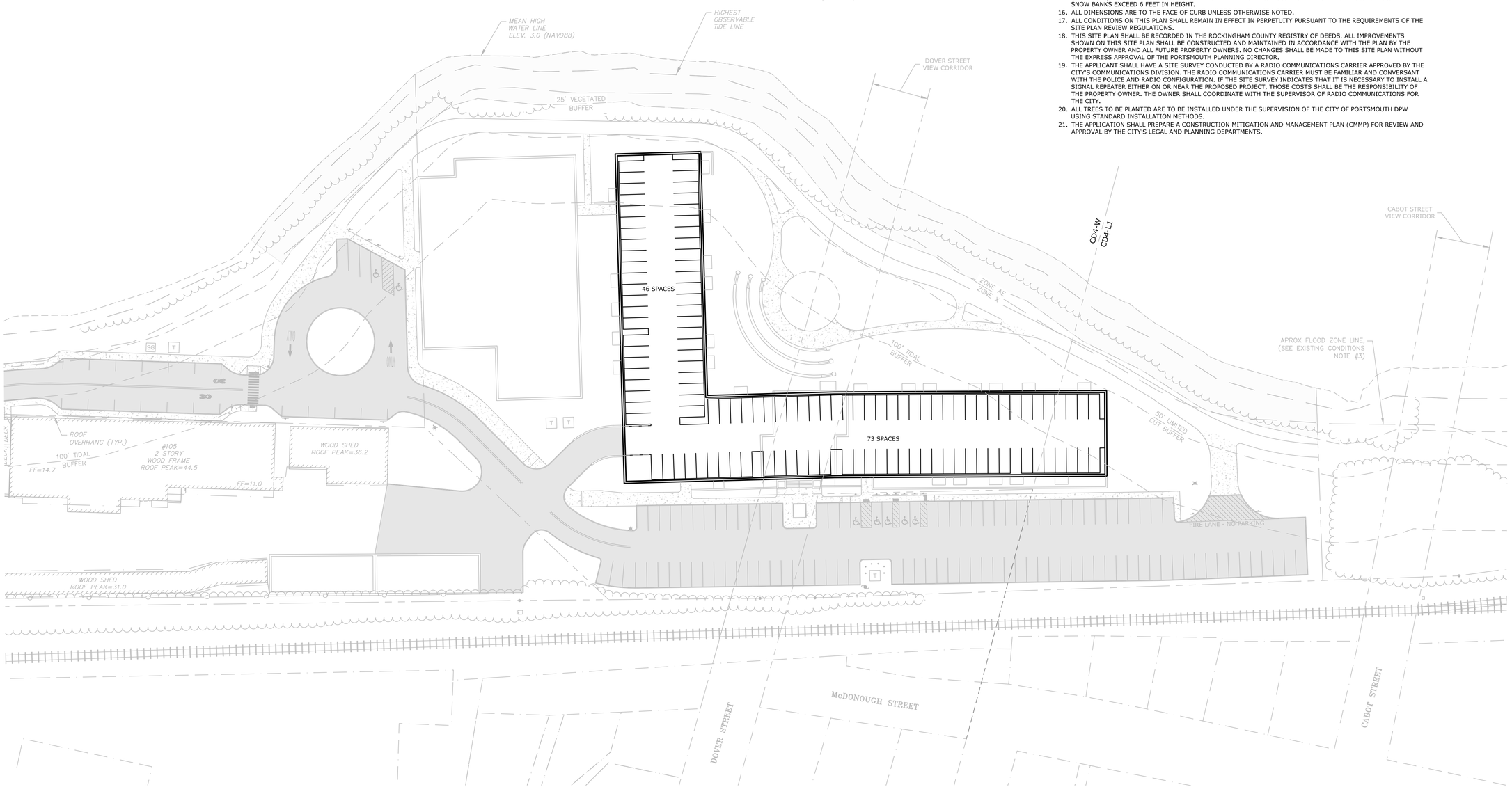

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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: 11/16/2020
Plotted: Nov 17, 2020 - 2:17pm By: NAHansen
Tighe & Bond: J:\C\C0960 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.
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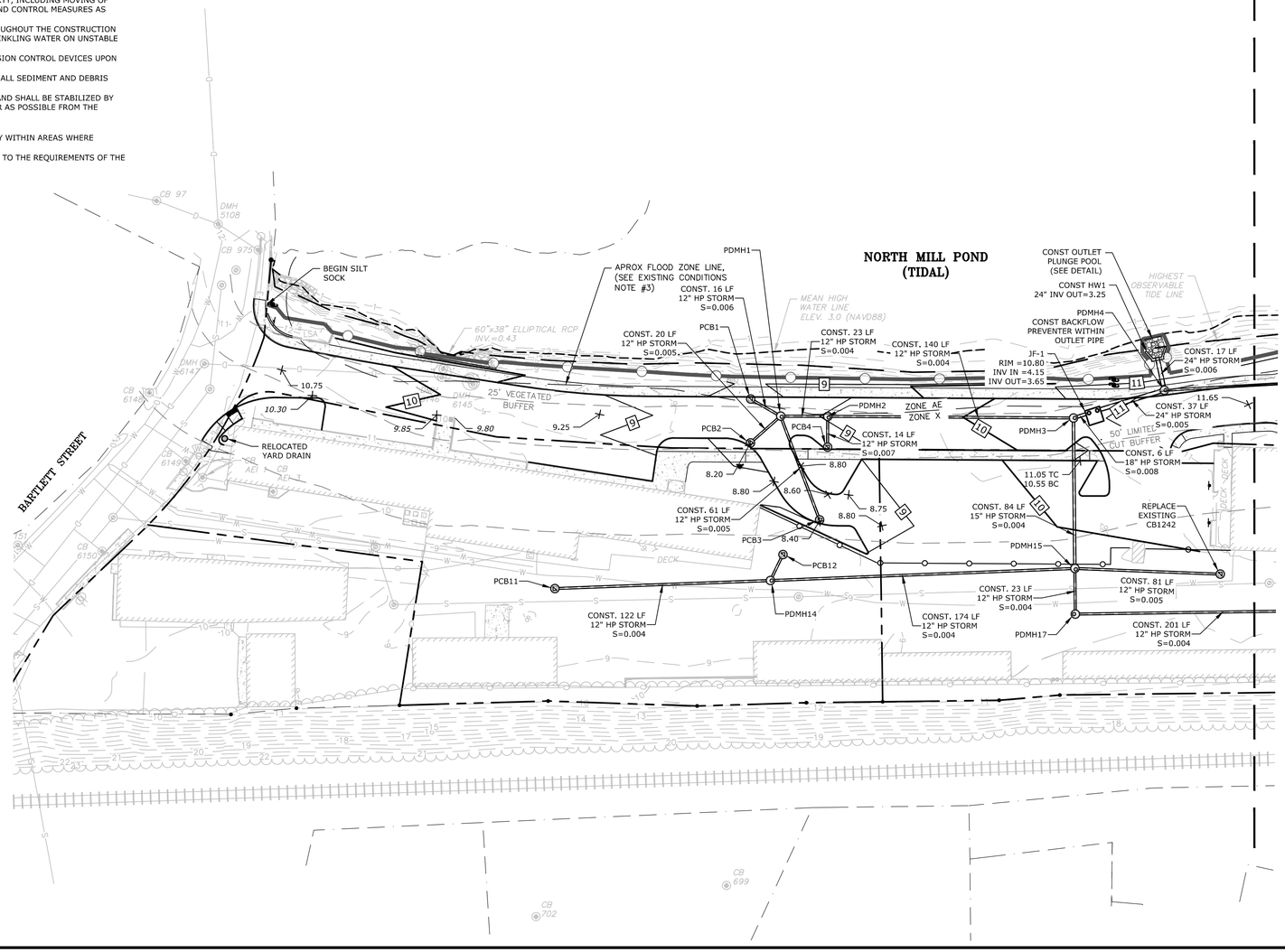
10. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
11. ALL CATCH BASIN SUMPS AND PIPING SHALL BE THOROUGHLY CLEANED TO REMOVE ALL SEDIMENT AND DEBRIS AFTER THE PROJECT HAS BEEN FULLY PAVED.
12. TEMPORARY SOIL STOCKPILE SHALL 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

DRAINAGE STRUCTURE TABLE

CB1242 RIM=9.30 INV.OUT=5.80 SW	PCB2 RIM=8.20 INV.OUT=5.30 N	PCB7 RIM=10.50 INV.OUT=7.50 NW	PCB12 RIM=8.60 INV.OUT=5.45 S	PDMH5 RIM=11.30 INV.IN=5.05 NE INV.OUT=4.95 SW	PDMH10 RIM=14.50 INV.IN=4.60 SE INV.OUT=4.60 NW INV.OUT=6.80 SW	PDMH15 RIM=9.60 INV.IN=5.40 SE INV.IN=5.40 NE INV.IN=4.70 SW INV.OUT=4.65 NW	POS1 RIM=10.50 INV.OUT=7.15 NE
CB1243 RIM=9.55 INV.IN=6.65 NW INV.OUT=6.55 SE	PCB3 RIM=8.40 INV.OUT=5.50 NW	PCB8 RIM=12.65 INV.OUT=8.65 NW	PDMH1 RIM=8.35 INV.IN=5.20 W INV.IN=5.20 S INV.IN=5.20 SE INV.OUT=5.10 NE	PDMH6 RIM=9.85 INV.IN=6.00 NE INV.IN=6.00 SE INV.OUT=5.90 SW	PDMH11 RIM=14.40 INV.IN=6.50 NE INV.OUT=6.40 NW	PDMH16 RIM=10.00 INV.IN=6.45 NE INV.IN=6.45 NW INV.OUT=6.35 SW	PYD1 RIM=12.50 INV.OUT=7.70 N
CB1244 RIM=10.00 INV.OUT=6.85 SW	PCB4 RIM=8.70 INV.OUT=5.10 NW	PCB9 RIM=12.15 INV.OUT=9.15 NW	PDMH2 RIM=9.05 INV.IN=5.00 SW INV.IN=5.00 SE INV.OUT=4.90 NE	PDMH7 RIM=11.90 INV.IN=6.60 NW INV.OUT=6.50 SE	PDMH12 RIM=13.50 INV.IN=4.60 SE INV.OUT=4.50 N	PDMH17 RIM=9.70 INV.IN=5.60 NE INV.OUT=5.50 NW	PYD2 RIM=12.30 INV.IN=7.50 S INV.OUT=7.40 NE
CB1264 RIM=9.50 INV.OUT=6.50 NE	PCB5 RIM=9.60 INV.OUT=6.10 NW	PCB10 RIM=11.55 INV.OUT=8.55 SE	PDMH3 RIM=10.50 INV.IN=4.30 SE INV.IN=4.30 SW INV.OUT=4.20 NE	PDMH8 RIM=11.00 INV.IN=6.25 NW INV.IN=6.25 SE INV.OUT=6.15 NE	PDMH13 RIM=12.85 INV.IN=4.00 S INV.IN=5.00 SW INV.IN=3.80 SE INV.OUT=3.70 N	PDMH18 RIM=15.50 INV.IN=11.50 NE INV.IN=11.50 SW INV.OUT=11.40 NW	PYD3 RIM=11.00 INV.IN=7.10 SW INV.OUT=7.00 NE
PCB1 RIM=8.25 INV.OUT=5.30 E	PCB6 RIM=9.80 INV.OUT=6.30 SW	PCB11 RIM=8.60 INV.OUT=5.80 NE	PDMH4 RIM=11.75 INV.IN=3.45 SW INV.IN=4.30 NE INV.OUT=3.35 NW	PDMH9 RIM=12.85 INV.IN=8.20 NW INV.IN=8.20 SE INV.OUT=8.10 SW	PDMH14 RIM=8.75 INV.IN=5.35 SW INV.IN=5.35 N INV.OUT=5.35 NE	PDMH19 RIM=16.30 INV.IN=9.00 SE INV.IN=6.00 SW INV.OUT=5.80 NW	



0 40' 80'

GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

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DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103.1

Last Saved: 11/16/2020
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LEGEND

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TYP	TYPICAL
COORD	COORDINATE
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DRAINAGE STRUCTURE TABLE

CB1242
RIM=9.30
INV.OUT=5.80 SW

CB1243
RIM=9.55
INV.IN=6.65 NW
INV.OUT=6.55 SE

CB1244
RIM=10.00
INV.OUT=6.85 SW

CB1264
RIM=9.50
INV.OUT=6.50 NE

PCB1
RIM=8.25
INV.OUT=5.30 E

PCB2
RIM=8.20
INV.OUT=5.30 N

PCB3
RIM=8.40
INV.OUT=5.50 NW

PCB4
RIM=8.70
INV.OUT=5.10 NW

PCB5
RIM=9.60
INV.OUT=6.10 NW

PCB6
RIM=9.80
INV.OUT=6.30 SW

PCB7
RIM=10.50
INV.OUT=7.50 NW

PCB8
RIM=12.65
INV.OUT=8.65 NW

PCB9
RIM=12.15
INV.OUT=9.15 NW

PCB10
RIM=11.55
INV.OUT=8.55 SE

PCB11
RIM=8.60
INV.OUT=5.80 NE

PCB12
RIM=8.60
INV.OUT=5.45 S

PDMH1
RIM=8.35
INV.IN=5.20 W
INV.IN=5.20 S
INV.IN=5.20 SE
INV.OUT=5.10 NE

PDMH2
RIM=9.05
INV.IN=5.00 SW
INV.IN=5.00 SE
INV.OUT=4.90 NE

PDMH3
RIM=10.50
INV.IN=4.30 SE
INV.IN=4.30 SW
INV.OUT=4.20 NE

PDMH4
RIM=11.75
INV.IN=3.45 SW
INV.IN=4.30 NE
INV.OUT=3.35 NW

PDMH5
RIM=11.30
INV.IN=5.05 NE
INV.OUT=4.95 SW

PDMH6
RIM=9.85
INV.IN=6.00 NE
INV.IN=6.00 SE
INV.OUT=5.90 SW

PDMH7
RIM=11.90
INV.IN=6.60 NW
INV.OUT=6.50 SE

PDMH8
RIM=11.00
INV.IN=6.25 NW
INV.IN=6.25 SE
INV.IN=6.25 SW
INV.OUT=6.15 NE

PDMH9
RIM=12.85
INV.IN=8.20 NW
INV.IN=8.20 SE
INV.OUT=8.10 SW

PDMH10
RIM=14.50
INV.IN=4.60 SE
INV.OUT=4.60 NW
INV.OUT=6.80 SW

PDMH11
RIM=14.40
INV.IN=6.50 NE
INV.OUT=6.40 NW

PDMH12
RIM=13.50
INV.IN=4.60 SE
INV.OUT=4.50 N

PDMH13
RIM=12.85
INV.IN=4.00 S
INV.IN=5.00 SW
INV.IN=3.80 SE
INV.OUT=3.70 N

PDMH14
RIM=8.75
INV.IN=5.35 SW
INV.IN=5.35 N
INV.OUT=5.35 NE

PDMH15
RIM=9.60
INV.IN=5.40 SE
INV.IN=5.40 NE
INV.IN=4.70 SW
INV.OUT=4.65 NW

PDMH16
RIM=10.00
INV.IN=6.45 NE
INV.IN=6.45 NW
INV.OUT=6.35 SW

PDMH17
RIM=9.70
INV.IN=5.60 NE
INV.OUT=5.50 NW

PDMH18
RIM=15.50
INV.IN=11.50 NE
INV.IN=11.50 SW
INV.OUT=11.40 NW

PDMH19
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INV.IN=9.00 SE
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PYD1
RIM=12.50
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PYD2
RIM=12.30
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INV.OUT=7.40 NE

PYD3
RIM=11.00
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GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

BELOW PAVED OR CONCRETE AREAS	95%
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BELOW LOAM AND SEED AREAS	90%

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13. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.

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1. INSTALL EROSION CONTROL BARRIERS AS SHOWN AS FIRST ORDER OF WORK.
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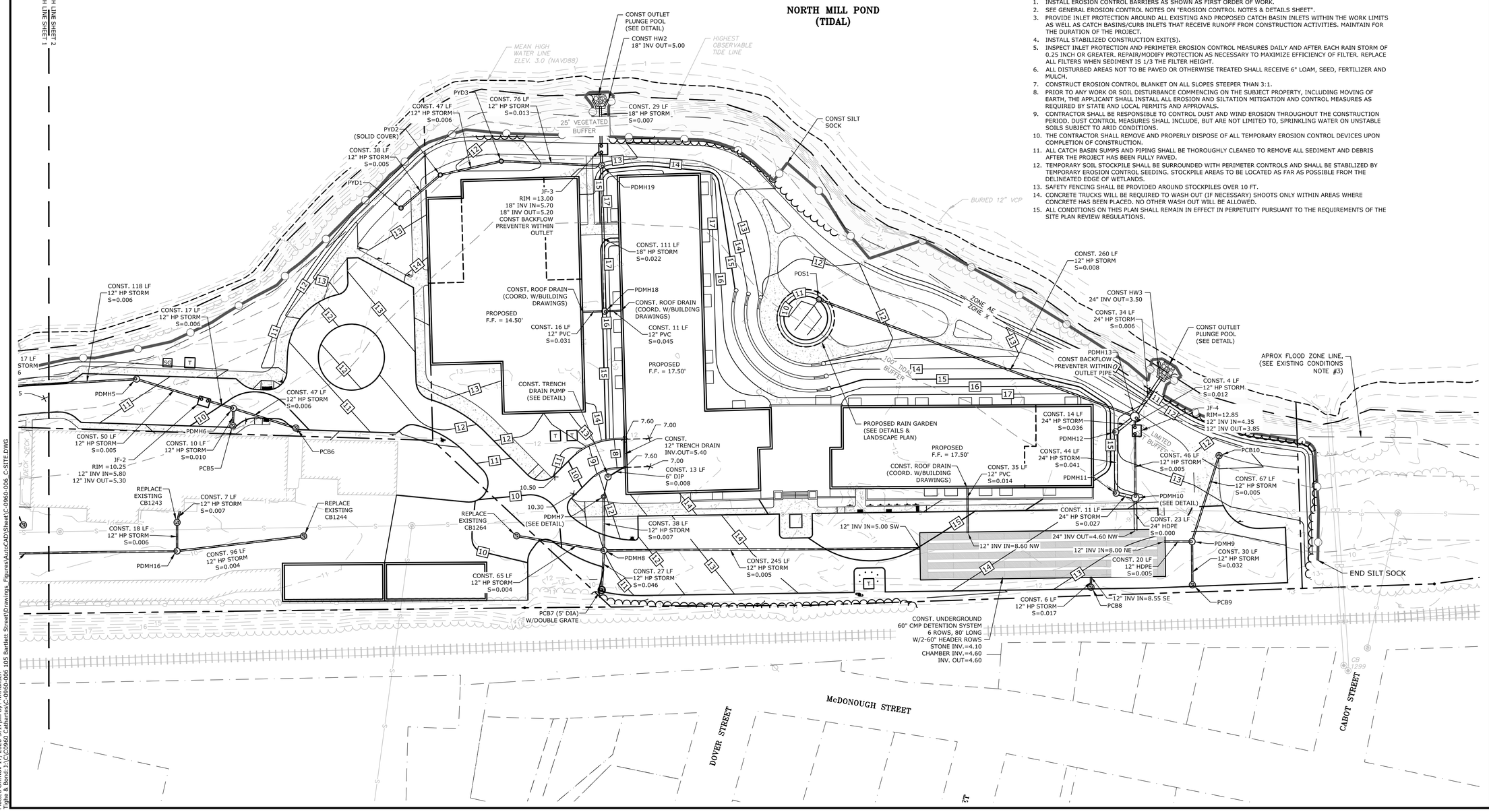

MATCH LINE SHEET 2
MATCH LINE SHEET 1

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Tighe&Bond

BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
11-16-20

PATRICK M. CUMMINS No. 19670 LICENSED PROFESSIONAL LAND SURVEYOR STATE OF NEW HAMPSHIRE
11/18/2020

0 40' 80'
GRAPHIC SCALE

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APPROVED:	BML

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

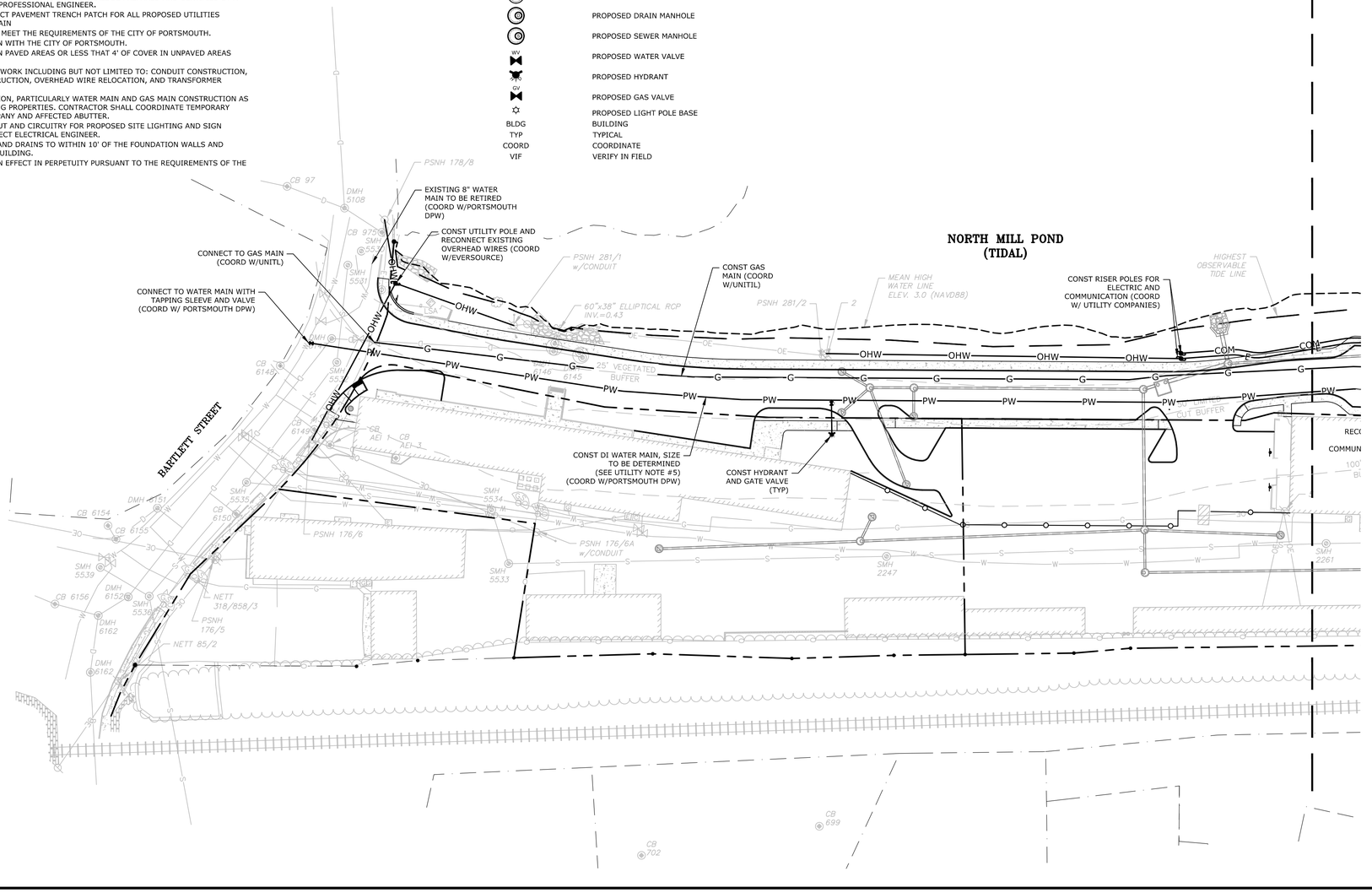
C-103.2

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



Tighe&Bond

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
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E	5/20/2020	TAC Resubmission
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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

UTILITIES PLAN

SCALE: AS SHOWN

C-104.1

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
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WV	PROPOSED WATER VALVE
	PROPOSED HYDRANT
GV	PROPOSED GAS VALVE
	PROPOSED LIGHT POLE BASE
BLDG	BUILDING
TYP	TYPICAL
COORD	COORDINATE
VIF	VERIFY IN FIELD

MATCH LINE SHEET 2
MATCH LINE SHEET 1

NORTH MILL POND (TIDAL)

MEAN HIGH WATER LINE ELEV. 3.0 (NAVD88)
HIGHEST OBSERVABLE TIDE LINE
25' VEGETATED BUFFER
100' TIDAL BUFFER
100' LIMITED BUFFER
BURIED 12" VCP
CONST ELECTRIC CONDUIT (COORD W/EVERSOURCE)
CONST COMMUNICATION CONDUIT (COORD W/UTILITY COMPANIES)
CONST HAND HOLE (COORD W/UTILITY COMPANIES)
CONST SWITCH GEAR (COORD W/EVERSOURCE)
CONST 3 PHASE TRANSFORMER (COORD W/EVERSOURCE)
CONST ELECTRIC CONDUIT (COORD W/EVERSOURCE)
PSMH1 RIM=13.20 INV IN=7.20 W/INSIDE DROP INV OUT=2.75
CONST SEWER CONNECTION 57 LF, 8" PVC SDR 35 S=0.020, INV=8.35 (COORD W/BUILDING DWGS)
CONST FIRE AND DOMESTIC WATER SERVICE CONNECTIONS (COORD W/BUILDING DWGS, FIRE DEPT & DPW)
CONST GAS CONNECTION (COORD W/UNITIL & BUILDING DWGS)
CONST ELECTRIC AND COMMUNICATION CONNECTIONS (COORD W/BUILDING DWGS & UTILITY COMPANIES)
CONST 3 PHASE TRANSFORMER (TYP OF 2) (COORD W/EVERSOURCE)
CONST 73 LF 8"PVC SDR 35 S = 0.004
RECONNECT EXISTING ELECTRIC AND COMMUNICATION SERVICE
CONST HYDRANT AND GATE VALVE (TYP)
PSMH2 RIM=11.60 INV IN=2.45 INV OUT=2.35
CONST 153 LF 8"PVC SDR 35 S = 0.005
CONST 40 LF 8"PVC SDR 35 S = 0.005
CONNECT TO EXISTING SEWER AT MAIN INV=2.15 (VIF)
CONST HAND HOLE (COORD W/UTILITY COMPANIES)
CONST DI WATER MAIN, SIZE TO BE DETERMINED (SEE UTILITY NOTE #5) (COORD W/PORTSMOUTH DPW)
CONST GAS MAIN (COORD W/UNITIL)
PSMH3 RIM=12.00 INV IN=5.00 W/INSIDE DROP INV OUT=3.15
CONST SEWER CONNECTION 6 LF, 8" PVC SDR 35 S=0.025, INV=5.15 (COORD W/BUILDING DWGS)
CONST FIRE AND DOMESTIC WATER SERVICE CONNECTIONS (COORD W/BUILDING DWGS, FIRE DEPT & DPW)
CONST GAS CONNECTION (COORD W/UNITIL & BUILDING DWGS)
CONST HYDRANT AND GATE VALVE (TYP)
CONST ELECTRIC MANHOLE (COORD W/EVERSOURCE)
CONST ELECTRIC AND COMMUNICATION CONNECTIONS (COORD W/BUILDING DWGS & UTILITY COMPANIES)
CONST FIRE AND DOMESTIC WATER SERVICE CONNECTIONS (COORD W/BUILDING DWGS, FIRE DEPT & DPW)
CONST SEWER CONNECTION 5 LF, 8" PVC SDR 35 S=0.033, INV=5.60 (COORD W/BUILDING DWGS)
CONST GAS CONNECTION (COORD W/UNITIL & BUILDING DWGS)
CONST 23 LF 8"PVC SDR 35 S = 0.005
PSMH4 RIM=12.50 INV IN=5.50 INV OUT=5.40
CONST HYDRANT AND GATE VALVE (TYP)
CONNECT TO EXISTING BRICK SEWER WITH INSERTA TEE CONNECTION INV=3.50 (VIF)
CONST GAS MAIN CAP AND VALVE (COORD W/UNITIL)
CONST WATER MAIN VALVE AND CAP (COORD W/PORTSMOUTH DPW)
CONST COMMUNICATION CONDUIT (COORD W/UTILITY COMPANIES)
CONST TEE W/VALVES, 8" MAIN TO DOVER STREET (COORD W/PORTSMOUTH DPW)
CONNECT TO 8" MAIN AT END OF DOVER STREET (COORD W/PORTSMOUTH DPW)
CONST UTILITY POLE AND OVERHEAD WIRE TO EXISTING POLE AT END OF DOVER STREET (COORD W/EVERSOURCE)
CONST 3 PHASE TRANSFORMER (COORD W/EVERSOURCE)
SMH 2261
SMH 2260
SMH 5453
SMH 5454
CB 1299
DOVER STREET
McDONOUGH STREET
CABOT STREET

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.
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Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MEZQUITA No. 08838 — LICENSED PROFESSIONAL ENGINEER — 11/18/20

PATRICK M. CRIMMINS No. 12078 — LICENSED LAND SURVEYOR — 11-18-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

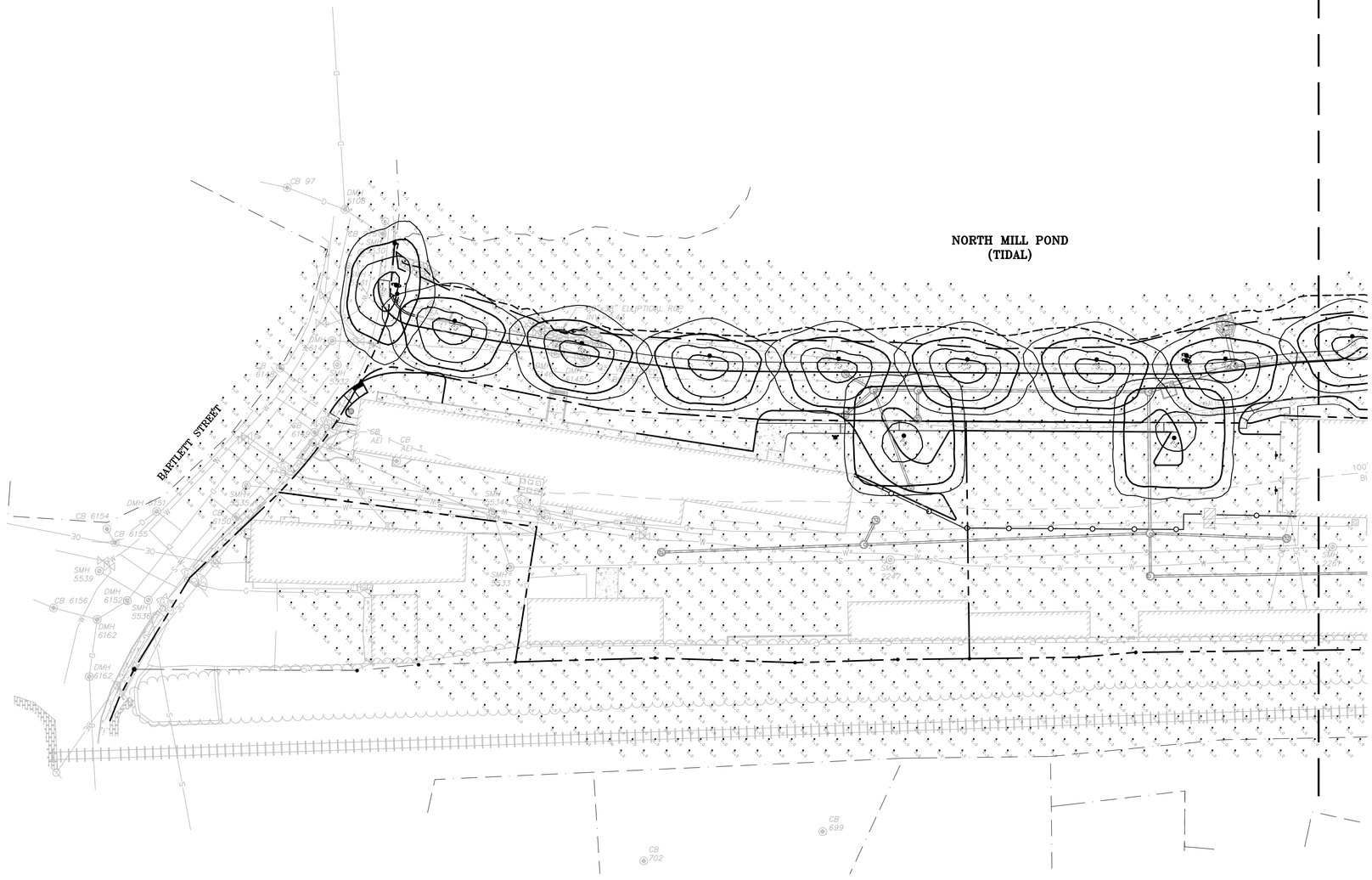
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

UTILITIES PLAN

SCALE: AS SHOWN

C-104.2

Last Saved: 11/16/2020
Plotted: Nov 17, 2020 - 3:17pm By: NAHansen
Tighe & Bond: J:\CV\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG



StatArea_1
LARGE, MAIN PARKING LOT AREA ONLY
Illuminance (Fc)
Average = 0.87
Maximum = 3.6
Minimum = 0.0
Avg/Min Ratio = N.A.
Max/Min Ratio = N.A.

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Description	CRI	Lum. Lumens	[MANUFAC]
⊙	9	B	SINGLE	CAV414-LT-WA-20W3K-U-5-N-BK	80	1775	Pemco Lighting Products Inc.
●	25	P3	SINGLE	SOUTH-NL-40W3K-U-3-N-BK/ POLE STYLE TBD	85	4126	PEMCO
●	4	P5	SINGLE	SOUTH-NL-40W3K-U-5-N-BK/ POLE STYLE TBD	85	4209	PEMCO
⊙	9	W	SINGLE	CMPRD-E-C3-2X20-U-CXX / WALL MTD 15' AFG	80	4518	PEMCO
▯	2	W1	SINGLE	ISS-AF-600-LED-E1-SL4/ WALL MTD 15' AFG	70	3535	EATON - McGRAW-EDISON (FORMER COOPER LIG

Tighe&Bond

BRADLEE MEZQUITA No. 08830
11-18-20

PATRICK M. CRIMMINS No. 12378
11-18-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

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Portsmouth,
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PHOTOMETRIC PLAN

SCALE: AS SHOWN

C-105.1

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Tighe&Bond

StatArea_1
LARGE, MAIN PARKING LOT AREA ONLY
Illuminance (Fc)
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Maximum = 3.6
Minimum = 0.0
Avg/Min Ratio = N.A.
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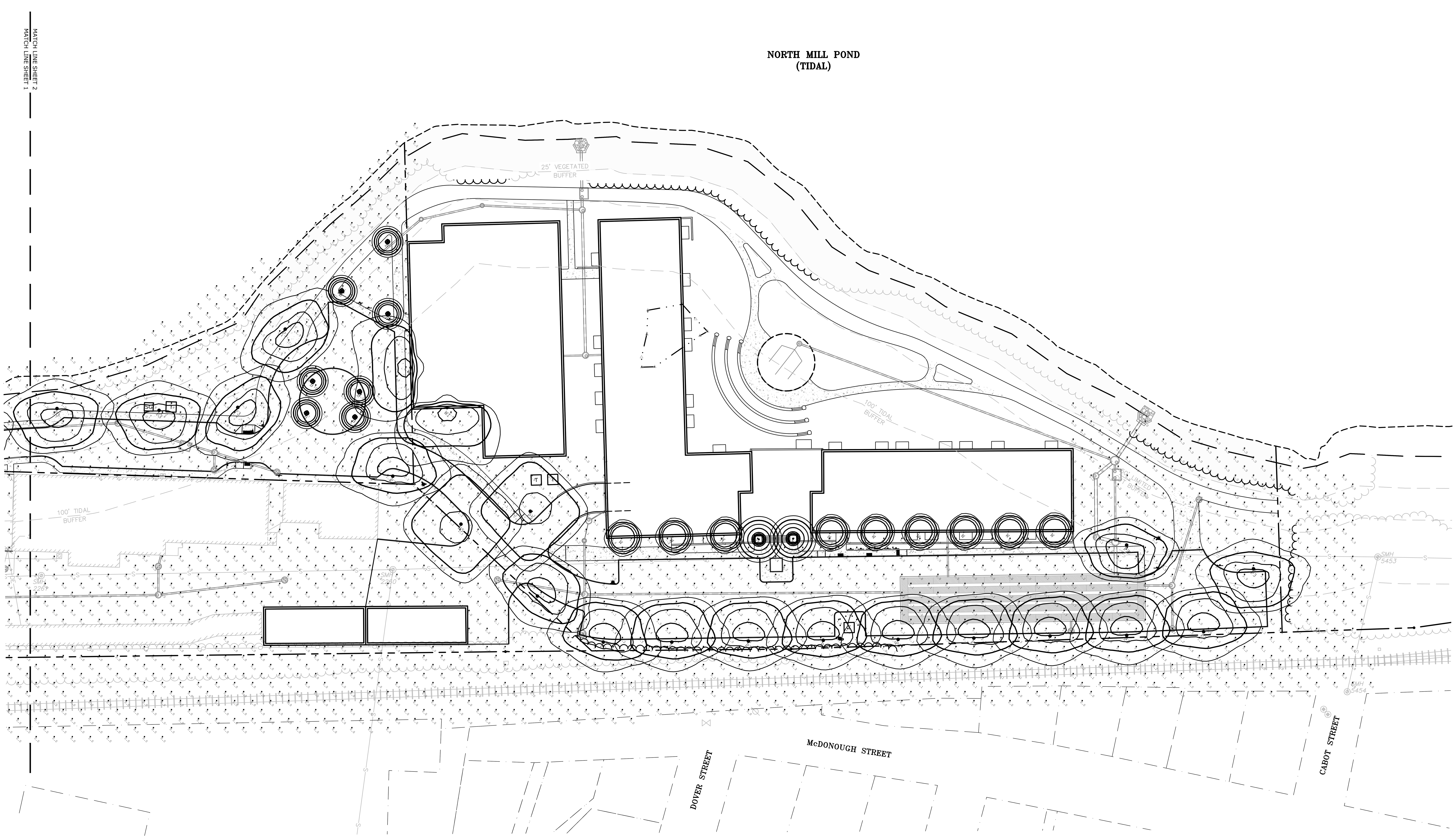

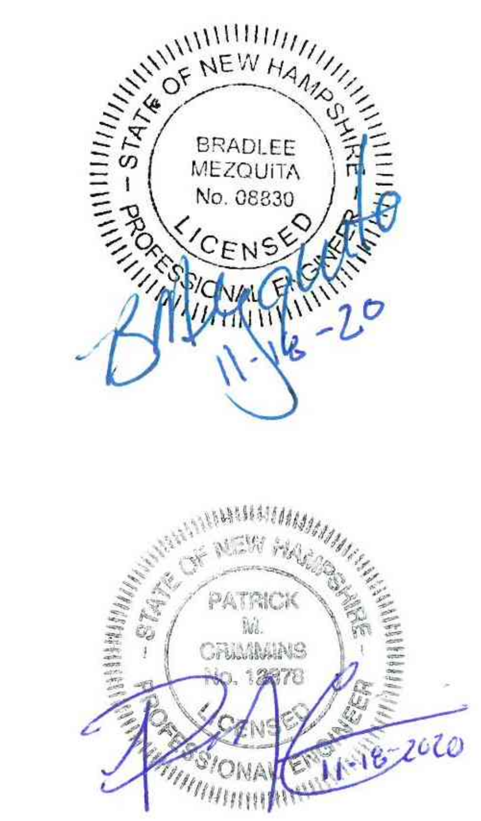

0 40' 80'
GRAPHIC SCALE

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SCALE: AS SHOWN

C-105.2

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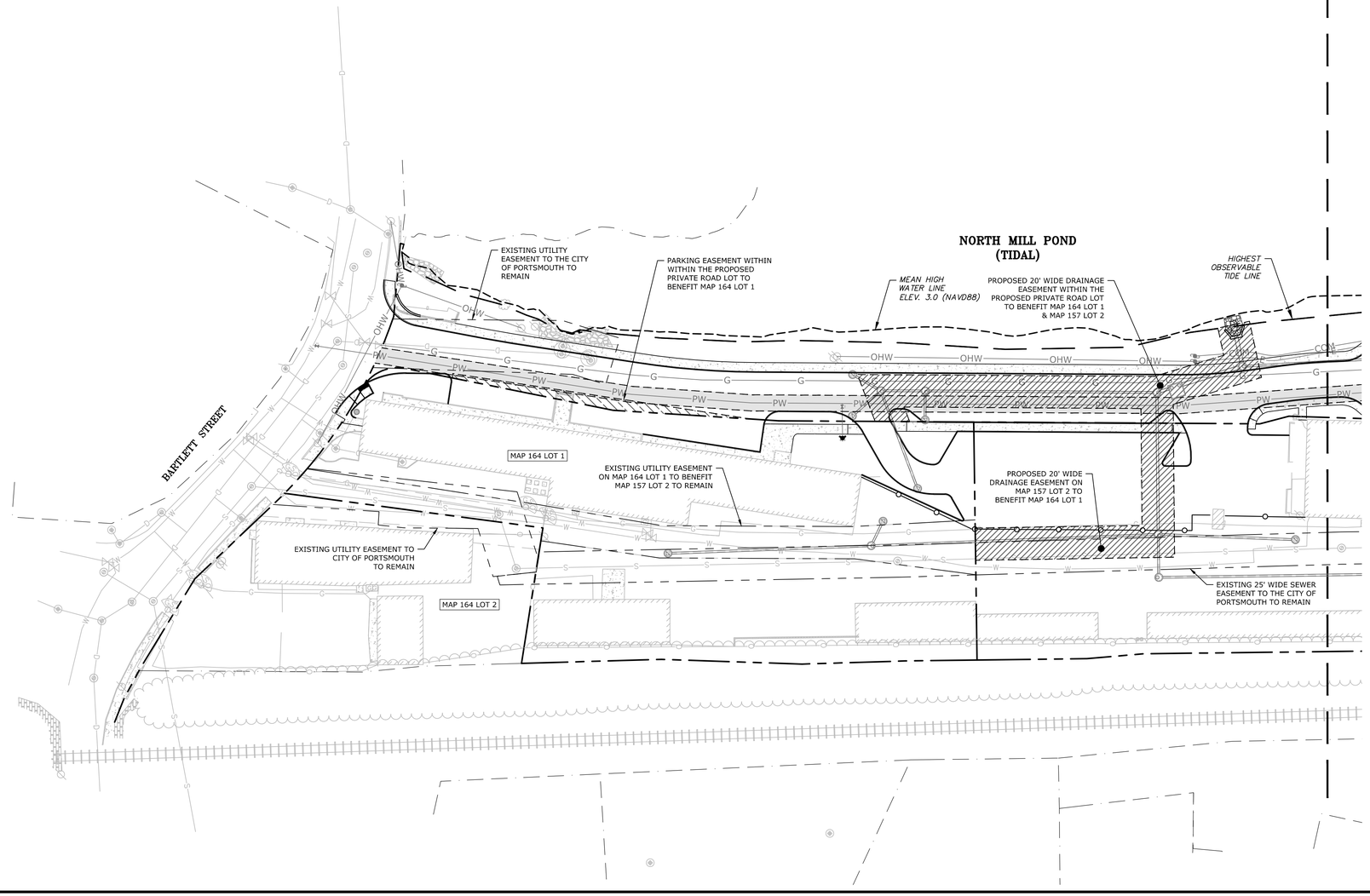
LEGEND

- PROPOSED SEWER EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED PARKING EASEMENT
- PROPOSED WATER EASEMENT
- PROPOSED COMMUNITY SPACE 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.



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GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
BRADLEE MEZQUITA
No. 06830
LICENSED
PROFESSIONAL ENGINEER
11-18-20

STATE OF NEW HAMPSHIRE
PATRICK M. CRIMMINS
No. 15670
PROFESSIONAL ENGINEER
11-18-2020

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EASEMENT PLAN

SCALE: AS SHOWN

C-301.1

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' COMMUNITY SPACE EASEMENT TO BENEFIT THE CITY OF PORTSMOUTH WITHIN TAX MAP 157 LOT 1

PROPOSED WATER EASEMENT TO THE CITY OF PORTSMOUTH WITHIN THE PROPOSED PRIVATE ROAD LOT

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

MAP 157 LOT 2

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

EXISTING 20' WIDE PRIVATE SEWER EASEMENT TO REMAIN

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

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

PROPOSED DRAINAGE EASEMENT TO BENEFIT MAP 157 LOT 2

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

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

McDONOUGH STREET

DOVER STREET

CABOT STREET

LEGEND

- PROPOSED SEWER EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED PARKING EASEMENT
- PROPOSED WATER EASEMENT
- PROPOSED COMMUNITY SPACE 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 – PROFESSIONAL ENGINEER – BRADLEE MEZOUITA No. 08830 LICENSED 11-18-20

STATE OF NEW HAMPSHIRE – PATRICK M. CUMMINS No. 13970 LICENSED PROFESSIONAL SURVEYOR 11-18-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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

EASEMENT PLAN

SCALE: AS SHOWN

C-301.2

Last Saved: 11/16/2020
Plotted: Nov 17, 2020 - 2:18pm By: NAHansen
Tighe & Bond J:\CV\C0960 Catharties\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. SEE LANDSCAPE PLAN FOR SEEDBED PREPARATION REQUIREMENTS;
   B. SEEDING:
      a. SEE LANDSCAPE PLAN FOR SEEDING REQUIREMENTS;
   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. SEE LANDSCAPE PLAN FOR PERMANENT MEASURES AND PLANTINGS:
      a. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      b. 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 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:

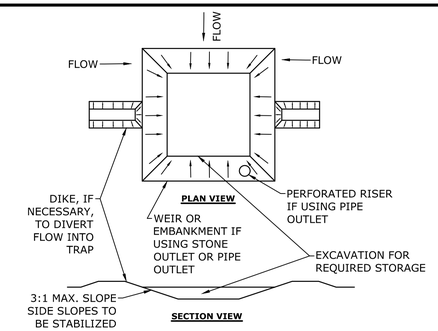
1. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING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

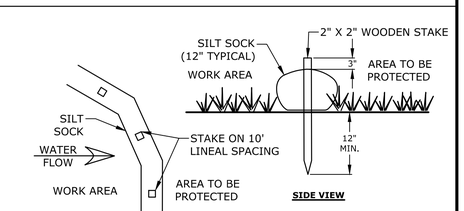
EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

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.



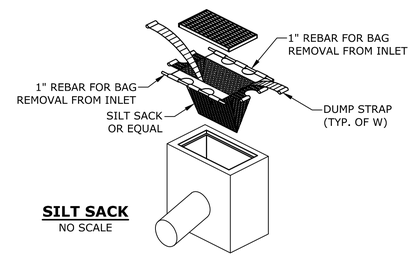
NOTES:
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING AREA TO A SINGLE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. TRAP OUTLET SHALL BE MINIMUM OF ONE 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

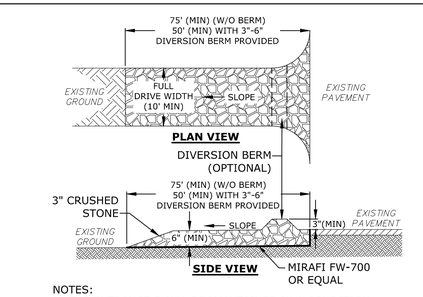


NOTES:
1. SILT SOCK SHALL BE SILT SOXX BY FILTREXX OR APPROVED EQUAL
2. INSTALL SILT SOCK IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS

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

STATE OF NEW HAMPSHIRE – BRADLEE MEZQUITA No. 08830 LICENSED PROFESSIONAL ENGINEER – 11-18-20

STATE OF NEW HAMPSHIRE – PATRICK M. CRIMMINS 19670 LICENSED PROFESSIONAL ENGINEER – 11-18-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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

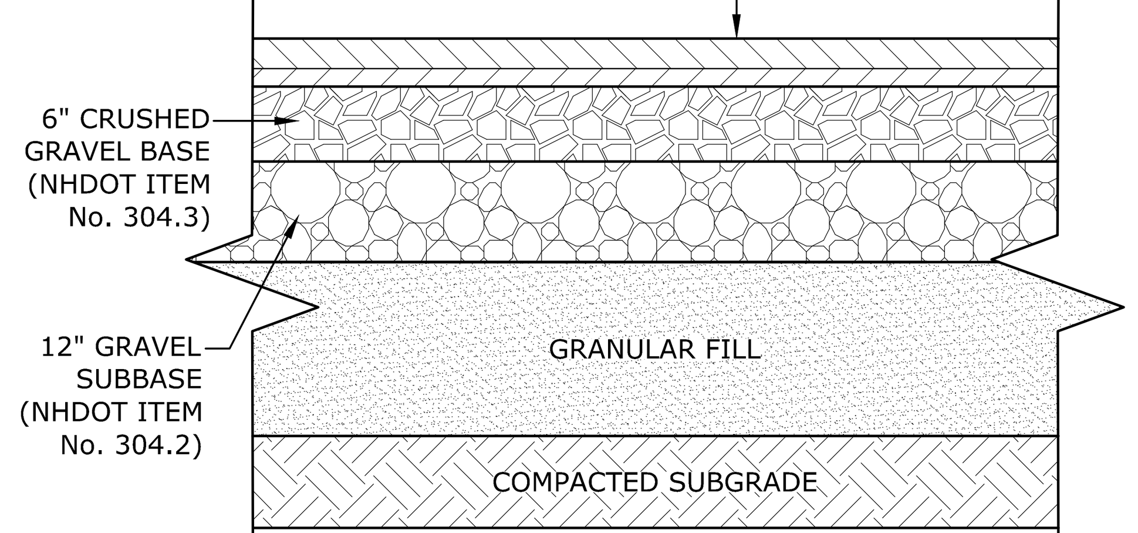
SCALE: AS SHOWN

C-501

Last Saved: 11/17/2020
Printed: 11/18/2020 - 4:05pm By: NAHansen
Tighe & Bond: J:\C0960 Cathsters\C-0960-006_105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg

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

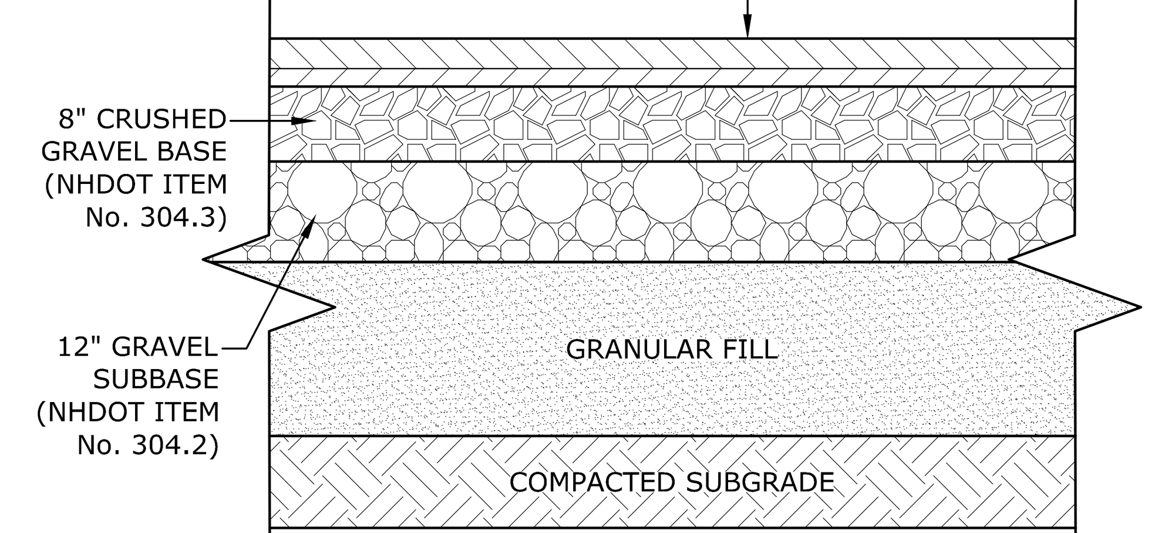


NOTES:
1. COORDINATE FINAL DESIGN SECTION WITH GEOTECHNICAL ENGINEER.
2. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
4. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.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

PARKING LOT PAVEMENT SECTION
NO SCALE

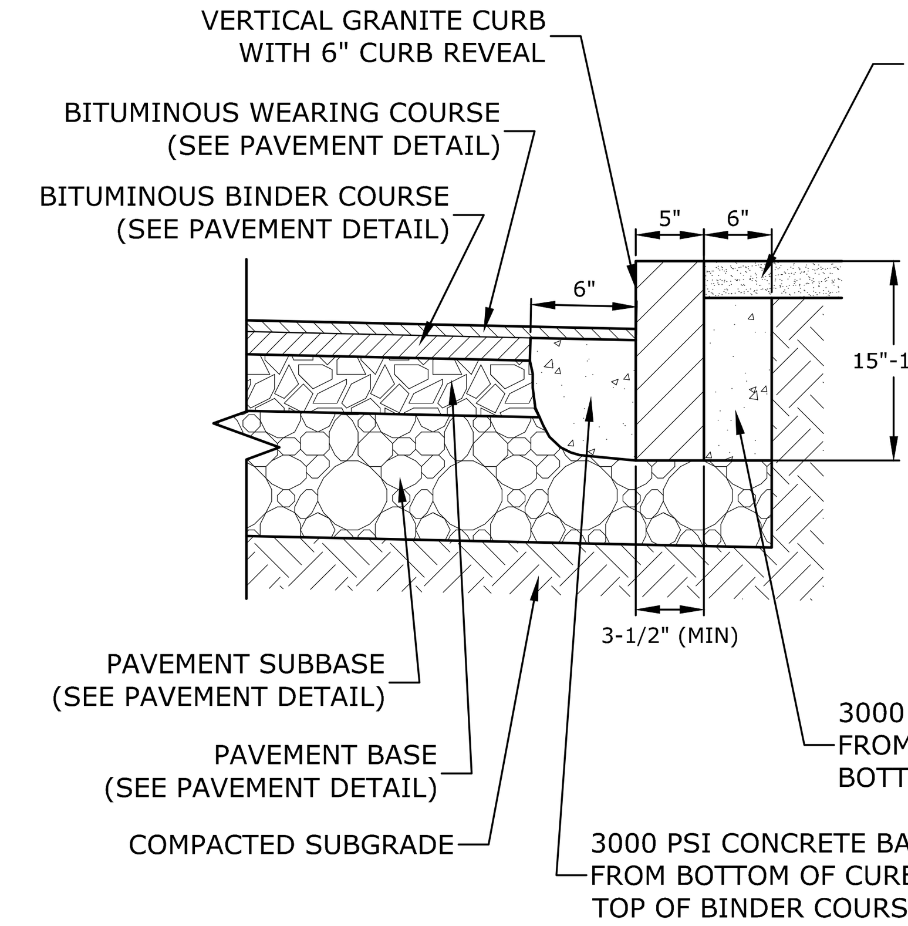
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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.

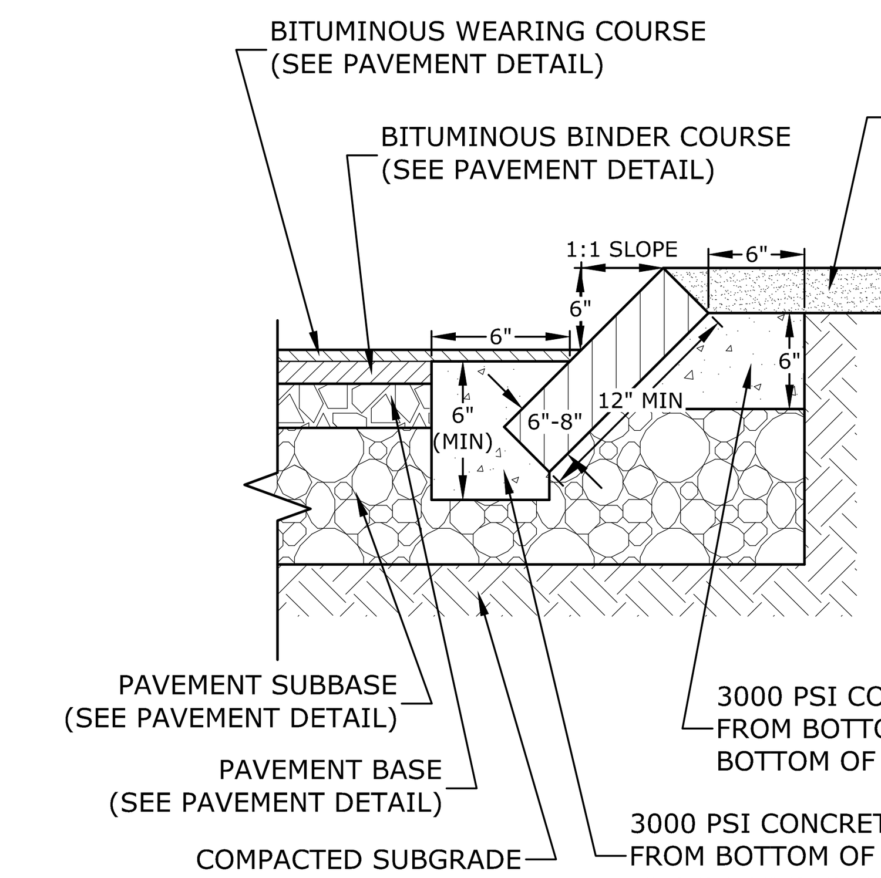
ROADWAY PAVEMENT SECTION
NO SCALE



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.

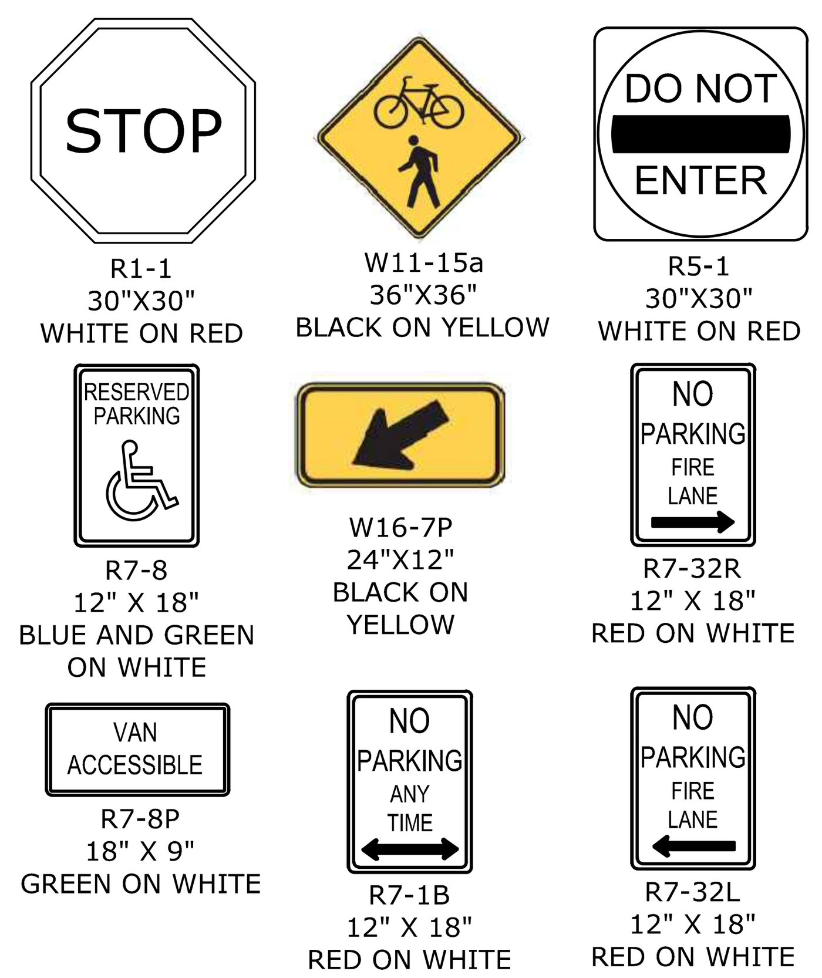
VERTICAL GRANITE CURB
NO SCALE

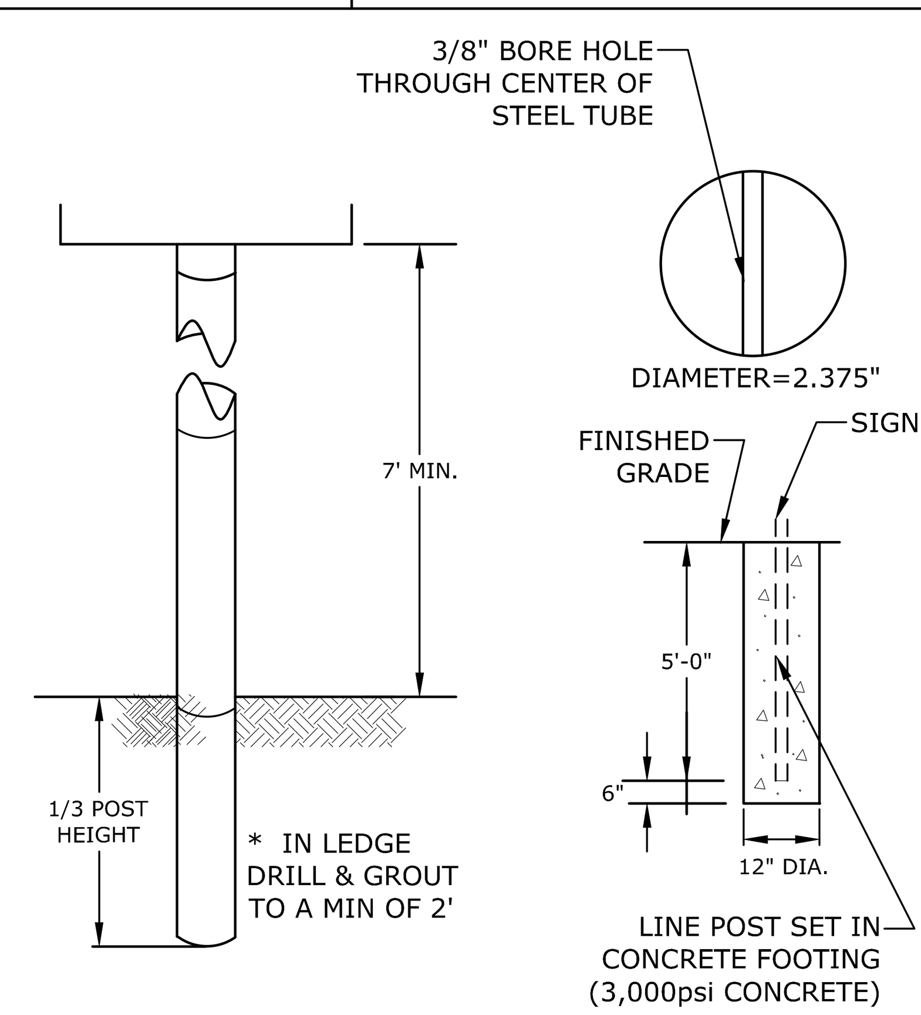


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

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.

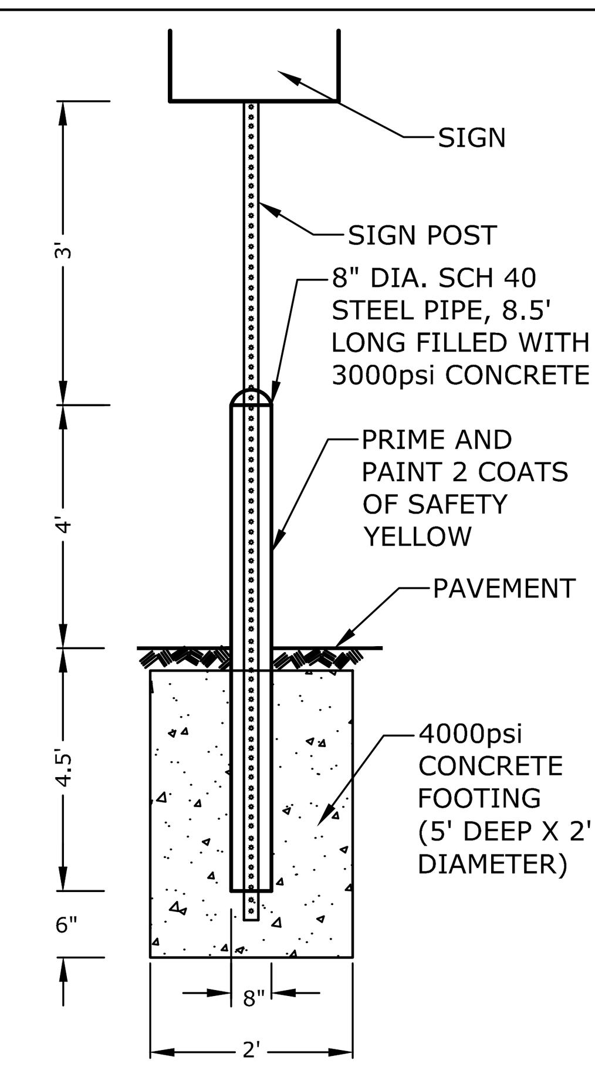
SLOPED GRANITE CURB
NO SCALE



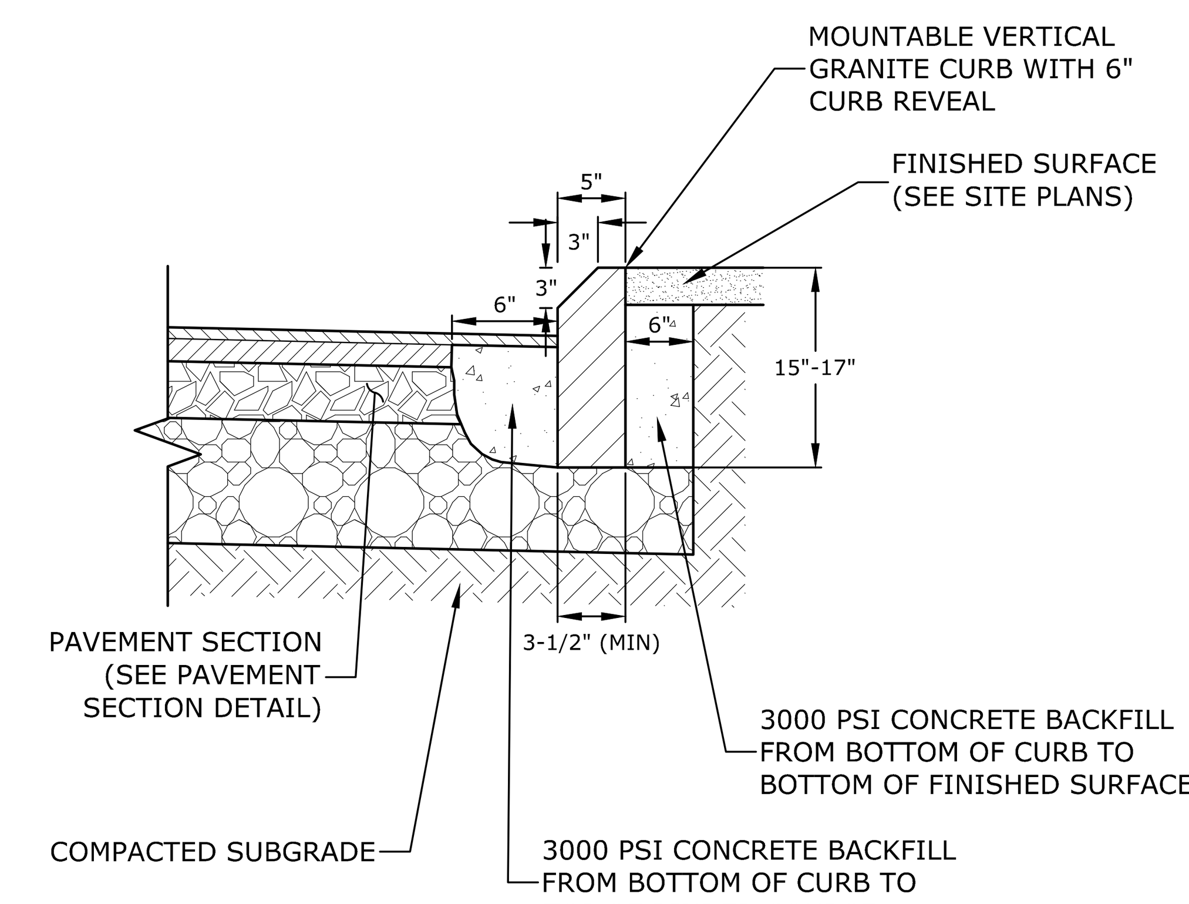


NOTES:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
FINISH: POST TO BE POWDER COATED GLOSS BLACK
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER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

SIGN LEGEND & SIGN POST
NO SCALE

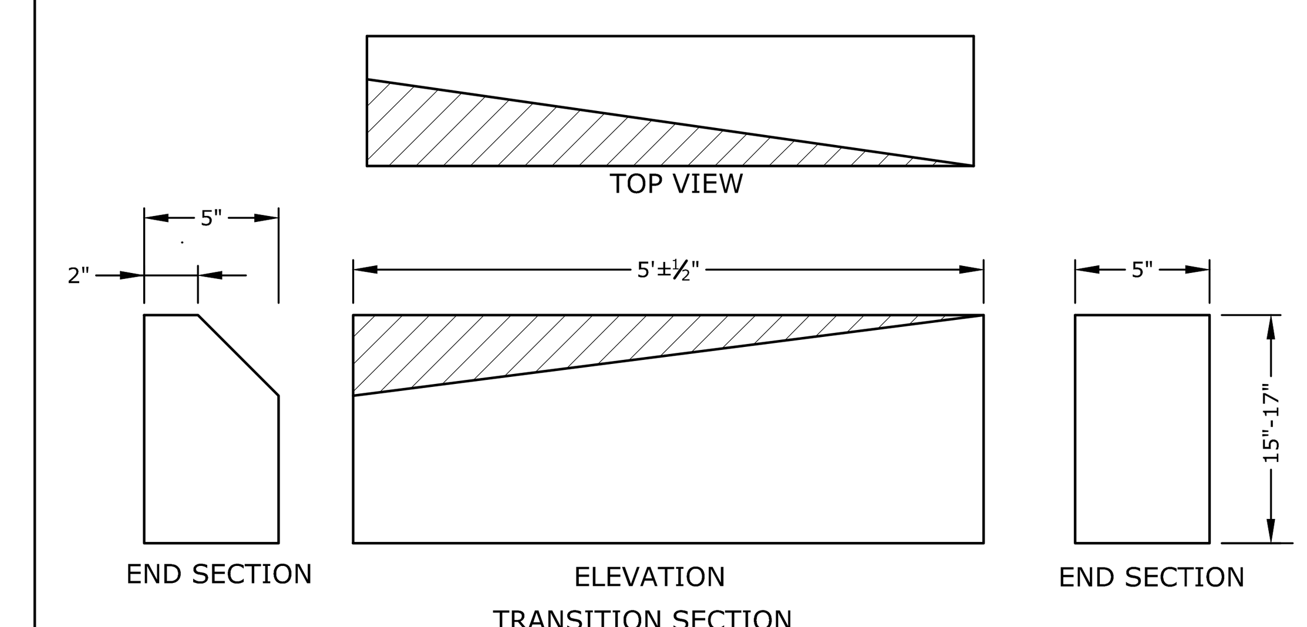


BOLLARD MOUNTED SIGN DETAIL
NO SCALE



NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF MOUNTABLE VERTICAL GRANITE CURB (MVGC).
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.

MOUNTABLE VERTICAL GRANITE CURB
NO SCALE



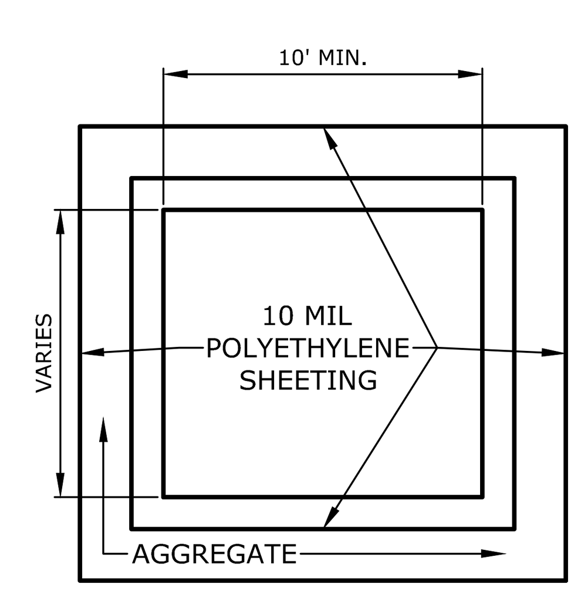
MOUNTABLE VERTICAL GRANITE CURB TO VERTICAL GRANITE CURB

NOTES:
1. THE INTENT OF THIS ITEM IS TO PROVIDE A SMOOTH TRANSITION BETWEEN VERTICAL GRANITE CURB AND MOUNTABLE VERTICAL GRANITE CURB WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION. THE MOUNTABLE VERTICAL GRANITE CURB MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SLOPE CURB TO STANDARD REVEAL AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

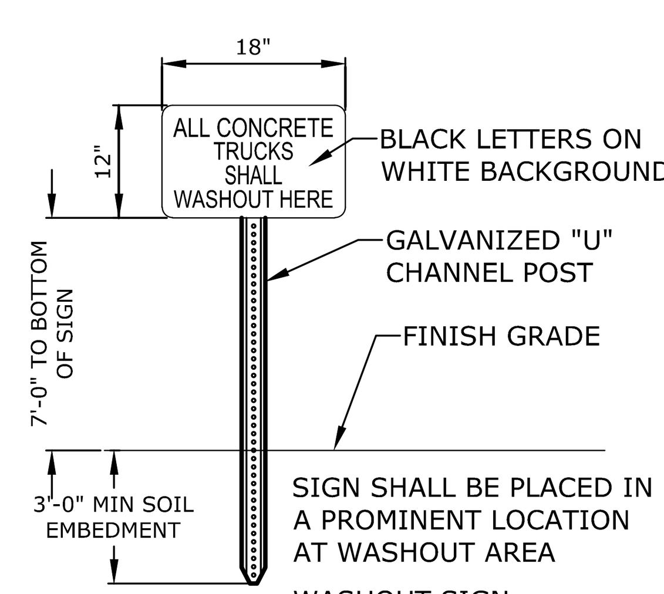
CURB TRANSITION
NO SCALE

NOTES:
1. 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.

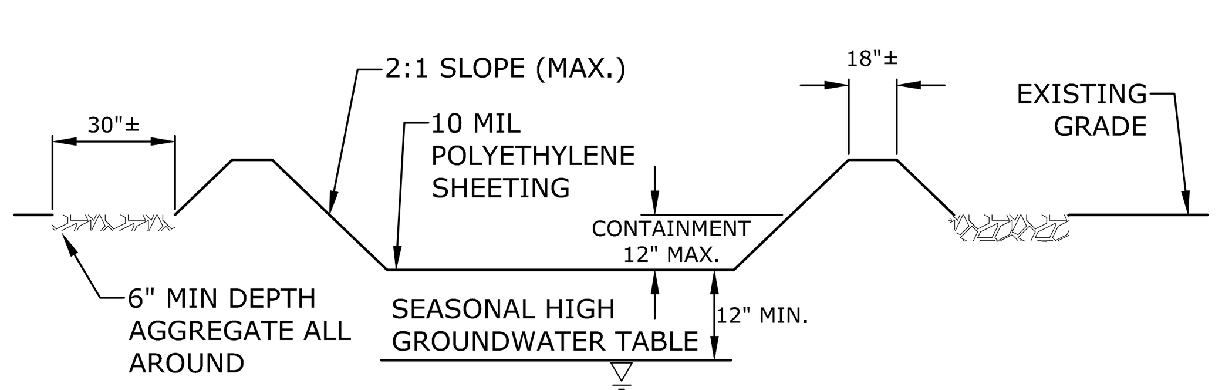
CONCRETE WASHOUT AREA
NO SCALE



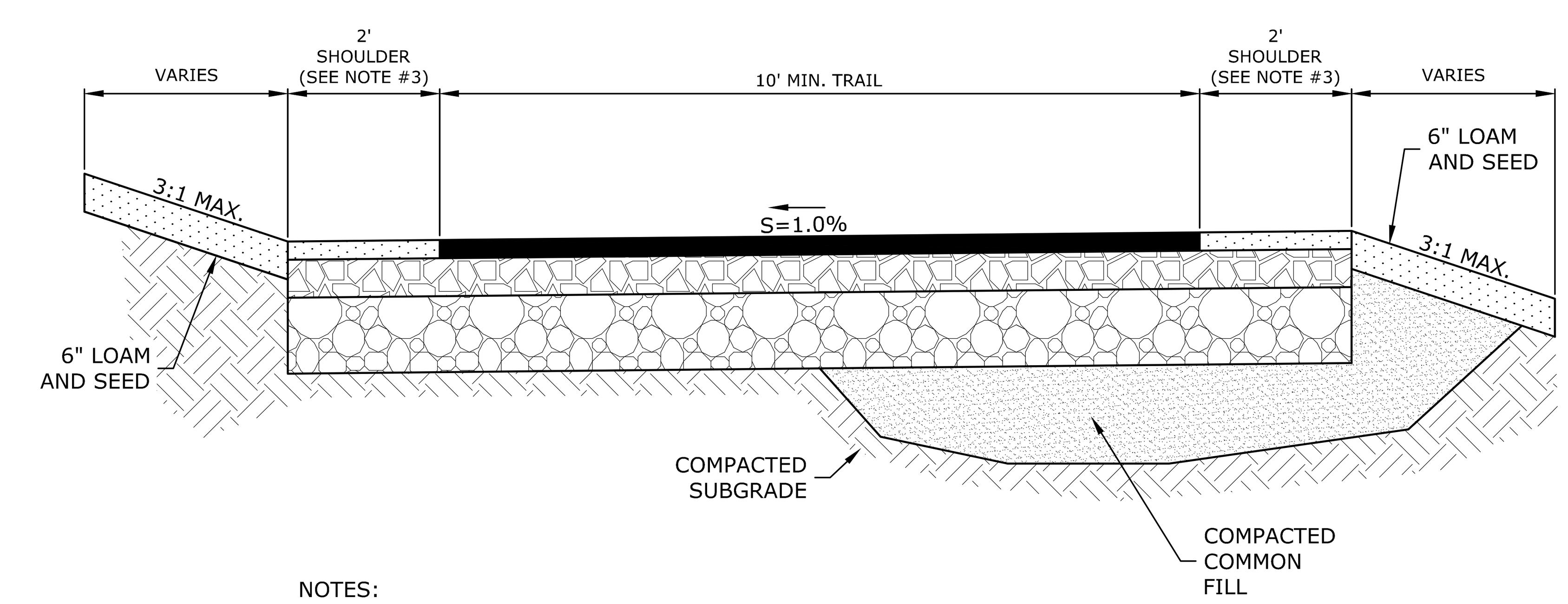
PLAN



WASHOUT SIGN



TYPICAL SECTION



NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. 2' SHOULDER SHALL HAVE FULL DEPTH BASE GRAVEL SECTION WITH 3" MIN. LOAM & SEED
4. SEE PARKING LOT PAVEMENT SECTION FOR PAVEMENT AND GRAVEL SPECIFICATIONS.

COMMUNITY SPACE TRAIL TYPICAL CROSS SECTION
NO SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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F	10/28/2020	Wetland CUP Resubmission
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D	4/29/2020	Wetland CUP Submission
C	4/20/2020	TAC Submission
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DRAWN BY:	NAH
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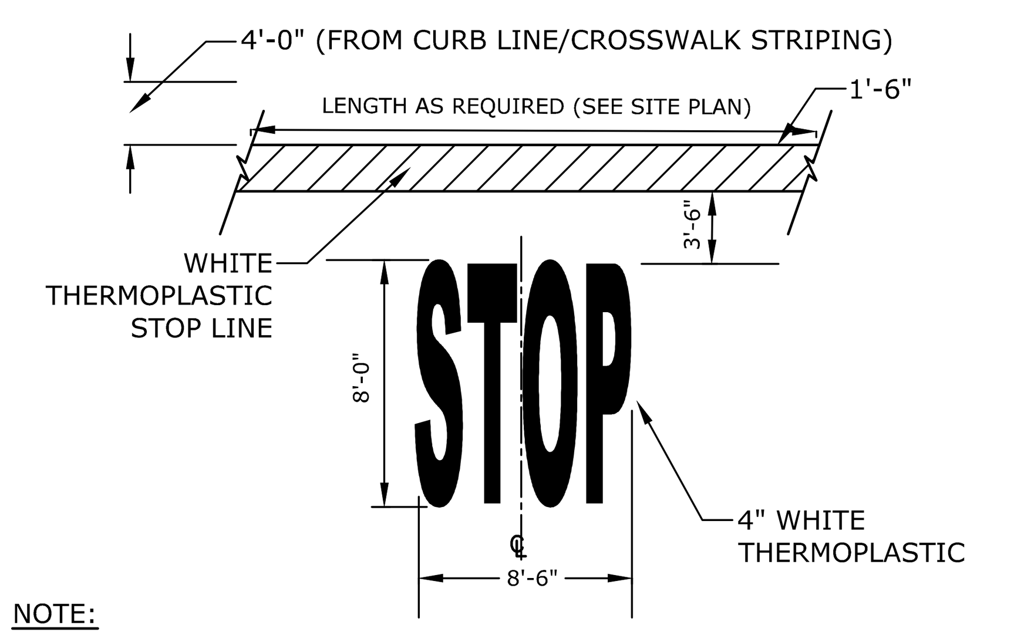
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

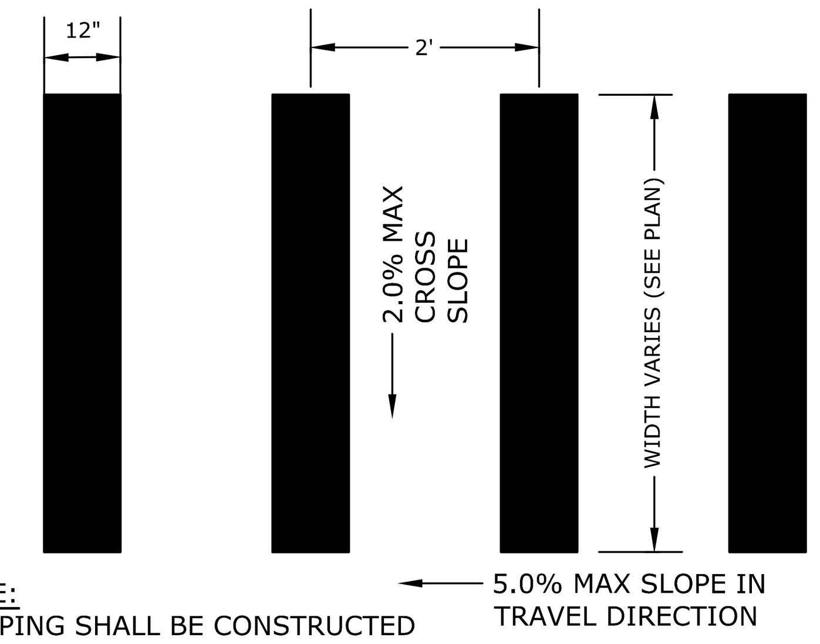
C-502



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

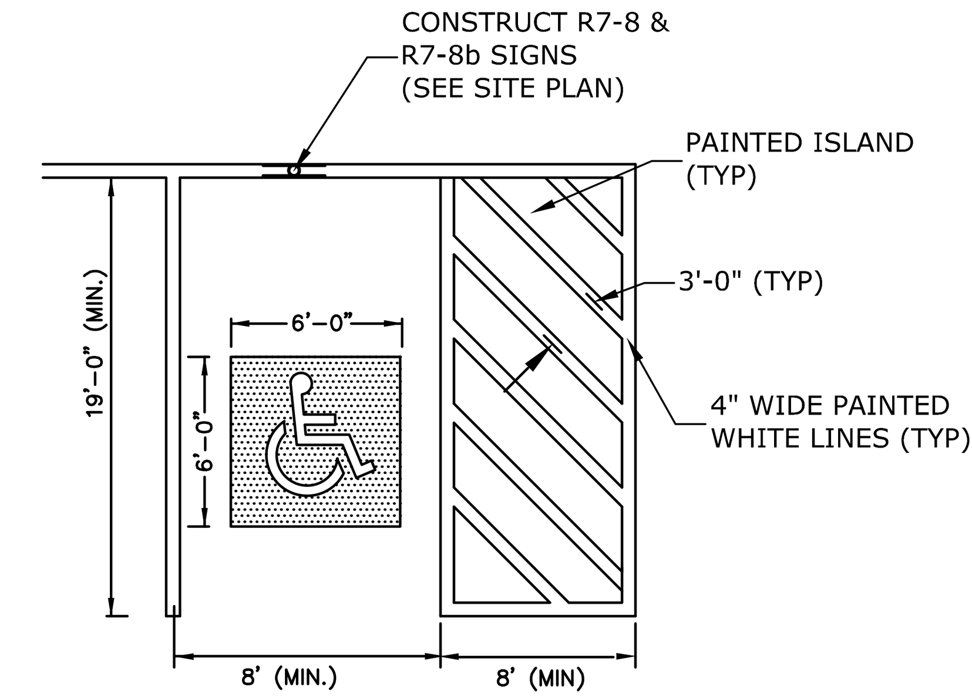
NO SCALE



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

CROSSWALK STRIPING

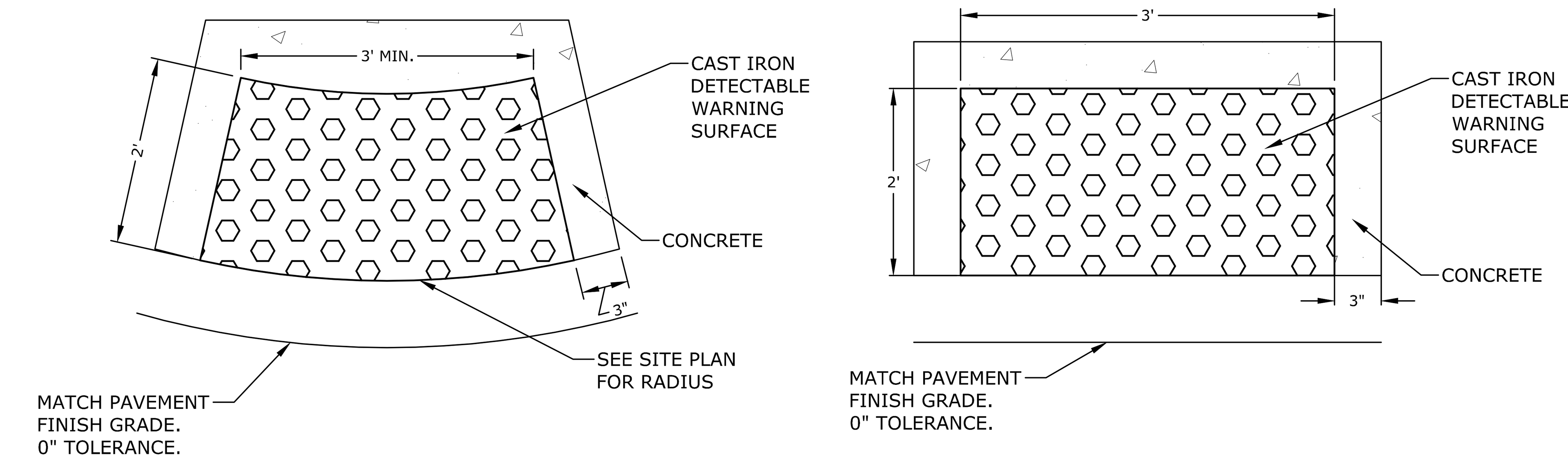
NO SCALE



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



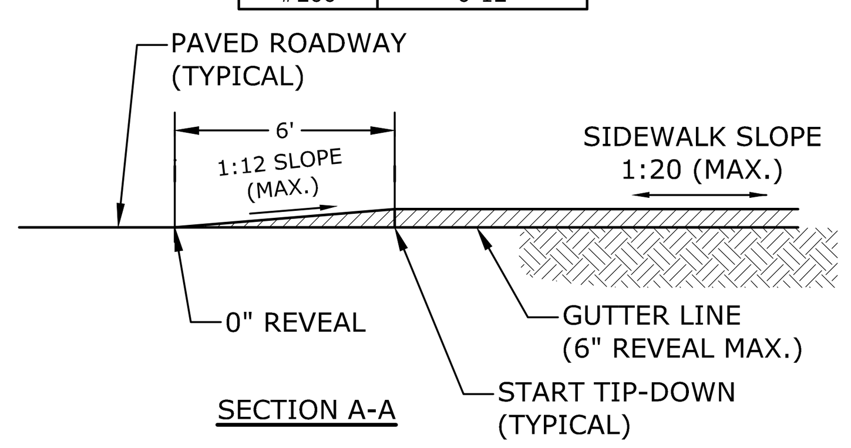
NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

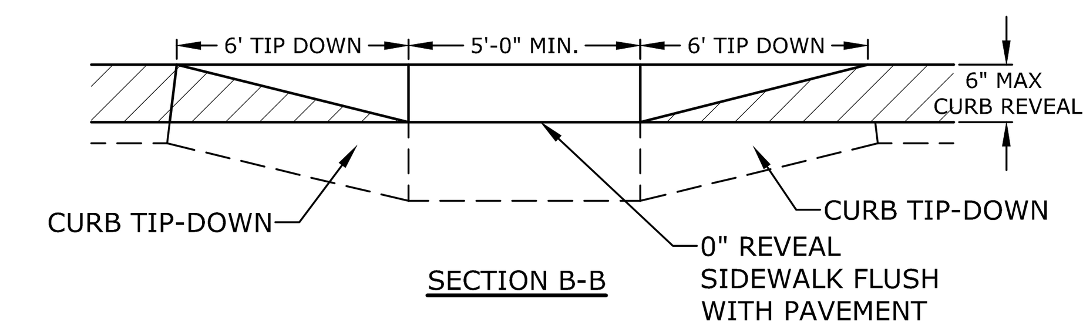
RADIUS TYPE CAST IRON DETECTABLE WARNING SURFACE

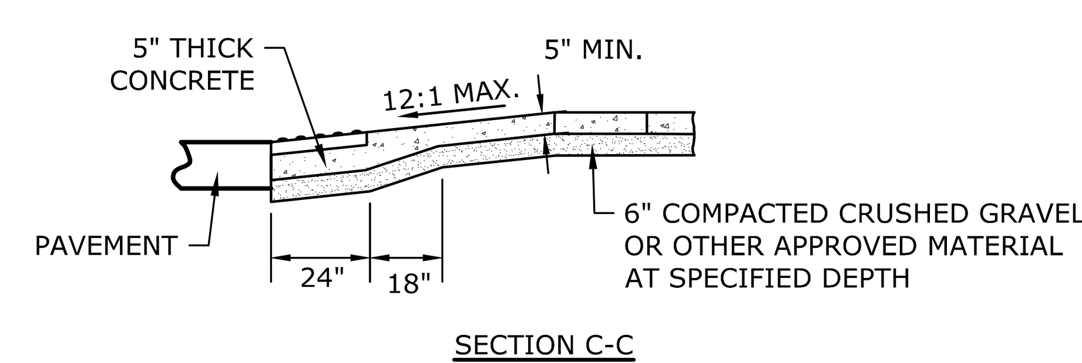
NO SCALE

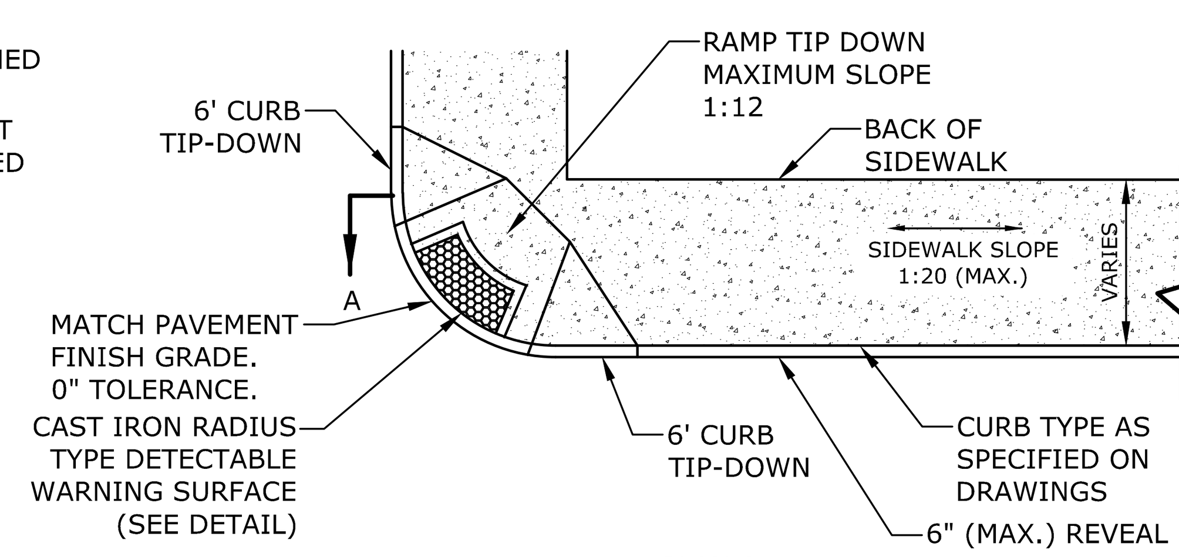
NOTES:
1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
2. A 6" COMPACTED CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
3. DETECTABLE WARNING PANEL SHALL BE CAST IRON SET IN CONCRETE (SEE DETAIL.)
4. PROVIDE 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).

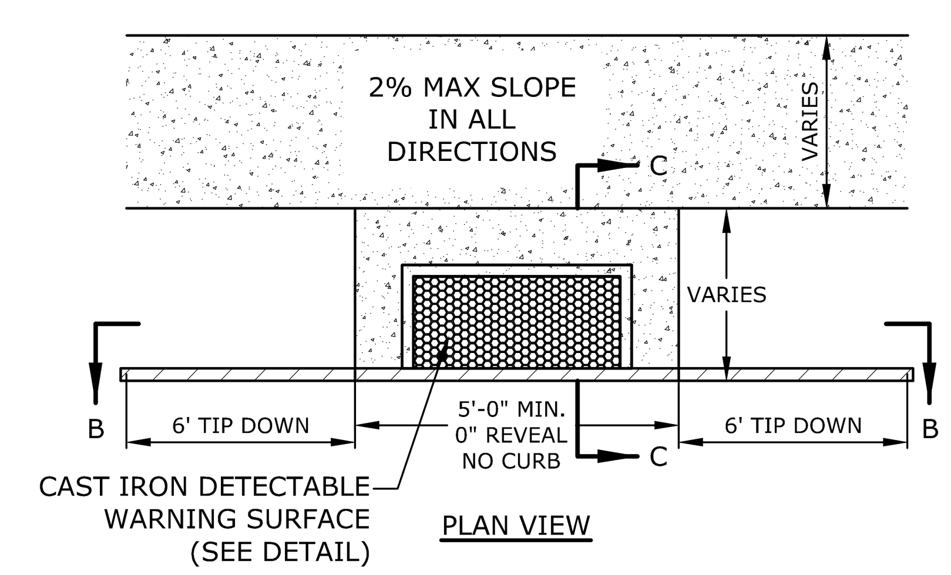
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12





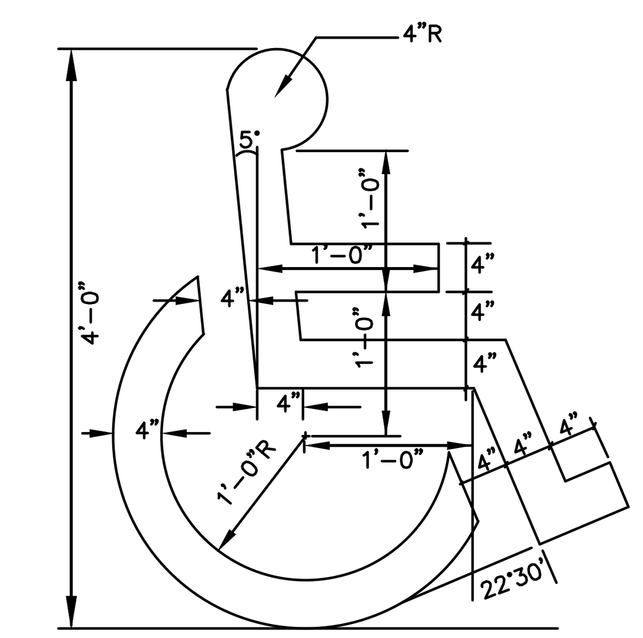






CONCRETE WHEELCHAIR ACCESSIBLE RAMP

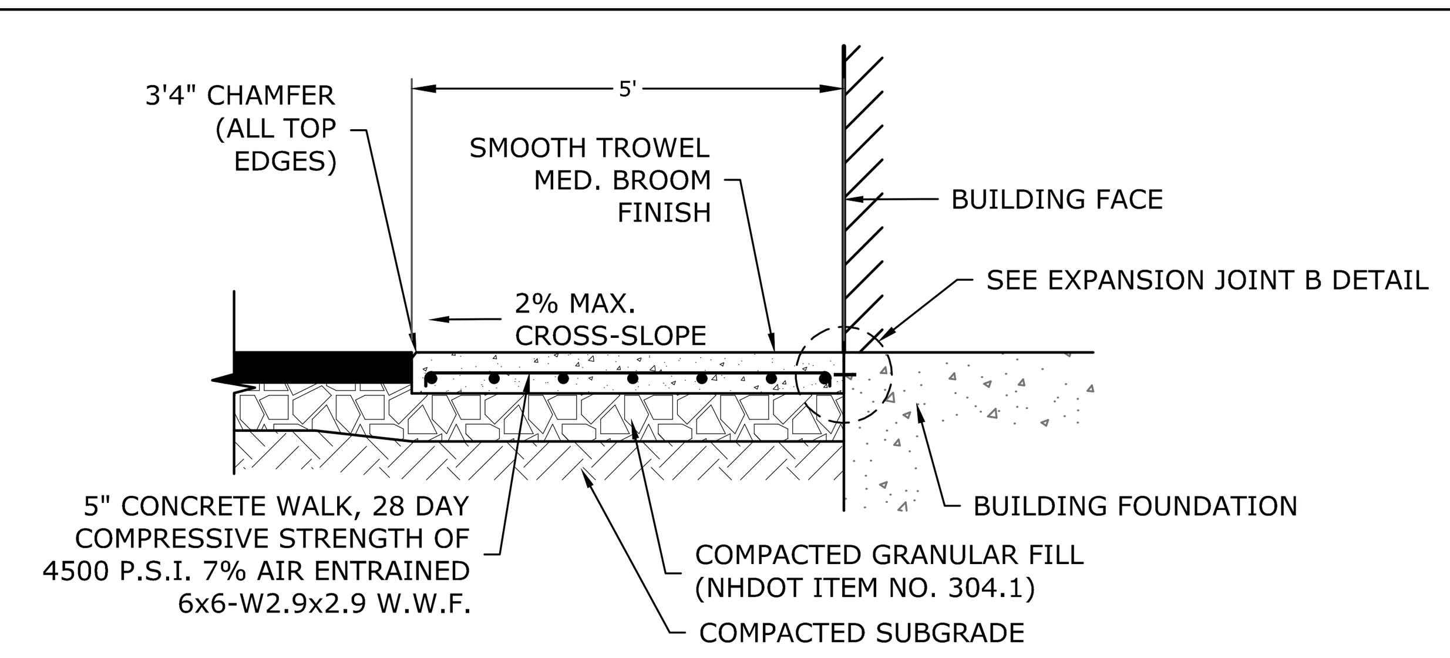
NO SCALE

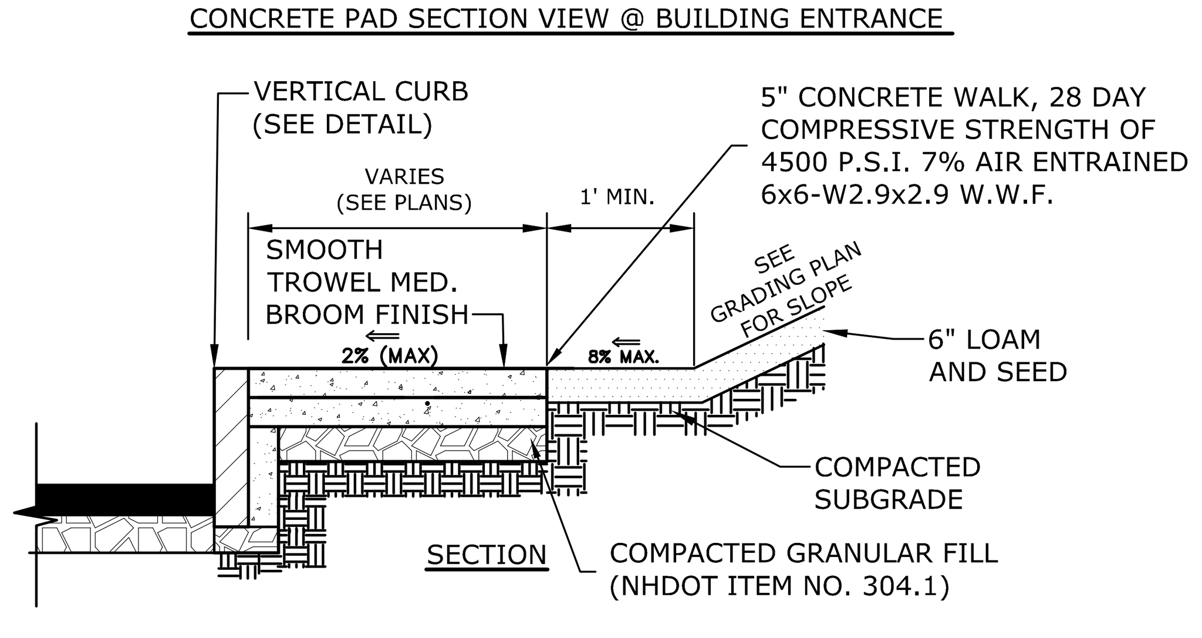


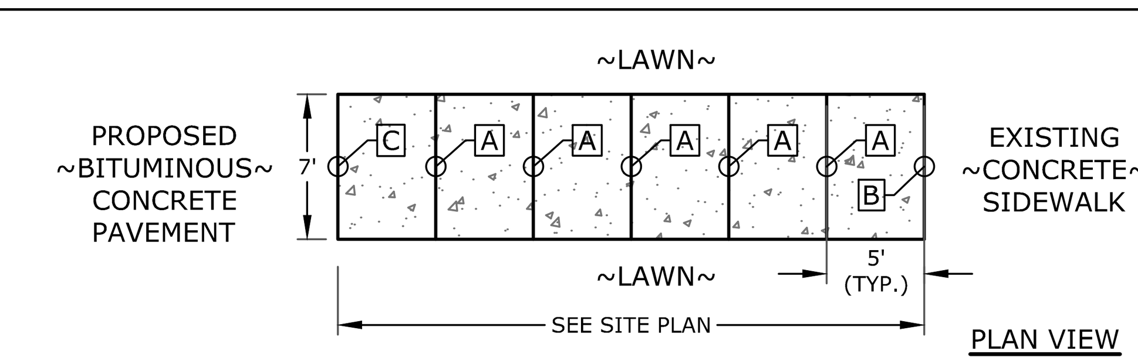
NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING WHITE THERMOPLASTIC, REFLECTORIZED PAVEMENT PARKING MATERAL MEETING THE REQUIREMENTS OF ASTM D 4505.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

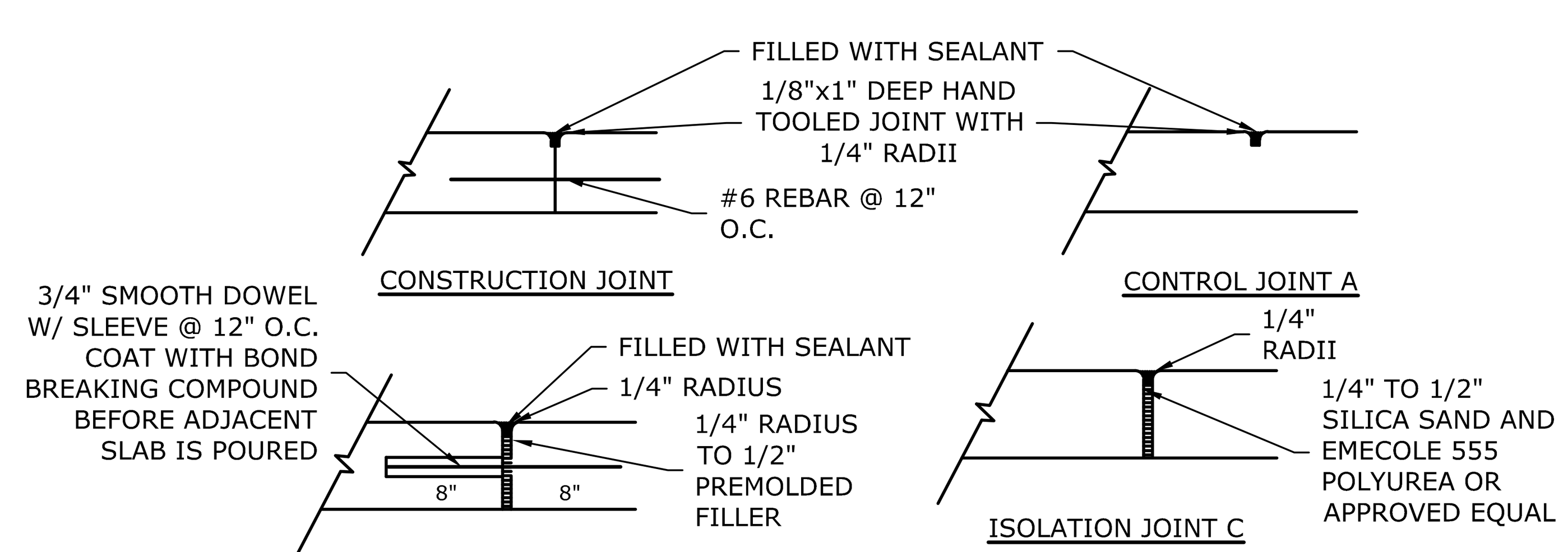
ACCESSIBLE SYMBOL

NO SCALE









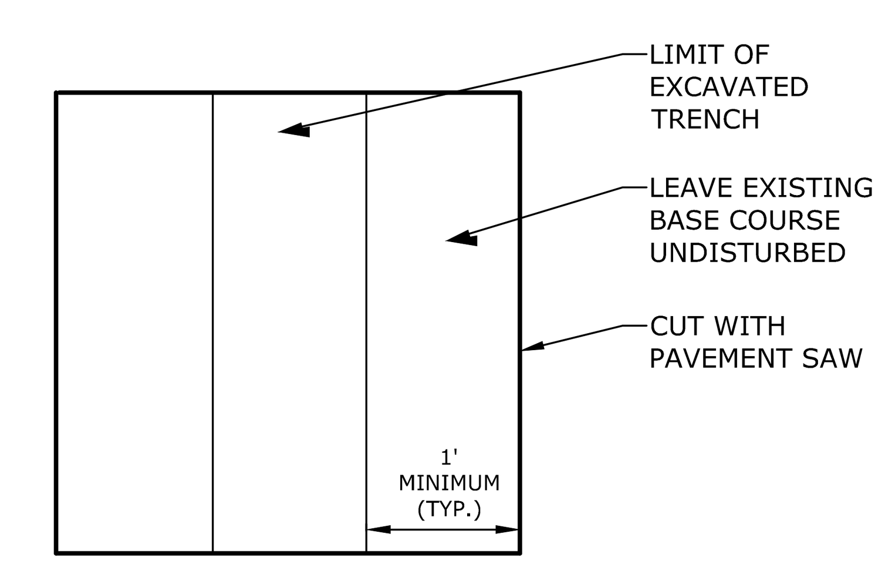
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.

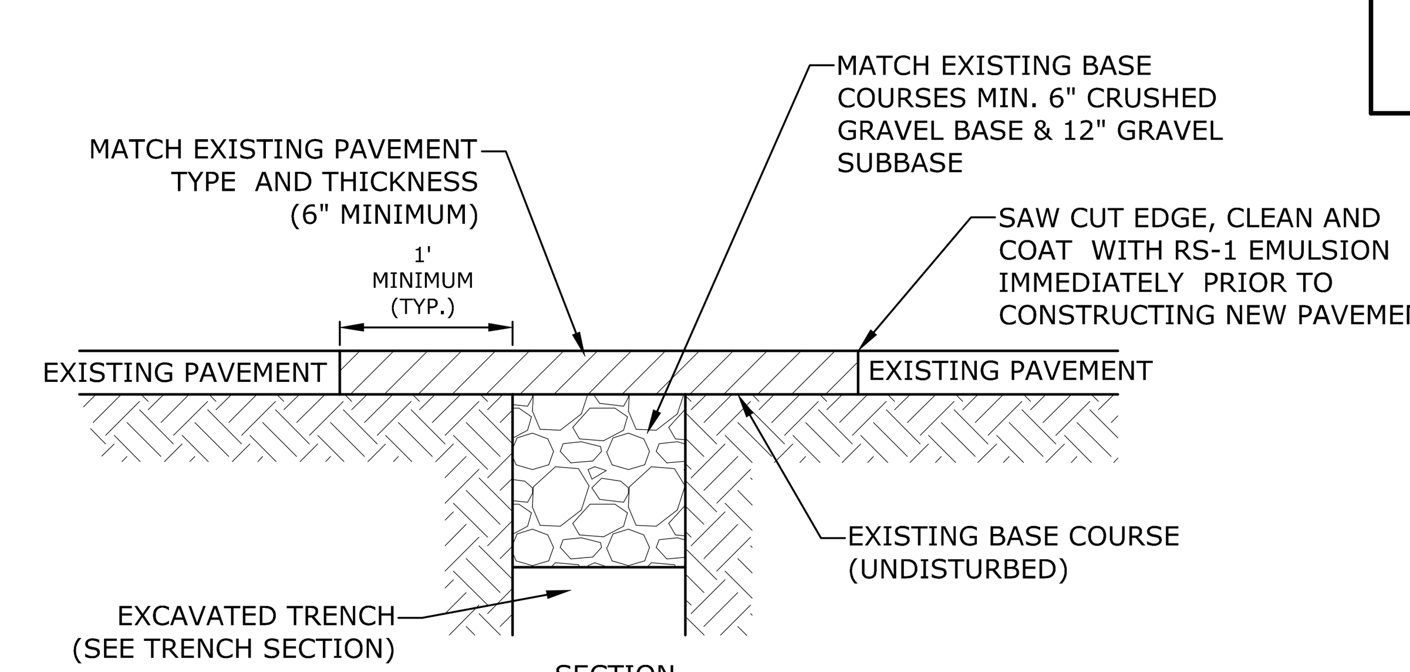
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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





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

Proposed Multi-Family Development

Iron Horse Properties, LLC

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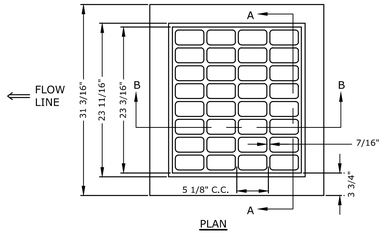
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

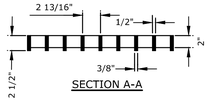
SCALE: AS SHOWN

C-503

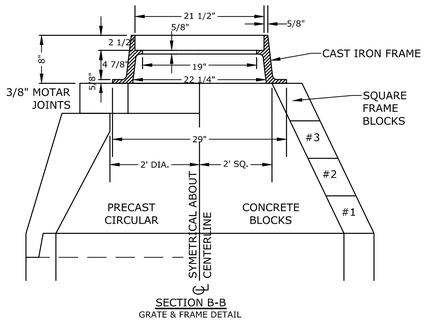


PLAN

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

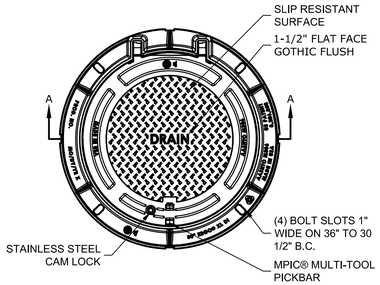


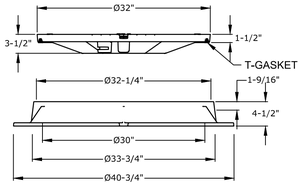
SECTION A-A



SECTION B-B
GRATE & FRAME DETAIL

CATCH BASIN FRAME & GRATE
NO SCALE

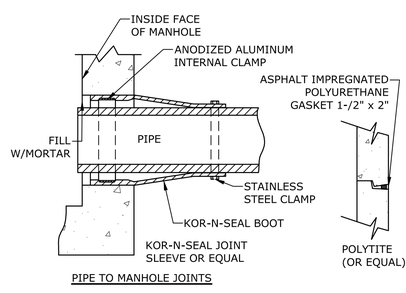




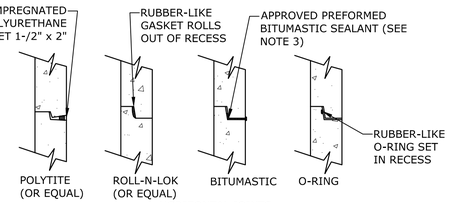
SECTION A-A

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



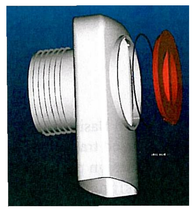
PIPE TO MANHOLE JOINTS



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

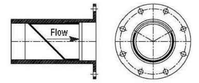
"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE

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
18	450	31	787	1	4	102	20	6
24	600	47.5	1207	2	8	203	20	6

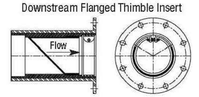
Mounting Styles and Configurations

Downstream Clamp

Downstream Flanged

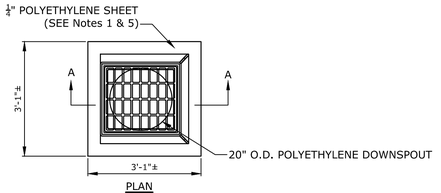


Downstream Flanged Thimble Insert

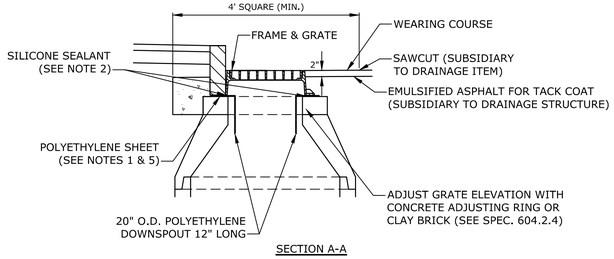


Flange shape and bolt pattern can be customized.
Flangeless thimble inserts are available.

TYPICAL BACK FLOW PREVENTER
NO SCALE



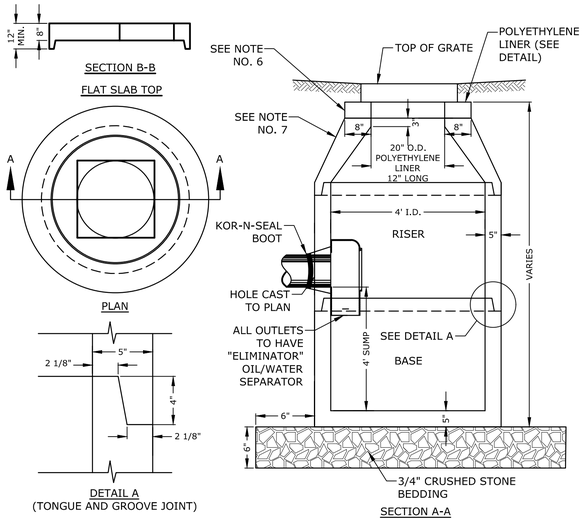
PLAN



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

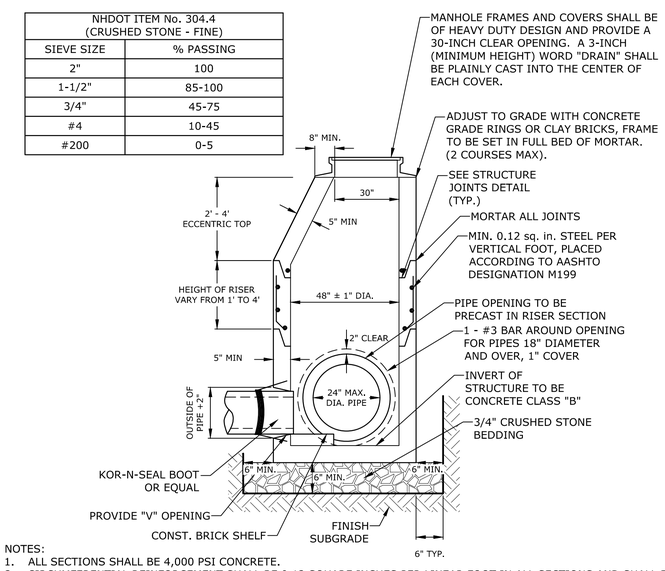
POLYETHYLENE LINER
NO SCALE



NOTES:
1. 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

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

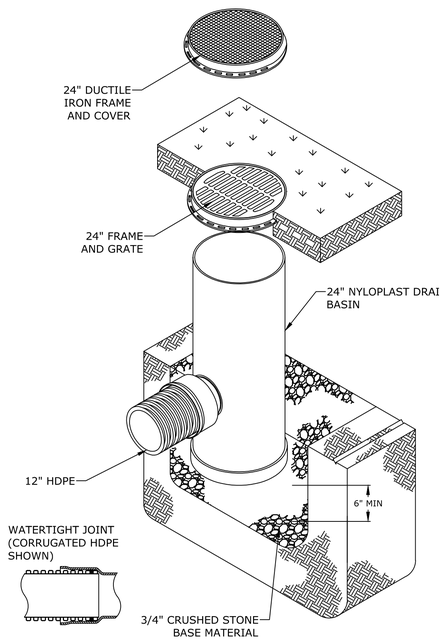
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

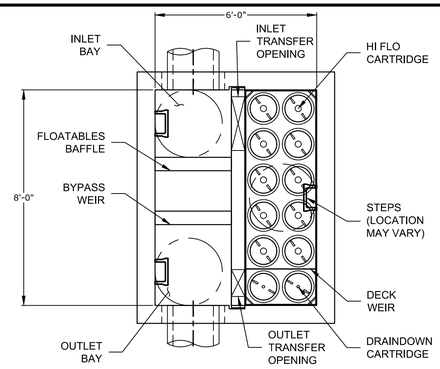
C-504

Last Saved: 11/17/2020
Plotted: Nov 18, 2020 - 4:05pm By: NAHansen
Xrefs: None
Tighe & Bond: J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg

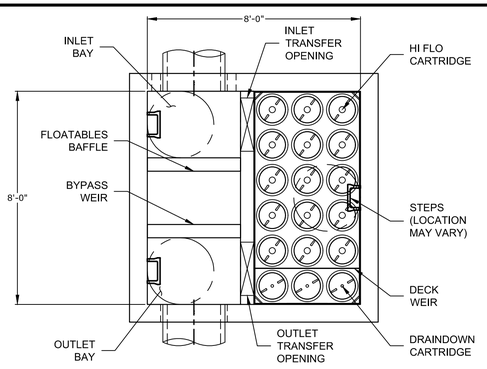


NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE, AND EROSION CONTROL PLAN FOR LOCATIONS.

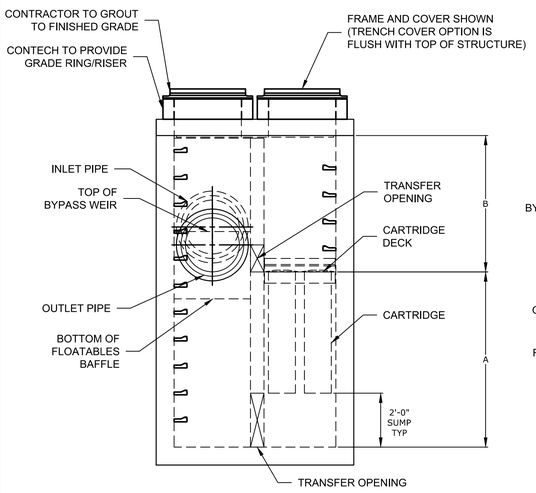
YARD DRAIN
NO SCALE



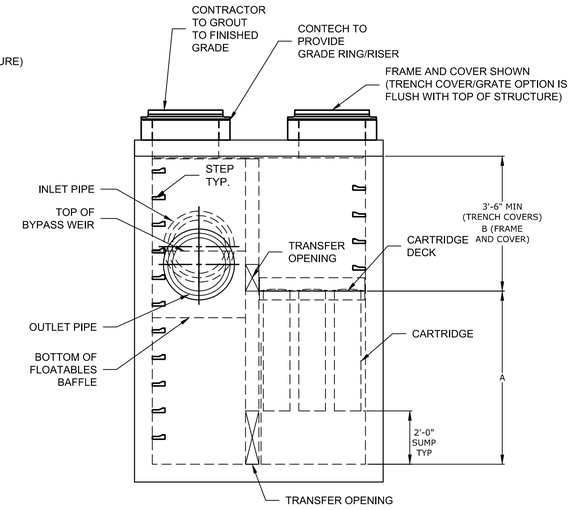
PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW
JELLYFISH JFPD0806



ELEVATION VIEW
JELLYFISH JFPD0808

CONTECH JELLYFISH STORMWATER FILTER
NO SCALE

JELLYFISH JFPD0808 - DESIGN NOTES

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

CARTRIDGE SELECTION

CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	2.94	2.21	1.47	0.81
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

JELLYFISH JFPD0806 - DESIGN NOTES

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

CARTRIDGE SELECTION

CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

SITE SPECIFIC DATA REQUIREMENTS

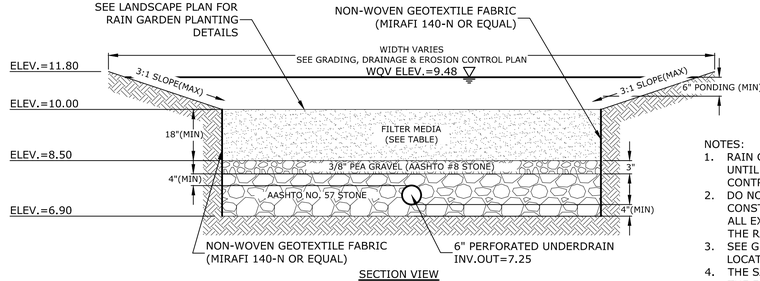
STRUCTURE ID	JF-1	JF-2	JF-3	JF-4
MODEL SIZE	JFPD0808	JFPD0806	JFPD0806	JFPD0806
WATER QUALITY FLOW RATE (cfs)	2.853	0.617	0.992	1.021
PEAK FLOW RATE (cfs)	26.54	5.07	8.82	4.48
RETURN PERIOD OF PEAK FLOW (yrs)	25	25	25	25
# OF CARTRIDGES REQUIRED (HF / DD)	15/3	5/1	5/2	7/2
CARTRIDGE SIZE	54"	40"	54"	54"

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

Jellyfish Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENT NO. 8,287,726; 8,221,618 & US 8,123,935. OTHER INTERNATIONAL PATENTS PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX



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

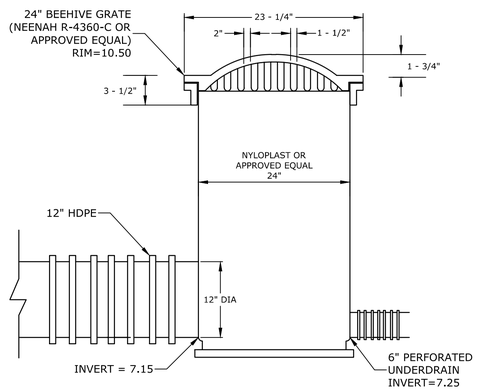
AASHTO #8 STONE (#8 to 3/8")	
SIEVE SIZE	% PASSING
1/2"	100
3/8"	85-100
#4	10-30
#8	0-10
#16	0-5

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

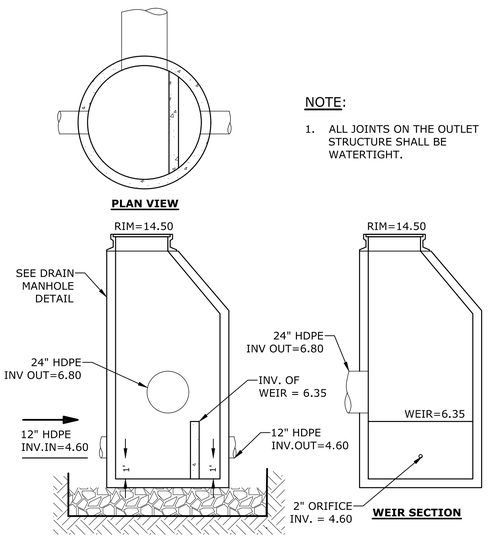
NOTES:
1. RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL KEEP ALL EXCAVATION EQUIPMENT OUTSIDE OF THE LIMIT OF THE RAIN GARDEN.
3. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR LOCATIONS, LAYOUTS, AND ELEVATIONS.
4. 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

RAIN GARDEN
NO SCALE



OUTLET STRUCTURE (POS1) DETAIL
NO SCALE



PDMH10 (5' DIA)
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEE MEZQUITA No. 06830 — LICENSED PROFESSIONAL ENGINEER — 11-18-20

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 12070 — LICENSED PROFESSIONAL ENGINEER — 11-18-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
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DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

C-505

Last Saved: 11/17/2020
Plotted: Nov 17, 2020 @ 14:05pm By: NAHansen
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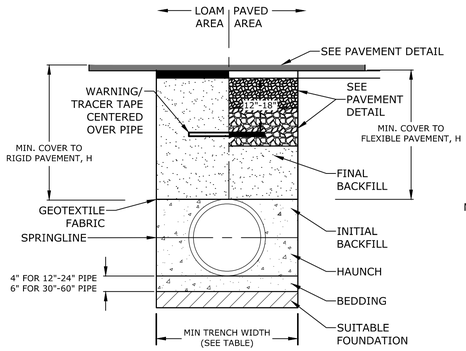


PIPE DIAM.	MIN. TRENCH WIDTH
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

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'

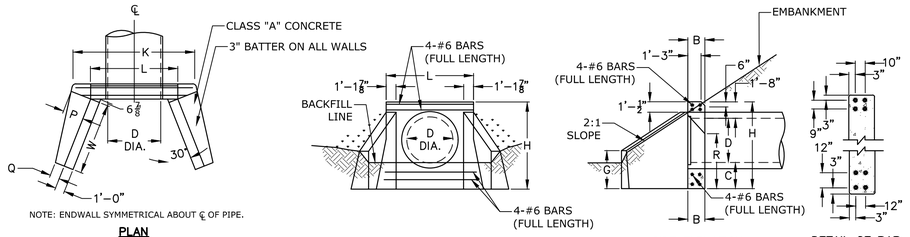
TABLE 3, MAXIMUM COVER FOR ADS HP STORM PIPE
FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
NO HYDROSTATIC PRESSURE
UNIT WEIGHT OF SOIL (γs) = 120 PCF

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



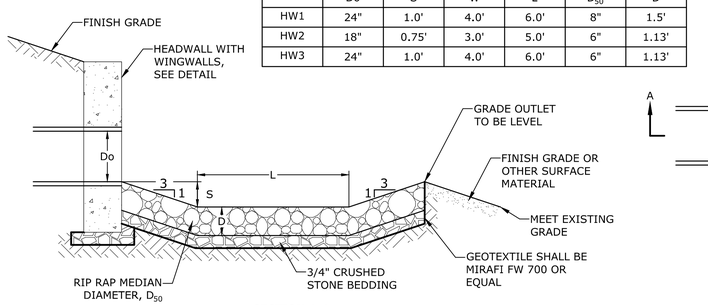
DIMENSIONS AND QUANTITIES FOR ONE WING TYPE ENDWALL													
D	B	C	G	H	K	L	P	Q	R	W	VOL.
IN.*	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	CY
24	1'-6"	2'-0"	3'-3"	6'-9"	9'-1 1/2"	7'-3 1/4"	1'-4 5/8"	0'-9 3/4"	3'-4 5/8"	5'-5 3/4"	5.87
36	1'-6"	2'-0"	3'-3"	6'-8"	9'-1 1/4"	7'-3 3/4"	1'-4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

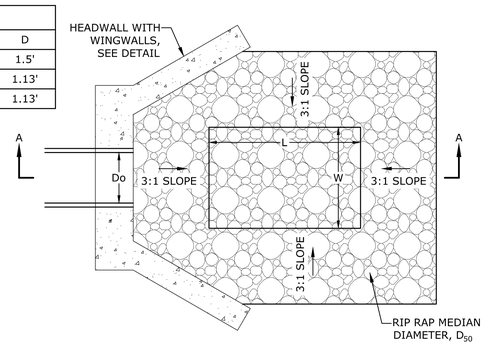
* FOR D<36" USE DIMENSIONS LISTED FOR D=36"

HEADWALL WITH WINGWALLS

NO SCALE

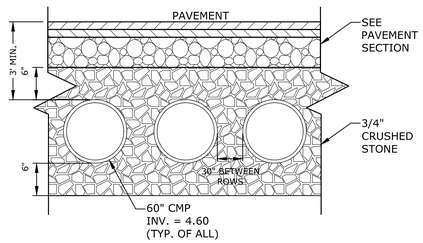
OUTLET PLUNGE POOL SIZING						
	Do	S	W	L	D_{50}	D
HW1	24"	1.0'	4.0'	6.0'	8"	1.5'
HW2	18"	0.75'	3.0'	5.0'	6"	1.13'
HW3	24"	1.0'	4.0'	6.0'	6"	1.13'



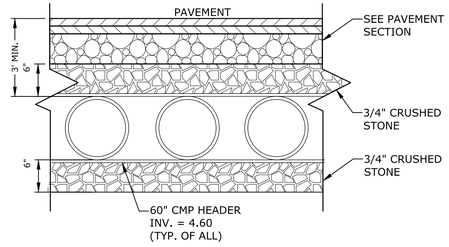


OUTLET PLUNGE POOL

NO SCALE



UNDERGROUND DETENTION AREA

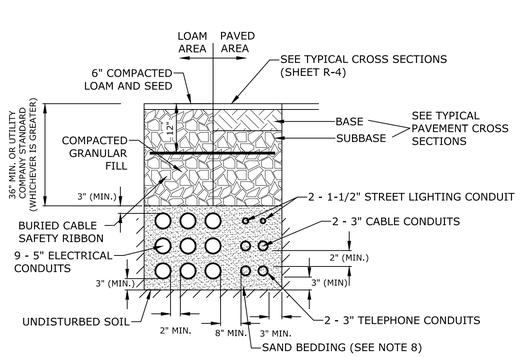


HEADER ROW

NOTES:
1. UNDERGROUND DETENTION SYSTEM TO BE 60" CMP PIPE DESIGNED FOR H-20 LOADING. CONTRACTOR TO SUBMIT PIPE SPECIFICATIONS AND FINAL MANUFACTURES DESIGN TO ENGINEER FOR APPROVAL.
2. MANUFACTURER TO SUBMIT PLANS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.
3. THE DESIGN ENGINEER SHALL PROVIDE SUFFICIENT INSPECTION TO CERTIFY THAT THE SYSTEM HAS BEEN INSTALLED PER THE APPROVED DESIGN PLAN.
4. REFER TO STANDARD DUTY PAVEMENT SECTION DETAIL FOR PAVEMENT SECTION.

UNDERGROUND DETENTION SYSYTEM DETAIL

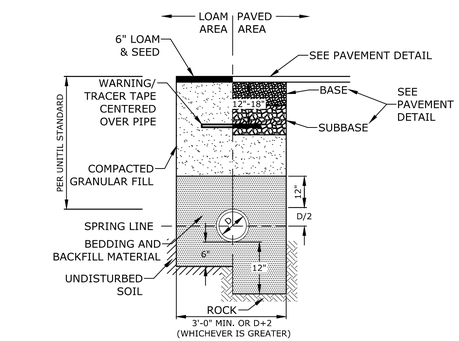
NO SCALE



ELECTRICAL AND COMMUNICATION CONDUIT

NO SCALE

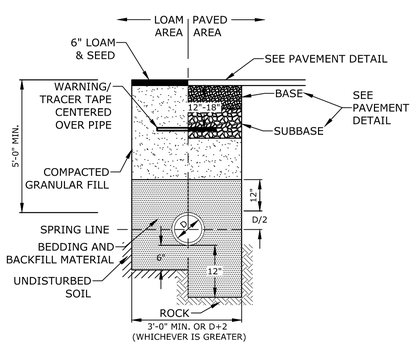
NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING.
2. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY 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.



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

GAS TRENCH

NO SCALE



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

WATER TRENCH

NO SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
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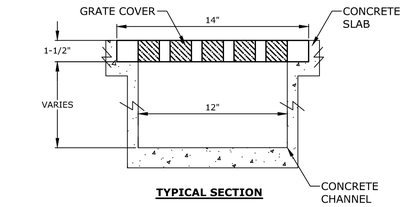
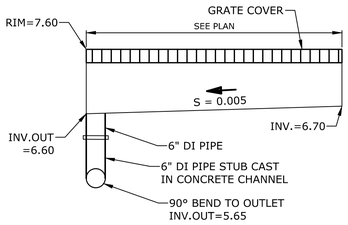
DETAILS SHEET

SCALE: AS SHOWN

C-506



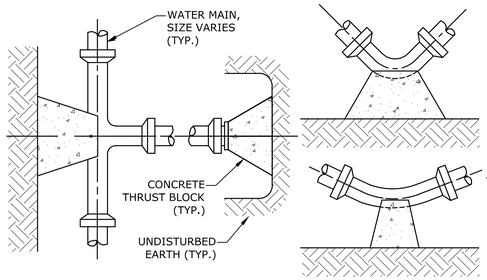
TYPICAL SECTION



TRENCH DRAIN PROFILE

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

TRENCH DRAIN DETAIL
NO SCALE

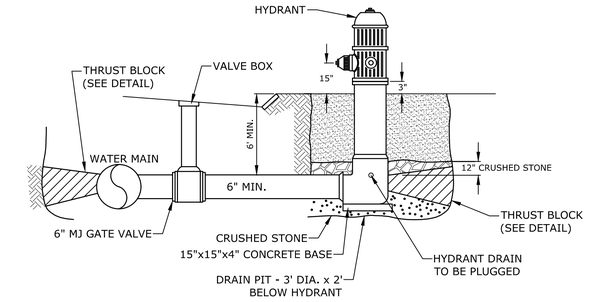


TEST PRESSURE = 200psi

REACTION TYPE	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL				
	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

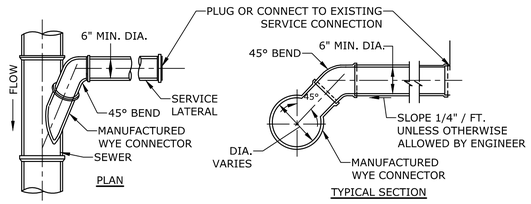
NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT 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

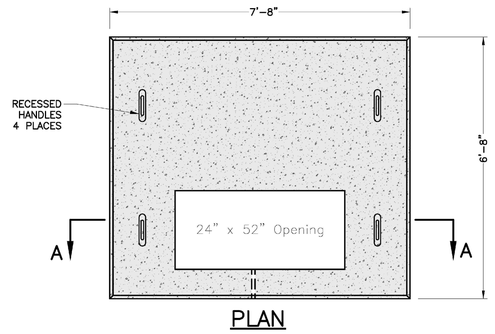


NOTE:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

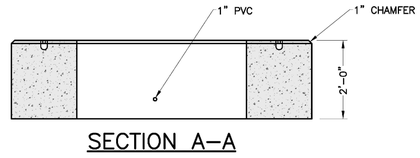
FIRE HYDRANT
NO SCALE



STANDARD SERVICE LATERAL CONNECTION
NO SCALE



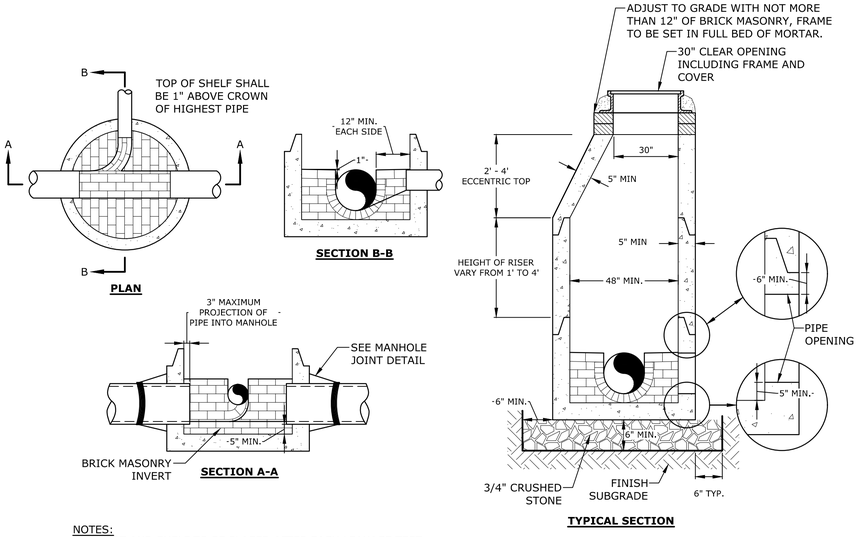
PLAN



SECTION A–A

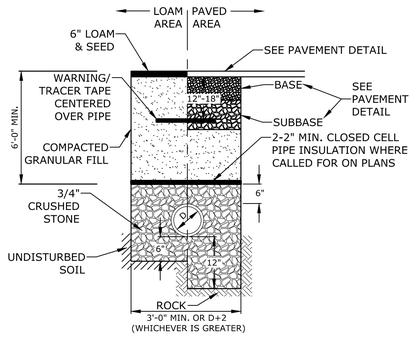
3-PHASE TRANSFORMER PAD
NO SCALE

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



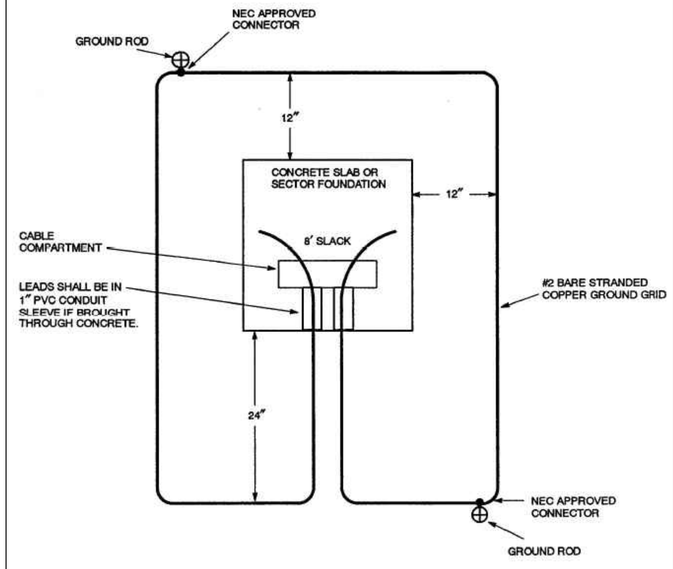
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. BITUMINOUS WATERPROOF COATING TO BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: 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



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

SEWER SERVICE TRENCH
NO SCALE



NOTES:
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 MEZQUITA No. 08830 — LICENSED PROFESSIONAL ENGINEER — 11-18-20

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS No. 15070 — LICENSED PROFESSIONAL ENGINEER — 11-18-2020

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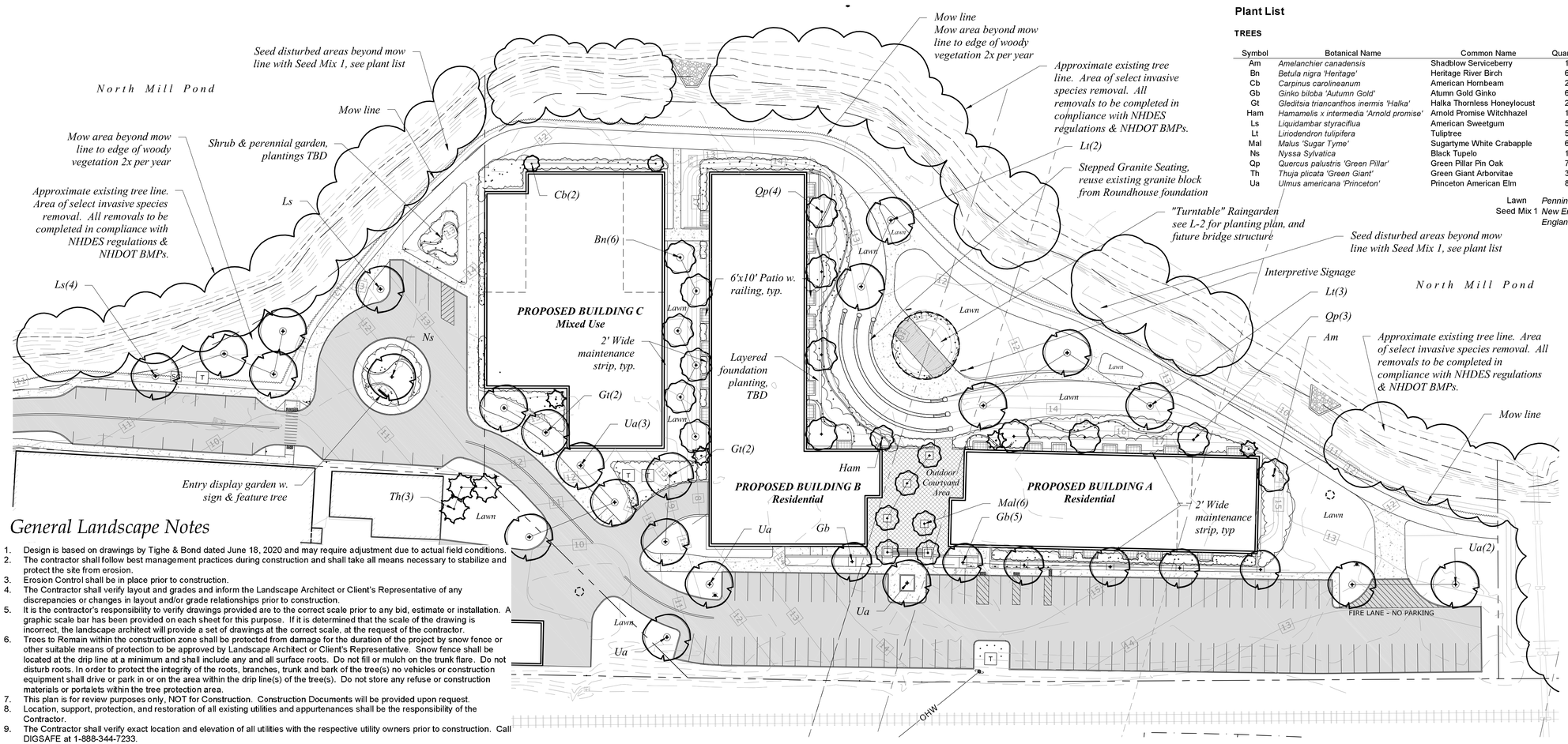


Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Am	*Amelanchier canadensis*	Shadblow Serviceberry	1	2.5-3" Cal	B&B
Bn	*Betula nigra 'Heritage'*	Heritage River Birch	6	8-10' Ht	Multi-stem, B&B
Cb	*Carpinus carolineanum*	American Hornbeam	2	2.5-3" Cal	B&B
Gb	*Ginko biloba 'Autumn Gold'*	Atumn Gold Ginko	6	2.5-3" Cal	B&B
Gt	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust	2	2.5-3" Cal	B&B
Ham	*Hamamelis x intermedia 'Arnold promise'*	Arnold Promise Witchhazel	1	8-10' Ht	Multi-stem, B&B
Ls	*Liquidambar styraciflua*	American Sweetgum	5	2.5-3" Cal	B&B
Lt	*Liriodendron tulipifera*	Tuliptree	5	2.5-3" Cal	B&B
Mal	*Malus 'Sugar Tyme'*	Sugartyme White Crabapple	6	1.5-2" Cal	B&B
Ns	*Nyssa Sylvatica*	Black Tupelo	1	4" Cal	B&B
Qp	*Quercus palustris 'Green Pillar'*	Green Pillar Pin Oak	7	2.5-3" Cal	B&B
Th	*Thuja plicata 'Green Giant'*	Green Giant Arborvitae	3	2.5-3" Cal	B&B
Ua	*Ulmus americana 'Princeton'*	Princeton American Elm	8	2.5-3" Cal	B&B

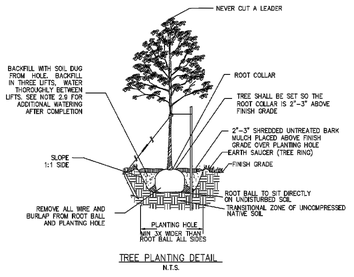
Lawn Seed Mix 1 — *Pennington Smartseed Tall Fescue Blend New England Wetland Plants, Inc. New England Conservation/Wildlife Mix*

General Landscape Notes

1. Design is based on drawings by Tighe & Bond dated June 18, 2020 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
5. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
6. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
7. This plan is for review purposes only, NOT for Construction. Construction Documents will be provided upon request.
8. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
9. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 1-888-344-7233.
10. The Contractor shall procure any required permits prior to construction.
11. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
12. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a contractor is aware of a potential issue, and does not bring it to the attention of the landscape architect or owner's representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
13. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
14. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
15. All plants shall be legibly tagged with proper botanical name.
16. The Contractor shall guarantee all plants for not less than one year from time of acceptance.
17. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
18. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
19. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
20. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
21. The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, and watering of plants. Plants shall be appropriately watered prior to, during and after planting. It is the contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
22. All disturbed areas will be dressed with 6" of topsoil and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
23. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
24. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
25. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
26. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
27. Landscape Architect is not responsible for the means and methods of the contractor.

City of Portsmouth Landscape Notes

1. The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials.
2. All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair.
3. The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director.



TREE PLANTING DETAIL
N.T.S.

City of Portsmouth Tree Planting Detail

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 8 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 8 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

0 10 20 40 80

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Proposed Multi-Family Development

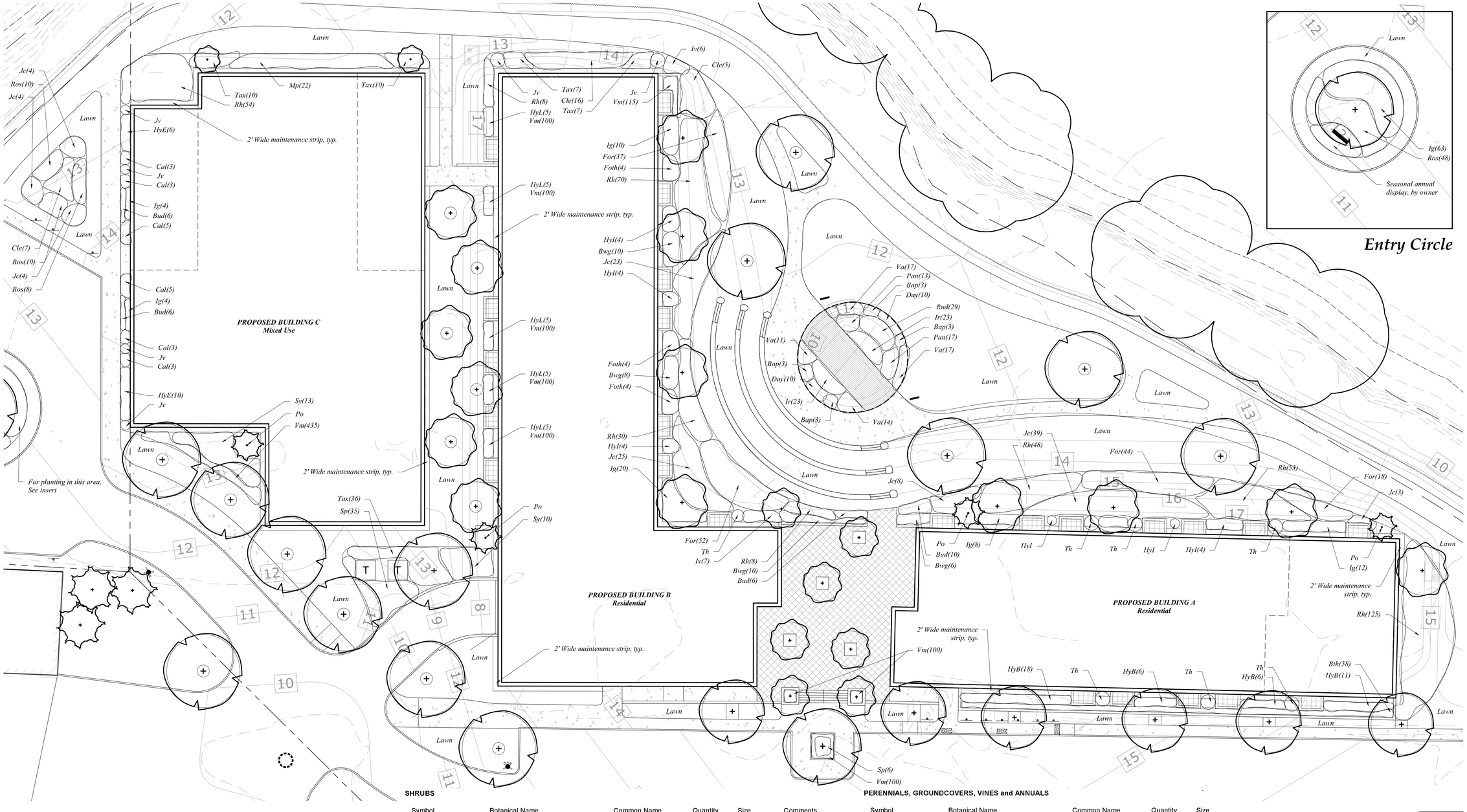
SITE LANDSCAPE PLAN

105 Bartlett Street Portsmouth, New Hampshire

Drawn By:	VM
Checked By:	RW
Scale:	1" = 40' - 0"
Date:	May 20, 2020
Revisions:	October 28, 2020 November 18, 2020

L-1

Sheet 1 of 2



NOTE: For tree planting plan, see L-1

SHRUBS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Bth	*Buxus 'Tide Hill'*	Tide Hill Boxwood	58	2' Ht	B&B
Bud	*Buddleia 'Lo and Behold'*	Lo and Behold Butterflybush	29	3 gal	
Bwg	*Buxus 'Winter Gem'*	Winter Gem Boxwood	34	2' Ht	B&B
Cle	*Clethra alnifolia 'Hummingbird'*	Hummingbird Summersweet	28	5 gal	
For	*Forsythia 'Gold Tide'*	Gold Tide Forsythia	151	3 gal	
Foth	*Fothergilla gardenii*	Dwarf Fothergilla	12	5 gal	
HyB	*Hydrangea paniculata 'Bobo'*	Bobo Hydrangea	41	3 gal	
HyE	*Hydrangea macrophylla 'Endless Summer'*	Endless Summer Hydrangea	16	5 gal	
HyI	*Hydrangea arborescens 'Incrediball'*	Incrediball Hydrangea	18	3 gal	
HyL	*Hydrangea paniculata 'Little Lime'*	Little Lime Hydrangea	25	3 gal	
Ig	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	121	5 gal	full to ground
Iv	*Ilex verticillata 'Red Sprite'*	Red Sprite Winterberry	13	3 gal	
Jc	*Juniperus chinensis 'Sargenti'*	Sargent Juniper	110	5 gal	
Jv	*Juniperus virginiana 'Emerald Sentinel'*	Emerald Sentinel Red Cedar	6	7-8' Ht	B&B
Mp	*Myrica pensylvanica*	Northern Bayberry	22	5 gal	
Po	*Picea orientalis 'Gowdy'*	Gowdy Oriental Spruce	4	8-10' Ht	B&B
Rh	*Rhus aromatica 'Grow-Low'*	Grow Low Sumac	396	3 gal	
Ros	*Rosa 'Blush Knockout'*	Blush Knockout Rose	76	3 gal	
Sp	*Spiraea x bumalda 'Anthony Waterer'*	Anthony Waterer Spirea	41	5 gal	
Sy	*Syringa meyeri 'Palibin'*	Dwarf Korean Lilac	23	3-4' Ht	B&B
Tax	*Taxus media 'Ever-Low'*	Ever-Low Yew	70	3 gal	
Th	*Thuja occidentalis 'Smaragd'*	Emerald Green Arborvitae	7	7-8' Ht	B&B
Va	*Vaccinium angustifolium*	Lowbush Blueberry	59	1 gal	

PERENNIALS, GROUNDCOVERS, VINES and ANNUALS

Symbol	Botanical Name	Common Name	Quantity	Size
Bap	*Baptisia australis*	False Blue Indigo	12	1 gal
Cal	*Calamagrostis acutifolia 'Karl Foerster'*	Feather Reed Grass	22	1 gal
Day	*Hemerocallis 'Big Time Happy'*	Big Time Happy Daylily	20	1 gal
Ir	*Iris versicolor*	Blue Flag Iris	46	1 gal
Pan	*Panicum virgatum 'Heavy Metal'*	Heavy Metal Switch Grass	30	1 gal
Rud	*Rudbeckia fulgida 'Goldsturm'*	Black-Eyed Susan	29	1 gal
Vm	*Vinca minor 'Bowles'*	Bowles Periwinkle	1250	2.5" pots
Lawn	*Pennington Smartseed Tall Fescue Blend*			
Seed Mix 1	*New England Wetland Plants, Inc. New England Conservation/Wildlife Mix*			

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

Proposed Multi-Family Development

FOUNDATION PLANTING PLAN

105 Bartlett Street Portsmouth, New Hampshire

Drawn By: VM
Checked By: RW
Scale: 1" = 20' - 0"
Date: November 4, 2020
Revisions: November 18, 2020

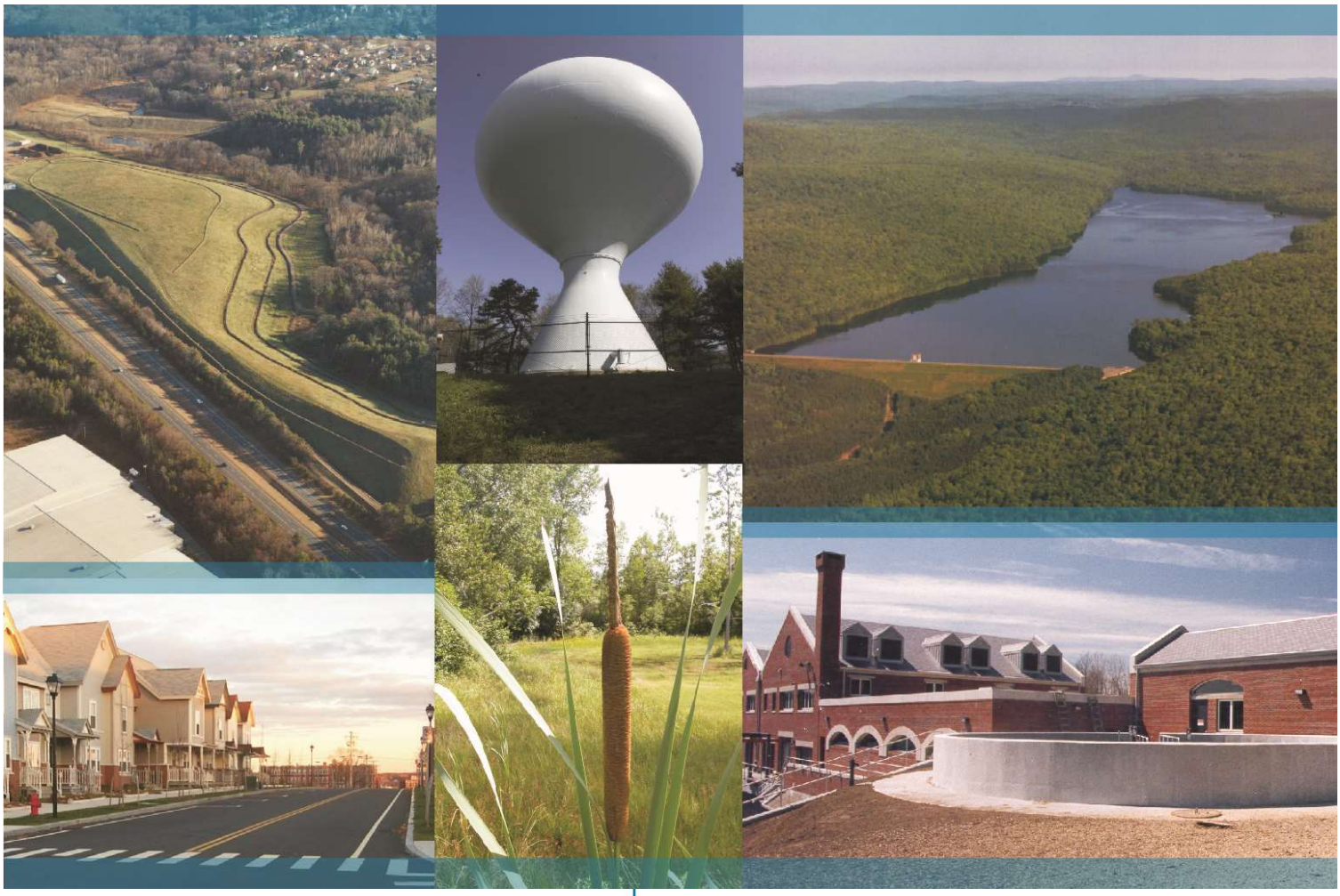
L-2

Sheet 2 of 2

105 Bartlett Street - City of Portsmouth TAC COMMENT RESPONSE Date: November 18, 2020

City of Portsmouth TAC, June 02, 2020:			
	TAC Comment	**Applicant Response**	**Sheet**
TAC Comments from 6/1 Correspondence:			
1	Driveway corner radius at Bartlett should be enlarged to provide easier access and egress. *(It does not appear modifications were made to address this)*	Driveway corner radius for right turns onto Bartlett Street has been increased from a 15-foot radius to a 25-foot radius.	C-102.1
2	Third party peer review of updated traffic generation memo shall be completed prior to Planning Board review.	Confirmed. Peer review memo has been completed by TEC. An updated Trip Generation Memo prepared by Stephan G. Pernaw & Company is also included with this submission.	N/A
3	Applicant is responsible for final design, construction, and permitting of the greenway trail along the North Mill Pond, as it counts toward the community space requirement. Construction of the trail will have to be coordinated with occupancy of the building it is required for fire department access to the building and may also need to be designed to support a fire truck.	Applicant agrees to construct improvements along North Mill Pond as shown enclosed Site and Landscape Plans.	C-102.2 & L-1
4	Section 10.1018.30 of the Zoning Ordinance requires porous pavement be installed for any new pavement in the wetland buffer . It appears as if there may be new pavement proposed in the wetland buffer. Please either confirm there is no new pavement in the wetland buffer or expand upon your rational for not providing porous pavement in the wetland buffer including details on the depth to the water table and technical justification for not including porous pavement.	As per TAC meeting on 6/2, applicant is proposing to construct stormwater treatment units in lieu of porous asphalt due to existing soils and groundwater constraints. As shown in the enclosed revised Drainage Analysis, the proposed treatment units with pretreatment measures have higher TSS, phosphorus and nitrogen removal rates then the porous asphalt. In addition, the stormwater management system on the development site has been revised to include a detention system to detain the water quality volume of runoff for a 24-hour period in order to reduce temperature prior to discharge into the North Mill Pond.	C-103.1 & 103.2
5	Has any soil testing been done to determine if there is any contamination on this site. If so, how will the contaminated soil be managed during construction?	Soil testing on site has been done. An Environmental Summary Memo has been included with this submission. A soil management plan will be prepared in accordance with NHDES regulations prior to construction.	
6	It appears on Sheet C-301.2 that a small portion of the proposed elevated walkway along the front of Buildings A & B is within the city's 25 foot wide sewer easement area.	The elevated walkway in front Buildings A & B has been entirely pulled out of the City sewer easement.	C-102.2
7	The ground floor uses of the proposed buildings should be noted on the Site Data table on Sheet C-102.	The proposed ground floor uses have been added to the Site Data table on Sheet C-102.	C-102
8	All the building dimensions should be show in order to demonstrate compliance with the building block, height, and façade modulation requirements.	All of the buildings have been dimensioned and site data table updated to show compliance with all of the building requirements.	C-102 & C-102.2
9	The existing zoning district lines should be shown on the Grade Plane Plan to demonstrate full compliance with the building height requirements for each district.	The existing zoning district lines have been added to the Grade Plane Plan to demonstrate full compliance with the building height requirements for each district.	Grade Plane Exhibit
10	The proposed round-about should be posted as a one-way circle.	One way pavement markings and a "Do Not Enter" sign has been added to the proposed round-about indicating one-way traffic.	C-102.2
11	Consideration should be given to replace the small landscape areas between the proposed sidewalk and roadway along the proposed round-about with a wider sidewalk area in order to improve functionality and the viability for maintenance of these landscape areas. Note the landscape plan shown on Sheet L-1 does not show any planting details for these areas. Consistent with the site plan, additional landscaping shall also be added to the landscape plan along the end of the proposed parking lot near Langdon Street.	The sidewalk has been revised to eliminate the small landscape islands near the cul-de-sac and on street parking areas.	C-102, C-102.1 & C-102.2
12	Pavement markings or signs should be added to the proposed round-about indicating one-way traffic.	One way pavement markings and a "Do Not Enter" sign has been added to the proposed round-about indicating one-way traffic.	C-102.2

13	A detail should be provided for the mountable vertical curb proposed for fire access to the waterfront side of the buildings	A detail has been added for the mountable vertical curb and curb transition proposed for fire lane access to the waterfront side of the buildings	C-502
14	Visitor parking areas should be shown.	Visitor parking areas have been added to the site plan.	C-102.2
15	The no-parking / turn-around area at the end of the surface parking lot should be reduced to only include the driveway aisle and a single space furthest from the waterfront.	The no-parking / turn-around area at the end of the surface parking lot has been reduced to only include the driveway aisle and a single space furthest from the waterfront. The length of the parking area has also been reduced to pull all of the parking spaces out of the 100' tidal buffer zone.	C-102 & C-102.2
Additional Comments from 6/2 TAC Meeting:			
16	Designed to be useable including snow removal. Grade and ability to support fire truck and outriggers for a width of 14' minimum in rear of building	A detail has been added to show the minimum cross section of the community space trail which includes a 10' minimum width and a full depth gravel width of 14' to support a fire truck and outriggers. The path has also been designed to be wider at the building corners to allow for the fire truck turning to be within the paved path surface.	C-102.2 & C-502
17	Add proper signage for fire lane around rear of building	Fire lane signage has been added to the fire lane access.	C-102.2
18	Turning templates are too tight at turnaround.	Turning templates have been revised for the update site layout.	
19	Move Jellyfish 4 closer to the path for better maintenance access	Jellyfish 4 has been moved closer to the path for better maintenance access	C-103.2
20	Move fire hydrant at the end of Building A to the opposite side of the fire access to remove conflict with the proposed drainage. End of the main should be a tee to the hydrant, followed by a valve, 10ft of pipe and then the cap. Fire would prefer to keep the hydrant on the building side of the turnaround so the turn around is not blocked by a hose running across the access.	The revisions to the drainage and utilities plans have eliminated the conflict between the water line and the drainage lines and structures.	C-104.2
21	Add more detail landscape plan	More detailed landscape plans are included.	L-1



Tighe&Bond

Proposed Multi-Family Development
105 Bartlett Street
Portsmouth, NH

Drainage Analysis

Prepared For:

Iron Horse Properties LLC

April 20, 2020
Last Revised: November 18, 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. A detention system is included on the development site for the purpose of mitigating temperature differences between the stormwater runoff and the North Mill Pond.

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)

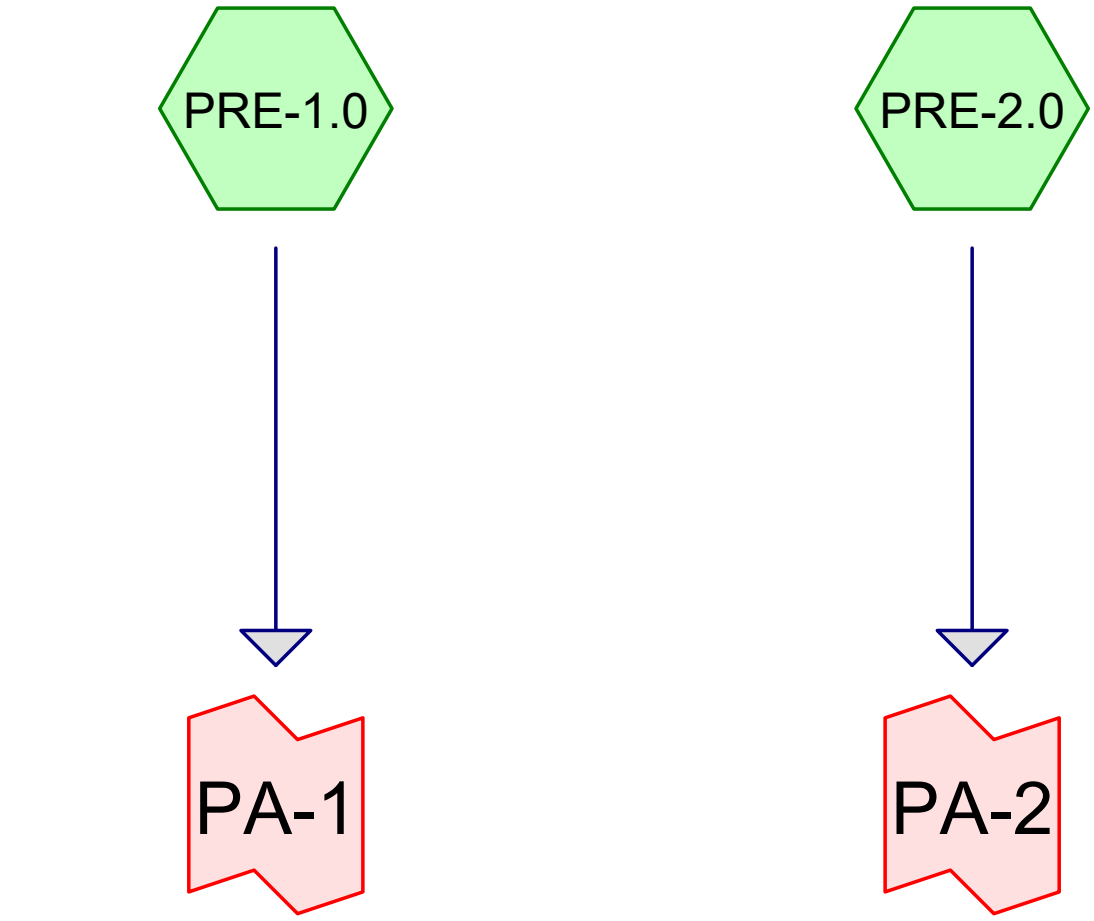
Pre-development Watershed 1.0 (PRE 1.0) is comprised of mostly impervious surfaces from paved parking and structures, as well as some disturbed forested areas to the northeast that surround a dilapidated roundhouse, former railroad turntable, and a machine shop. Banks along the shoreline of North Mill 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 11/16/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.507	39	>75% Grass cover, Good, HSG A (PRE-1.0)
0.419	61	>75% Grass cover, Good, HSG B (PRE-1.0, PRE-2.0)
0.922	74	>75% Grass cover, Good, HSG C (PRE-1.0, PRE-2.0)
0.071	80	>75% Grass cover, Good, HSG D (PRE-1.0)
1.173	96	Gravel surface, HSG C (PRE-1.0, PRE-2.0)
3.596	98	Paved parking, HSG C (PRE-1.0, PRE-2.0)
1.695	98	Roofs, HSG C (PRE-1.0, PRE-2.0)
0.496	30	Woods, Good, HSG A (PRE-1.0)
0.292	55	Woods, Good, HSG B (PRE-1.0, PRE-2.0)
1.378	70	Woods, Good, HSG C (PRE-1.0, PRE-2.0)
0.306	77	Woods, Good, HSG D (PRE-1.0)
10.853	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.003	HSG A	PRE-1.0
0.711	HSG B	PRE-1.0, PRE-2.0
8.763	HSG C	PRE-1.0, PRE-2.0
0.376	HSG D	PRE-1.0
0.000	Other	
10.853		**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=280,495 sf 37.67% Impervious Runoff Depth>1.71"
Flow Length=461' Tc=12.7 min CN=79 Runoff=10.22 cfs 0.918 af

SubcatchmentPRE-2.0: Runoff Area=192,280 sf 64.91% Impervious Runoff Depth>2.62"
Flow Length=248' Tc=5.0 min CN=90 Runoff=13.43 cfs 0.965 af

Link PA-1: NORTH MILL POND Inflow=10.22 cfs 0.918 af
Primary=10.22 cfs 0.918 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=13.43 cfs 0.965 af
Primary=13.43 cfs 0.965 af

Total Runoff Area = 10.853 ac Runoff Volume = 1.883 af Average Runoff Depth = 2.08"
51.25% Pervious = 5.563 ac 48.75% Impervious = 5.291 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=280,495 sf 37.67% Impervious Runoff Depth>3.32"
Flow Length=461' Tc=12.7 min CN=79 Runoff=19.96 cfs 1.780 af

SubcatchmentPRE-2.0: Runoff Area=192,280 sf 64.91% Impervious Runoff Depth>4.45"
Flow Length=248' Tc=5.0 min CN=90 Runoff=22.22 cfs 1.639 af

Link PA-1: NORTH MILL POND Inflow=19.96 cfs 1.780 af
Primary=19.96 cfs 1.780 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=22.22 cfs 1.639 af
Primary=22.22 cfs 1.639 af

Total Runoff Area = 10.853 ac Runoff Volume = 3.419 af Average Runoff Depth = 3.78"
51.25% Pervious = 5.563 ac 48.75% Impervious = 5.291 ac

Summary for Subcatchment PRE-1.0:

Runoff = 19.96 cfs @ 12.18 hrs, Volume= 1.780 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
22,079	39	>75% Grass cover, Good, HSG A
21,626	30	Woods, Good, HSG A
15,637	61	>75% Grass cover, Good, HSG B
9,580	55	Woods, Good, HSG B
43,774	98	Roofs, HSG C
13,394	74	>75% Grass cover, Good, HSG C
61,882	98	Paved parking, HSG C
33,912	70	Woods, Good, HSG C
42,224	96	Gravel surface, HSG C
3,074	80	>75% Grass cover, Good, HSG D
13,313	77	Woods, Good, HSG D
280,495	79	Weighted Average
174,839		62.33% Pervious Area
105,656		37.67% 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:

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

Runoff = 22.22 cfs @ 12.07 hrs, Volume= 1.639 af, Depth> 4.45"

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
2,616	61	>75% Grass cover, Good, HSG B
3,131	55	Woods, Good, HSG B
30,043	98	Roofs, HSG C
26,755	74	>75% Grass cover, Good, HSG C
94,757	98	Paved parking, HSG C
26,114	70	Woods, Good, HSG C
8,864	96	Gravel surface, HSG C
192,280	90	Weighted Average
67,480		35.09% Pervious Area
124,800		64.91% 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 = 6.439 ac, 37.67% Impervious, Inflow Depth > 3.32" for 10-YR event
Inflow = 19.96 cfs @ 12.18 hrs, Volume= 1.780 af
Primary = 19.96 cfs @ 12.18 hrs, Volume= 1.780 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, 64.91% Impervious, Inflow Depth > 4.45" for 10-YR event
Inflow = 22.22 cfs @ 12.07 hrs, Volume= 1.639 af
Primary = 22.22 cfs @ 12.07 hrs, Volume= 1.639 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

Subcatchment PRE-1.0: Runoff Area=280,495 sf 37.67% Impervious Runoff Depth>4.67"
Flow Length=461' Tc=12.7 min CN=79 Runoff=28.08 cfs 2.504 af

Subcatchment PRE-2.0: Runoff Area=192,280 sf 64.91% Impervious Runoff Depth>5.92"
Flow Length=248' Tc=5.0 min CN=90 Runoff=29.06 cfs 2.177 af

Link PA-1: NORTH MILL POND Inflow=28.08 cfs 2.504 af
Primary=28.08 cfs 2.504 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=29.06 cfs 2.177 af
Primary=29.06 cfs 2.177 af

Total Runoff Area = 10.853 ac Runoff Volume = 4.681 af Average Runoff Depth = 5.18"
51.25% Pervious = 5.563 ac 48.75% Impervious = 5.291 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

Subcatchment PRE-1.0: Runoff Area=280,495 sf 37.67% Impervious Runoff Depth>5.96"
Flow Length=461' Tc=12.7 min CN=79 Runoff=35.62 cfs 3.200 af

Subcatchment PRE-2.0: Runoff Area=192,280 sf 64.91% Impervious Runoff Depth>7.29"
Flow Length=248' Tc=5.0 min CN=90 Runoff=35.39 cfs 2.683 af

Link PA-1: NORTH MILL POND Inflow=35.62 cfs 3.200 af
Primary=35.62 cfs 3.200 af

Link PA-2: COMBINED SYSTEM TO SEWER Inflow=35.39 cfs 2.683 af
Primary=35.39 cfs 2.683 af

Total Runoff Area = 10.853 ac Runoff Volume = 5.883 af Average Runoff Depth = 6.50"
51.25% Pervious = 5.563 ac 48.75% Impervious = 5.291 ac

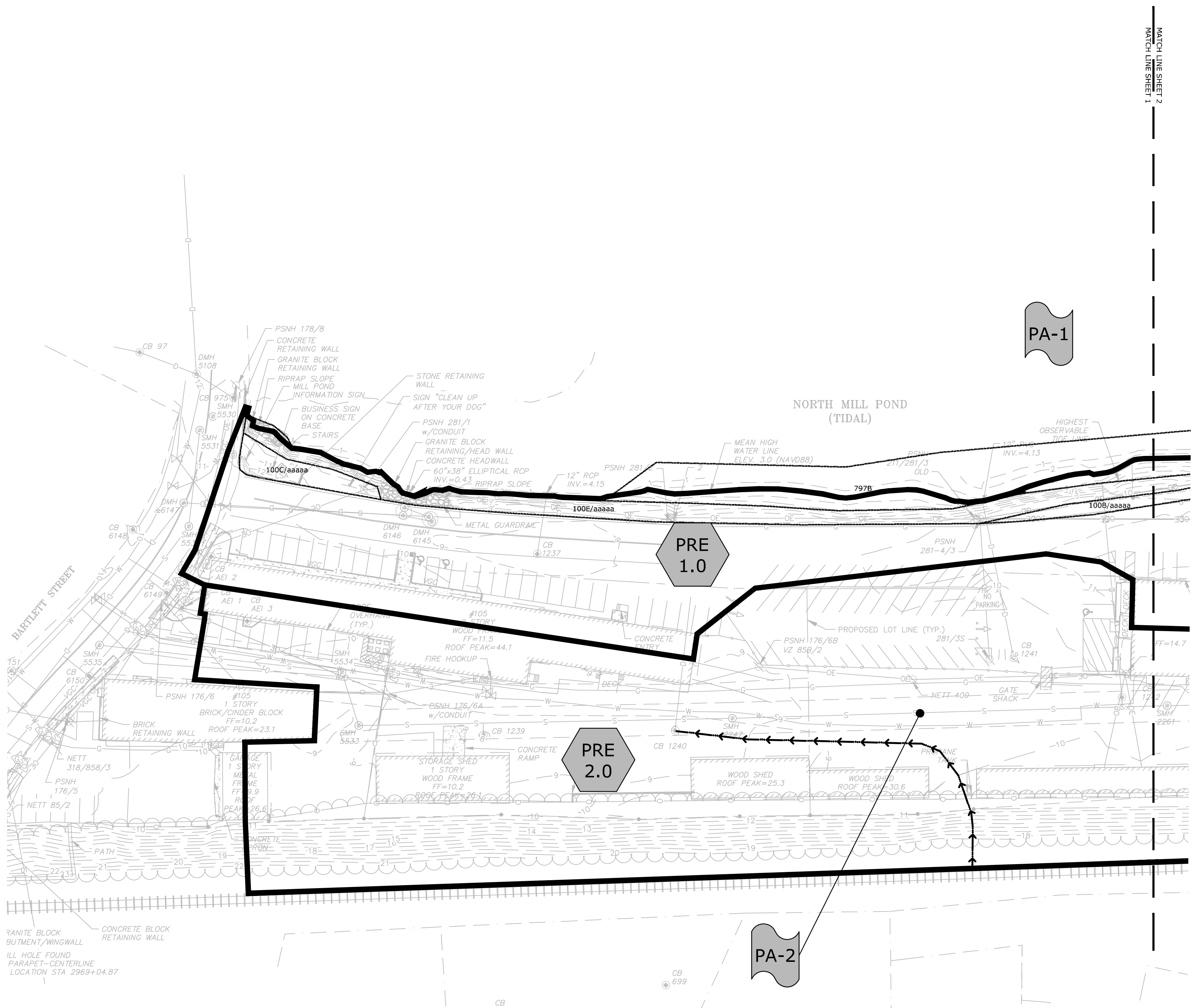
LEGEND

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

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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

Last Saved: 11/16/2020
Plotted On:Nov 17, 2020-3:18pm By: NAHansen
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MATCH LINE SHEET 2
MATCH LINE SHEET 1

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

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
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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

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801.2

Last Saved: 11/16/2020
Printed: Nov 17, 2020 - 3:18pm By: NAHanson
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Section 3
Post-Development Conditions

The post-development condition was analyzed by dividing the watersheds into seven (7) 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.

A detention system is included on the development site for the purpose of mitigating temperature differences between the stormwater runoff and the North Mill Pond. The detention system and outlet structure have been sized to detain the WQV with a drain down time of 24 hours, prior to discharging to the treatment unit. Flows greater than the 2-year storm event are designed to bypass the treatment unit.

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 1.1 (POST-1.1) 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 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 yard drains 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.

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 underground detention system. The detention system and outlet structure have been sized to detain the WQV with a drain down time of 24 hours, prior to discharging to the treatment unit, a Contech Jellyfish Stormwater Filter (JF-4). Flows greater than the 2-year storm event are designed to bypass the treatment unit. 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 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.

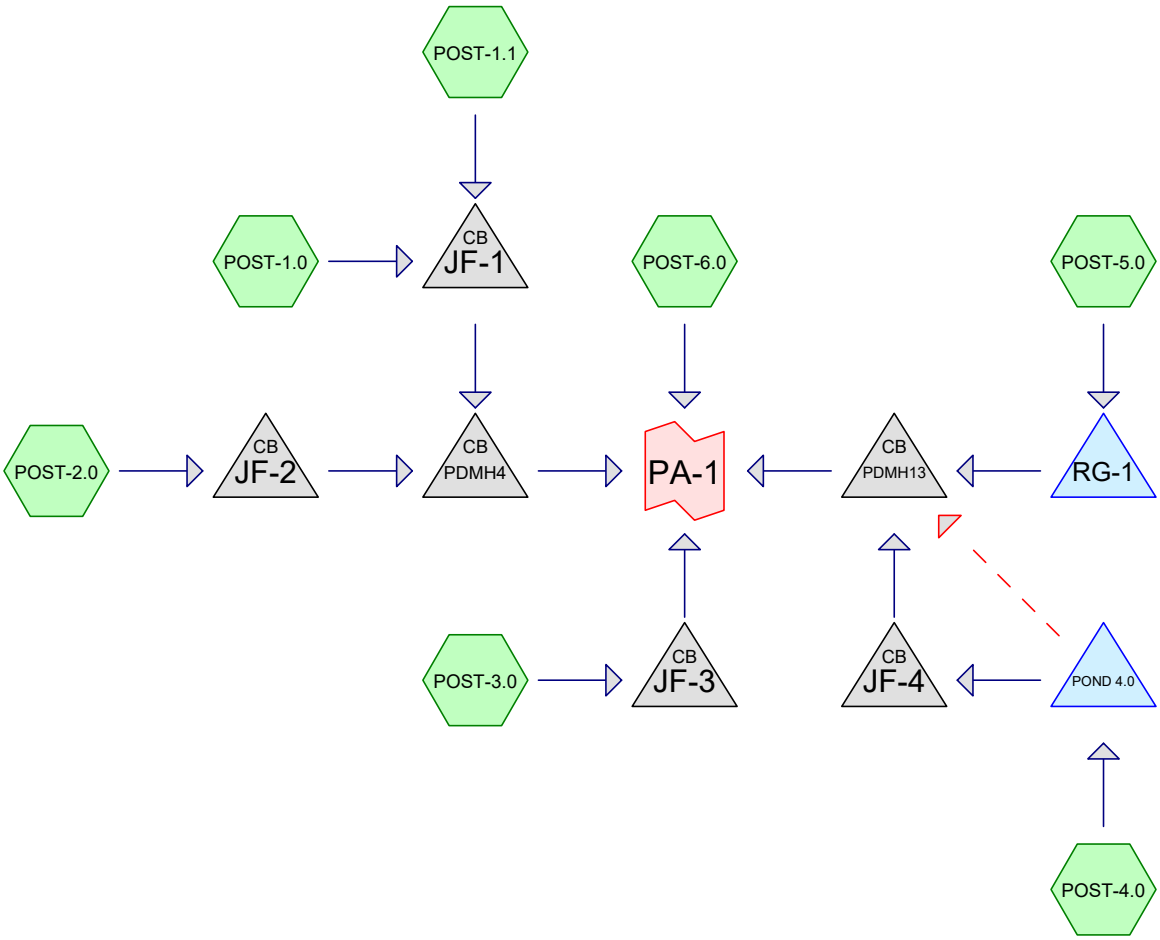
Post-development Watershed 6.0 (POST-6.0) is comprised mostly of grassy and slightly forested areas along the shoreline of North Mill Pond. Runoff from this watershed simply sheets toward and discharges into North Mill Pond, as in the existing condition. There are no proposed impervious surfaces that are within this watershed area that would require treatment.

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



Subcat Reach Pond Link

Routing Diagram for C0960-006 POST
Prepared by Tighe & Bond, Printed 11/16/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.483	39	>75% Grass cover, Good, HSG A (POST-3.0, POST-4.0, POST-6.0)
0.373	61	>75% Grass cover, Good, HSG B (POST-4.0, POST-6.0)
1.682	74	>75% Grass cover, Good, HSG C (POST-1.0, POST-1.1, POST-2.0, POST-3.0, POST-4.0, POST-5.0, POST-6.0)
0.076	80	>75% Grass cover, Good, HSG D (POST-5.0, POST-6.0)
0.421	89	Gravel roads, HSG C (POST-1.0)
0.089	98	Paved parking, HSG A (POST-1.1, POST-3.0, POST-4.0, POST-5.0)
0.224	98	Paved parking, HSG B (POST-4.0)
3.919	98	Paved parking, HSG C (POST-1.0, POST-1.1, POST-2.0, POST-3.0, POST-4.0, POST-5.0)
0.002	98	Paved parking, HSG D (POST-5.0)
2.122	98	Roofs, HSG C (POST-1.0, POST-1.1, POST-2.0, POST-3.0, POST-4.0)
0.028	98	Roofs, HSG D (POST-3.0)
0.432	30	Woods, Good, HSG A (POST-6.0)
0.114	55	Woods, Good, HSG B (POST-4.0, POST-6.0)
0.619	70	Woods, Good, HSG C (POST-1.0, POST-4.0, POST-6.0)
0.270	83	Woods, Poor, HSG D (POST-6.0)
10.853	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.003	HSG A	POST-1.1, POST-3.0, POST-4.0, POST-5.0, POST-6.0
0.711	HSG B	POST-4.0, POST-6.0
8.763	HSG C	POST-1.0, POST-1.1, POST-2.0, POST-3.0, POST-4.0, POST-5.0, POST-6.0
0.376	HSG D	POST-3.0, POST-5.0, POST-6.0
0.000	Other	
10.853		**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 66.78% Impervious Runoff Depth>2.72"
Tc=5.0 min CN=91 Runoff=9.28 cfs 0.671 af

SubcatchmentPOST-1.1: Runoff Area=42,709 sf 91.75% Impervious Runoff Depth>3.23"
Tc=5.0 min CN=96 Runoff=3.45 cfs 0.264 af

SubcatchmentPOST-2.0: Runoff Area=32,228 sf 84.61% Impervious Runoff Depth>3.02"
Tc=5.0 min CN=94 Runoff=2.50 cfs 0.186 af

SubcatchmentPOST-3.0: Runoff Area=53,219 sf 82.46% Impervious Runoff Depth>2.82"
Tc=5.0 min CN=92 Runoff=3.93 cfs 0.287 af

SubcatchmentPOST-4.0: Runoff Area=113,769 sf 62.53% Impervious Runoff Depth>2.35"
Tc=5.0 min CN=87 Runoff=7.17 cfs 0.512 af

SubcatchmentPOST-5.0: Runoff Area=34,408 sf 30.39% Impervious Runoff Depth>1.86"
Tc=5.0 min CN=81 Runoff=1.73 cfs 0.123 af

SubcatchmentPOST-6.0: Runoff Area=67,401 sf 0.00% Impervious Runoff Depth>0.34"
Tc=5.0 min CN=53 Runoff=0.24 cfs 0.044 af

Pond JF-1: Peak Elev=6.29' Inflow=12.73 cfs 0.935 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=12.73 cfs 0.935 af

Pond JF-2: Peak Elev=6.27' Inflow=2.50 cfs 0.186 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=2.50 cfs 0.186 af

Pond JF-3: Peak Elev=4.41' Inflow=3.93 cfs 0.287 af
18.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=3.93 cfs 0.287 af

Pond JF-4: Peak Elev=5.25' Inflow=3.71 cfs 0.389 af
15.0" Round Culvert n=0.013 L=55.0' S=0.0055 '/' Outflow=3.71 cfs 0.389 af

Pond PDMH13: Peak Elev=4.71' Inflow=4.81 cfs 0.498 af
24.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=4.81 cfs 0.498 af

Pond PDMH4: Peak Elev=5.70' Inflow=15.23 cfs 1.122 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=15.23 cfs 1.122 af

Pond POND 4.0: Peak Elev=6.78' Storage=7,962 cf Inflow=7.17 cfs 0.512 af
Primary=3.71 cfs 0.389 af Secondary=0.00 cfs 0.000 af Outflow=3.71 cfs 0.389 af

Pond RG-1: Peak Elev=10.66' Storage=1,286 cf Inflow=1.73 cfs 0.123 af
Outflow=1.46 cfs 0.109 af

Link PA-1: Inflow=21.43 cfs 1.950 af
Primary=21.43 cfs 1.950 af

Total Runoff Area = 10.853 ac Runoff Volume = 2.087 af Average Runoff Depth = 2.31"
41.17% Pervious = 4.469 ac 58.83% Impervious = 6.385 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 66.78% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=91 Runoff=15.16 cfs 1.127 af

SubcatchmentPOST-1.1: Runoff Area=42,709 sf 91.75% Impervious Runoff Depth>5.13"
Tc=5.0 min CN=96 Runoff=5.34 cfs 0.419 af

SubcatchmentPOST-2.0: Runoff Area=32,228 sf 84.61% Impervious Runoff Depth>4.90"
Tc=5.0 min CN=94 Runoff=3.95 cfs 0.302 af

SubcatchmentPOST-3.0: Runoff Area=53,219 sf 82.46% Impervious Runoff Depth>4.67"
Tc=5.0 min CN=92 Runoff=6.35 cfs 0.476 af

SubcatchmentPOST-4.0: Runoff Area=113,769 sf 62.53% Impervious Runoff Depth>4.13"
Tc=5.0 min CN=87 Runoff=12.43 cfs 0.900 af

SubcatchmentPOST-5.0: Runoff Area=34,408 sf 30.39% Impervious Runoff Depth>3.52"
Tc=5.0 min CN=81 Runoff=3.25 cfs 0.232 af

SubcatchmentPOST-6.0: Runoff Area=67,401 sf 0.00% Impervious Runoff Depth>1.15"
Tc=5.0 min CN=53 Runoff=1.74 cfs 0.149 af

Pond JF-1: Peak Elev=8.43' Inflow=20.50 cfs 1.546 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=20.50 cfs 1.546 af

Pond JF-2: Peak Elev=7.18' Inflow=3.95 cfs 0.302 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=3.95 cfs 0.302 af

Pond JF-3: Peak Elev=4.81' Inflow=6.35 cfs 0.476 af
18.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=6.35 cfs 0.476 af

Pond JF-4: Peak Elev=5.73' Inflow=4.25 cfs 0.689 af
15.0" Round Culvert n=0.013 L=55.0' S=0.0055 '/' Outflow=4.25 cfs 0.689 af

Pond PDMH13: Peak Elev=5.25' Inflow=9.32 cfs 0.981 af
24.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=9.32 cfs 0.981 af

Pond PDMH4: Peak Elev=6.83' Inflow=24.45 cfs 1.848 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=24.45 cfs 1.848 af

Pond POND 4.0: Peak Elev=7.56' Storage=11,761 cf Inflow=12.43 cfs 0.900 af
Primary=4.25 cfs 0.689 af Secondary=2.59 cfs 0.074 af Outflow=6.65 cfs 0.763 af

Pond RG-1: Peak Elev=10.80' Storage=1,442 cf Inflow=3.25 cfs 0.232 af
Outflow=3.16 cfs 0.218 af

Link PA-1: Inflow=40.47 cfs 3.453 af
Primary=40.47 cfs 3.453 af

Total Runoff Area = 10.853 ac Runoff Volume = 3.603 af Average Runoff Depth = 3.98"
41.17% Pervious = 4.469 ac 58.83% Impervious = 6.385 ac

Summary for Subcatchment POST-1.0:

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

Runoff = 15.16 cfs @ 12.07 hrs, Volume= 1.127 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
27,484	98	Roofs, HSG C
576	74	>75% Grass cover, Good, HSG C
58,692	98	Paved parking, HSG C
23,967	70	Woods, Good, HSG C
18,322	89	Gravel roads, HSG C
129,041	91	Weighted Average
42,865		33.22% Pervious Area
86,176		66.78% Impervious Area

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

Summary for Subcatchment POST-1.1:

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

Runoff = 5.34 cfs @ 12.07 hrs, Volume= 0.419 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	98	Paved parking, HSG A
5,020	98	Roofs, HSG C
3,525	74	>75% Grass cover, Good, HSG C
34,159	98	Paved parking, HSG C
42,709	96	Weighted Average
3,525		8.25% Pervious Area
39,184		91.75% 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:

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

Runoff = 3.95 cfs @ 12.07 hrs, Volume= 0.302 af, Depth> 4.90"

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

Area (sf)	CN	Description
6,843	98	Roofs, HSG C
4,959	74	>75% Grass cover, Good, HSG C
20,426	98	Paved parking, HSG C
32,228	94	Weighted Average
4,959		15.39% Pervious Area
27,269		84.61% 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:

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

Runoff = 6.35 cfs @ 12.07 hrs, Volume= 0.476 af, Depth> 4.67"

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

Area (sf)	CN	Description
2,277	39	>75% Grass cover, Good, HSG A
2,396	98	Paved parking, HSG A
37,574	98	Roofs, HSG C
7,059	74	>75% Grass cover, Good, HSG C
2,676	98	Paved parking, HSG C
1,237	98	Roofs, HSG D
53,219	92	Weighted Average
9,336		17.54% Pervious Area
43,883		82.46% 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:

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

Runoff = 12.43 cfs @ 12.07 hrs, Volume= 0.900 af, Depth> 4.13"

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
196	39	>75% Grass cover, Good, HSG A
1,384	98	Paved parking, HSG A
15,548	61	>75% Grass cover, Good, HSG B
9,773	98	Paved parking, HSG B
3,314	55	Woods, Good, HSG B
15,516	98	Roofs, HSG C
21,639	74	>75% Grass cover, Good, HSG C
44,469	98	Paved parking, HSG C
1,930	70	Woods, Good, HSG C
113,769	87	Weighted Average
42,627		37.47% Pervious Area
71,142		62.53% 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:

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

Runoff = 3.25 cfs @ 12.08 hrs, Volume= 0.232 af, Depth> 3.52"

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

Area (sf)	CN	Description
71	98	Paved parking, HSG A
23,745	74	>75% Grass cover, Good, HSG C
10,302	98	Paved parking, HSG C
205	80	>75% Grass cover, Good, HSG D
85	98	Paved parking, HSG D
34,408	81	Weighted Average
23,950		69.61% Pervious Area
10,458		30.39% Impervious Area

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

Summary for Subcatchment POST-6.0:

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

Runoff = 1.74 cfs @ 12.10 hrs, Volume= 0.149 af, Depth> 1.15"

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
18,570	39	>75% Grass cover, Good, HSG A
18,806	30	Woods, Good, HSG A
694	61	>75% Grass cover, Good, HSG B
1,635	55	Woods, Good, HSG B
11,771	74	>75% Grass cover, Good, HSG C
1,065	70	Woods, Good, HSG C
3,085	80	>75% Grass cover, Good, HSG D
11,775	83	Woods, Poor, HSG D
67,401	53	Weighted Average
67,401		100.00% Pervious 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 = 3.943 ac, 72.99% Impervious, Inflow Depth > 4.70" for 10-YR event
Inflow = 20.50 cfs @ 12.07 hrs, Volume= 1.546 af
Outflow = 20.50 cfs @ 12.07 hrs, Volume= 1.546 af, Atten= 0%, Lag= 0.0 min
Primary = 20.50 cfs @ 12.07 hrs, Volume= 1.546 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 8.43' @ 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=17.27 cfs @ 12.07 hrs HW=8.03' TW=6.72' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 17.27 cfs @ 5.50 fps)

Summary for Pond JF-2:

Inflow Area = 0.740 ac, 84.61% Impervious, Inflow Depth > 4.90" for 10-YR event
Inflow = 3.95 cfs @ 12.07 hrs, Volume= 0.302 af
Outflow = 3.95 cfs @ 12.07 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min
Primary = 3.95 cfs @ 12.07 hrs, Volume= 0.302 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.18' @ 12.11 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=2.00 cfs @ 12.07 hrs HW=6.84' TW=6.72' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.00 cfs @ 1.63 fps)

Summary for Pond JF-3:

Inflow Area = 1.222 ac, 82.46% Impervious, Inflow Depth > 4.67" for 10-YR event
Inflow = 6.35 cfs @ 12.07 hrs, Volume= 0.476 af
Outflow = 6.35 cfs @ 12.07 hrs, Volume= 0.476 af, Atten= 0%, Lag= 0.0 min
Primary = 6.35 cfs @ 12.07 hrs, Volume= 0.476 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 4.81' @ 12.07 hrs
Flood Elev= 13.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	3.30'	**18.0" Round Culvert** L= 5.0' Ke= 0.500 Inlet / Outlet Invert= 3.30' / 3.20' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=6.11 cfs @ 12.07 hrs HW=4.77' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 6.11 cfs @ 4.38 fps)

Summary for Pond JF-4:

Inflow Area = 2.612 ac, 62.53% Impervious, Inflow Depth > 3.17" for 10-YR event
Inflow = 4.25 cfs @ 12.13 hrs, Volume= 0.689 af
Outflow = 4.25 cfs @ 12.13 hrs, Volume= 0.689 af, Atten= 0%, Lag= 0.0 min
Primary = 4.25 cfs @ 12.13 hrs, Volume= 0.689 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 5.73' @ 12.18 hrs
Flood Elev= 13.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	4.00'	**15.0" Round Culvert** L= 55.0' Ke= 0.500

Inlet / Outlet Invert= 4.00' / 3.70' S= 0.0055 '/' Cc= 0.900
n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.73 cfs @ 12.13 hrs HW=5.63' TW=5.23' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.73 cfs @ 3.04 fps)

Summary for Pond PDMH13:

Inflow Area = 3.402 ac, 55.07% Impervious, Inflow Depth > 3.46" for 10-YR event
Inflow = 9.32 cfs @ 12.15 hrs, Volume= 0.981 af
Outflow = 9.32 cfs @ 12.15 hrs, Volume= 0.981 af, Atten= 0%, Lag= 0.0 min
Primary = 9.32 cfs @ 12.15 hrs, Volume= 0.981 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 5.25' @ 12.15 hrs
Flood Elev= 10.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	3.60'	**24.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 3.60' / 3.40' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=9.28 cfs @ 12.15 hrs HW=5.25' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 9.28 cfs @ 4.56 fps)

Summary for Pond PDMH4:

[80] Warning: Exceeded Pond JF-2 by 0.17' @ 12.05 hrs (2.46 cfs 0.010 af)

Inflow Area = 4.683 ac, 74.83% Impervious, Inflow Depth > 4.73" for 10-YR event
Inflow = 24.45 cfs @ 12.07 hrs, Volume= 1.848 af
Outflow = 24.45 cfs @ 12.07 hrs, Volume= 1.848 af, Atten= 0%, Lag= 0.0 min
Primary = 24.45 cfs @ 12.07 hrs, Volume= 1.848 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.83' @ 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=23.54 cfs @ 12.07 hrs HW=6.72' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 23.54 cfs @ 7.49 fps)

Summary for Pond POND 4.0:

Inflow Area = 2.612 ac, 62.53% Impervious, Inflow Depth > 4.13" for 10-YR event
Inflow = 12.43 cfs @ 12.07 hrs, Volume= 0.900 af
Outflow = 6.65 cfs @ 12.19 hrs, Volume= 0.763 af, Atten= 46%, Lag= 6.9 min
Primary = 4.25 cfs @ 12.13 hrs, Volume= 0.689 af
Secondary = 2.59 cfs @ 12.21 hrs, Volume= 0.074 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 7.56' @ 12.21 hrs Surf.Area= 7,104 sf Storage= 11,761 cf
Flood Elev= 9.60' Surf.Area= 7,104 sf Storage= 19,046 cf

Plug-Flow detention time= 106.5 min calculated for 0.763 af (85% of inflow)
Center-of-Mass det. time= 42.5 min (838.3 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	4.10'	0 cf	**37.00'W x 192.00'L x 6.00'H Field A** 42,624 cf Overall - 19,046 cf Embedded = 23,578 cf x 0.0% Voids
#2A	4.60'	19,046 cf	**CMP Round 60** x 45 Inside #1 Effective Size= 60.0"W x 60.0"H => 19.63 sf x 20.00'L = 392.7 cf Overall Size= 60.0"W x 60.0"H x 20.00'L 5 Rows of 9 Chambers 35.00' Header x 19.63 sf x 2 = 1,374.4 cf Inside
		19,046 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	4.60'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 4.60' / 4.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	4.60'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	6.35'	**4.0' long x 5.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	6.80'	**24.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 6.80' / 6.50' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.04 cfs @ 12.13 hrs HW=7.46' TW=5.63' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 4.04 cfs @ 5.14 fps)
└**2=Orifice/Grate** (Passes < 0.14 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Passes < 14.37 cfs potential flow)

Secondary OutFlow Max=2.57 cfs @ 12.21 hrs HW=7.56' TW=5.17' (Dynamic Tailwater)
└**4=Culvert** (Inlet Controls 2.57 cfs @ 2.34 fps)

Summary for Pond RG-1:

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=91)

Inflow Area = 0.790 ac, 30.39% Impervious, Inflow Depth > 3.52" for 10-YR event
Inflow = 3.25 cfs @ 12.08 hrs, Volume= 0.232 af
Outflow = 3.16 cfs @ 12.10 hrs, Volume= 0.218 af, Atten= 3%, Lag= 1.6 min
Primary = 3.16 cfs @ 12.10 hrs, Volume= 0.218 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 10.80' @ 12.10 hrs Surf.Area= 1,198 sf Storage= 1,442 cf
Flood Elev= 11.80' Surf.Area= 1,590 sf Storage= 2,835 cf

Plug-Flow detention time= 55.4 min calculated for 0.217 af (94% of inflow)
Center-of-Mass det. time= 24.1 min (837.1 - 813.0)

Volume	Invert	Avail.Storage	Storage Description
#1	7.25'	2,835 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7.25	919	0.0	0	0
8.50	919	40.0	460	460
10.00	919	10.0	138	597
11.00	1,269	100.0	1,094	1,691
11.80	1,590	100.0	1,144	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	7.15'	**12.0" Round Culvert** L= 238.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.15' / 5.00' S= 0.0090 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	10.50'	**16.4" x 16.4" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.25'	**6.0" Vert. UD** C= 0.600
#4	Device 3	10.00'	**0.26 cfs Exfiltration when above 10.00'**

Primary OutFlow Max=3.14 cfs @ 12.10 hrs HW=10.80' TW=5.20' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.14 cfs of 4.61 cfs potential flow)
  └**2=Orifice/Grate** (Weir Controls 2.88 cfs @ 1.78 fps)
  └**3=UD** (Passes 0.26 cfs of 1.72 cfs potential flow)
    └**4=Exfiltration** (Exfiltration Controls 0.26 cfs)

Summary for Link PA-1:

Inflow Area = 10.853 ac, 58.83% Impervious, Inflow Depth > 3.82" for 10-YR event
Inflow = 40.47 cfs @ 12.08 hrs, Volume= 3.453 af
Primary = 40.47 cfs @ 12.08 hrs, Volume= 3.453 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 66.78% Impervious Runoff Depth>6.03"
Tc=5.0 min CN=91 Runoff=19.73 cfs 1.490 af

SubcatchmentPOST-1.1: Runoff Area=42,709 sf 91.75% Impervious Runoff Depth>6.62"
Tc=5.0 min CN=96 Runoff=6.81 cfs 0.541 af

SubcatchmentPOST-2.0: Runoff Area=32,228 sf 84.61% Impervious Runoff Depth>6.38"
Tc=5.0 min CN=94 Runoff=5.07 cfs 0.394 af

SubcatchmentPOST-3.0: Runoff Area=53,219 sf 82.46% Impervious Runoff Depth>6.15"
Tc=5.0 min CN=92 Runoff=8.22 cfs 0.626 af

SubcatchmentPOST-4.0: Runoff Area=113,769 sf 62.53% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=87 Runoff=16.51 cfs 1.213 af

SubcatchmentPOST-5.0: Runoff Area=34,408 sf 30.39% Impervious Runoff Depth>4.90"
Tc=5.0 min CN=81 Runoff=4.50 cfs 0.322 af

SubcatchmentPOST-6.0: Runoff Area=67,401 sf 0.00% Impervious Runoff Depth>2.00"
Tc=5.0 min CN=53 Runoff=3.36 cfs 0.257 af

Pond JF-1: Peak Elev=11.22' Inflow=26.54 cfs 2.030 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=26.54 cfs 2.030 af

Pond JF-2: Peak Elev=9.20' Inflow=5.07 cfs 0.394 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=5.07 cfs 0.394 af

Pond JF-3: Peak Elev=5.15' Inflow=8.22 cfs 0.626 af
18.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=8.22 cfs 0.626 af

Pond JF-4: Peak Elev=6.23' Inflow=4.48 cfs 0.893 af
15.0" Round Culvert n=0.013 L=55.0' S=0.0055 '/' Outflow=4.48 cfs 0.893 af

Pond PDMH13: Peak Elev=5.74' Inflow=13.63 cfs 1.383 af
24.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=13.63 cfs 1.383 af

Pond PDMH4: Peak Elev=8.61' Inflow=31.61 cfs 2.424 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=31.61 cfs 2.424 af

Pond POND 4.0: Peak Elev=7.99' Storage=13,756 cf Inflow=16.51 cfs 1.213 af
Primary=4.48 cfs 0.893 af Secondary=5.73 cfs 0.182 af Outflow=9.96 cfs 1.075 af

Pond RG-1: Peak Elev=10.88' Storage=1,537 cf Inflow=4.50 cfs 0.322 af
Outflow=4.38 cfs 0.308 af

Link PA-1: Inflow=54.96 cfs 4.691 af
Primary=54.96 cfs 4.691 af

Total Runoff Area = 10.853 ac Runoff Volume = 4.843 af Average Runoff Depth = 5.35"
41.17% Pervious = 4.469 ac 58.83% Impervious = 6.385 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 66.78% Impervious Runoff Depth>7.41"
Tc=5.0 min CN=91 Runoff=23.96 cfs 1.830 af

SubcatchmentPOST-1.1: Runoff Area=42,709 sf 91.75% Impervious Runoff Depth>8.02"
Tc=5.0 min CN=96 Runoff=8.19 cfs 0.655 af

SubcatchmentPOST-2.0: Runoff Area=32,228 sf 84.61% Impervious Runoff Depth>7.78"
Tc=5.0 min CN=94 Runoff=6.11 cfs 0.479 af

SubcatchmentPOST-3.0: Runoff Area=53,219 sf 82.46% Impervious Runoff Depth>7.53"
Tc=5.0 min CN=92 Runoff=9.96 cfs 0.767 af

SubcatchmentPOST-4.0: Runoff Area=113,769 sf 62.53% Impervious Runoff Depth>6.93"
Tc=5.0 min CN=87 Runoff=20.30 cfs 1.509 af

SubcatchmentPOST-5.0: Runoff Area=34,408 sf 30.39% Impervious Runoff Depth>6.21"
Tc=5.0 min CN=81 Runoff=5.66 cfs 0.409 af

SubcatchmentPOST-6.0: Runoff Area=67,401 sf 0.00% Impervious Runoff Depth>2.90"
Tc=5.0 min CN=53 Runoff=5.07 cfs 0.374 af

Pond JF-1: Peak Elev=14.44' Inflow=32.14 cfs 2.485 af
24.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=32.14 cfs 2.485 af

Pond JF-2: Peak Elev=11.48' Inflow=6.11 cfs 0.479 af
15.0" Round Culvert n=0.013 L=50.0' S=0.0040 '/' Outflow=6.11 cfs 0.479 af

Pond JF-3: Peak Elev=5.50' Inflow=9.96 cfs 0.767 af
18.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=9.96 cfs 0.767 af

Pond JF-4: Peak Elev=6.79' Inflow=4.58 cfs 1.073 af
15.0" Round Culvert n=0.013 L=55.0' S=0.0055 '/' Outflow=4.58 cfs 1.073 af

Pond PDMH13: Peak Elev=6.37' Inflow=17.71 cfs 1.765 af
24.0" Round Culvert n=0.013 L=37.0' S=0.0054 '/' Outflow=17.71 cfs 1.765 af

Pond PDMH4: Peak Elev=10.63' Inflow=38.26 cfs 2.965 af
24.0" Round Culvert n=0.013 L=11.0' S=0.0045 '/' Outflow=38.26 cfs 2.965 af

Pond POND 4.0: Peak Elev=8.37' Storage=15,414 cf Inflow=20.30 cfs 1.509 af
Primary=4.58 cfs 1.073 af Secondary=8.93 cfs 0.297 af Outflow=13.09 cfs 1.370 af

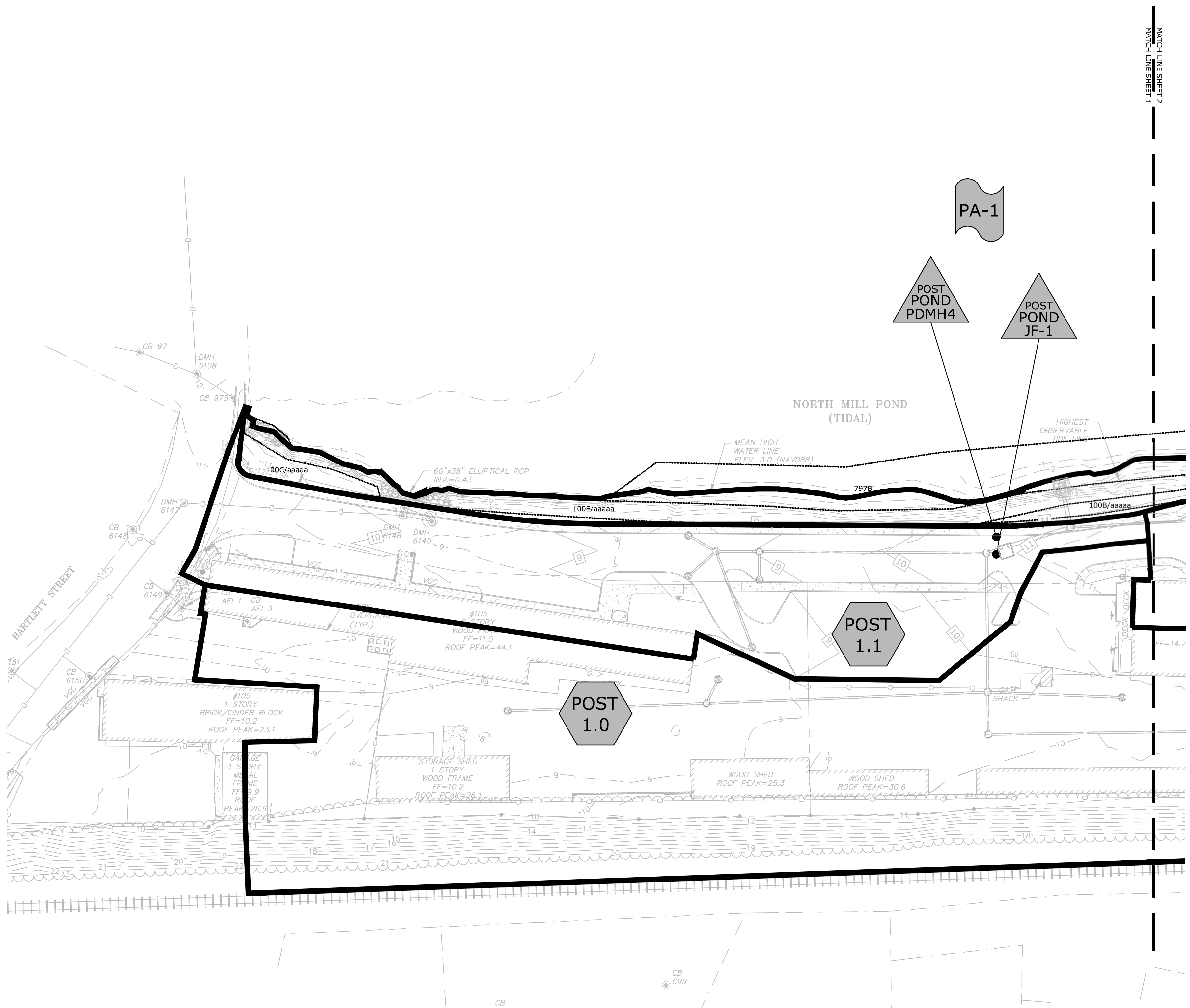
Pond RG-1: Peak Elev=11.04' Storage=1,739 cf Inflow=5.66 cfs 0.409 af
Outflow=4.71 cfs 0.395 af

Link PA-1: Inflow=68.17 cfs 5.871 af
Primary=68.17 cfs 5.871 af

Total Runoff Area = 10.853 ac Runoff Volume = 6.024 af Average Runoff Depth = 6.66"
41.17% Pervious = 4.469 ac 58.83% Impervious = 6.385 ac

LEGEND

(thick line)	POST-DEVELOPMENT WATERSHED BOUNDARY
(arrowed line)	LONGEST FLOW PATH
POST 1.0	PRE DEVELOPMENT WATERSHED AREA DESIGNATION
POST POND 1	POST-DEVELOPMENT POND DESIGNATION
PA-1	POINT OF ANALYSIS



Tighe&Bond

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

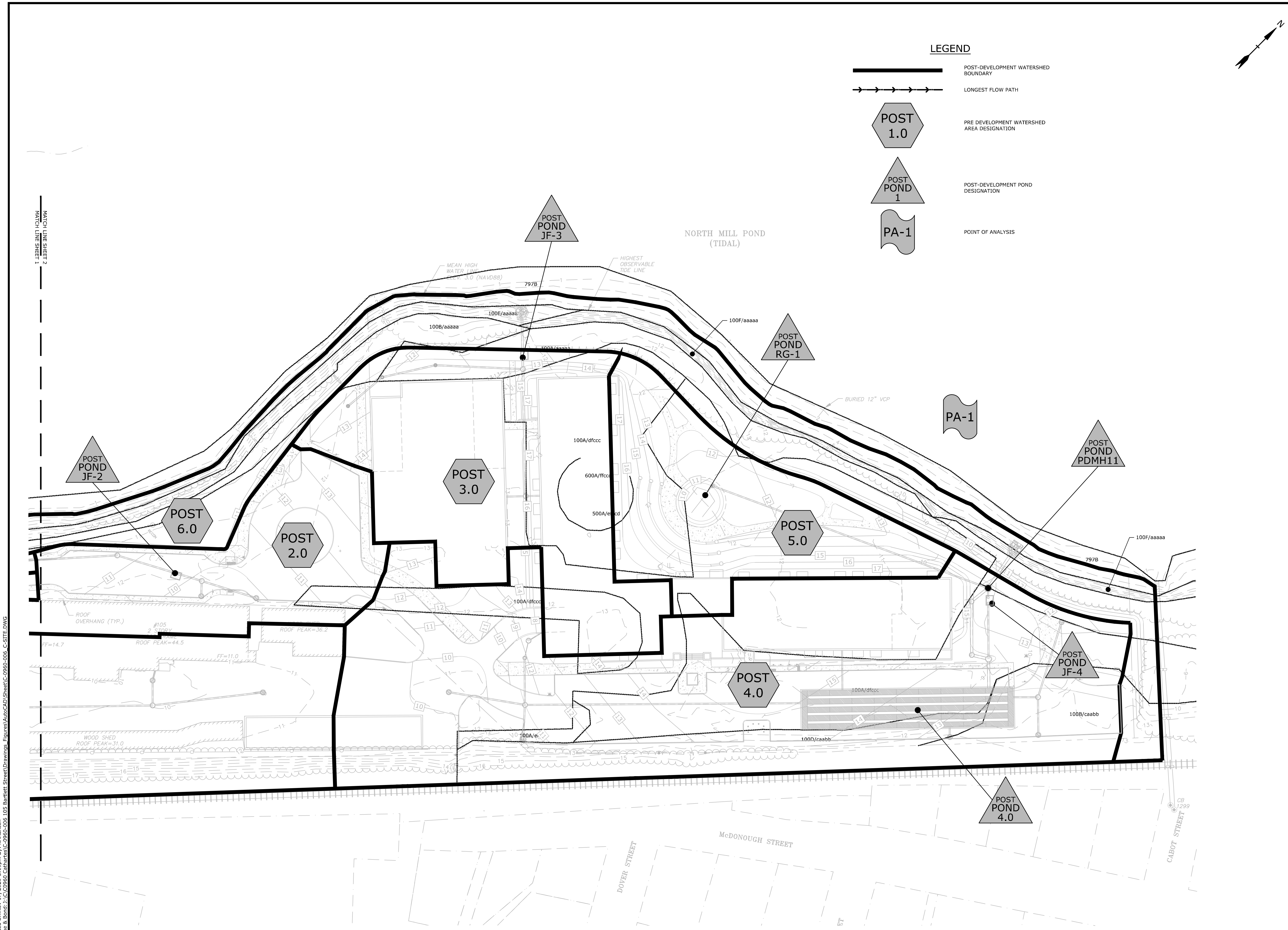
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802.1

Last Saved: 11/16/2020
Plotted On:Nov 17, 2020-3:19pm By: NAHansen
Tighe & Bond:J:\C\C0960 Catharses\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG



Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
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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: 11/16/2020
Plotted On:Nov 17, 2020-3:19pm By: NAHansen
Tighe & Bond:J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

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.

Table 4.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Jellyfish Filter w/Pretreatment[1]	91%	53%	61%
Raingarden[2]	90%	65%	65%
Porous Pavement w/Underdrain[2]	90%	10%	45%

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

Table 4.2 – Pollutant Removal Calculations				
Contech Jellyfish Filter				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood[1]	0.15	1.00	0.15	0.85
Jellyfish Filter[2]	0.89	0.85	0.76	0.09
	Total Suspended Solids Removed:			**91%**
	TN Removal Rate	Starting TN Load	TN Removed	Remaining TN Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.51	0.95	0.48	0.47
	Total Nitrogen Removed:			**53%**
	TP Removal Rate	Starting TP Load	TP Removed	Remaining TP Load
Deep Sump Catchbasin w/Hood[1]	0.05	1.00	0.05	0.95
Jellyfish Filter[2]	0.59	0.95	0.56	0.39
	Total Phosphorus Removed:			**61%**

1. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E.
2. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stromwater Treatment performance testing results.

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)

3.94	ac	A = Area draining to the practice
2.88	ac	A_I = Impervious area draining to the practice
0.73	decimal	I = percent impervious area draining to the practice, in decimal form
0.71	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
2.79	ac-in	WQV= 1" x Rv x A
10,118	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".
0.71	inches	Q = water quality depth. Q = WQV/A
97	unitless	CN = unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.3	inches	S = potential maximum retention. S = (1000/CN) - 10
0.061	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
2.853	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 & 1.1 combined

JF-1

PEAK FLOW = 26.54 CFS

CONTECH Stormwater Solutions Inc. Engineer: DRA
Date Prepared: **11/13/2020**

Site Information

Project Name	**105 Bartlett Street JF1**	
Project State	**NH**	
Project City	**Portsmouth**	
Total Drainage Area, Ad	**3.94**	ac
Post Development Impervious Area, Ai	**2.88**	ac
Pervious Area, Ap	**1.06**	ac
% Impervious	**73%**	
Runoff Coefficient, Rc	**0.71**	

Mass Loading Calculations

Mean Annual Rainfall, P	**50**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**455583**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**1989.70**	lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**1591.76**	lbs
Water Quality Flow	**2.85**	cfs

Method to Use **FLOW BASED**

Summary			
Flow	Treatment Flow Rate	2.94	cfs
	Required Size	**JFPD0808-15-3**	

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)

0.74	ac	A = Area draining to the practice
0.63	ac	A_I = Impervious area draining to the practice
0.85	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
2,189	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
0.035	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
0.617	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: JF-2

PEAK FLOW = 5.07 CFS

CONTECH Stormwater Solutions Inc. Engineer: DRA
Date Prepared: **11/13/2020**

Site Information

Project Name	**105 Bartlett Street JF2**	
Project State	**NH**	
Project City	**Portsmouth**	
Total Drainage Area, Ad	**0.74**	ac
Post Development Impervious Area, Ai	**0.63**	ac
Pervious Area, Ap	**0.11**	ac
% Impervious	**85%**	
Runoff Coefficient, Rc	**0.82**	

Mass Loading Calculations

Mean Annual Rainfall, P	**50**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**98663**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**430.90**	lbs

Filter System

Filtration Brand	**Jelly Fish**	
Cartridge Length	**40**	in

Jelly Fish Sizing

Mass to be Captured by System	**344.72**	lbs
Water Quality Flow	**0.62**	cfs

Method to Use **FLOW BASED**

Summary			
Flow	Treatment Flow Rate	0.73	cfs
	Required Size	**JFPD0806-5-1**	

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)

1.22	ac	A = Area draining to the practice
1.01	ac	A_I = Impervious area draining to the practice
0.83	decimal	I = percent impervious area draining to the practice, in decimal form
0.79	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.97	ac-in	WQV= 1" x Rv x A
3,518	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".
0.79	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
0.040	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
0.992	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: JF-3

PEAK FLOW = 8.82 CFS

CONTECH Stormwater Solutions Inc. Engineer: DRA
Date Prepared: **11/13/2020**

Site Information

Project Name	**105 Bartlett Street JF3**	
Project State	**NH**	
Project City	**Portsmouth**	
Total Drainage Area, Ad	**1.22**	ac
Post Development Impervious Area, Ai	**1.01**	ac
Pervious Area, Ap	**0.21**	ac
% Impervious	**83%**	
Runoff Coefficient, Rc	**0.80**	

Mass Loading Calculations

Mean Annual Rainfall, P	**50**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**158450**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**692.01**	lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**553.60**	lbs
Water Quality Flow	**0.99**	cfs

Method to Use **FLOW BASED**

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

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)

2.61	ac	A = Area draining to the practice
1.64	ac	A_I = Impervious area draining to the practice
0.63	decimal	I = percent impervious area draining to the practice, in decimal form
0.62	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.61	ac-in	WQV= 1" x Rv x A
5,835	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".
0.62	inches	Q = water quality depth. Q = WQV/A
96	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
0.088	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
1.645	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: JF-4

PEAK FLOW = 4.48 CFS

CONTECH Stormwater Solutions Inc. Engineer: DRA
Date Prepared: **11/13/2020**

Site Information

Project Name	**105 Bartlett Street JF4**
Project State	**NH**
Project City	**Portsmouth**

Total Drainage Area, Ad	**2.61**	ac
Post Development Impervious Area, Ai	**1.64**	ac
Pervious Area, Ap	**0.97**	ac
% Impervious	**63%**	
Runoff Coefficient, Rc	**0.62**	

Mass Loading Calculations

Mean Annual Rainfall, P	**50**	in
Agency Required % Removal	**80%**	
Percent Runoff Capture	**90%**	
Mean Annual Runoff, Vt	**262422**	ft^3
Event Mean Concentration of Pollutant, EMC	**70**	mg/l
Annual Mass Load, M total	**1146.09**	lbs

Filter System

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

Jelly Fish Sizing

Mass to be Captured by System	**916.87**	lbs

Summary			
Mass	Treatment Mass	1001.00	lbs
	Required Size	**JFPD0806-7-2**	

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
919	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
8.50	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
7.25	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.25	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	← ≥ 1'
8.50	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	← ≥ 1'
8.50	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	← ≥ 1'
10.93	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
11.80	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,).

6.4 Chloride Management Plan

Winter Operational Guidelines

The following Chloride Management Plan is for the 105 Bartlett Street, Multi-Family, Mixed Use Development in Portsmouth, New Hampshire. The Plan includes operational guidelines including: winter operator certification requirements, weather monitoring, equipment calibration requirements, mechanical removal, and salt usage evaluation and

monitoring. Due to the evolving nature of chloride management efforts, the Chlorides Management Plan will be reviewed annually, in advance of the winter season, to reflect the current management standards.

6.4.1 Background Information

The 105 Bartlett Street, Multi-Family, Mixed Use Development is located along the North Mill Pond in Portsmouth, New Hampshire.

6.4.2 Operational Guidelines – Chloride Management

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

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

6.4.2.1 Winter Operator Certification Requirements

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

6.4.2.2 Improved Weather Monitoring

The property manager will coordinate weather information for use by winter maintenance contractors. This information in conjunction with site specific air/ground surface temperature monitoring will ensure that private contractors engaged at the premises for the purpose of winter operational snow removal and surface maintenance will make more informed decisions as to when and to what extent de-icing, anti-icing and pretreatment materials are applied to private roadways, sidewalks, and parking lots.

6.4.2.3 Equipment Calibration Requirements

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

6.4.2.3.1 Annual Calibration Requirements

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

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

6.4.2.4 Increased Mechanical Removal Capabilities

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

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

6.4.3 Salt Usage Evaluation and Monitoring

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

6.4.4 Summary

The above-described methodologies are incorporated into the Operational Manual and are to be used to qualify and retain all private contractors engaged at the 105 Bartlett Street premises for the purpose of winter operational snow removal and surface maintenance. This section of the Manual, is intended to be an adaptive management document that is modified as required based on experience gained from past practices and technological advancements that reflect chloride BMP standards. All employees directly involved with winter operational activities are required to review this document and the current standard Best Management Practices published by the UNH Technology Transfer (T2) program annually. All employees directly involved with winter operational activities, and all private contractors engaged at the premises for the purposes of winter operational snow removal and surface maintenance, must be current UNHT2 Green SnowPro Certified operators or equivalent and undergo the necessary requirements to maintain this certification annually.

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

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

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

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

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

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

6.5 Invasive Species

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

6.6 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

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 (Updated November 11, 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 development area by +1.72 acres, 3) increasing the number of dwellings to 170 units, and 4) providing 10,300 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. The following tabulation compares these development proposals.

	Original Development Proposal	Current Development Proposal	Change
1. Apartments (units)	120	170	+50 units
2. Office Space (sf)	0	10,300	+10,300 sf
3. Great Rhythm Brewing Co	remains	razed	- 68 AM & -85 PM trips
4. Play All Day dog care	remains	razed	
5. Access/Egress	Via Bartlett St. Only	Via Bartlett St. Only	No change
6. Development area	2.99 Acres	4.71 Acres	+58% increase

Table 1A summarizes the updated trip generation analyses and shows that the proposed residences and office space will generate a total of approximately 70 (AM) and 86 (PM) vehicle-trips during the peak hour periods (see Attachment 2). 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 3). The removal of the brewery and daycare uses essentially cancels out the impact of the proposed residential / commercial development.

Table 1A **Trip Generation Summary - Current Development Proposal (11/11/20)**

	Current Development Proposal				
	Apartments [1] (170 units)	Office [2] (10,300 sf)	Subtotal	Less Brewery & Dog Daycare [3]	Net Trips Generated
Weekday AM Peak Hour					
Entering	15 veh	10 veh	25 veh	-34 veh	-9 veh
Exiting	43 veh	2 veh	45 veh	-34 veh	11 veh
Total	58 trips	12 trips	70 trips	-68 trips	2 trips
Weekday PM Peak Hour					
Entering	45 veh	2 veh	47 veh	-43 veh	4 veh
Exiting	29 veh	10 veh	39 veh	-42 veh	-3 veh
Total	74 trips	12 trips	86 trips	-85 trips	1 trips

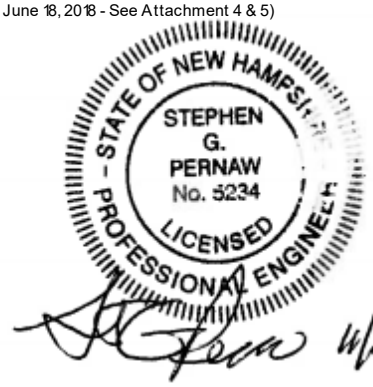
[1] ITE Land Use Code 221- Multifamily Housing (Mid-Rise) - Equation Method - See Attachment 2
[2] ITE Land Use Code 710 - Office - Rate Method - See Attachment 2
[3] October 2018 Driveway Counts - See Attachment 3

Table 1B compares the trip generating characteristics of the previous and current development proposals and demonstrates that the current development proposal will generate approximately -39 (AM) and -52 (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.

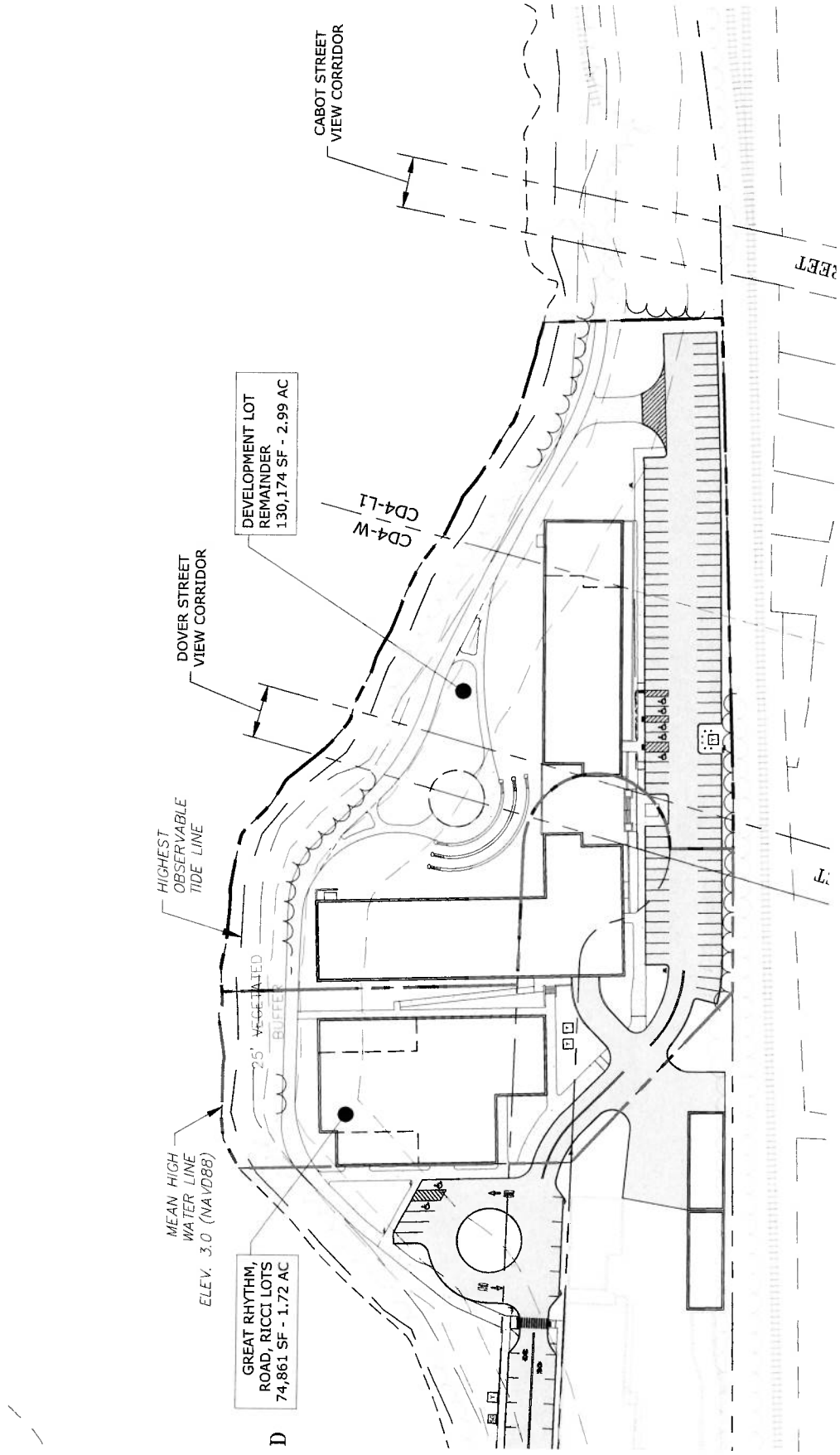
Table 1B **Trip Generation Comparison (11/11/20)**

	Previous Development Proposal [1] (120 Apartments)	Current Development Proposal [2]	Net Change
Weekday AM Peak Hour			
Entering	11 veh	-9 veh	-20 veh
Exiting	30 veh	11 veh	-19 veh
Total	41 trips	2 trips	-39 fewer trips
Weekday PM Peak Hour			
Entering	32 veh	4 veh	-28 veh
Exiting	21 veh	-3 veh	-24 veh
Total	53 trips	1 trips	-52 fewer trips

[1] "Traffic Impact and Site Access Study-Proposed Residential Subdivision" Table 1, dated June 18, 2018 - See Attachment 4 & 5)
[2] See "net trips generated" on Table 1A



Attachments


CABOT STREET
VIEW CORRIDOR
DEVELOPMENT LOT
REMAINDER
130,174 SF - 2.99 AC
CD4-W
CD4-L1
DOVER STREET
VIEW CORRIDOR
HIGHEST
OBSERVABLE
TIDE LINE
25' VEGETATED
BUFFER
MEAN HIGH
WATER LINE
ELEV. 3.0 (NAVD88)
GREAT RHYTHM,
ROAD, RICCI LOTS
74,861 SF - 1.72 AC

Trip Generation Summary

Alternative: Current Development Proposal
Phase:
Project: 1955A

Open Date: 6/25/2020
Analysis Date: 6/25/2020

ITE	Land Use		Weekday Average Daily Trips *	Enter	Exit	Total	Weekday AM Peak Hour of Adjacent Street Traffic *	Enter	Exit	Total	Weekday PM Peak Hour of Adjacent Street Traffic *	Enter	Exit	Total
221	MID-RISE 1			463	462	925		15	43	58		45	29	74
	170	Dwelling Units												
710				50	50	100		10	2	12		2	10	12
	10.3	1000 Sq. Ft. GFA												
Unadjusted Volume				513	512	1025		25	45	70		47	39	86
Internal Capture Trips				0	0	0		0	0	0		1	1	2
Pass-By Trips				0	0	0		0	0	0		0	0	0
Volume Added to Adjacent Streets				513	512	1025		25	45	70		46	38	84

Total Weekday Average Daily Trips Internal Capture = 0 Percent
Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 2 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition
TRIP GENERATION 10, TRAFFICWARE, LLC

Attachment 2

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).

Trip Generation Summary

Alternative: Previous Development Proposal
Phase:
Project: 1955A

Open Date: 6/25/2020
Analysis Date: 6/25/2020

ITE	Land Use		Weekday Average Daily Trips			Weekday AM Peak Hour of Adjacent Street Traffic			Weekday PM Peak Hour of Adjacent Street Traffic		
		*	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
221	MID-RISE 2		327	326	653	11	30	41	32	21	53
	120 Dwelling Units										
Unadjusted Volume			327	326	653	11	30	41	32	21	53
Internal Capture Trips			0	0	0	0	0	0	0	0	0
Pass-By Trips			0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets			327	326	653	11	30	41	32	21	53

Total Weekday Average Daily Trips Internal Capture = 0 Percent
Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition
TRIP GENERATION 10, TRAFFICWARE, LLC

Attachment 5

Tighe&Bond
Engineers | Environmental Specialists

C-0960-006
November 4, 2020

Mr. Jeff Johnston, Principal
Cathartes
100 Summer Street, Suite 1600
Boston, MA 02110

Re: **Environmental Summary**
105 Bartlett Street
Portsmouth, New Hampshire

Dear Mr. Johnston:

Tighe & Bond conducted an environmental assessment in 2019 for the 105 Bartlett Street, New Hampshire property (herein referred to as the "Site") on behalf of Cathartes. Tighe & Bond conducted a limited subsurface exploration program to help assess the subsurface conditions potentially impacted by historical operations and to better understand potential environmental risks associated with property acquisition and redevelopment.

Below is a summary of potential environmental concerns associated with the Site identified during this limited environmental assessment:

- Tighe & Bond completed an Environmental Site Assessment which included visual field observations of soil and the collection and chemical analysis of both soil and ground water samples across the Site.
    - A total of ten(10) environmental soil samples were collected across the Site and submitted for a comprehensive chemical analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyl (PCBs), RCRA 8 Metals and reactivity.

    - A total of four(4) groundwater samples were collected across the Site and submitted for a comprehensive chemical analysis of VOCs, SVOCs and dissolved RCRA 8 metals.

- Tighe & Bond concluded that in general, portions of the site are underlain with a layer of anthropogenic fill material at varying thickness which is attributed to the historic site use. The anthropogenic fil material is generally consistent with typical urban sites with similar commercial/industrial historical site uses.

- Portions of the Site were formerly utilized for B&M railroad operations and a foundry. The presence of coal tar was not observed in test pits, and/or the soil and groundwater data collected at the site to date.

- Analytical data from soil samples collected during the 2019 subsurface investigations indicate concentrations of contaminants are typical for similar urban sites are considered background conditions from the anthropogenic fill material at the Site and do not constitute a NHDES reporting condition.

Analytical data obtained from the 2019 groundwater sampling at the Site indicate no exceedances of the NHDES groundwater standards were observed.

- A 20,000 gallon tank was removed from the site in 1992. The soil in this area has limited petroleum contaminants in soil. This area will be remediated under a soil management plan and in accordance with NHDES regulations during redevelopment.

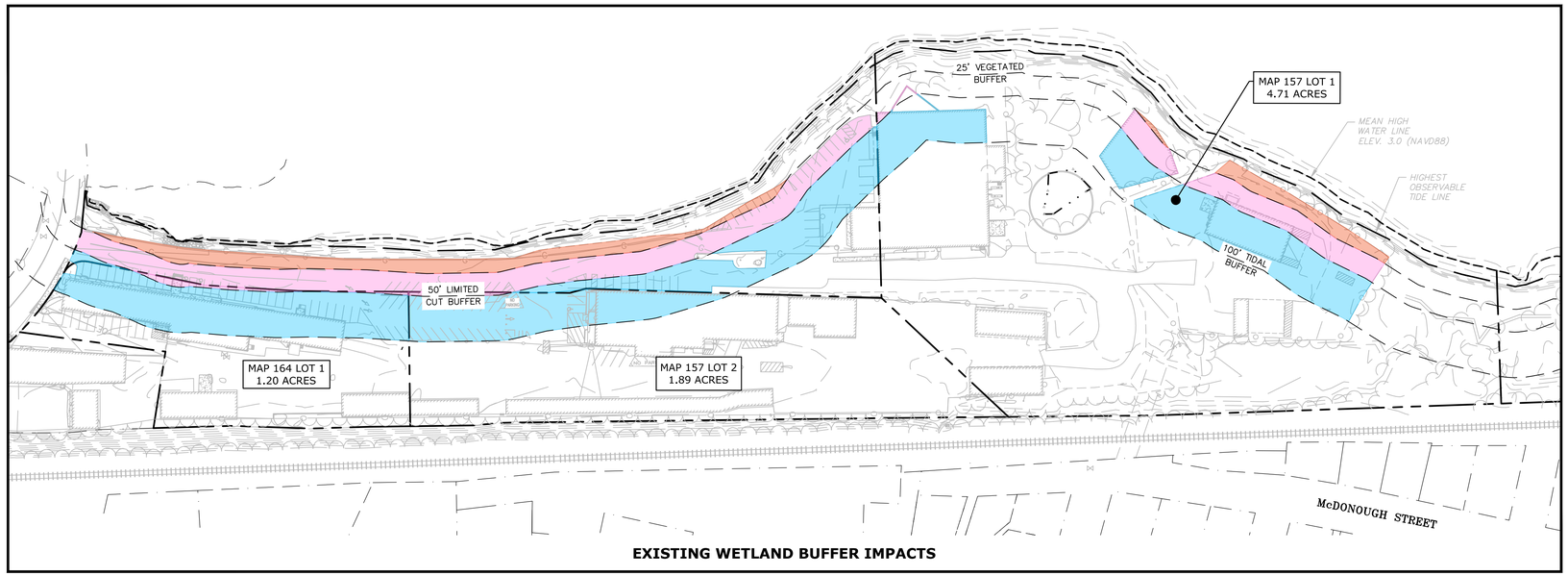
If you have any questions pertaining to this limited subsurface investigation, please feel free to contact the undersigned.

Very truly yours,

TIGHE & BOND, INC.

Bryan Gammons
Senior Environmental Scientist

\\Tighebond.com\data\Data\Projects\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Environmental\Reports\Environmental Memo - November 2020\2020-1104-105 Bartlett Street - Environmental Memo-Final.doc



EXISTING WETLAND BUFFER IMPACTS

Buffer Impact Area for Project Parcels								
Wetland Buffer Setback	**Map 157 Lot 1**		**Roadway Lot**		**Map 157 Lot 2**		**Map 164 Lot 1**	
	Proposed Development		**Private Road**		**Ricci Lumber**		**Ricci Design Center**	
	Existing Impact	**Proposed Impact**	**Existing Impact**	**Proposed Impact**	**Existing Impact**	**Proposed Impact**	**Existing Impact**	**Proposed Impact**
0 - 25 FT	3,094 SF (1)	0 SF	9,694 SF	6,664 SF	0 SF	0 SF	0 SF	0 SF
25 - 50 FT	7,537 SF (2)	8,542 SF (4)	21,656 SF	17,652 SF	422 SF	422 SF	863 SF	837 SF
50 - 100 FT	20,407 SF (3)	14,698 SF	14,253 SF	11,506 SF	13,345 SF	12,610 SF	18,839 SF	16,135 SF
Total Lot Impact	**31,038 SF**	**23,240 SF**	**45,603 SF**	**35,822 SF**	**13,767 SF**	**13,032 SF**	**19,702 SF**	**16,971 SF**
Net Buffer Improvement on Parcels	**7,799 SF**		**9,781 SF**		**735 SF**		**2,731 SF**	
Overall Project Improvement	**21,046 SF**							

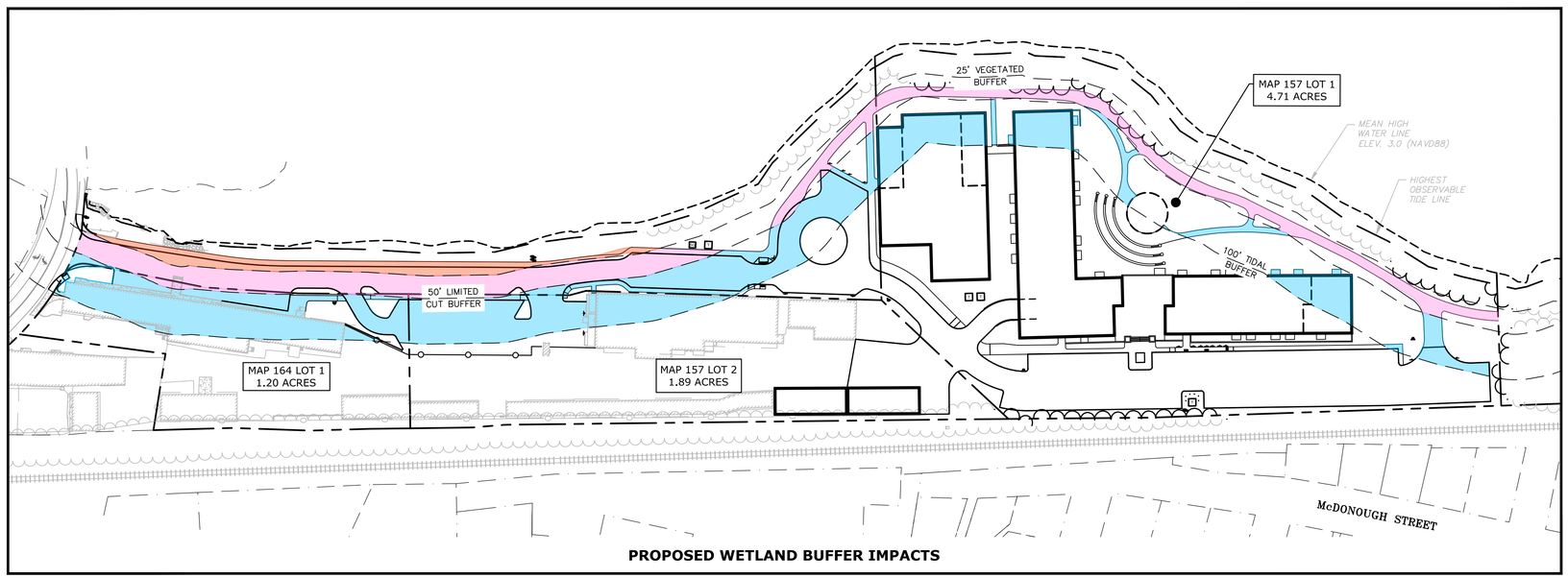
Notes:

(1) Includes 147 SF of impact in 0 - 25 ft buffer from the existing railroad turntable structure.

(2) Includes 1,806 SF of impact in 25 - 50 ft buffer from the existing railroad turntable structure.

(3) Includes 2,397 SF of impact in 50 - 100 ft buffer from the existing railroad turntable structure.

(4) Includes 8,294 SF of impact in the 25 - 50 ft buffer for the City's North Mill Pond Trail & Greenway.



PROPOSED WETLAND BUFFER IMPACTS

Tighe&Bond

0 80' 160'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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

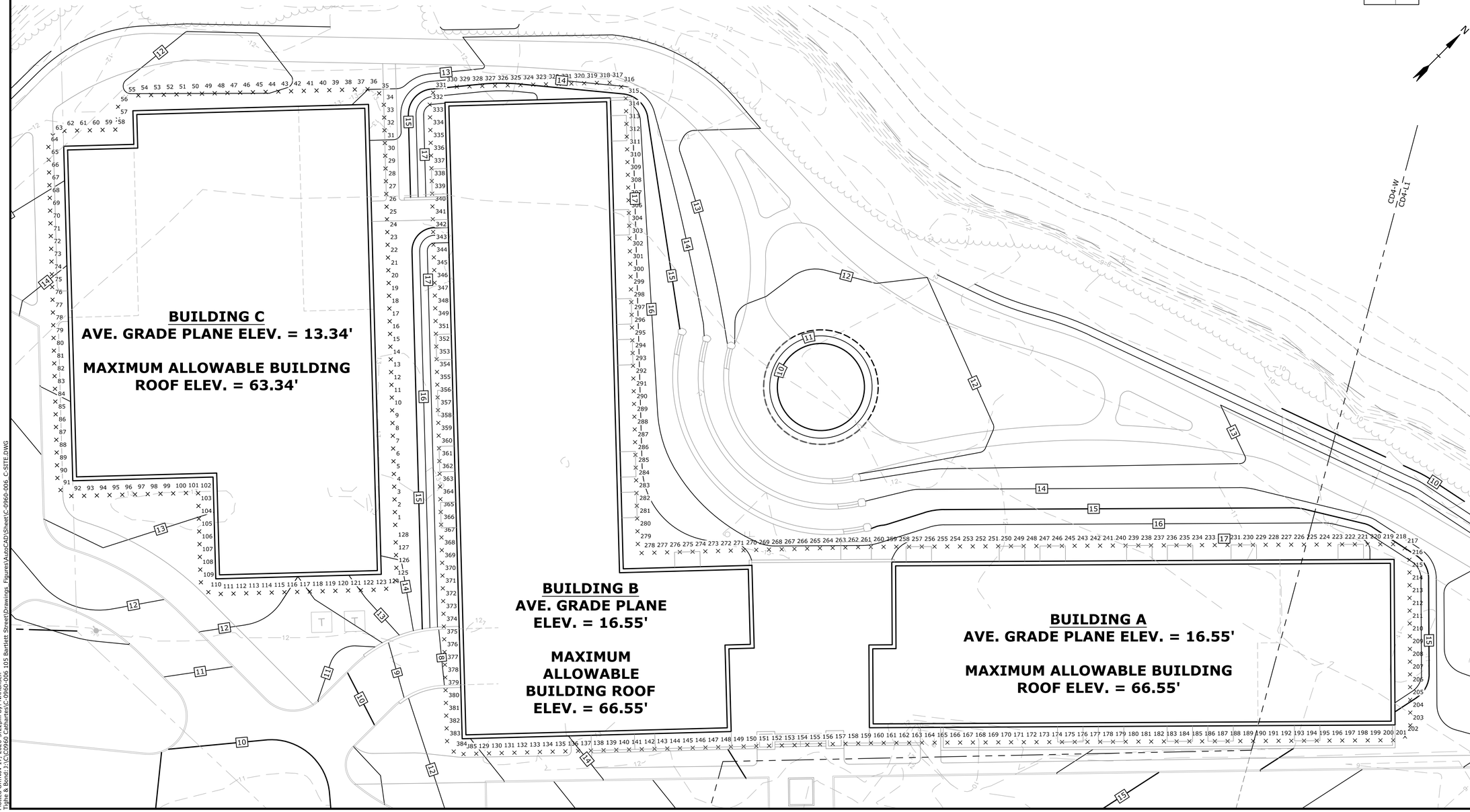
1 OF 1

BUILDING C GRADE PLANE ELEVATIONS

POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV
1	14.50	18	14.50	35	13.15	52	12.00	69	13.30	86	13.75	103	13.15	120	12.50
2	14.50	19	14.50	36	13.00	53	12.00	70	13.45	87	13.70	104	13.00	121	12.75
3	14.50	20	14.50	37	12.80	54	12.00	71	13.60	88	13.60	105	12.90	122	13.00
4	14.50	21	14.50	38	12.60	55	12.00	72	13.75	89	13.50	106	12.80	123	13.20
5	14.50	22	14.50	39	12.40	56	12.10	73	13.90	90	13.40	107	12.70	124	13.40
6	14.50	23	14.50	40	12.20	57	12.30	74	14.00	91	13.35	108	12.60	125	13.60
7	14.50	24	14.50	41	12.05	58	12.50	75	14.05	92	13.30	109	12.55	126	13.80
8	14.50	25	14.50	42	12.00	59	12.60	76	14.10	93	13.30	110	12.50	127	14.00
9	14.50	26	14.50	43	12.00	60	12.60	77	14.15	94	13.30	111	12.45	128	14.25
10	14.50	27	14.50	44	12.00	61	12.60	78	14.20	95	13.30	112	12.40		
11	14.50	28	14.50	45	12.00	62	12.60	79	14.25	96	13.30	113	12.35	**AVERAGE GRADE PLANE**	**13.34**
12	14.50	29	14.50	46	12.00	63	12.70	80	14.20	97	13.30	114	12.25		
13	14.50	30	14.50	47	12.00	64	12.80	81	14.15	98	13.30	115	12.15		
14	14.50	31	14.00	48	12.00	65	12.85	82	14.05	99	13.30	116	12.00		
15	14.50	32	13.80	49	12.00	66	12.95	83	14.00	100	13.30	117	11.95		
16	14.50	33	13.65	50	12.00	67	13.00	84	13.95	101	13.30	118	12.00		
17	14.50	34	13.40	51	12.00	68	13.20	85	13.85	102	13.30	119	12.25		

BUILDING A & B GRADE PLANE ELEVATIONS

POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV	POINT #	ELEV
129	12.90	146	16.20	163	17.20	180	17.50	197	17.50	214	16.50	231	17.50	249	17.50	266	16.10	283	17.50	300	17.50	318	14.00	335	17.50	353	17.50	370	17.50
130	13.10	147	16.60	164	16.80	181	17.50	198	17.50	215	16.50	232	17.50	250	17.50	267	16.25	284	17.50	301	17.50	319	14.10	336	17.50	354	17.50	371	17.50
131	13.20	148	17.00	165	16.40	182	17.50	199	17.50	216	15.90	233	17.50	251	17.50	268	16.25	285	17.50	302	17.50	320	14.40	337	17.50	355	17.50	372	17.50
132	13.30	149	17.40	166	17.50	183	17.50	200	17.50	217	15.00	234	17.50	252	17.50	269	16.60	286	17.50	303	17.50	321	14.65	338	17.50	356	17.50	373	17.50
133	13.45	150	17.50	167	17.50	184	17.50	201	17.50	218	15.50	235	17.50	253	17.50	270	17.20	287	17.50	304	17.50	322	14.85	339	17.50	357	17.50	374	17.50
134	13.60	151	17.50	168	17.50	185	17.50	202	14.80	219	16.30	236	17.50	254	17.50	271	17.50	288	17.50	306	17.50	323	15.00	340	14.50	358	17.50	375	7.90
135	13.75	152	17.50	169	17.50	186	17.50	203	14.90	220	17.05	237	17.50	255	17.50	272	17.50	289	17.50	307	17.50	324	15.00	341	14.50	359	17.50	376	7.90
136	13.90	153	15.50	170	17.50	187	17.50	204	15.00	221	17.50	238	17.50	256	17.50	273	17.50	290	17.50	308	17.50	325	15.00	342	15.50	360	17.50	377	7.95
137	14.00	154	15.50	171	17.50	188	17.50	205	15.50	222	17.50	239	17.50	257	17.50	274	17.50	291	17.50	309	17.50	326	15.00	343	17.00	361	17.50	378	7.95
138	14.10	155	15.50	172	17.50	189	17.50	206	16.50	223	17.50	240	17.50	258	16.90	275	17.50	292	17.50	310	17.50	327	15.00	344	17.50	362	17.50	379	12.70
139	14.50	156	15.50	173	17.50	190	17.50	207	16.50	224	17.50	241	17.50	259	16.10	276	17.50	293	17.50	311	17.50	328	15.00	345	17.50	363	17.50	380	12.65
140	14.90	157	17.50	174	17.50	191	17.50	208	16.50	225	17.50	242	17.50	260	16.10	277	17.50	294	17.50	312	17.50	329	15.00	346	17.50	364	17.50	381	12.60
141	15.00	158	17.50	175	17.50	192	17.50	209	16.50	226	17.50	243	17.50	261	16.10	278	17.50	295	17.50	313	17.50	330	15.00	347	17.50	365	17.50	382	12.55
142	15.00	159	17.50	176	17.50	193	17.50	210	16.50	227	17.50	245	17.50	262	16.10	279	17.50	296	17.50	314	17.50	331	15.50	348	17.50	366	17.50	383	12.50
143	15.00	160	17.50	177	17.50	194	17.50	211	16.50	228	17.50	246	17.50	263	16.10	280	17.50	297	17.50	315	17.50	332	17.00	349	17.50	367	17.50	384	12.60
144	15.40	161	17.50	178	17.50	195	17.50	212	16.50	229	17.50	247	17.50	264	16.10	281	17.50	298	17.50	316	14.00	333	17.50	351	17.50	368	17.50	385	12.68
145	15.80	162	17.50	179	17.50	196	17.50	213	16.50	230	17.50	248	17.50	265	16.10	282	17.50	299	17.50	317	14.00	334	17.50	352	17.50	369	17.50	**AVERAGE GRADE PLANE**	**16.55**		



Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
E	5/20/2020	TAC Resubmission
D	4/29/2020	Wetland CUP Submission
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

GRADE PLANE EXHIBIT

SCALE: AS SHOWN

1 OF 1

Last Saved: 11/16/2020
Plotted: 11/16/2020 - 3:32pm By: NAHansen
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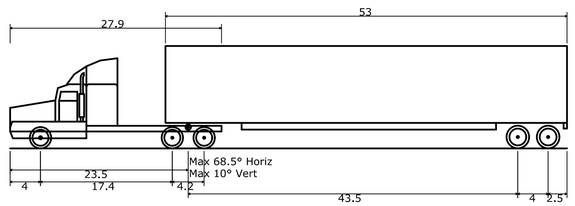
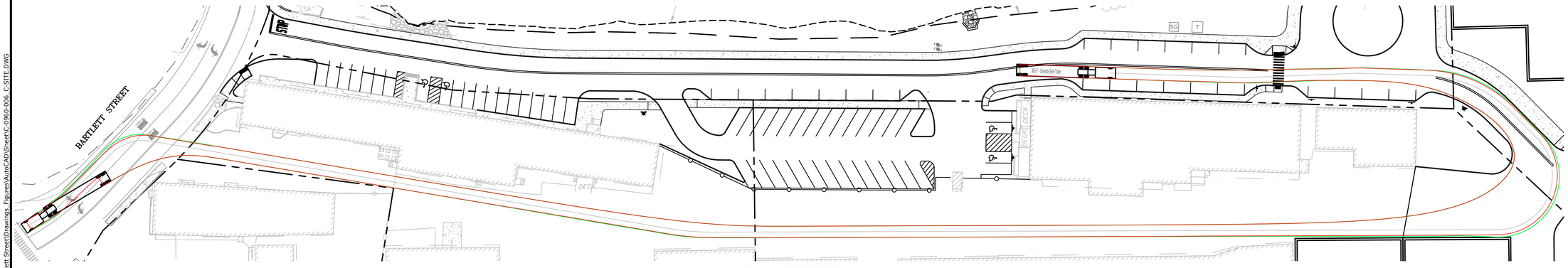
WB-67 ENTERING



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°



WB-67 EXITING

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
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E	5/20/2020	TAC Resubmission
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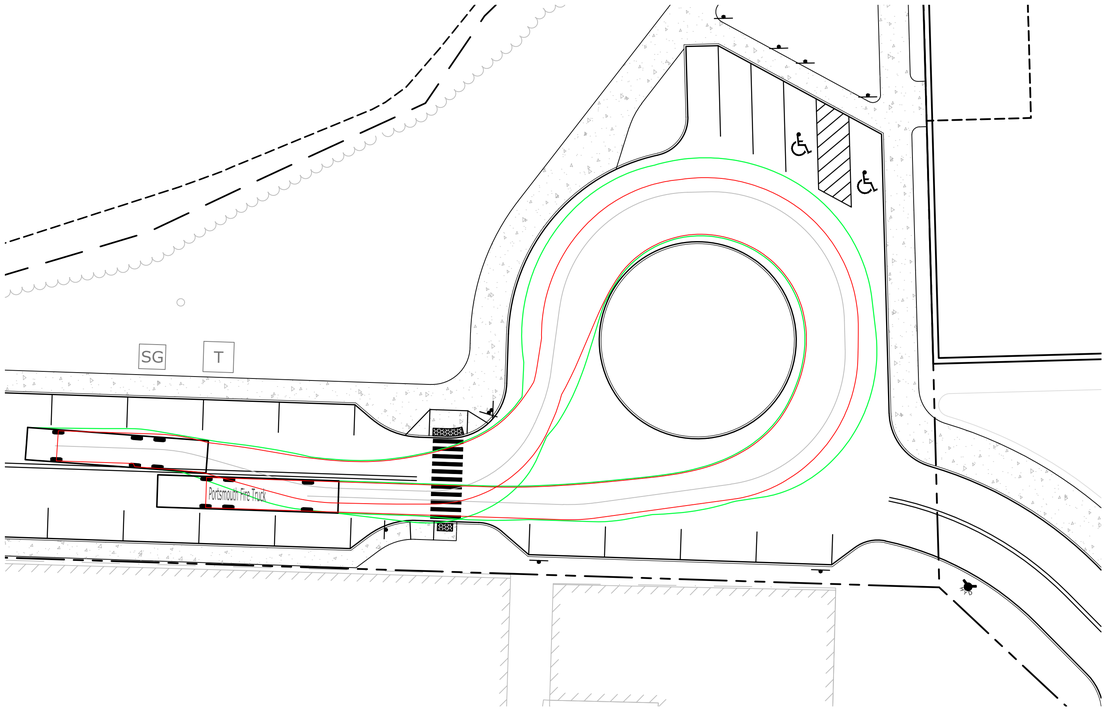
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

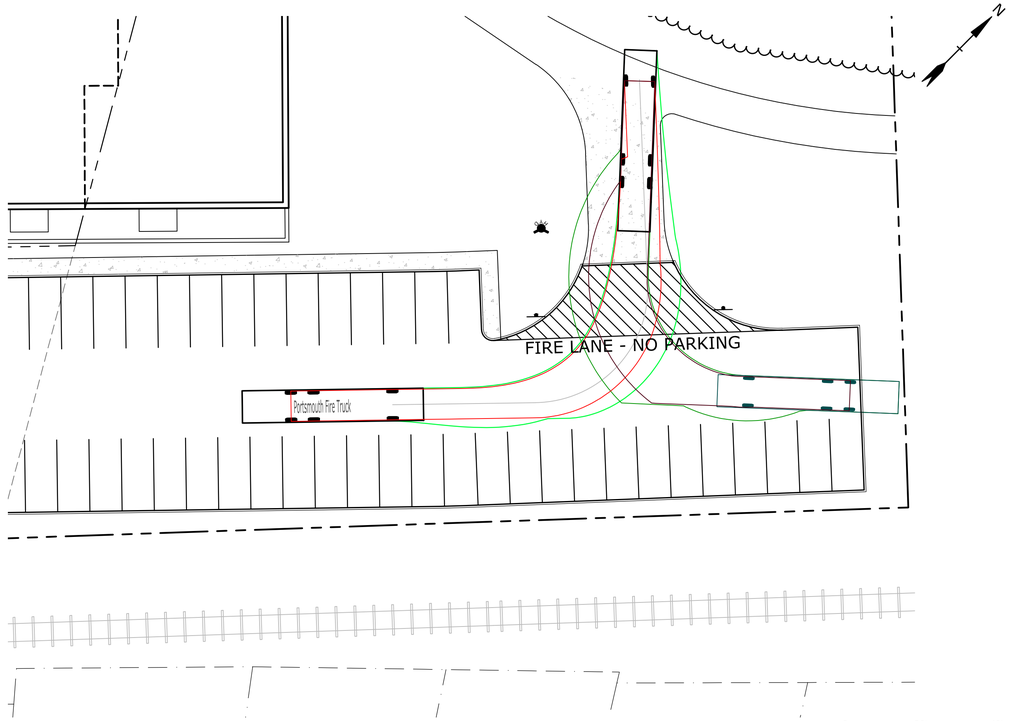
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

TRUCK TURNING EXHIBIT

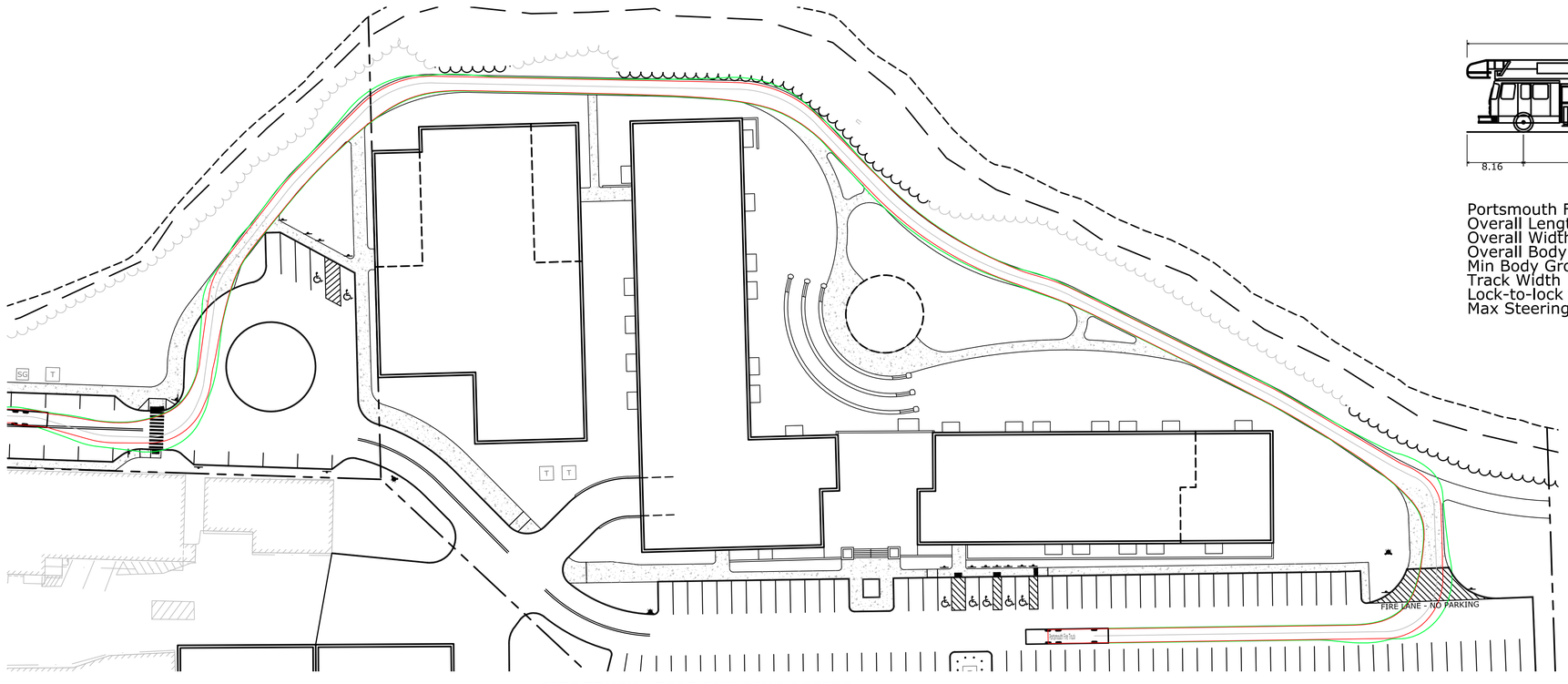
SCALE: AS SHOWN



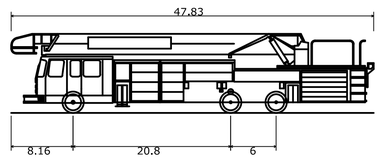
FIRE TRUCK CUL-DE-SAC



FIRE TRUCK TURN AROUND



FIRE TRUCK - REAR BUILDING ACCESS



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°

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
G	11/18/2020	TAC Resubmission
F	10/28/2020	Wetland CUP Resubmission
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PROJECT NO:	C-0960-006
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DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

TRUCK TURNING EXHIBIT

SCALE: AS SHOWN

2 OF 2

Last Saved: 11/16/2020
Plotted: Nov 17, 2020 - 3:21pm By: NAHanson
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