C0960-006
April 29, 2020

Mr. Steve Miller, Chairman
City of Portsmouth Conservation Commission
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Conditional Use Permit Application
Proposed Multi-Family Development, 105 Bartlett Street, Portsmouth, NH

Dear Steve:

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

- Site Plan Set last revised April 20, 2020;
- Wetland Delineation and Assessment of Functions and Values dated December, 2019;
- Drainage Analysis dated April 20, 2020;
- Site Constraints Plan dated February 26, 2020;
- Wetland Buffer Impact Exhibit dated April 29, 2020

The proposed project is located at 105 Bartlett Street on five (5) properties identified as Map 157 Lots 1 (1.42 acres) & 2 (2.34 acres), Map 164 Lots 1 (1.19 acres) & 4-2 (5.73 acres), and a private roadway lot (1.60 acres) identified on the City of Portsmouth Tax Maps. The proposed project consists of two (2) multi-family apartment buildings with basement level parking and one (1) mixed used building with first floor office and amenity space, and upper story apartments. The project will include a total of 174 dwelling units. The project will include associated site improvements that consist of a private road with cul-de-sac, parking, utilities, stormwater management and treatment, landscaping and lighting. The project will also include community space along the North Mill Pond. The land from North Mill Pond's mean high water (MHW) line to the 50ft wetland buffer will be designated as community space for the City's North Mill Pond Trail project. In addition, the project will construct a greenway park between the proposed buildings and North Mill Pond trail.

Proposed work within the 100-foot Tidal Buffer and subject to conditional use approval includes demolition and construction activities. The 100-foot tidal buffer within the development area is approximately 4.60 acres. The existing impervious area within the development area is 2.50 acres which is 54.3% of the tidal buffer area.

The work done by the proposed project within the 25-foot buffer to North Mill Pond is limited to the removal of existing impervious surfaces and the construction of three (3) stormwater outlets. An easement from the mean high-water line to the 50-foot buffer within the development lot will be granted to the City of Portsmouth by the developer to build the North Mill Pond Trail and Greenway. Work proposed under this application within the 50-foot buffer includes the removal of existing impervious surfaces and repaving of the existing private road. Work proposed between the 50-foot and 100-foot buffer includes the removal of existing impervious surfaces, repaving of the existing private road and Ricci Lumber parking lot, construction of a portion of the greenway park, reconstruction of a building within the footprint of the existing Great Rhythm building and a portion of two (2) new apartment buildings. Existing impacts to the 100-foot buffer will be reduced by 24,330 square feet through the removal and restoration of impervious surfaces (Table 1).

Table 1. 105 Bartlett Street, 100-Foot Tidal Buffer Impacts

Buffer Segment	Existing Impact (SF)	Final Impact (SF)	Net Impact (SF)
0-25 feet	12,788	6,691	-6,097
25-50 feet	30,479	18,391	-12,088
50-100 feet	66,812	60,667	-6,145
Total	108,845	85,029	-24,330

Jurisdictional wetland areas, including 2,000+/- linear feet of tidal wetlands and buffers along the North Mill Pond, were identified by Leonard A. Lord, PhD, CSS, CWS, Senior Environmental Scientist at Tighe & Bond, Inc. on October 29 and December 2, 2019. The review was limited to the vicinity of the proposed development, extending from Bartlett Street to an area opposite Cornwall Street, which runs roughly perpendicular to the parcel.

The results of the tidal wetland and buffer review and the assessment of the wetlands functions and values in the vicinity of the proposed project are in the enclosed "Wetland Delineation and Assessment of Functions and Values" dated December 2019.

Section 10.1017.50 of the Zoning Ordinance includes the following criteria for approval:

(1) The land is reasonably suited to the use, activity or alteration.
The subject properties are within the CD4-W and CD4-L1 Zoning Districts (Character Districts). Section 10.5A41.10A of the Zoning Ordinance defines the CD4-L1 district as consisting "of medium density areas with a mix of medium to large houses. Upper floor uses are almost entirely residential" and the CD4-W district as consisting of "of a medium-to-high density area with a mix of building types and residential, retail, and other commercial uses". The proposed project is consistent with the descriptions of uses in these zoning districts. Additionally, the proposed project site consists of previously disturbed tidal buffer area which has historically been used as an industrial area.

(2) There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.
The proposed project site has several constraints, as shown on the enclosed constraints plan, which limits the areas that are feasible for use. Section 10.5A42.40 of the Zoning Ordinance includes public view corridors extending from Dover Street and Cabot Street which breaks the development area into sections. An existing sewer easement runs through the site, along with a minimum 15' setback from the railroad. The placement of the proposed buildings and parking areas was done in a way to minimize the areas of impervious surface within the 100-foot tidal buffer. Of the 85,029 square feet of impervious area within the 100-foot buffer in the proposed condition, 82.5% of that area is within the existing roadway and Great Rhythm building footprint.

(3) There will be no adverse impact on the wetland functional values of the site or surrounding properties;
As previously stated, the impact to the Functions and values of the site and or surrounding properties will be negligible. The wetland area proposed to be impacted was is located within a man-made structure in a highly disturbed landscape and currently provides negligible wetland functions and values.

(4) Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals; and
The impact to the 100-foot buffer has been limited to the greatest extent possible. No unnecessary grading or clearing of vegetation will occur. The temporary disturbances of the wetland buffer for construction access and to construct the stormwater outlets will be restored following construction.

(5) The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this Section.
As previously noted, the proposed project offers the least possible impact to the wetland buffer. The jurisdictional wetlands impacted are located within a man-made structure in a highly disturbed landscape and currently provides negligible wetland functions and values. The placement of the proposed buildings and parking areas was done in a way to minimize the areas of impervious surface within the 100-foot tidal buffer. The proposed project will reduce the impervious area within the 100-foot tidal buffer by 24,330 square feet as shown in Table 1.

(6) Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.
The vegetated buffer strip will only be disturbed to construct the three (3) stormwater outlets from the stormwater collection and treatment systems. The existing property has no stormwater treatment measures. The proposed project will collect and treat the onsite existing and proposed impervious surfaces prior to discharging to North Mill Pond. Implementing these treatment measures will help improve the water quality in North Mill Pond. In order for this system to work, new discharge points need to be constructed. Areas temporarily disturbed for the construction of these outlets will be restored following construction. Additionally, the final design and construction of the outlets will need to be coordinated with the City of Portsmouth's design of the North Mill Pond trail.

Under separate cover, a Wetlands Conditional Use Permit application fee in the amount of $1,000 has been mailed to the Planning Department by the applicant.

We respectfully request to be placed on the Conservation Committee meeting agenda for May 13, 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

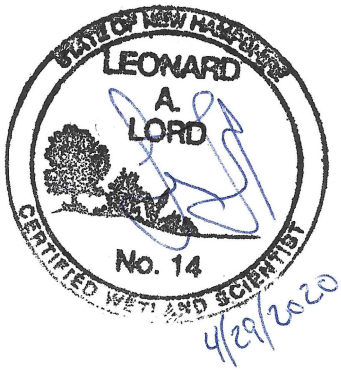
Enclosures
Copy: Clipper Traders, LLC (via E-mail)
Iron Horse Properties, LLC (via E-mail)
Portsmouth Lumber & Hardware, LLC (via E-mail)

J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Report_Evaluation\Applications\City of Portsmouth\20200429 Wetlands Conditional Use\C0960-006 Wetlands CUP Letter.docx

Cathartes
105 Bartlett Street Project
Portsmouth, NH

WETLAND DELINEATION AND ASSESSMENT OF FUNCTIONS AND VALUES

December 2019



Tighe&Bond
Engineers | Environmental Specialists

Table of Contents

1.0 Introduction

The purpose of this report is to characterize wetlands and buffers in the vicinity of a proposed multi-family development at 105 Bartlett Street in Portsmouth, NH. The site is long and narrow and is located between an active railroad and North Mill Pond. It includes commercial buildings with paved and gravel parking areas, abandoned railroad structures, disturbed forest, and a dense shrub thicket. The area is highly disturbed, being originally filled by the railroad in the late 1800s.

2.0 Methods

On October 29 and December 2, 2019, Tighe & Bond reviewed and assessed 2,000+/- linear feet of tidal wetlands and buffers along the North Mill Pond. The review was limited to the vicinity of a proposed multi-family development, extending from Bartlett Street to an area opposite Cornwall Street, which runs roughly perpendicular to the parcel.

The wetland delineation review was based on criteria specified in the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (January 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (January 2012). The Highest Observable Tide Line was reviewed based on the definition found in NH Department of Environmental Services Wetland Rules, Env-Wt 101.49/Env-Wt 602.23. Wetlands were classified based on *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979).

The Highest Observable Tide Line (HOTL) had been previously delineated by another consulting firm in 2017. This line was reviewed by exporting the 2017 surveyed line into ArcGIS to overlay on an aerial photographic base map. This base map was then uploaded to an iPad and paired with a Trimble R1 submeter GPS for in-field verification. Using the iPad and GPS as a guide, the line was then evaluated in the field. The HOTL was deemed accurate and the previous 2017 delineation was accepted by Tighe & Bond. A previously unidentified freshwater wetland was also found within a six-foot +/- deep abandoned railroad turntable. Tighe & Bond delineated this area with sequentially numbered flagging and located the wetland boundary using the GPS technology described above.

Functions and values were assessed in the vicinity of the proposed project. Assessment methodologies were adapted from the *Maine Citizens Guide to Evaluating, Restoring, and Managing Tidal Marshes* (Bryan et al., 1997) and *The Highway Methodology Workbook Supplement—Wetland Functions and Values: A Descriptive Approach*, NAEEP-360-1-30a, US Army Corps of Engineers, New England Division, September 1999.

Photographs of the wetlands and buffers are provided in Appendix A.

3.0 North Mill Pond

North Mill Pond is a 79+/- acre tidal pond at the outlet of Hodgson Brook. It receives tidal flows under Maplewood Avenue at the northeast end of the pond. The pond consists predominantly of exposed mudflats at low tide, and is classified as Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Flooded (E2US3N). A narrow band of salt marsh reaching up to 35+/- feet wide was identified between the mudflats and upland (Photo 1). The marsh is dominated by smooth cordgrass (*Spartina alterniflora*), with species such as

saltmeadow cordgrass (*Spartina patens*), sea lavender (*Limonium carolinianum*), and seaside goldenrod (*Solidago sempervirens*) more dominant toward the upland edge. This marsh area was classified as Estuarine, Intertidal, Emergent, Persistent, Regularly Flooded (E2EM1N).

North Mill Pond provides several important wetland functions and values, though many have been degraded by development and human activity. The following functions and values were assessed for the wetland in the vicinity of the proposed project.

3.1 Ecological Integrity

Ecological Integrity relates to how much the wetland has retained its native biotic and abiotic features and how these may have been degraded by human influences.

The Ecological Integrity of North Mill Pond has been compromised due to the presence of a tidal restriction, development of the upland buffer, water quality degradation, and filling along the project site. Efforts have been made in recent years to improve water quality entering the pond, improve tidal flushing, and restore some of the salt marshes. The peripheral salt marsh appears to be healthy and is comprised of native species along the project area.

3.2 Wildlife, Finfish, and Shellfish Habitat

The Wildlife, Finfish, and Shellfish Habitat function is the suitability of the habitat to support wildlife.

North Mill Pond contains extensive mudflats and a healthy but narrow peripheral salt marsh that contribute to wildlife habitat value. However, this value has been compromised by all the factors affecting Ecological Integrity described above. The area is likely to support a variety of wildlife, including migratory birds, finfish, and shellfish. Wildlife Action Plan mapping (Appendix B) depicts several small areas of the highest ranked wildlife value habitat around the pond. These high value habitats include two salt marsh areas in the vicinity of the proposed project; one directly across from the project and another just to the northeast of it.

3.3 Recreational and Commercial Potential

Recreational and Commercial Potential is the suitability of the wetland to support activities such as hiking, boating, hunting, bird watching, and shellfish harvesting.

North Mill Pond has the potential for use by small boats during high tide, though access appears to be limited to a boat launch on Marsh Lane, north of Maplewood Avenue. Shellfish harvesting is not allowed within the mudflats. Bird watching is a potential activity but public access is limited. There is an informal trail that runs through the proposed project area between Bartlett Street and Maplewood Avenue across private property that could be used for bird watching, but public access is not currently guaranteed. There is no visitor center, formally maintained trails, or access for disabled persons that would make this a more valuable area for recreation.

3.4 Aesthetic Quality

Aesthetic Quality refers to the ability of the wetland to provide interesting views and natural vistas.

The areas surrounding North Mill Pond are highly developed commercial and residential areas. There are few public viewing areas, but in locations where the pond can be seen it generally offers wide vistas and aesthetically pleasing views.

3.5 Educational Potential

Educational Potential consists of the ability of the wetland to serve as an outdoor classroom.

There is no safe public access to North Mill Pond near the project site. In addition to being private property, the project site has dangerous construction debris and steep banks to the pond, further diminishing the educational potential of this wetland.

3.6 Noteworthiness

Noteworthiness includes important qualities of the wetland not identified in previous functions, such as historic sites or unique natural features.

This area of North Mill Pond is noteworthy as it contains a salt marsh in a developed setting, which adds to its importance aesthetically and as part of the character of the area. In addition, the adjacent uplands have been proposed as part of the North Mill Pond Greenways project, which was presented to stakeholders in January 2019. (https://www.cityofportsmouth.com/planportsmouth/north-mill-pond-trail-and-greenway).

The wetland itself is not known for having any important historical features in the vicinity of the project area, though there have been historic structures and activities along its banks. The project area has some significance as the site of an old railroad yard with a turntable and roundhouse.

4.0 North Mill Pond Tidal Buffer

The North Mill Pond 100-foot tidal buffer can be divided into three zones within the project area: 1) a commercial area, including the Ricci Supply and Ace Hardware complex, the Great Rhythm Brewery building, a former railroad machine shop, and all the paved and unpaved impervious surfaces associated with those buildings; 2) the disturbed forest directly northeast and northwest of Great Rhythm Brewery, including the area around the old railroad turntable and roundhouse remains; and 3) the shrub thicket extending along the narrow portion of the parcel to the northeast. These areas all include historic filling 2-16 feet deep associated with railroad activities. The fill includes coal, coal ash, and possible slag.

4.1 Commercial Area Buffer

The commercial area (Photos 1-3) is comprised almost completely of impervious surfaces. These include buildings, paved and compact gravel parking lots, and a narrow strip of vegetation 10-20 feet wide extending down a steep bank to the tidal wetland. The vegetation includes lawn and species associated with disturbed sites such as staghorn sumac (*Rhus typhina*), autumn olive (*Elaeagnus umbellata*), black cherry (*Prunus serotina*), and Asiatic bittersweet (*Celastrus orbiculatus*). This area has little to offer in the way of functions and values other than contributing to stabilization of steep eroding

banks along the wetland. Runoff from this area likely contributes to the degraded water quality in North Mill Pond.

4.2 Disturbed Forest Buffer

The disturbed forested area northeast and southwest of Great Rhythm Brewery (Photos 4-6) is dominated by Norway Maple (*Acer platanoides*), black cherry, and staghorn sumac. The area includes significant rubble and debris as well as the railroad turntable and roundhouse remains. This area provides some screening for wildlife using the North Mill Pond and provides cover and food for small mammals and birds. However, it is dominated by invasive vegetation, and is highly disturbed by human activity.

4.3 Shrub Thicket Buffer

The shrub thicket northeast of the commercial area (Photos 7-8) is dominated by autumn olive with lesser amounts of staghorn sumac and other shrub species. This area provides wildlife habitat for small mammals and birds as well as screening for wildlife using North Mill Pond. Though invasive, the autumn olive provides prolific fruits utilized by birds and other frugivores. Bedding, clothing, campfire remains, trash, and other evidence suggests that this densely vegetated area has been used as camp sites by homeless individuals.

4.4 Buffer Impacts and Mitigation

The proposed project will not include any work within the 25-foot buffer to North Mill Pond. In addition, a 50-foot easement from the mean high water will be granted to the City of Portsmouth by the developer to build the North Mill Pond Trail and Greenway, which will provide improvements to the buffer, including invasive species management and revegetation with native species. Installation of the trail and greenway would result in improved functions and values of the wetland and buffer including: Ecological Integrity, Recreation Potential, Aesthetic Quality, and possibly Educational Potential. Existing impacts to the 100-foot buffer will be reduced by 53,716 square feet from the trail and greenway improvements through the removal and restoration of impervious surfaces (Table 4.1).

Table 4.1
105 Bartlett Street Multi-Family Development Buffer Impact Reductions

Buffer Segment	Existing Impact (SF)	Final Impact (SF)	Net Impact (SF)
0-25 feet	12,788	6,691	-6,097
25-50 feet	30,479	18,391	-12,088
50-100 feet	66,812	60,667	-6,145
Total	108,845	85,029	-24,330

5.0 Excavated Palustrine Forested Wetland

A small wetland was delineated by Tighe & Bond within the base of the six-foot +/- deep, concrete walled railroad roundtable (Photos 9-10) within the disturbed forested area. The soils in this wetland are poorly drained marine silts and clays. The vegetation is dominated by Norway maple and red osier dogwood (*Cornus sericea*). Nearby test pits identified approximately two to four feet of fill in the vicinity of the structure. Therefore, it is likely this wetland was at least partly excavated into native marine sediments during

construction of the turntable. It is unclear if this area was originally a wetland or if the wetland was created by the excavation. This wetland was classified as Palustrine, Forested, Deciduous, Saturated (PFO1B). The small size of the wetland and its location within a man-made structure in a highly disturbed landscape has resulted in this system providing negligible wetland functions and values.

6.0 Summary

Two wetlands were delineated and evaluated on the site:

North Mill Pond is a 79+/- acre tidal wetland with expansive mud flats (E2US3N) and a narrow fringe of salt marsh (E2EM1N). Wetland functions and values are primarily Wildlife, Finfish, and Shellfish Habitat, as well as Aesthetic Quality and Noteworthiness. It is noteworthy as an important aesthetic component of the area and as an important potential site for a greenways trail project. It also has compromised but improving Ecological Integrity and some Recreation Potential. Upland buffers to the wetland have been compromised by development and invasive species, but limited vegetation does provide some screening for wildlife in the wetland.

A small excavated forested wetland (PFO1B) was identified within the old railroad turntable, approximately six feet below existing grade within a concrete wall. The small size of the wetland and its location within a man-made structure in a highly disturbed landscape has resulted in this system providing negligible wetland functions and values.

J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Report_Evaluation\SSSM+Wetlands\Buffer\Wetland+Buffer Review Rev 2020-04-29.docx

Tighe&Bond

APPENDIX A

Appendix A- Photographic Log

Client: Cathartes **Job Number:** C-0960006

Site: 105 Bartlett St., Portsmouth, NH

Photograph No.: 1	**Date:** 10/29/19	**Direction Taken:** Northeast
Description: Salt marsh fringe along North Mill Pond at low tide opposite a commercial area in southwest portion of the site.		

Photograph No.: 2	**Date:** 10/29/19	**Direction Taken:** Northeast
Description: Paved buffer and eroding banks along North Mill Pond at low tide along the commercial area in southwest portion of the site.		

Client: Cathartes **Job Number:** C-0960006

Site: 105 Bartlett St., Portsmouth, NH

Photograph No.: 3	**Date:** 10/29/19	**Direction Taken:** Northeast
Description: Compact gravel drive and old railroad repair shop at the northern end of the commercial area with impervious surfaces.		

Photograph No.: 4	**Date:** 10/29/19	**Direction Taken:** Northeast
Description: Buffer fill slope with rubble adjacent to a narrow salt marsh along the disturbed forest just northwest of the Great Rhythm Brewing Company.		

Client: Cathartes **Job Number:** C-0960006

Site: 105 Bartlett St., Portsmouth, NH

Photograph No.: 5	**Date:** 10/29/19	**Direction Taken:** Southwest
Description: Lawn and disturbed forest buffer northwest of the Great Rhythm Brewing Company.		

Photograph No.: 6	**Date:** 10/29/19	**Direction Taken:** East
Description: Remains of the railroad roundhouse and disturbed forest buffer northeast of the Great Rhythm Brewing Company.		

Client: Cathartes **Job Number:** C-0960006

Site: 105 Bartlett St., Portsmouth, NH

Photograph No.: 7	**Date:** 10/29/19	**Direction Taken:** Northeast
Description: Shrub thicket and existing informal trail at the northeast end of the proposed project area.		

Photograph No.: 8	**Date:** 10/29/19	**Direction Taken:** Northeast
Description: Evidence of use as camp sites by homeless individuals within the shrub thicket at the northeast end of the project area.		

Client: Cathartes **Job Number:** C-0960006

Site: 105 Bartlett St., Portsmouth, NH

Photograph No.: 9	**Date:** 12/2/19	**Direction Taken:** South
Description: Wetland dominated by Norway maple and red osier dogwood within the old railroad turntable approximately six feet below grade.		

Photograph No.: 10	**Date:** 12/2/19	**Direction Taken:** n/a
Description: Poorly drained marine silts and clays observed in the bottom of the old railroad turntable.		

Tighe&Bond

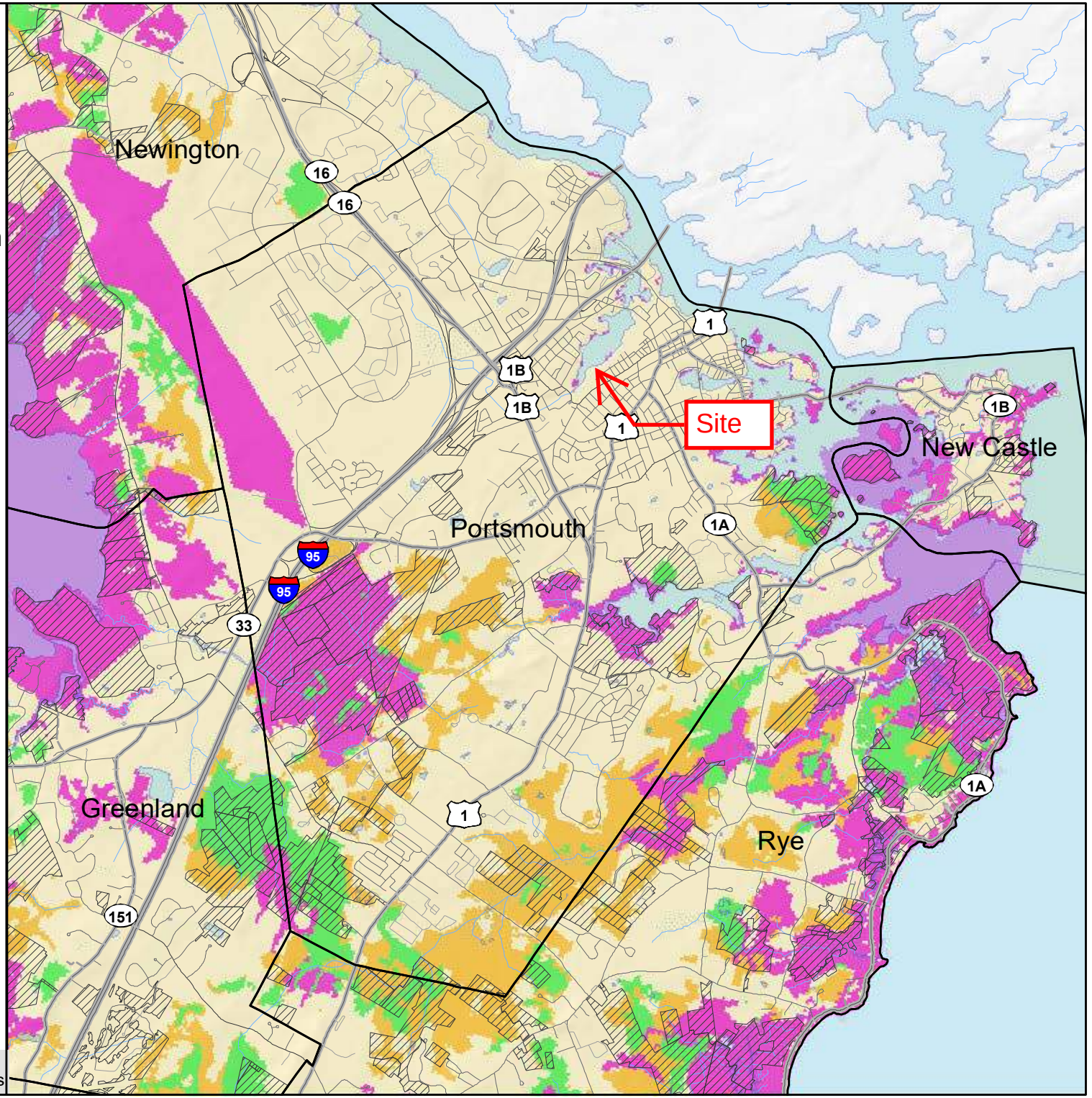
APPENDIX B

2015 HIGHEST RANKED WILDLIFE HABITAT BY ECOLOGICAL CONDITION

- Highest Ranked Habitat in New Hampshire
- Highest Ranked Habitat in the Biological Region

Biological region = TNC ecoregional subsection for terrestrial habitats or Aquatic Resource Mitigation region for wetlands and floodplain forest.

- Supporting Landscapes
- Conservation or public



Base map data provided by NH GRANIT at UNH September 2019. Intended for planning use only.

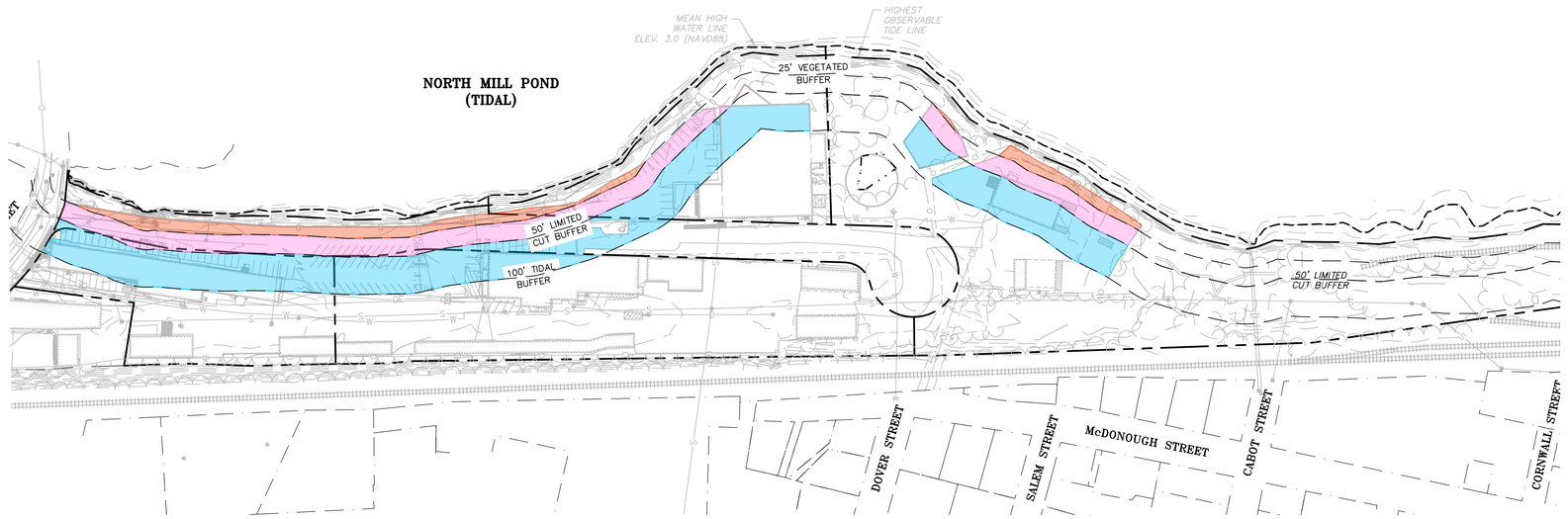
NEW HAMPSHIRE Wildlife Action Plan
September 2015

0 1 2 Kilometers

0 1 2 Miles

www.tighebond.com

100% Recyclable



EXISTING WETLAND BUFFER IMPACTS

LEGEND

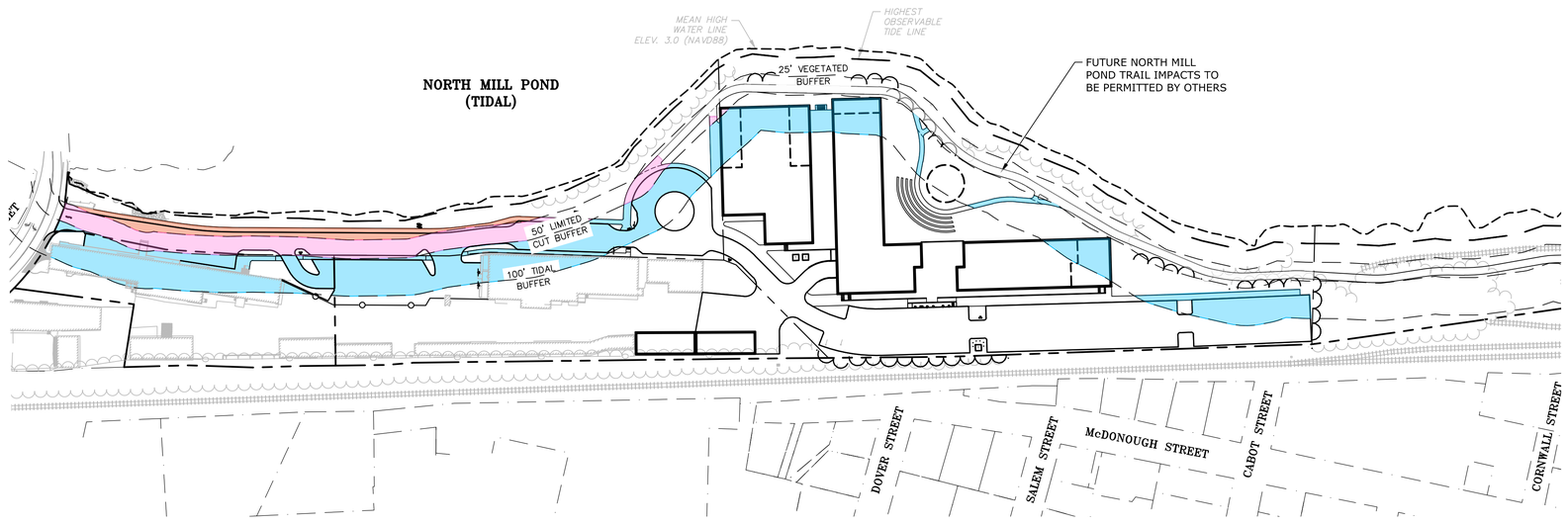
IMPACTS WITHIN 25 FT VEGETATED BUFFER = 12,788 SF

IMPACTS WITHIN 25 FT TO 50 FT LIMITED CUT AREA = 30,479 SF

IMPACTS WITHIN 50 FT TO 100 FT TIDAL BUFFER = 66,812 SF

0 100' 200'

GRAPHIC SCALE



PROPOSED WETLAND BUFFER IMPACTS

LEGEND

IMPACTS WITHIN 25 FT VEGETATED BUFFER = 6,691 SF

IMPACTS WITHIN 25 FT TO 50 FT LIMITED CUT AREA = 18,391 SF

IMPACTS WITHIN 50 FT TO 100 FT TIDAL BUFFER = 60,667 SF

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
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

PROPOSED MULTI-FAMILY DEVELOPMENT

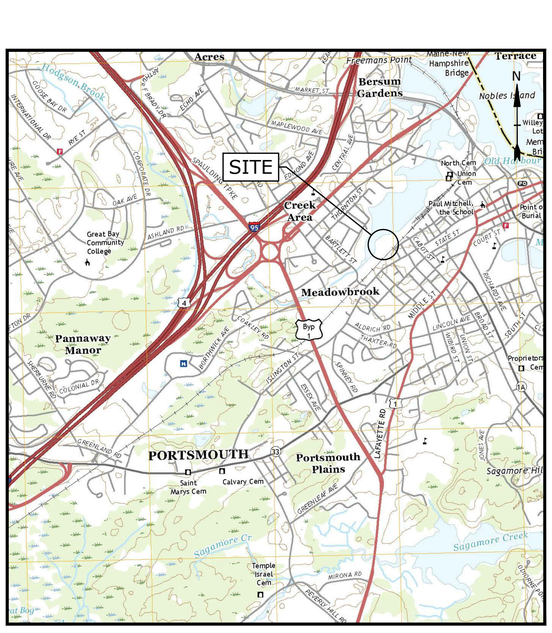
105 BARTLETT STREET
PORTSMOUTH, NEW HAMPSHIRE

JANUARY 2, 2020

LAST REVISED: APRIL 20, 2020

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

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



LOCATION MAP
SCALE: 1" = 2000'

PREPARED BY:

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

APPLICANT:

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

OWNERS:

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

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

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

T&B PROJECT NO: C0960-006

TAC REVIEW SUBMISSION
COMPLETE SET 21 SHEETS

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

LEGEND

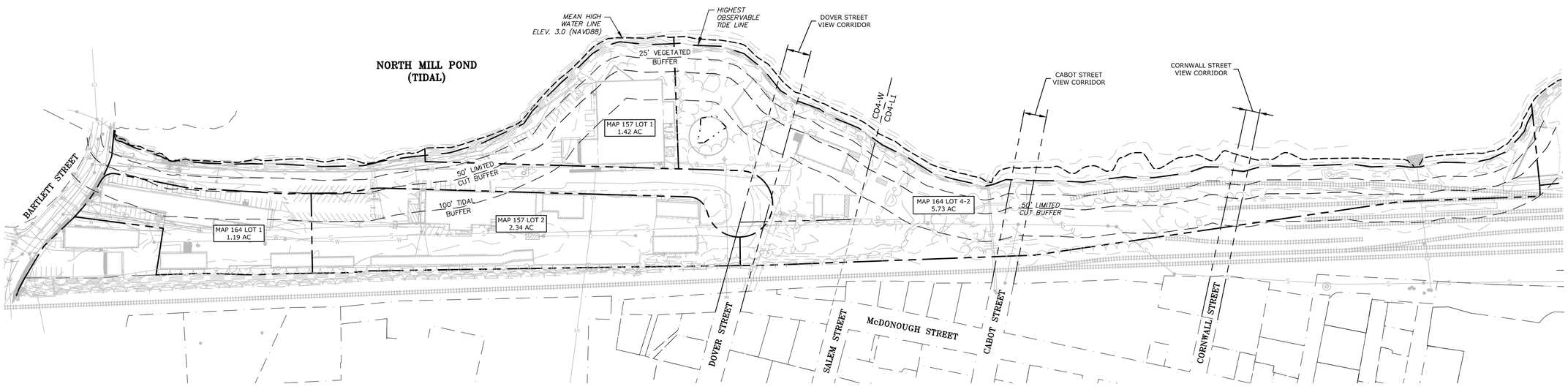
- BUILDING
- BUILDING OVERHANG
- BUILDING NO. 50 — BUILDING HATCH/TEXT
- CURB
- EDGE OF PAVEMENT
- RETAINING WALL
- STONE WALL
- CHAIN LINK FENCE
- FENCE LINE
- TREELINE
- PAVEMENT MARKING
- TRAFFIC SIGN
- 200 — MAJOR CONTOURS
- MINOR CONTOURS
- D — STORM DRAIN LINE
- S — SANITARY SEWER LINE
- W — WATER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

EXISTING CONDITIONS PLAN NOTES:

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

REFERENCE PLANS:

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



Tighe&Bond

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

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

0 100' 200'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

OVERALL EXISTING CONDITIONS PLAN

SCALE: AS SHOWN

C-101

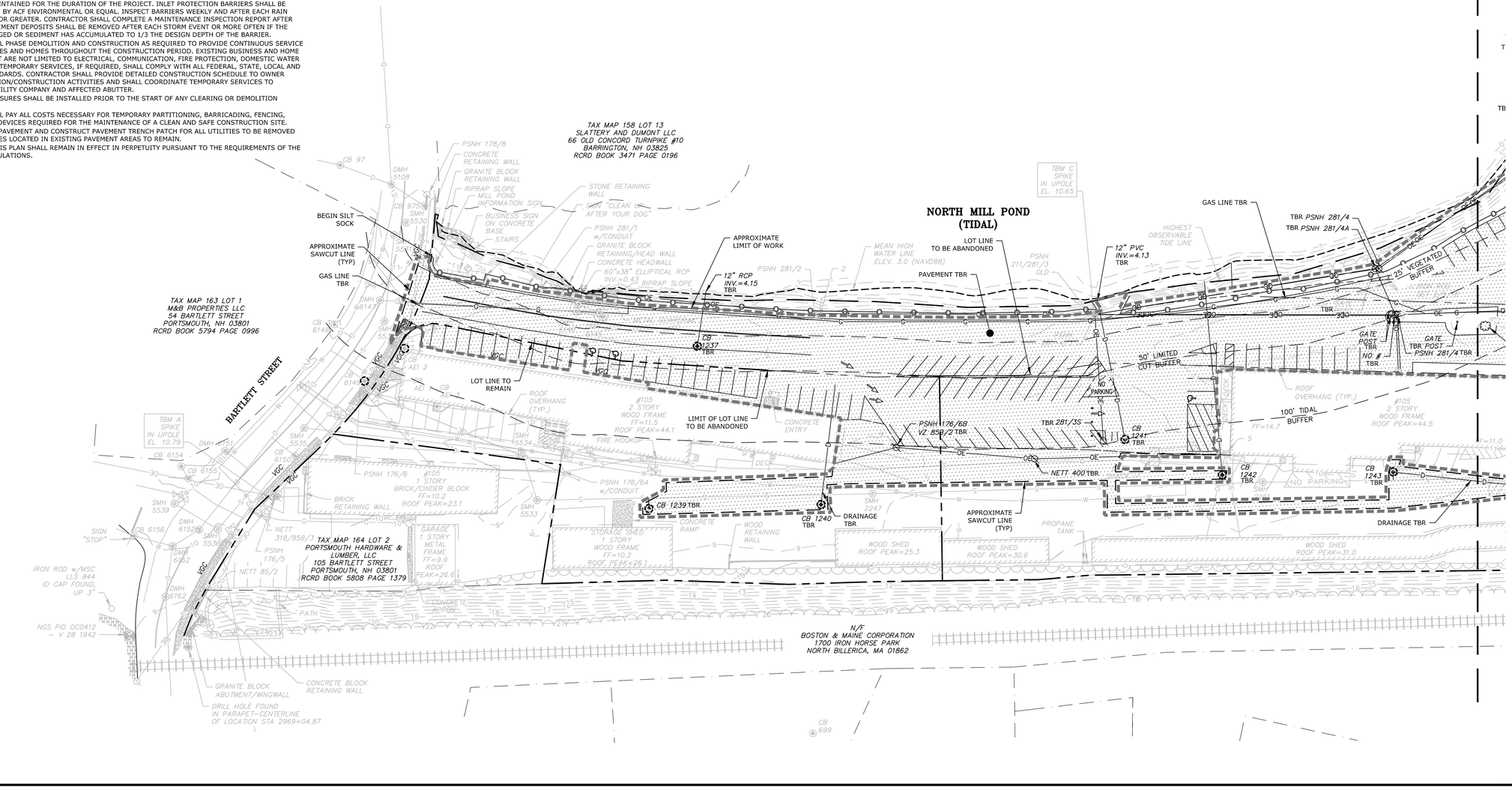
Last Saved: 4/20/2020
Plotted: Monday, April 20, 2020 - 4:33pm By: BGurcio
Tighe & Bond: J:\C\C0960 Catharles\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. ALL ITEMS WITHIN THE LIMIT OF WORK ARE TO REMAIN UNLESS SPECIFICALLY IDENTIFIED TO BE REMOVED OR OTHERWISE ALTERED BY THE CONTRACTOR. ITEMS TO BE REMOVED INCLUDE, BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, MANHOLES, CATCH BASINS, UNDERGROUND PIPING & UTILITIES, POLES, STAIRS, STRUCTURES, FENCES, RAMPS, BUILDING FOUNDATIONS, TREES, AND LANDSCAPING. THE CONTRACTOR SHALL CONFIRM WITH THE ENGINEER IF THE TREATMENT OF CERTAIN ITEMS IS UNCLEAR.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
15. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
16. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
18. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
19. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
20. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
21. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
22. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

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



0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

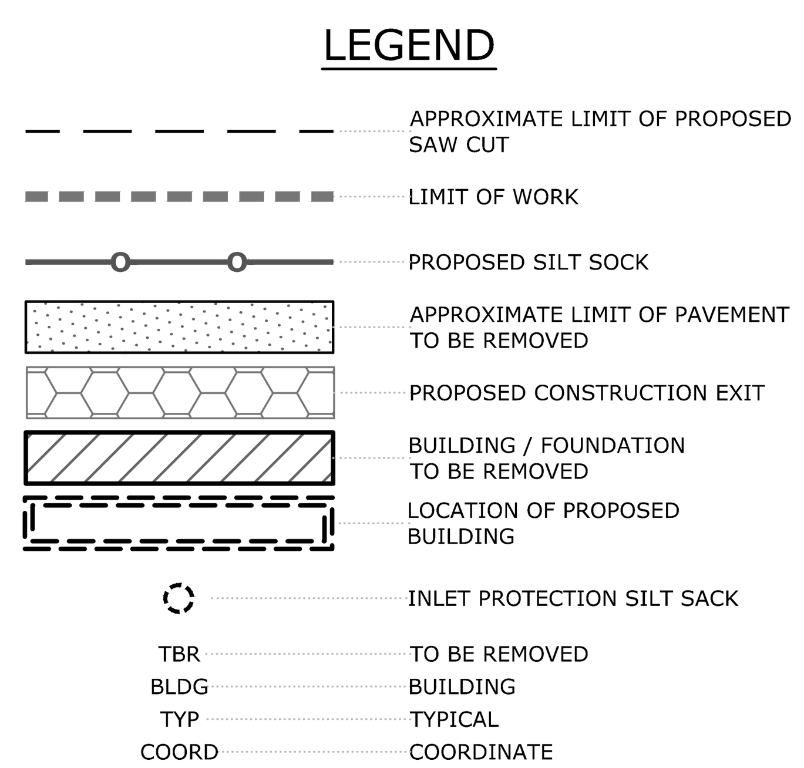
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

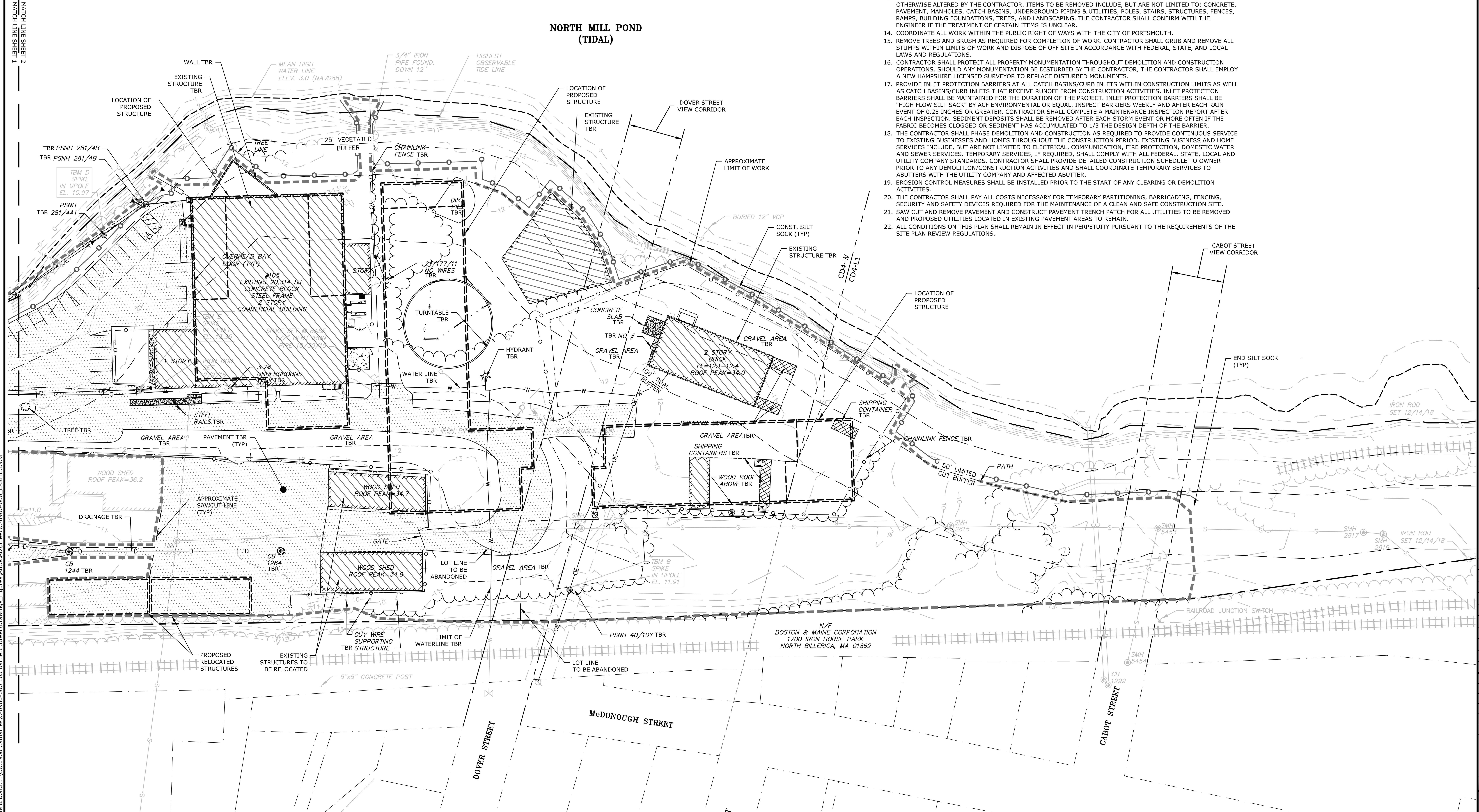
C-101.1

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



DEMOLITION NOTES:

1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
3. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
4. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
5. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
8. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. ALL ITEMS WITHIN THE LIMIT OF WORK ARE TO REMAIN UNLESS SPECIFICALLY IDENTIFIED TO BE REMOVED OR OTHERWISE ALTERED BY THE CONTRACTOR. ITEMS TO BE REMOVED INCLUDE, BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, MANHOLES, CATCH BASINS, UNDERGROUND PIPING & UTILITIES, POLES, STAIRS, STRUCTURES, FENCES, RAMPS, BUILDING FOUNDATIONS, TREES, AND LANDSCAPING. THE CONTRACTOR SHALL CONFIRM WITH THE ENGINEER IF THE TREATMENT OF CERTAIN ITEMS IS UNCLEAR.
14. COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
15. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
16. CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
18. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
19. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
20. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
21. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
22. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.



Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-4:58pm By: BCurcio
Tighe & Bond: J:\C\C0960 Cathartes\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
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

EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: AS SHOWN

C-101.2

SITE DATA:

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

DEVELOPMENT STANDARDS

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

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

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

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

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

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

ZONING VARIANCES:

REQUIREMENT:	SECTION:	GRANTED:
(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, 3 UNITS	1.5 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		3 SPACES
500 SF TO 750 SF 1.0 SPACES PER UNIT	BUILDING A, 24 UNITS	24 SPACES
	BUILDING B, 41 UNITS	41 SPACES
	BUILDING C, 26 UNITS	26 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		91 SPACES
OVER 750 SF 1.3 SPACES PER UNIT	BUILDING A, 21 UNITS	27.3 SPACES
	BUILDING B, 36 UNITS	46.8 SPACES
	BUILDING C, 21 UNITS	27.3 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		102 SPACES
OFFICE:		
1 SPACE PER 350 SF	10,300 SF	
MINUS 25% FOR WEST END INCENTIVE		23 SPACES
VISITORS:		
1 SPACE FOR EVERY 5 DWELLING UNITS	174 UNITS	35 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		254 SPACES

TOTAL PARKING SPACES PROVIDED:

TOTAL PARKING SPACES PROVIDED =	134 SPACES (SURFACE PARKING) 66 SPACES (BUILDING A, UNDERGROUND) 44 SPACES (BUILDING B, UNDERGROUND) 10 SPACES (CUL-DE-SAC)(1) 254 SPACES
ADA SPACES REQUIRED=	7 SPACES (FOR 201-300 FACILITY TOTAL)
ADA SPACES PROVIDED=	7 SPACES (INCLUDED IN SURFACE PARKING COUNT OF 134)

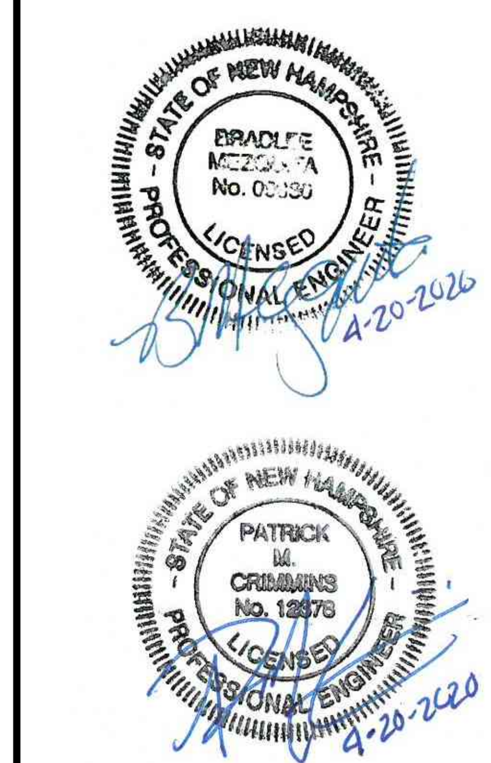
(1) - CONDITIONAL USE PERMIT REQUIRED FOR SHARED PARKING ON SEPARATE LOT

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

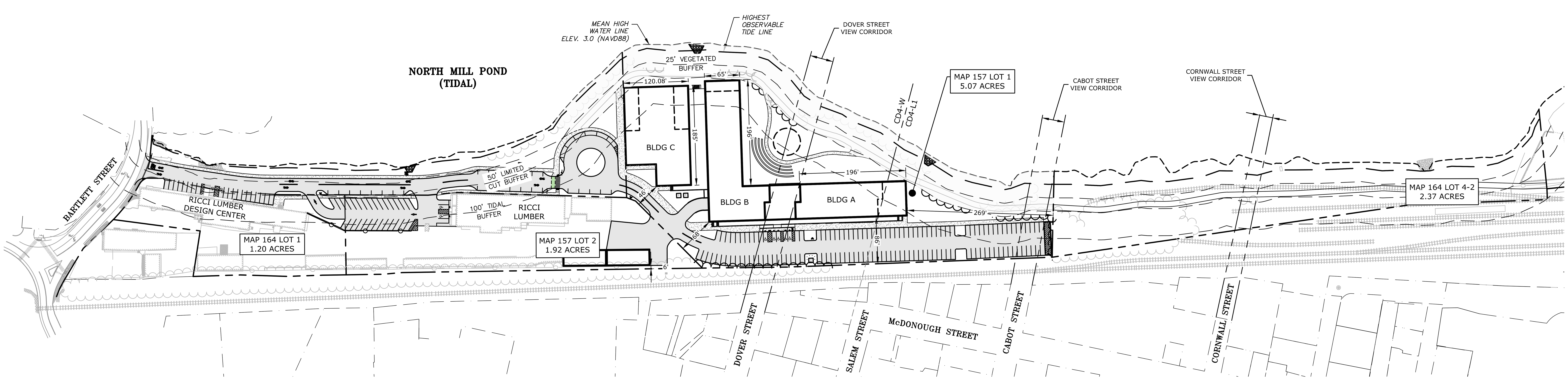
*INDOOR BIKE STORAGE WILL BE PROVIDED THAT MEETS OR EXCEEDS THE REQUIREMENT.

LEGEND

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



0 100' 200'
GRAPHIC SCALE



Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

OVERALL SITE PLAN

SCALE: AS SHOWN

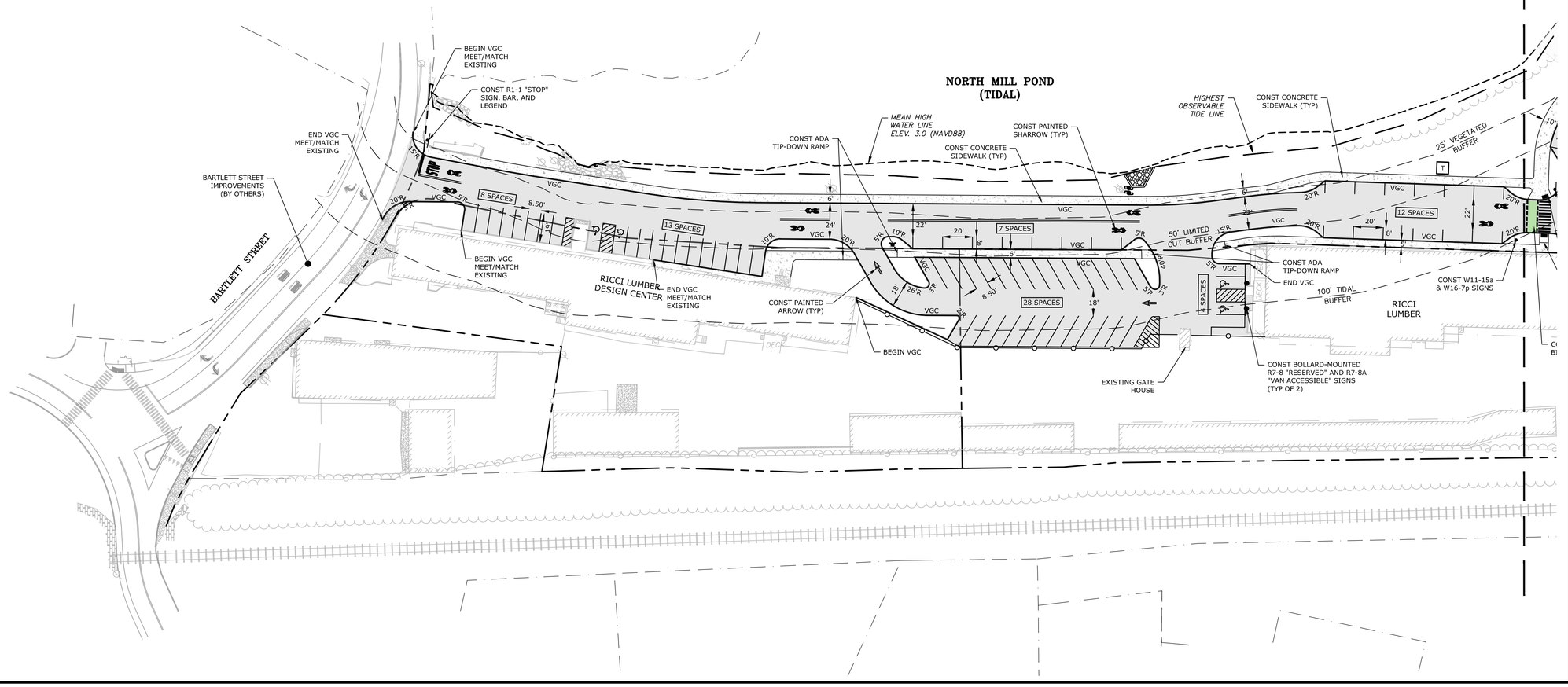
C-102

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. SEE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
15. 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 SNOW BANKS EXCEED 6 FEET IN HEIGHT.
16. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
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.
19. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES THAT IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
20. ALL TREES TO BE PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
21. THE APPLICATION SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.

LEGEND

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



0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

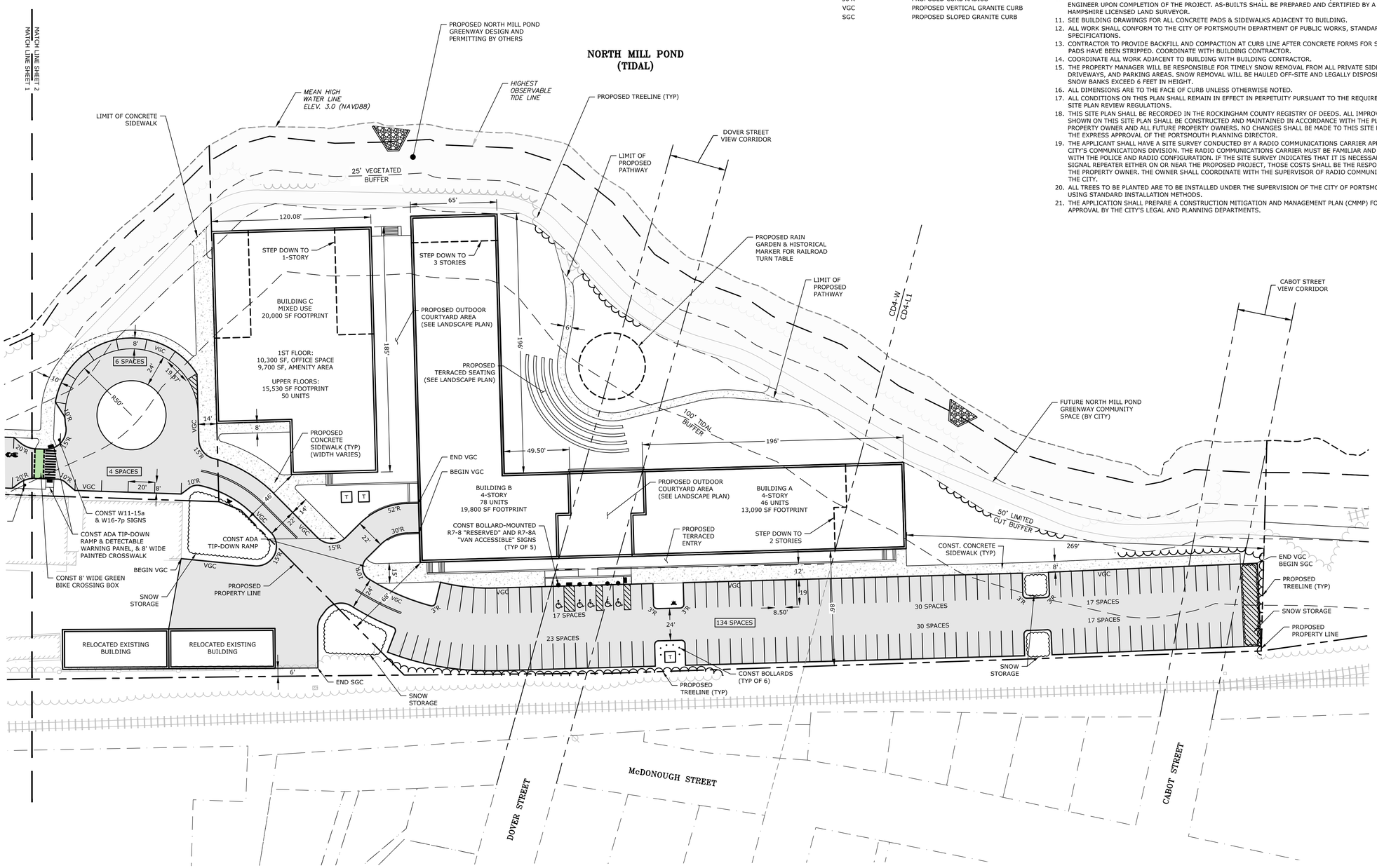
MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

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

SITE PLAN

SCALE: AS SHOWN

C-102.1



LEGEND

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

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. SEE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
15. 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 SNOW BANKS EXCEED 6 FEET IN HEIGHT.
16. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
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.
19. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES THAT IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
20. ALL TREES TO BE PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
21. THE APPLICATION SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.

Tighe&Bond

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

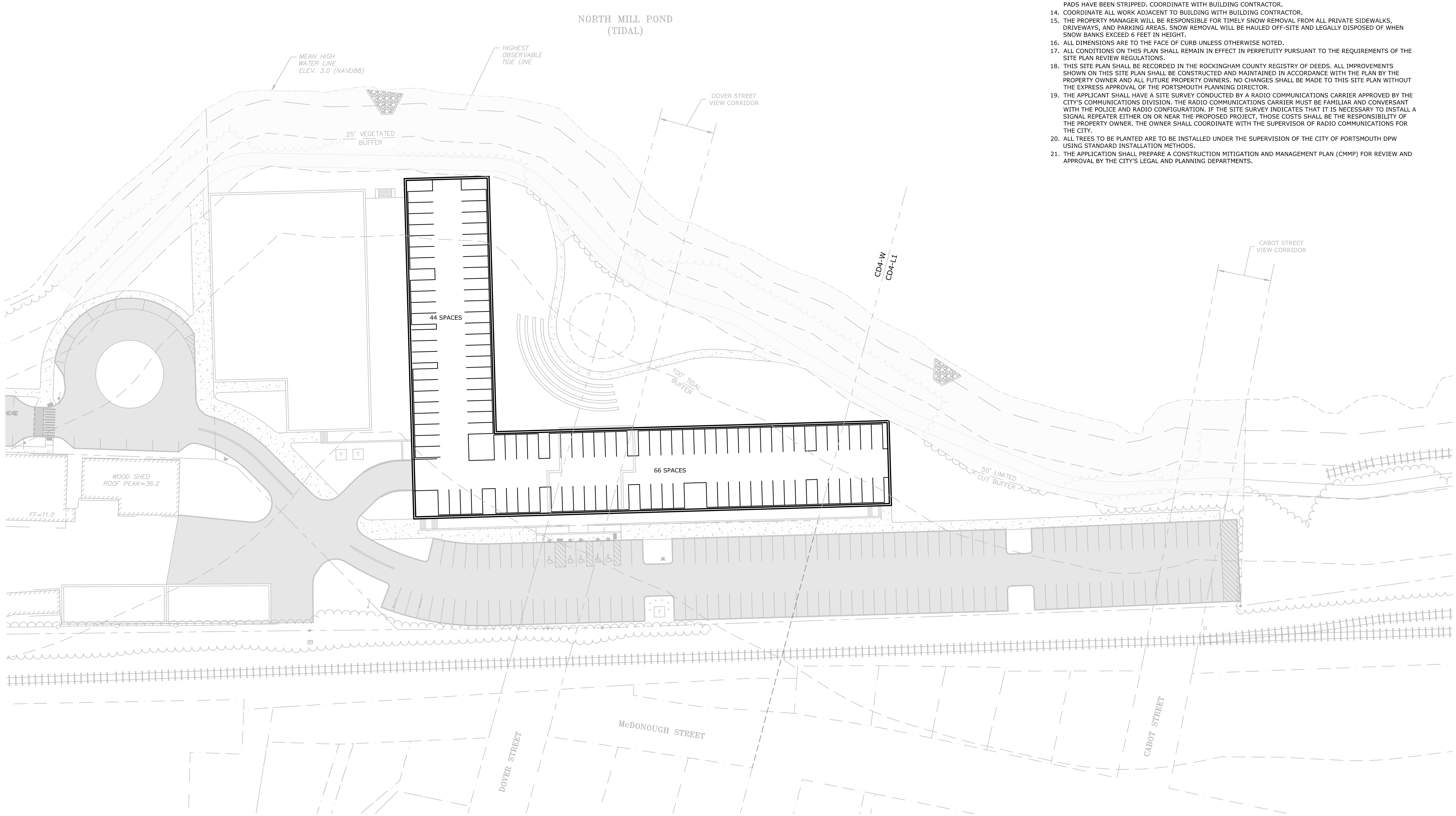
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

SITE PLAN

SCALE: AS SHOWN

C-102.2

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



LEGEND

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

SITE NOTES:

1. STRIPE PARKING AREAS AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES SHALL BE THERMOPLASTIC MATERIAL. THERMOPLASTIC MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO AASHTO M249. (ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT. CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING YELLOW TRAFFIC PAINT. ALL TRAFFIC PAINT SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F").
2. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
3. SEE DETAILS FOR PARKING STALL MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
4. CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES. STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE.
5. PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
6. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
7. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH.
10. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
11. SEE BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
12. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS.
13. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
14. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
15. 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 SNOW BANKS EXCEED 6 FEET IN HEIGHT.
16. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
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.
19. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES THAT IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.
20. ALL TREES TO BE PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.
21. THE APPLICATION SHALL PREPARE A CONSTRUCTION MITIGATION AND MANAGEMENT PLAN (CMMP) FOR REVIEW AND APPROVAL BY THE CITY'S LEGAL AND PLANNING DEPARTMENTS.

Tighe&Bond

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

BASEMENT LEVEL SITE PLAN

SCALE: AS SHOWN

C-102.3

GRADING AND DRAINAGE NOTES:

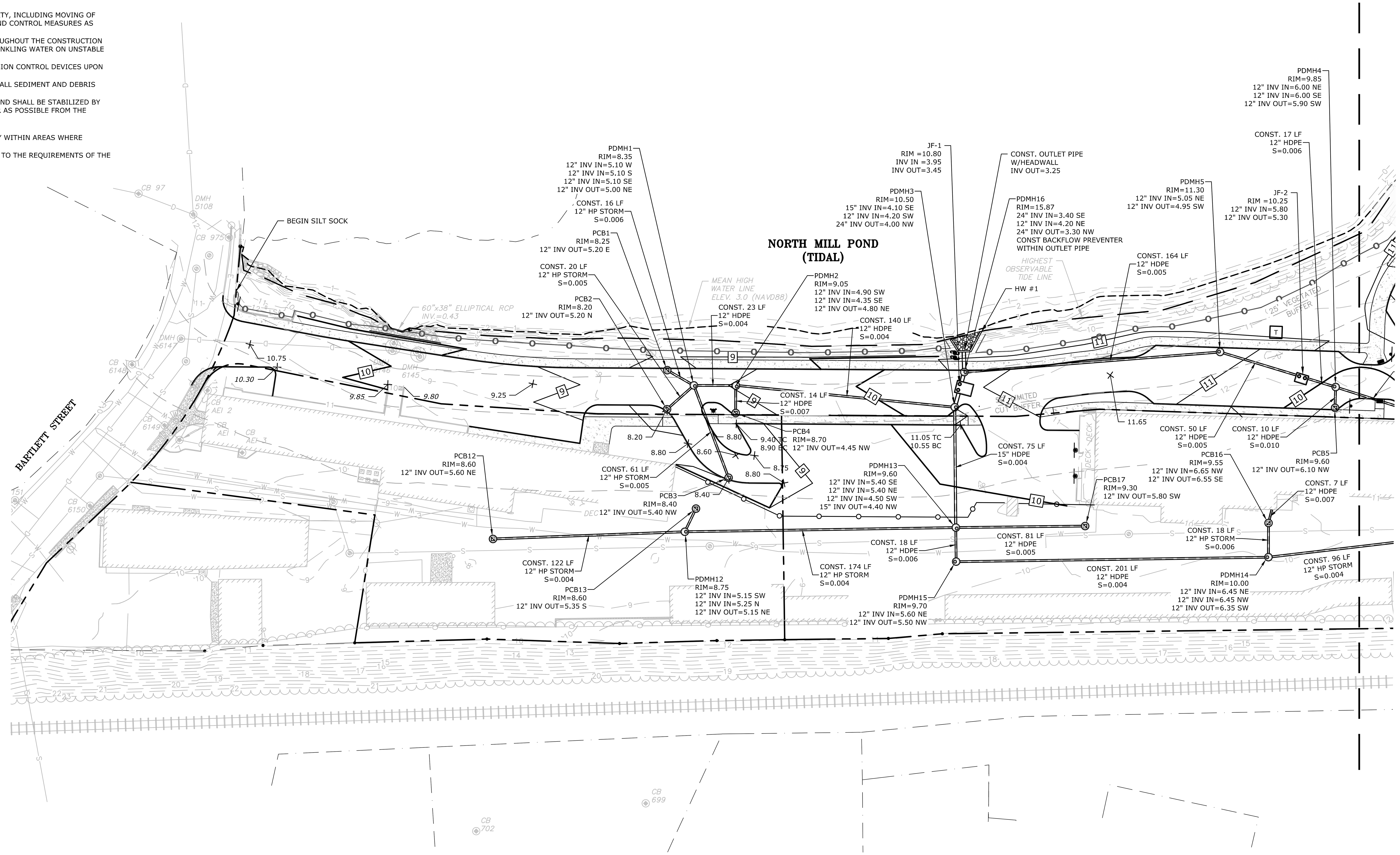
1. COMPACTION REQUIREMENTS:
   - BELOW PAVED OR CONCRETE AREAS 95%
   - TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL 95%
   - BELOW LOAM AND SEED AREAS 90%
   - * ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL), UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
8. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
9. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
10. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
12. CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
13. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.

EROSION CONTROL NOTES:

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

LEGEND

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



GRAPHIC SCALE 0 40' 80'

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

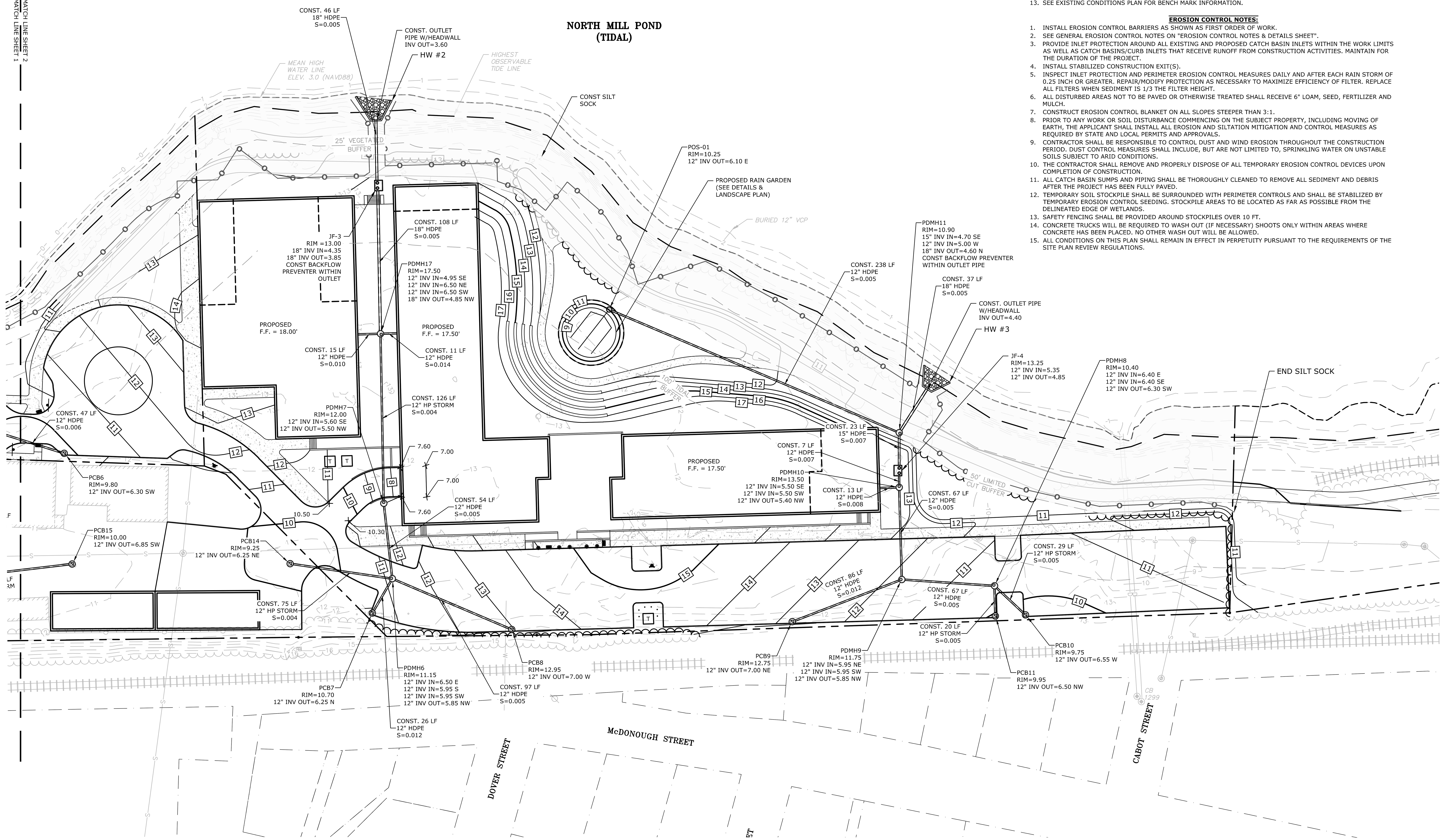
SCALE: AS SHOWN

C-103.1

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

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



GRADING AND DRAINAGE NOTES:

1. COMPACTION REQUIREMENTS:

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

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

EROSION CONTROL NOTES:

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

Tighe&Bond

STATE OF NEW HAMPSHIRE — BRADLEY MEZQUITA — No. 00000 — LICENSED PROFESSIONAL ENGINEER — 4-20-2020

STATE OF NEW HAMPSHIRE — PATRICK M. CRIMMINS — No. 12378 — LICENSED PROFESSIONAL ENGINEER — 4-20-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

GRADING, DRAINAGE, AND EROSION CONTROL PLAN

SCALE: AS SHOWN

C-103.2

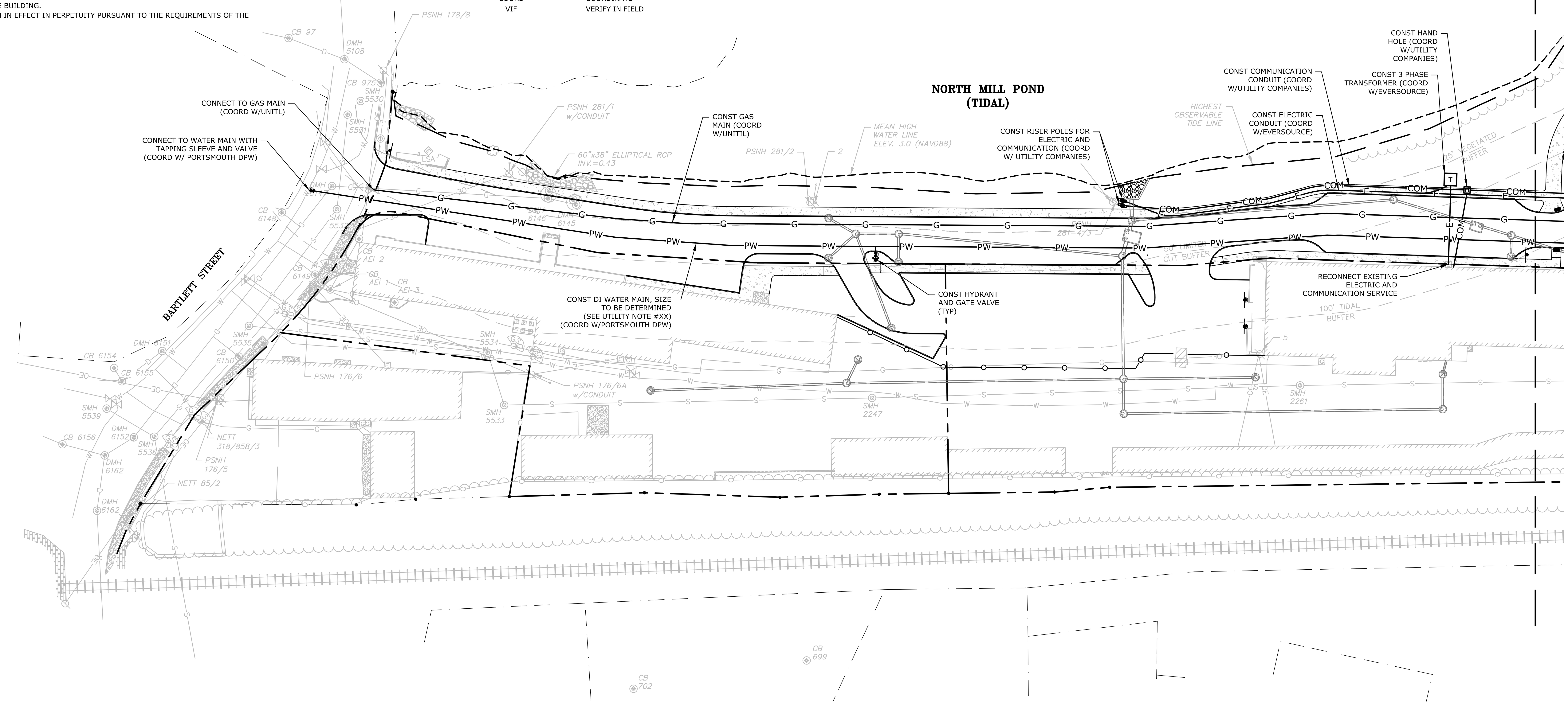
Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-4:36pm By: BCurcio
Tighe & Bond:J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

UTILITY NOTES:

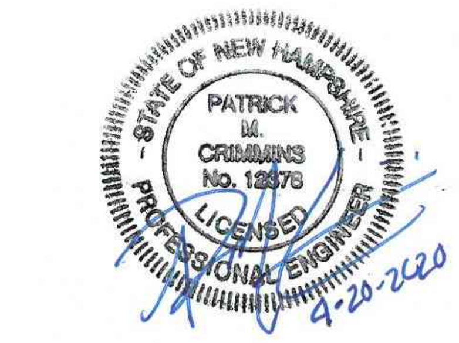
1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER/SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMMUNICATIONS & COMCAST
3. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
4. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
5. THE APPLICANT SHALL COORDINATE WITH THE CITY'S CONSULTANT TO COMPLETE A WATER CAPACITY ANALYSIS USING THE CITY'S CAPACITY MODELING AND SHALL MODIFY THE WATER SERVICE DESIGN AS REQUIRED. THE PRIVATE WATER LINE THAT CURRENTLY FEEDS THE DEVELOPMENT LOT SHALL BE EITHER REPLACED OR ABANDONED DEPENDING ON THE OUTCOME OF THE STUDY. ALL MODIFICATIONS SHALL BE REVIEWED AND APPROVED BY THE DPW AND THE FIRE DEPARTMENT.
6. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
7. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
8. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
9. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
10. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
11. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
12. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
13. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
14. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
15. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
16. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
17. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
18. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
19. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
20. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
21. THE CONTRACTOR SHALL CONTACT "DIG-SAFE" 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL HAVE THE "DIG-SAFE" NUMBER ON SITE AT ALL TIMES.
22. CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILES) TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
23. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
24. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
25. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
26. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
27. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
28. CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
29. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
30. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
31. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

LEGEND

Symbol	Description
—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
	EXISTING DRAIN MANHOLE
	EXISTING SEWER MANHOLE
	EXISTING HYDRANT
WV	EXISTING WATER VALVE
	EXISTING WATER SHUT OFF
GV	EXISTING GAS VALVE
	EXISTING GAS SHUT OFF
	EXISTING UTILITY POLE
	EXISTING ELECTRIC MANHOLE
	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



Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

UTILITIES PLAN

SCALE: AS SHOWN

C-104.1

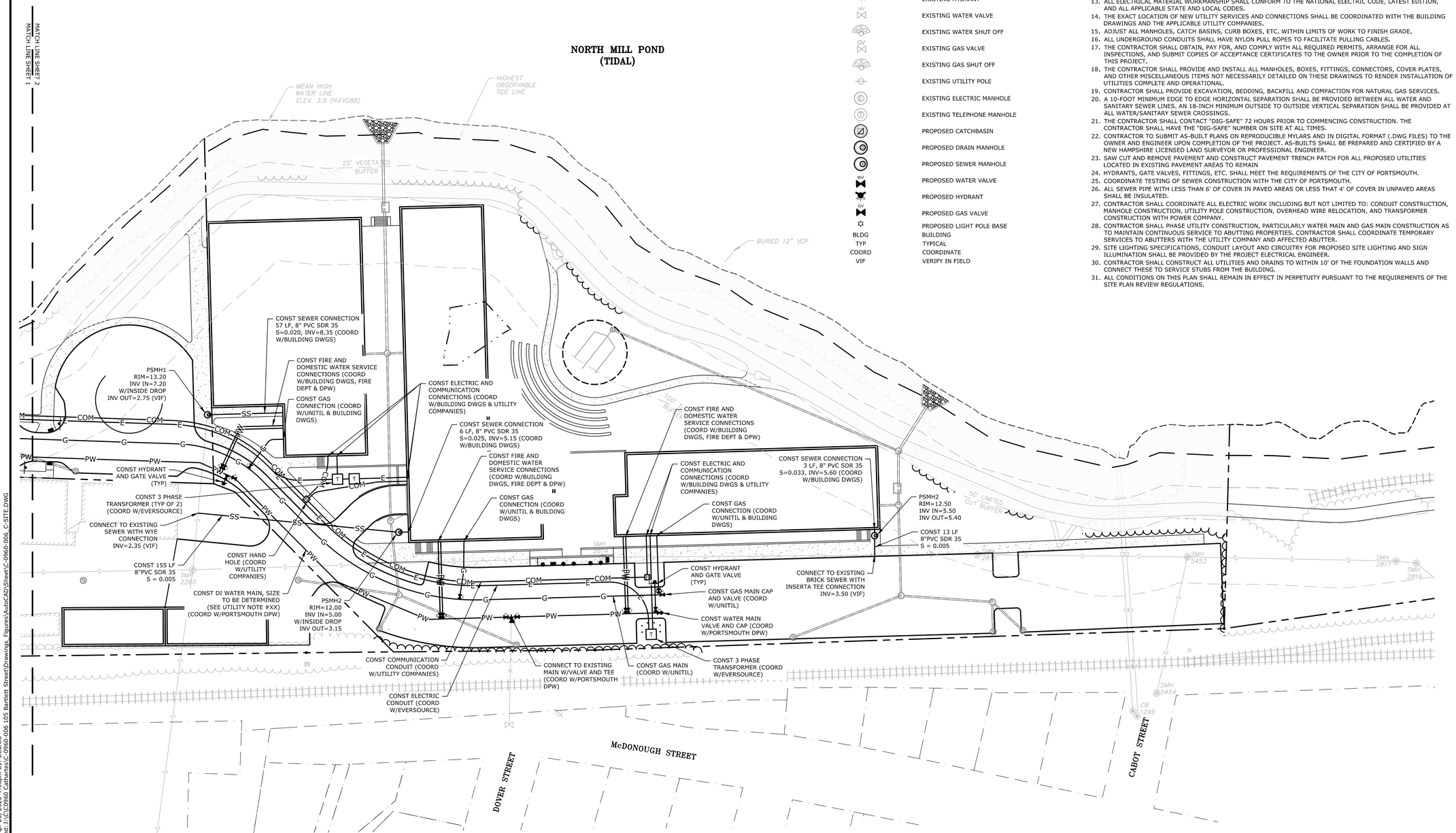
Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-4:36pm By: BCurcio
Tighe & Bond:J:\C\C0960 Catharses\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

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
	EXISTING DRAIN MANHOLE
	EXISTING SEWER MANHOLE
	EXISTING HYDRANT
WV	EXISTING WATER VALVE
	EXISTING WATER SHUT OFF
GV	EXISTING GAS VALVE
	EXISTING GAS SHUT OFF
	EXISTING UTILITY POLE
	EXISTING ELECTRIC MANHOLE
	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

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.



0 40' 80'

GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

UTILITIES PLAN

SCALE: AS SHOWN

C-104.2

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

LEGEND

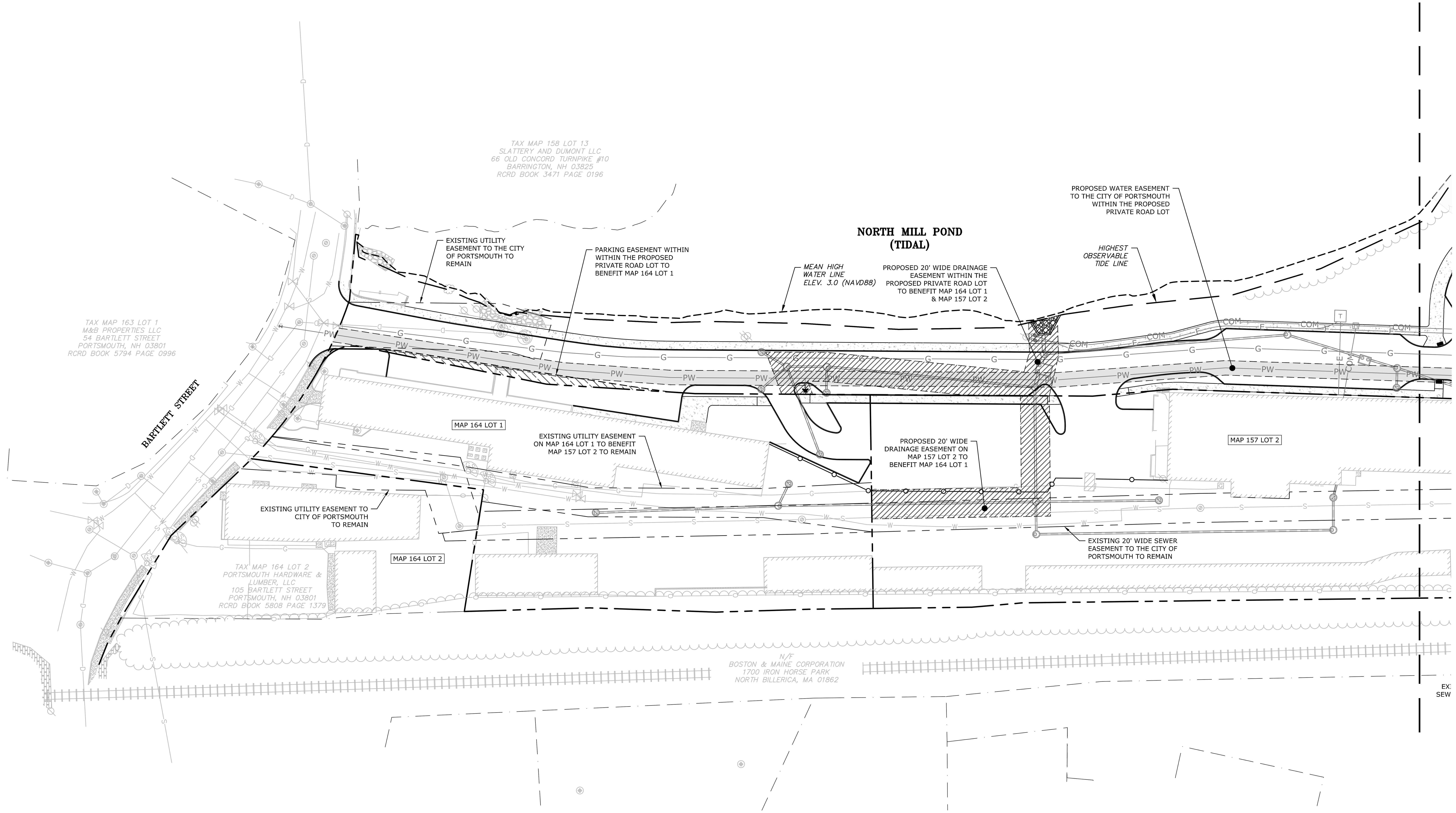
PROPOSED SEWER EASEMENT

PROPOSED DRAINAGE EASEMENT

PROPOSED PARKING EASEMENT

PROPOSED WATER EASEMENT

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



Tighe&Bond

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

STATE OF NEW HAMPSHIRE PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 4-20-2020

0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

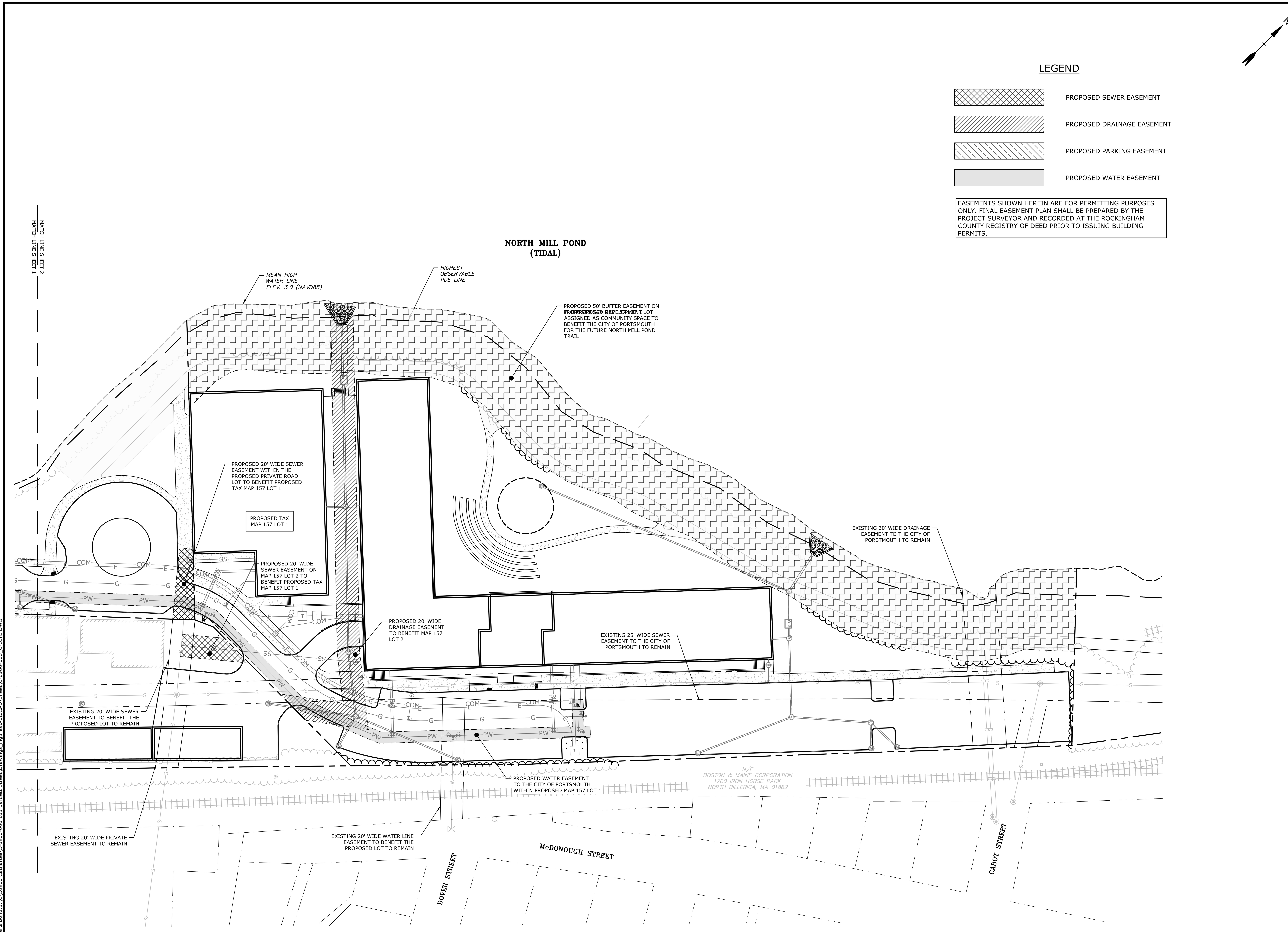
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

EASEMENT PLAN

SCALE: AS SHOWN

C-301.1

Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-4:42pm By: BCurcio
Tighe & Bond:J:\C\C0960 Catharses\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG


LEGEND
PROPOSED SEWER EASEMENT
PROPOSED DRAINAGE EASEMENT
PROPOSED PARKING EASEMENT
PROPOSED WATER EASEMENT
EASEMENTS SHOWN HEREIN ARE FOR PERMITTING PURPOSES ONLY. FINAL EASEMENT PLAN SHALL BE PREPARED BY THE PROJECT SURVEYOR AND RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEED PRIOR TO ISSUING BUILDING PERMITS.
NORTH MILL POND (TIDAL)
MEAN HIGH WATER LINE ELEV. 3.0 (NAVD88)
HIGHEST OBSERVABLE TIDE LINE
MATCH LINE SHEET 2
MATCH LINE SHEET 1
PROPOSED 20' WIDE SEWER EASEMENT WITHIN THE PROPOSED PRIVATE ROAD LOT TO BENEFIT PROPOSED TAX MAP 157 LOT 1
PROPOSED TAX MAP 157 LOT 1
PROPOSED 20' WIDE SEWER EASEMENT ON MAP 157 LOT 2 TO BENEFIT PROPOSED TAX MAP 157 LOT 1
PROPOSED 20' WIDE DRAINAGE EASEMENT TO BENEFIT MAP 157 LOT 2
EXISTING 25' WIDE SEWER EASEMENT TO THE CITY OF PORTSMOUTH TO REMAIN
EXISTING 30' WIDE DRAINAGE EASEMENT TO THE CITY OF PORTSMOUTH TO REMAIN
EXISTING 20' WIDE SEWER EASEMENT TO BENEFIT THE PROPOSED LOT TO REMAIN
PROPOSED WATER EASEMENT TO THE CITY OF PORTSMOUTH WITHIN PROPOSED MAP 157 LOT 1
N/F BOSTON & MAINE CORPORATION 1700 IRON HORSE PARK NORTH BILLERICA, MA 01862
EXISTING 20' WIDE PRIVATE SEWER EASEMENT TO REMAIN
EXISTING 20' WIDE WATER LINE EASEMENT TO BENEFIT THE PROPOSED LOT TO REMAIN
McDONOUGH STREET
DOVER STREET
CABOT STREET
0
40'
80'
GRAPHIC SCALE

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

Tighe&Bond

STATE OF NEW HAMPSHIRE BRADLEY MEZQUITA No. 09350 LICENSED PROFESSIONAL ENGINEER 4-20-2020

STATE OF NEW HAMPSHIRE PATRICK M. CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER 4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

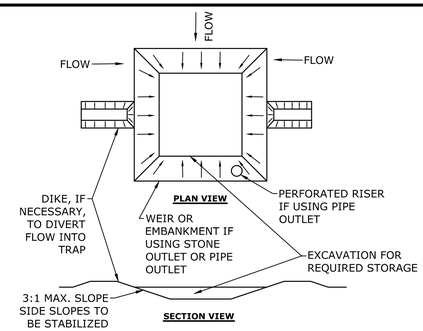
MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
B	2/6/2020	Design Review Submission
A	1/2/2020	ZBA Submission

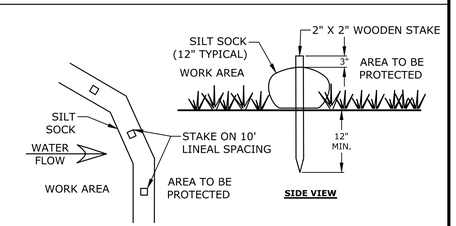
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-SITE.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

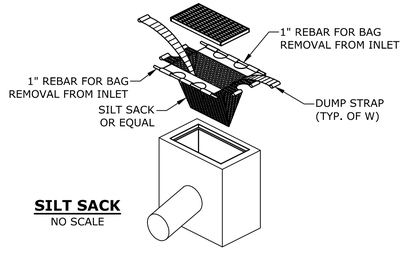
EASEMENT PLAN

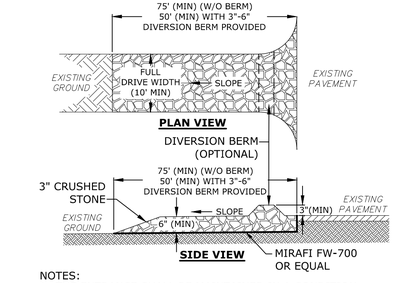
SCALE: AS SHOWN

C-301.2









GENERAL PROJECT INFORMATION

PROJECT APPLICANT:	IRON HORSE PROPERTIES, LLC 105 BARTLETT STREET PORTSMOUTH, NH 03801	PROJECT MAP/LOT: MAP 157 / LOT 1 MAP 157 / LOT 2
PROJECT NAME:	PROPOSED MULTI-FAMILY DEVELOPMENT	MAP 164 / LOT 1
PROJECT ADDRESS:	105 BARTLETT STREET PORTSMOUTH, NH 03801	MAP 164 / LOT 4-2

PROJECT LATITUDE/LONGITUDE: 43°-04'-20" N / 70°-46'-15" W

PROJECT DESCRIPTION

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

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 6.5 ACRES.

SOIL CHARACTERISTICS

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

NAME OF RECEIVING WATERS

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

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:

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

SPECIAL CONSTRUCTION NOTES:

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

EROSION CONTROL NOTES:

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

STABILIZATION:

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

DUST CONTROL:

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

STOCKPILES:

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

OFF SITE VEHICLE TRACKING:

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

VEGETATION:

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

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

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

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

CONCRETE WASHOUT AREA:

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

ALLOWABLE NON-STORMWATER DISCHARGES:

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

WASTE DISPOSAL:

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

SPILL PREVENTION:

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

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES

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

NOTES:

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

SEDIMENT TRAP

NO SCALE

NOTES:

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

SILT SOCK

NO SCALE

SILT SACK

NO SCALE

NOTES:

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

STABILIZED CONSTRUCTION EXIT

NO SCALE

Tighe&Bond

4-20-2020

PATRICK M. CRIMMINS No. 12378

4-20-2020

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

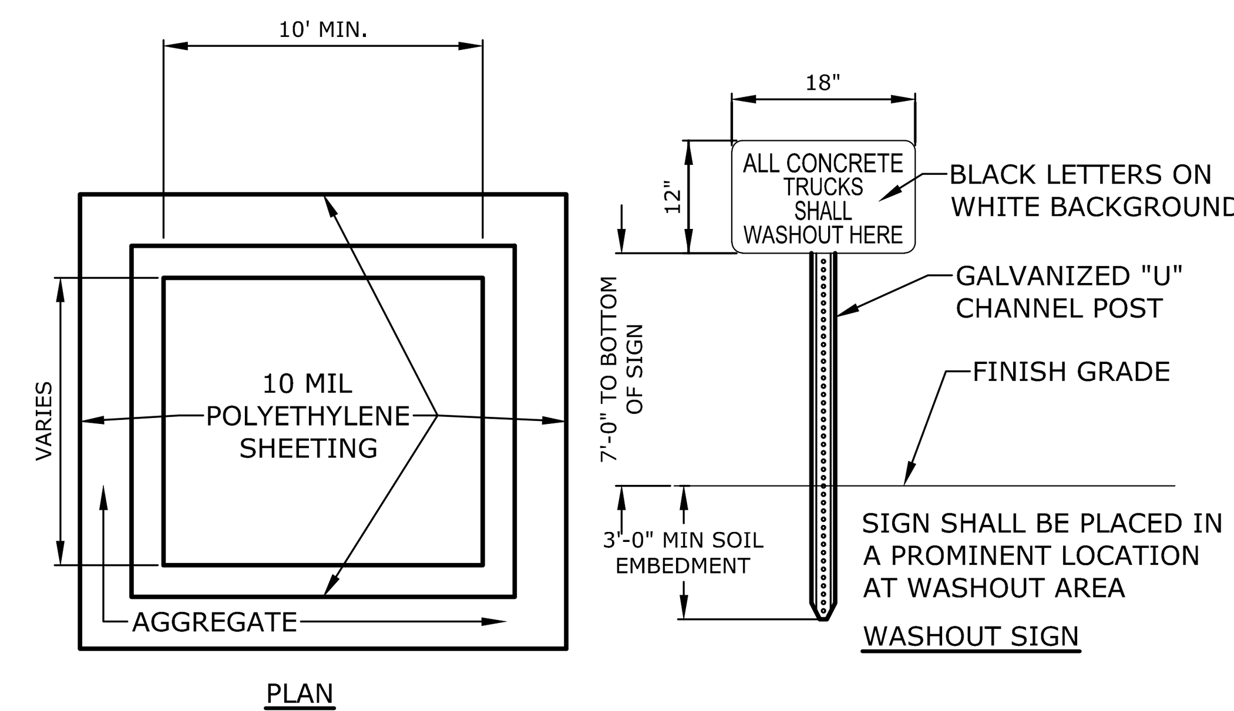
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

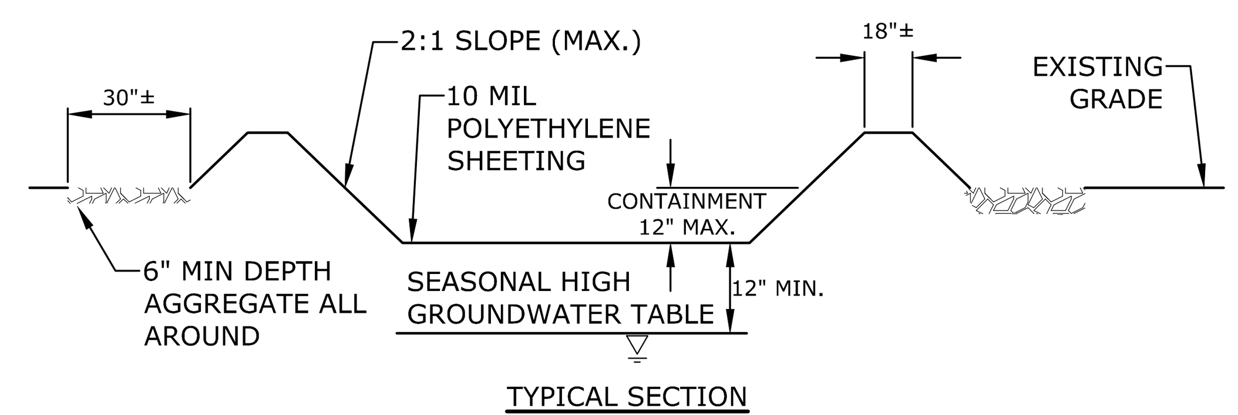
SCALE: AS SHOWN

C-501

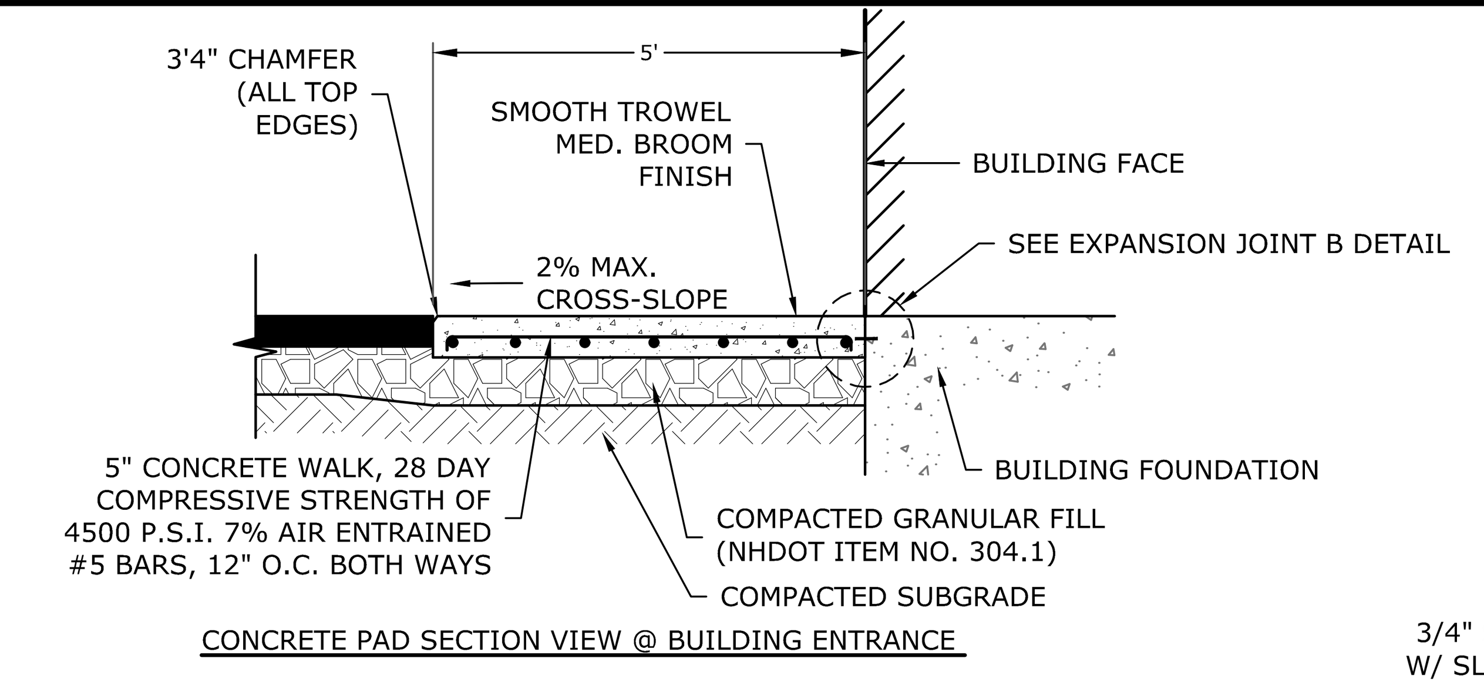
Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-12:33pm By: BCurcio
Tighe & Bond: J:\C\C0960 Cathartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg

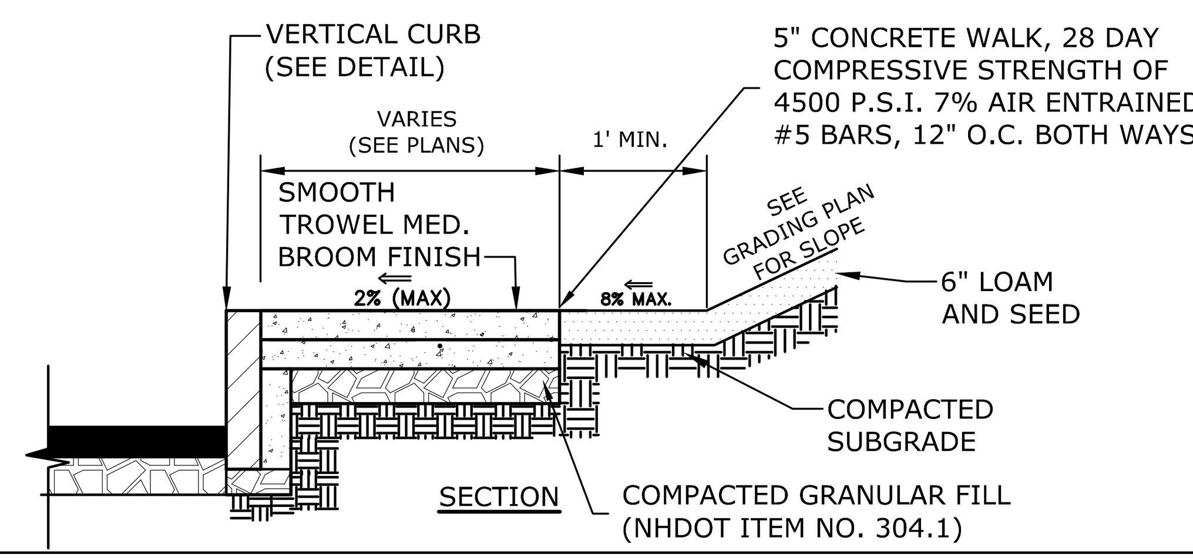


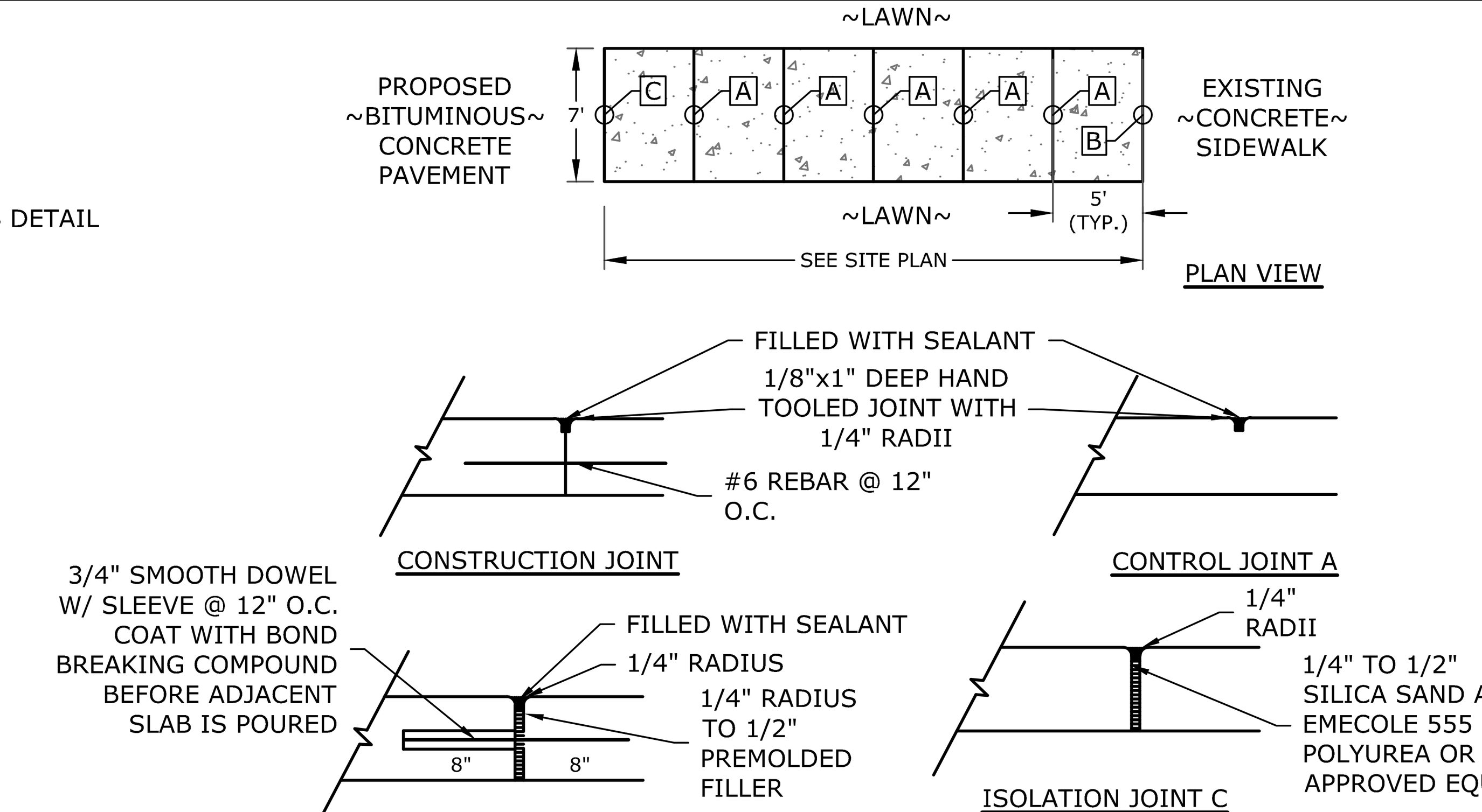
NOTES:
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75%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



CONCRETE WASHOUT AREA
NO SCALE





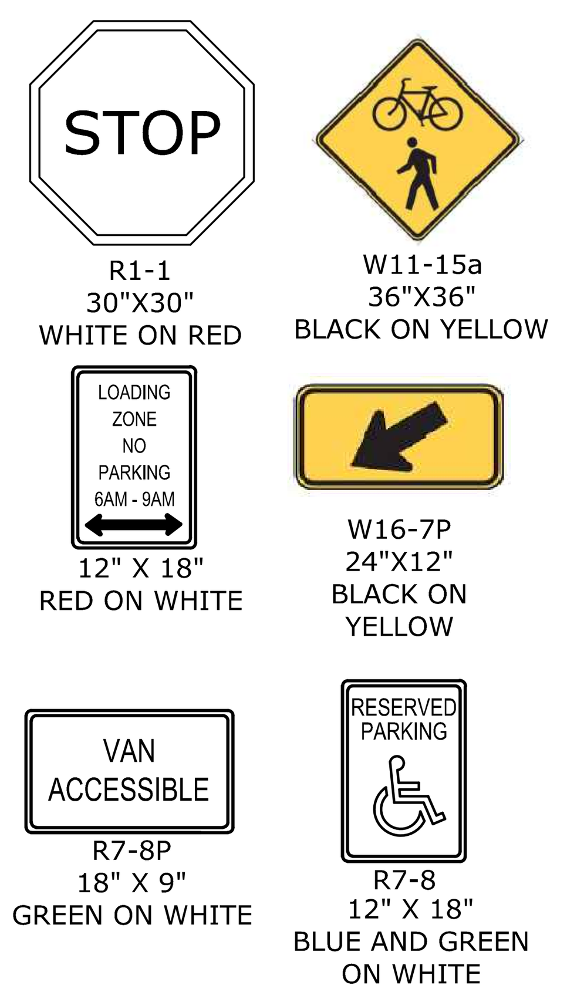


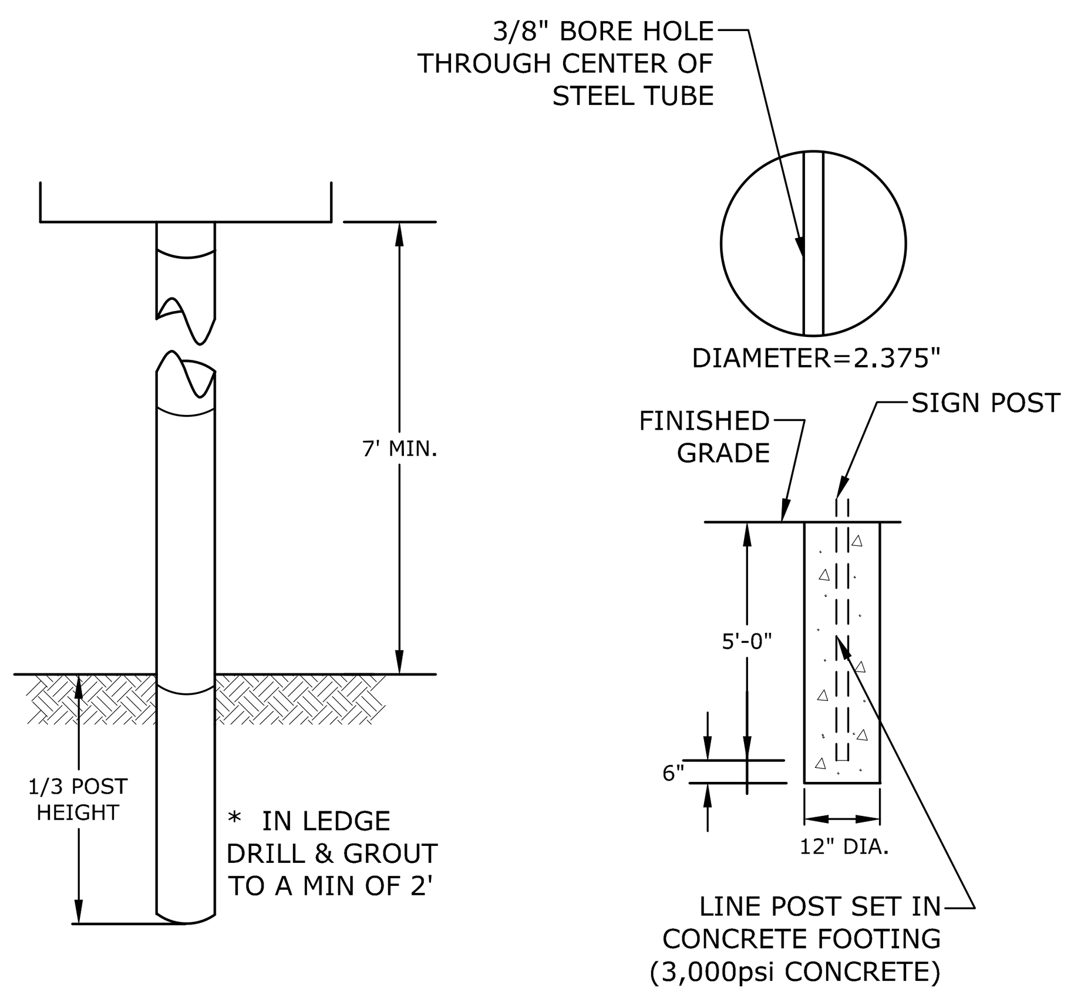
NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.

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

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

CONCRETE SIDEWALK
NO SCALE



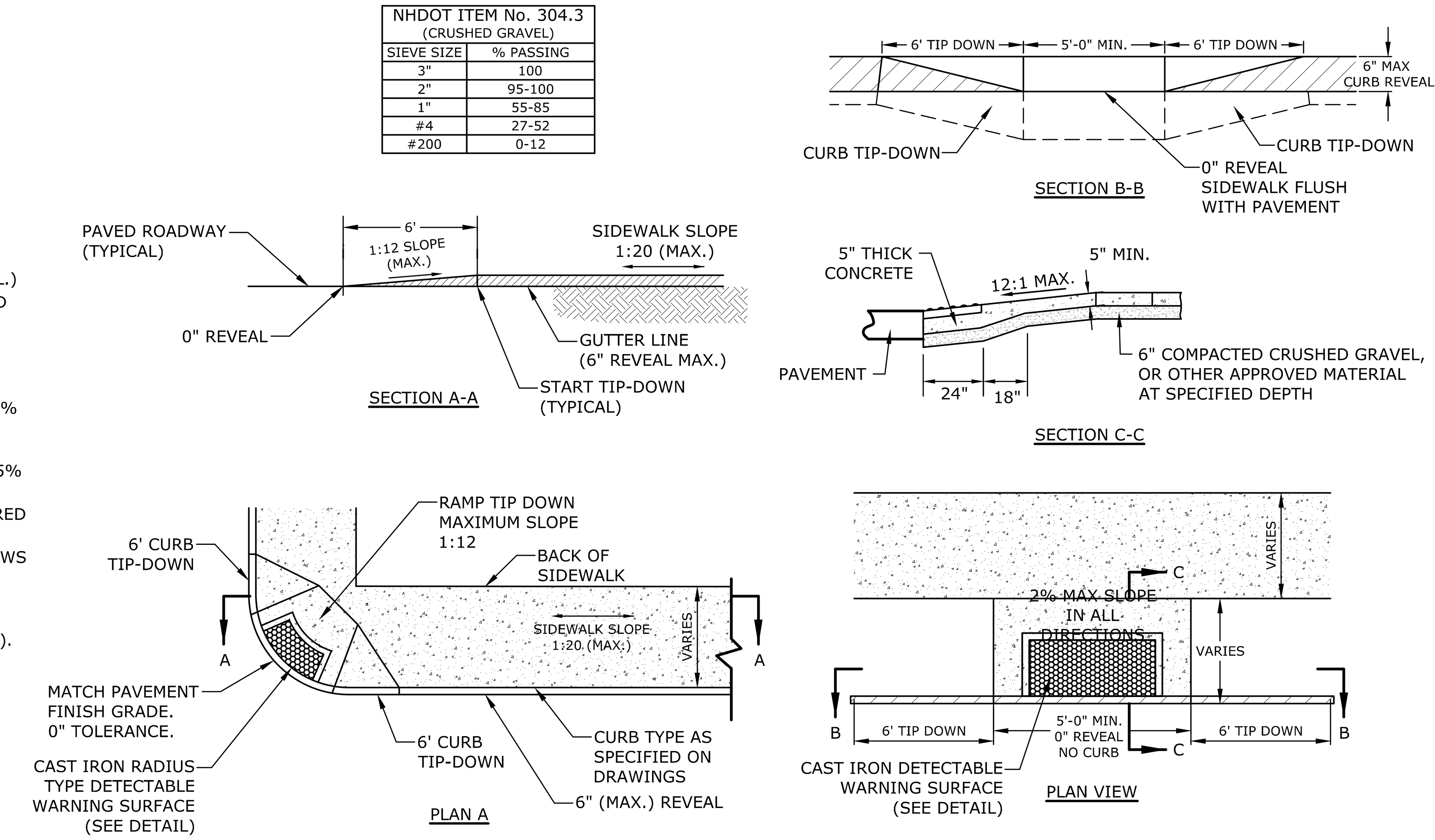


NOTES:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
POST: SCHEDULE 40 GALVANIZED STEEL PIPE (OUTSIDE DIA. = 2.375").
FINISH: POST TO BE POWDER COATED GLOSS BLACK
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER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

SIGN LEGEND & SIGN POST
NO SCALE

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

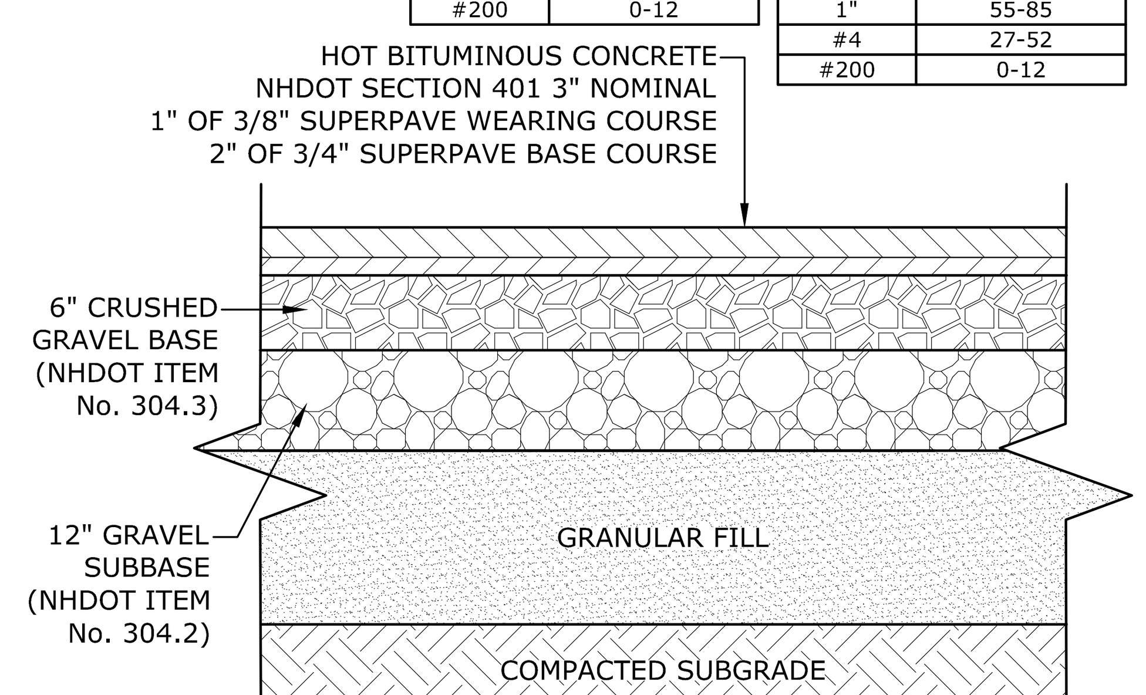
NHDOT ITEM No. 304.3 (CRUSHED GRAVEL)	
SIEVE SIZE	% PASSING
3"	100
2"	95-100
1"	55-85
#4	27-52
#200	0-12



CONCRETE WHEELCHAIR ACCESSIBLE RAMP
NO SCALE

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

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

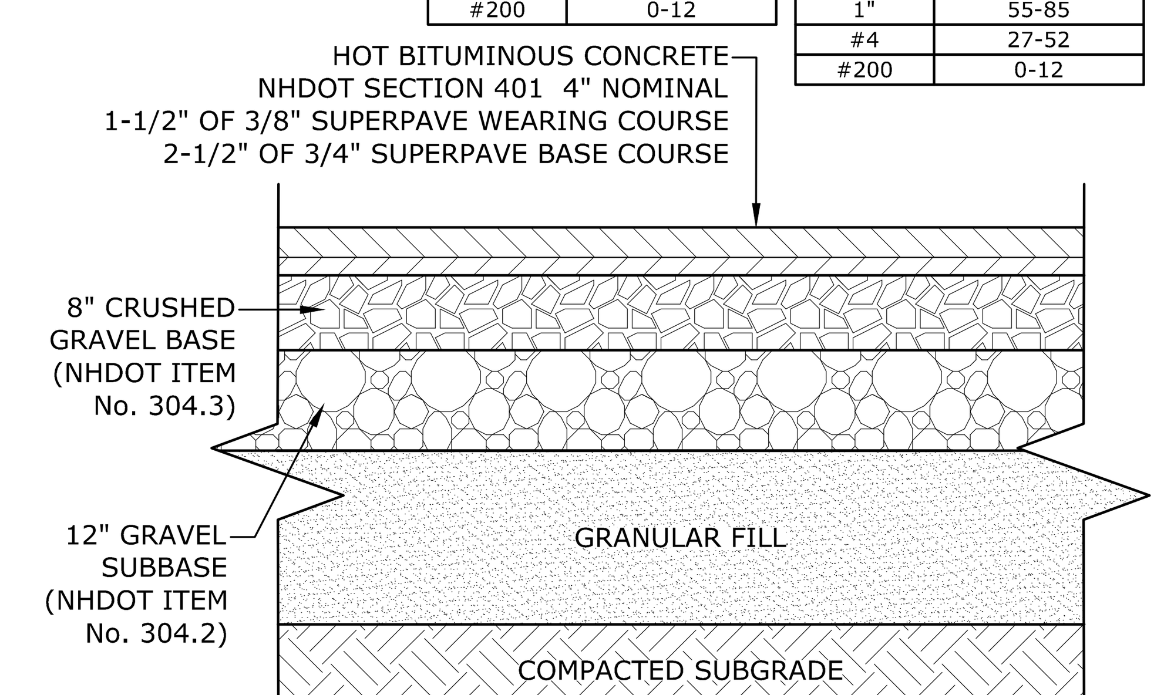


NOTES:
1. COORDINATE FINAL DESIGN SECTION WITH GEOTECHNICAL ENGINEER.
2. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
4. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.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

PARKING LOT PAVEMENT SECTION
NO SCALE

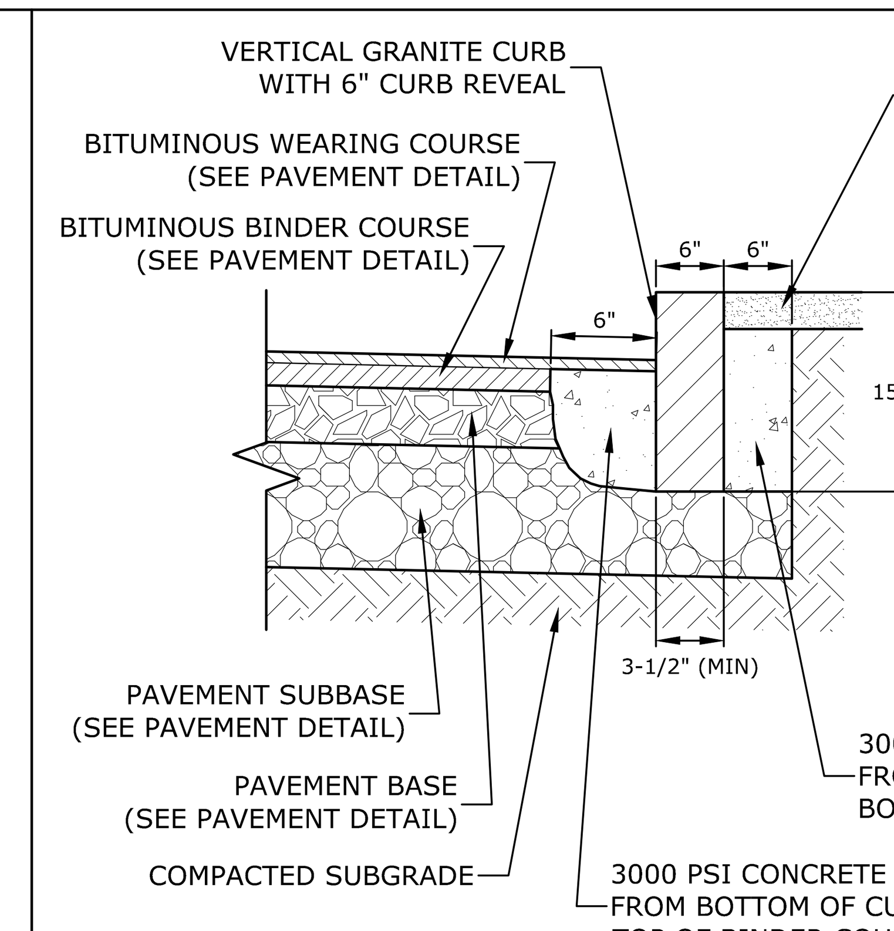
NHDOT ITEM No. 304.2 (GRAVEL)	
SIEVE SIZE	% PASSING
6"	100
#4	25-70
#200	0-12

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



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

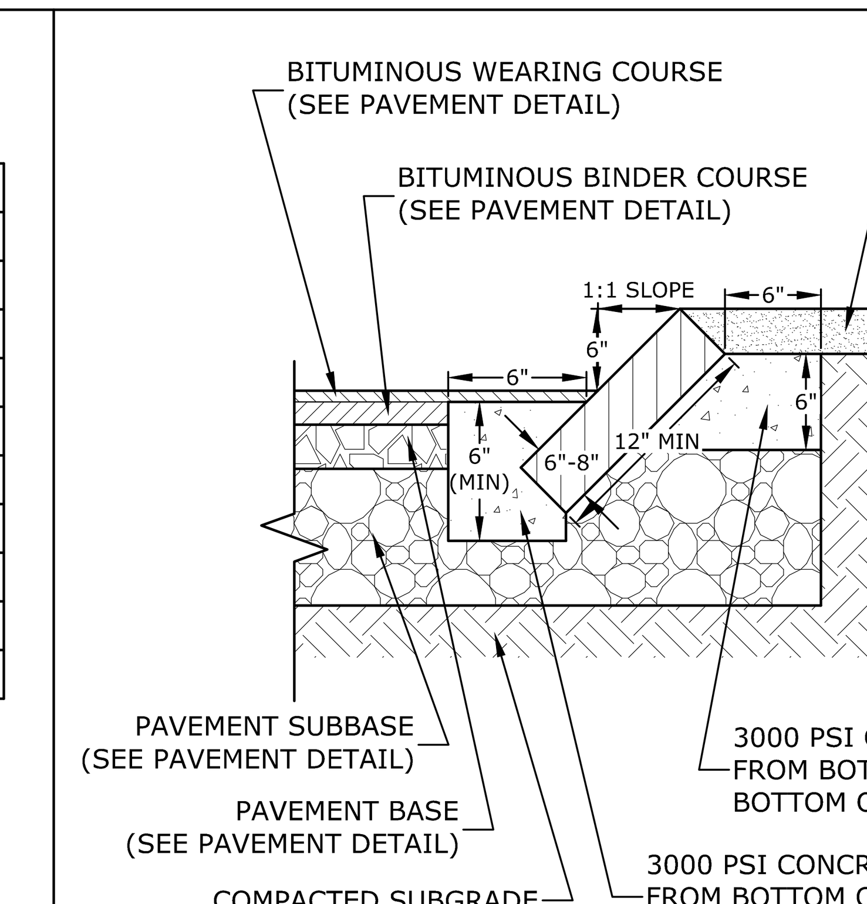
ROADWAY PAVEMENT SECTION
NO SCALE



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

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

VERTICAL GRANITE CURB
NO SCALE

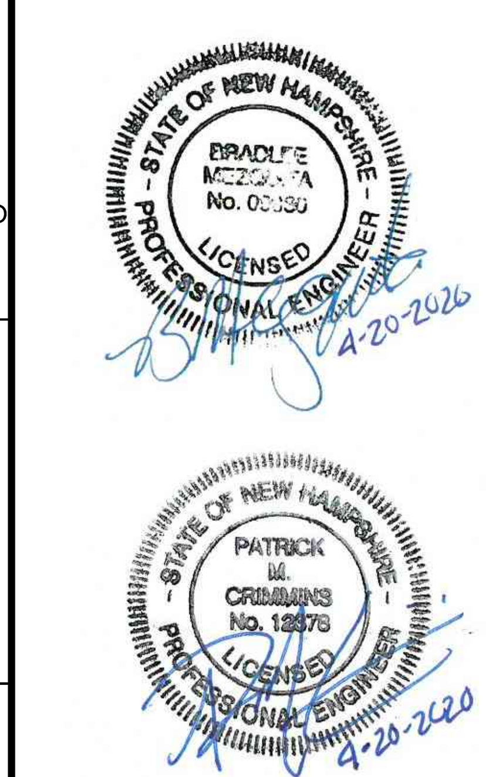


CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

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

SLOPED GRANITE CURB
NO SCALE

Tighe&Bond



Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

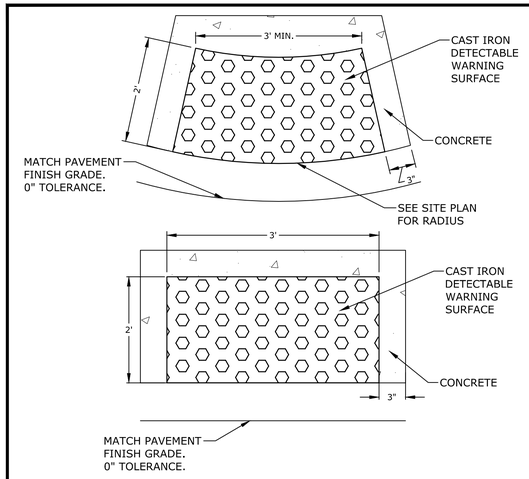
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

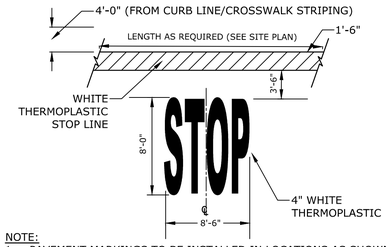
C-502

Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-12:34pm By: BCurcio
Tighe & Bond:J:\C\C0960 Catharts\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg



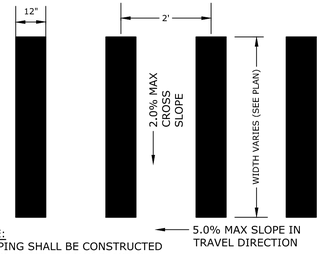
NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

RADIUS TYPE CAST IRON DETECTABLE WARNING SURFACE
NO SCALE



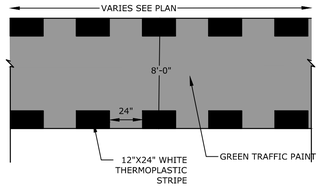
NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVEMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

STOP BAR AND LEGEND
NO SCALE



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

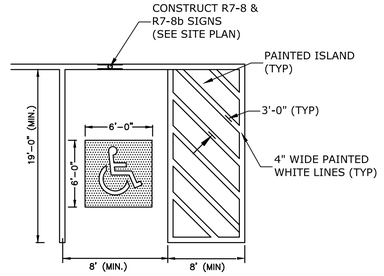
CROSSWALK STRIPING
NO SCALE



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

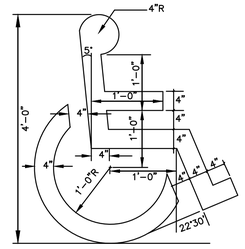
2. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.

BIKE CROSSING BOX
NO SCALE



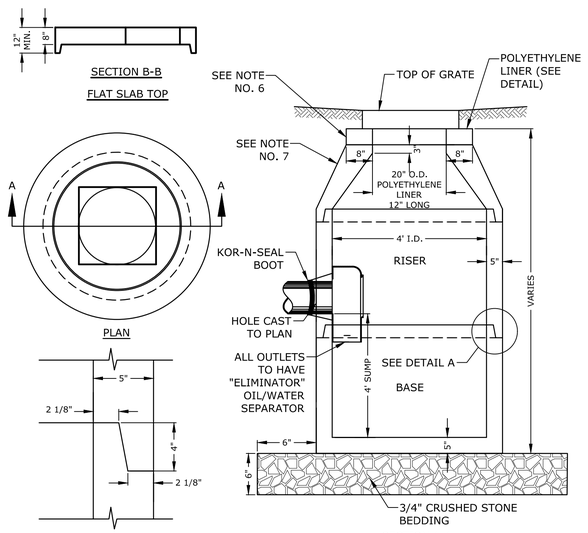
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN W/DISABILITIES ACT.

ACCESSIBLE PARKING STALL
NO SCALE



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

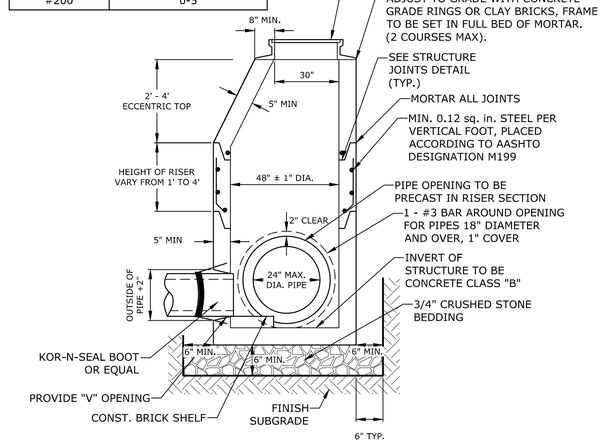
ACCESSIBLE SYMBOL
NO SCALE



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

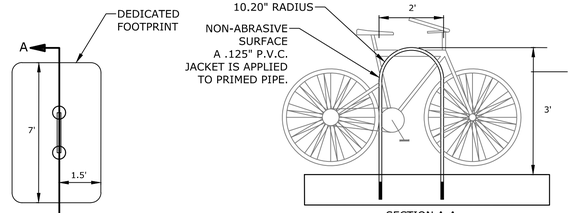
4' DIAMETER CATCHBASIN
NO SCALE

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

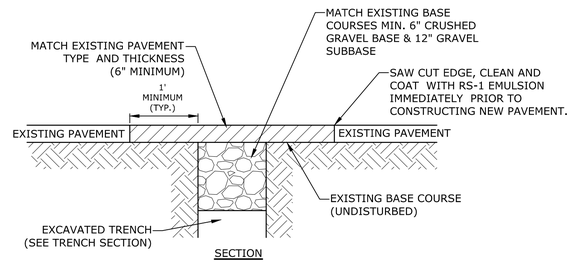


NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL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

4' DIAMETER DRAIN MANHOLE
NO SCALE



BIKE RACK
NO SCALE



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

ROADWAY TRENCH PATCH
NO SCALE

Tighe&Bond

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

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

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

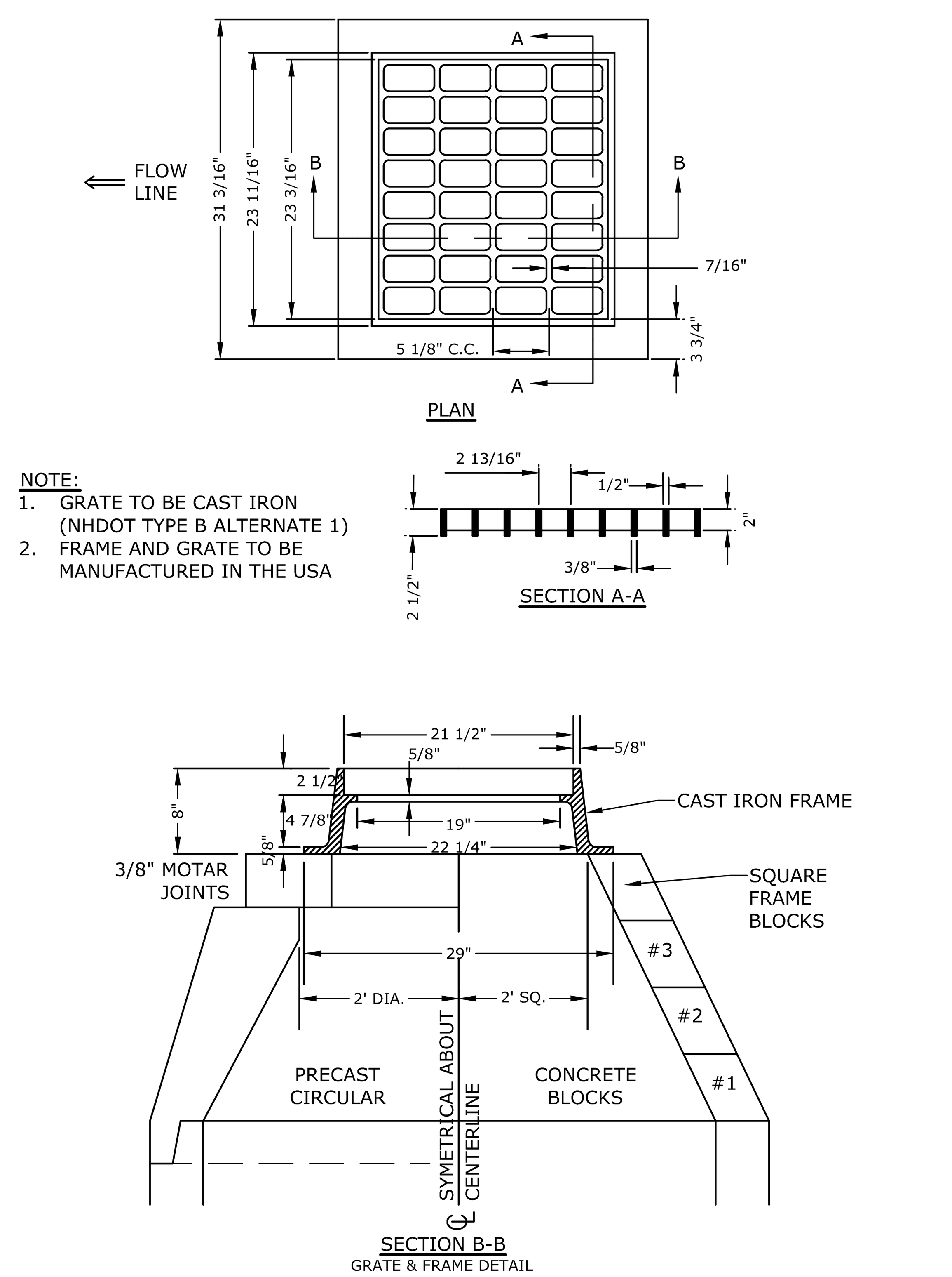
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

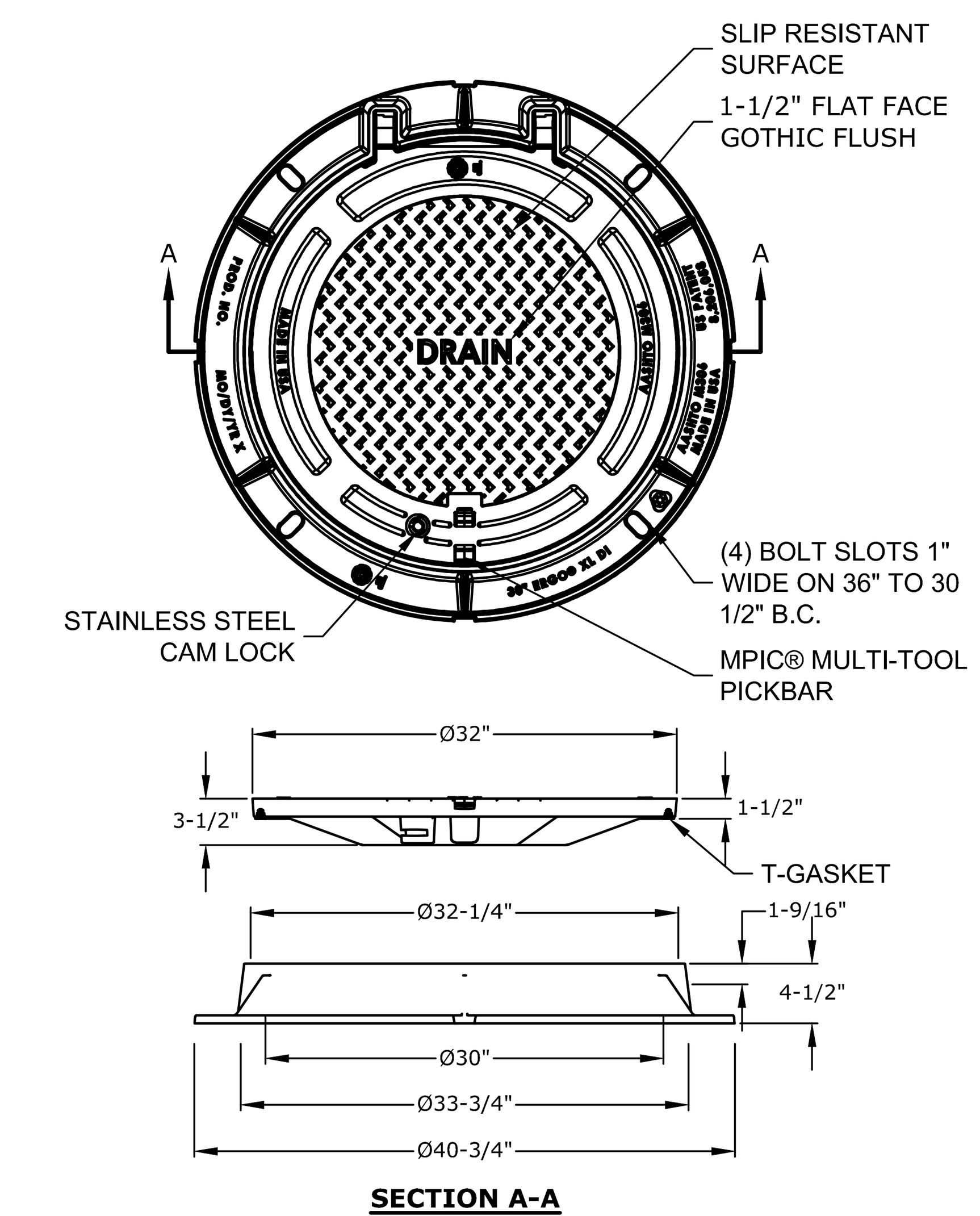
C-503

Last Saved: 4/20/2020
Plotted: Apr 20, 2020 - 12:34pm By: BCurcio
Tighe & Bond: J:\C\C0960 Catharines\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg



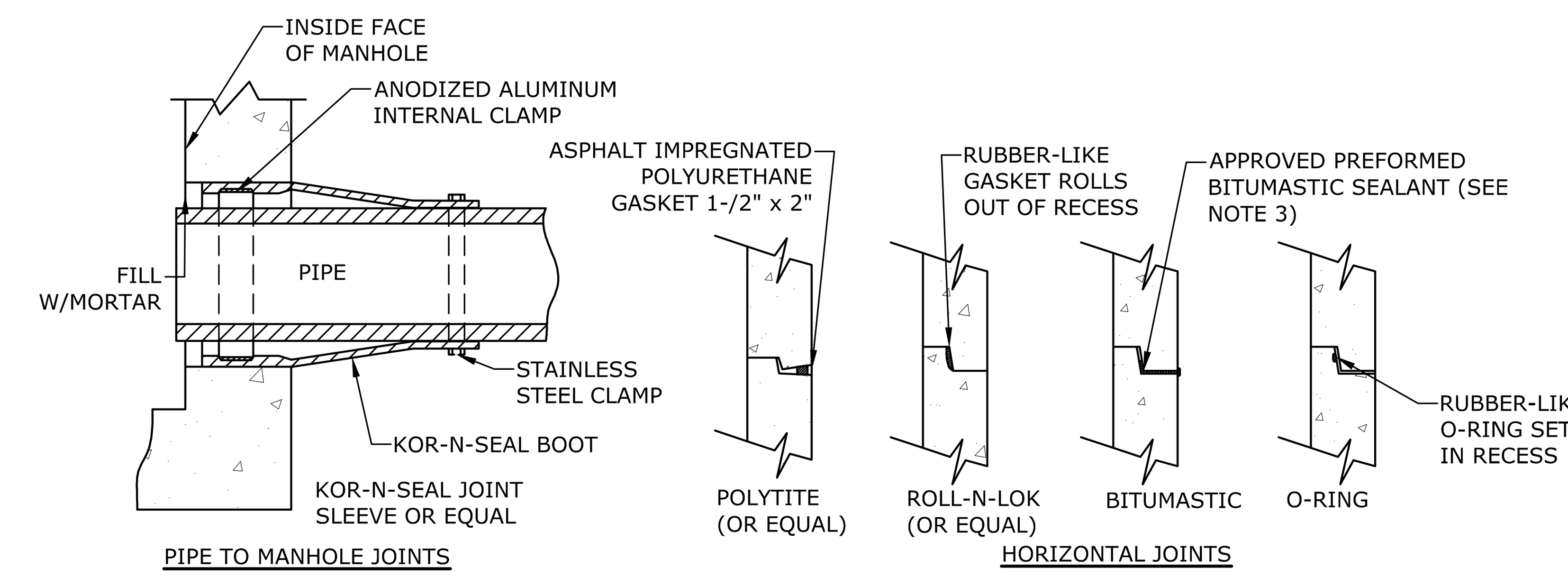
NOTE:
1. GRATE TO BE CAST IRON (NHDOT TYPE B ALTERNATE 1)
2. FRAME AND GRATE TO BE MANUFACTURED IN THE USA

CATCH BASIN FRAME & GRATE
NO SCALE



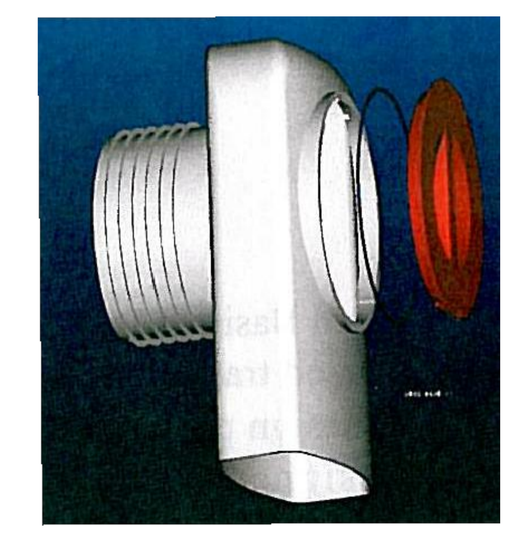
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN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

DRAIN MANHOLE FRAME & COVER
NO SCALE



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

MANHOLE JOINTS
NO SCALE

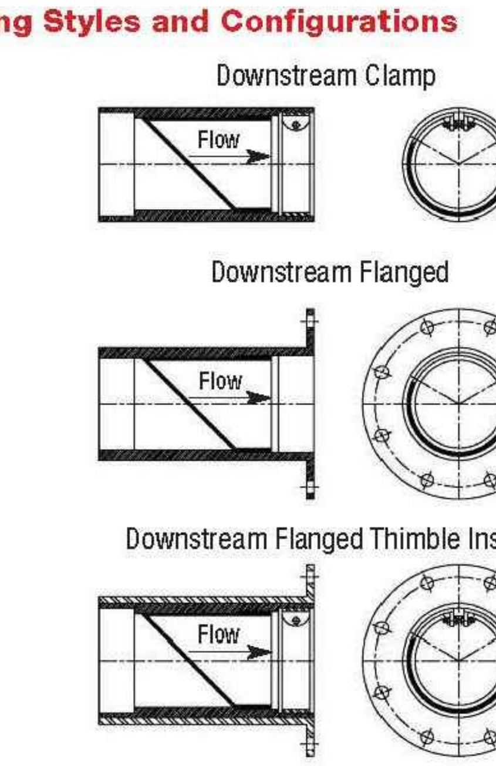


NOTES:
1. ALL CATCH BASIN OUTLETS TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)
2. INSTALL DEBRIS TRAP TIGHT TO INSIDE OF STRUCTURE.
3. 1/4" HOLE SHALL BE DRILLED IN TOP OF DEBRIS TRAP

"ELIMINATOR" OIL FLOATING DEBRIS TRAP
NO SCALE

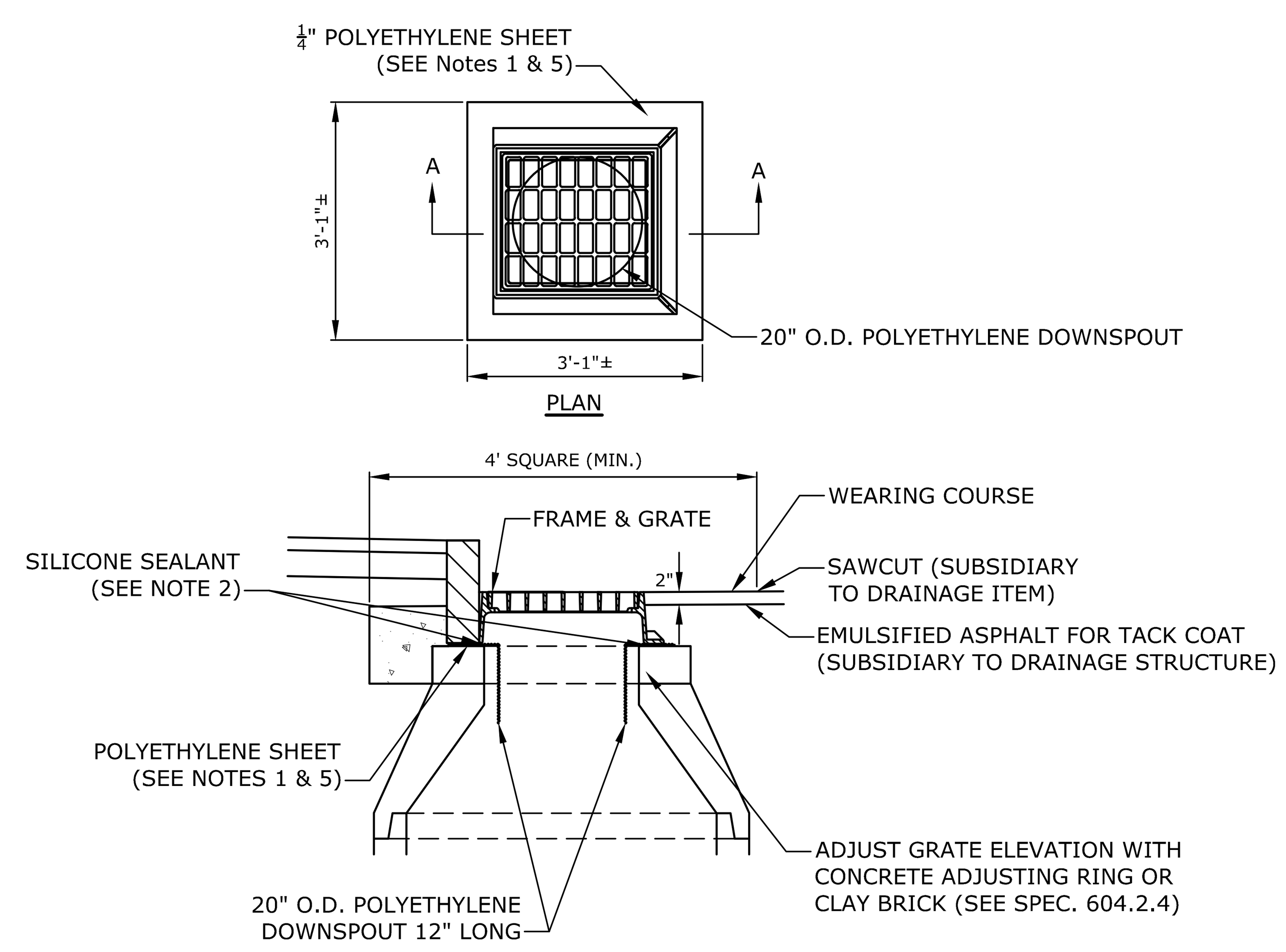
NOMINAL PIPE SIZE I.D.*		OVERALL LENGTH**		NUMBER OF CLAMPS	CUFF DEPTH		BACK PRESSURE RATING	
Inches	Millimeters	Inches	Millimeters		Inches	Millimeters	Feet	Meters
12	300	23	584	1	2	51	40	12

Mounting Styles and Configurations



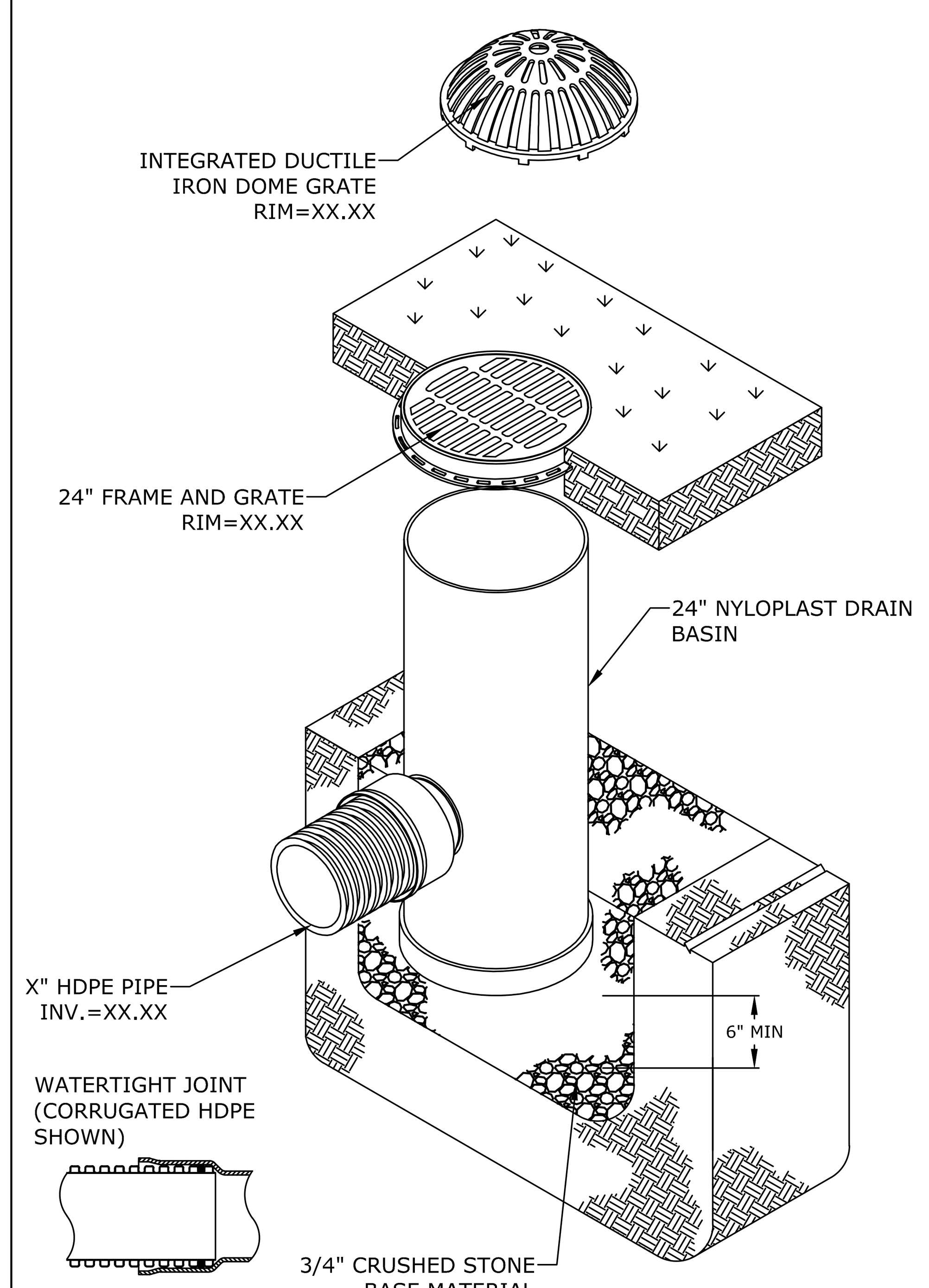
Flange shape and bolt pattern can be customized.
Flangeless thimble inserts are available.

TYPICAL BACK FLOW PREVENTER
NO SCALE



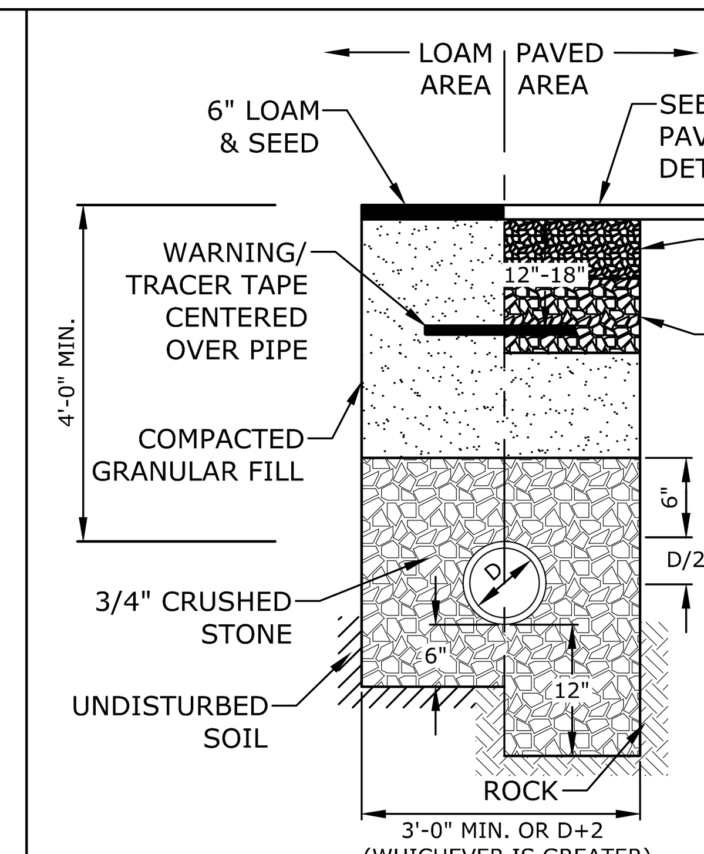
NOTES:
1. POLYETHYLENE LINER (ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
2. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
3. PLACE CLASS AA CONCRETE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

POLYETHYLENE LINER
NO SCALE



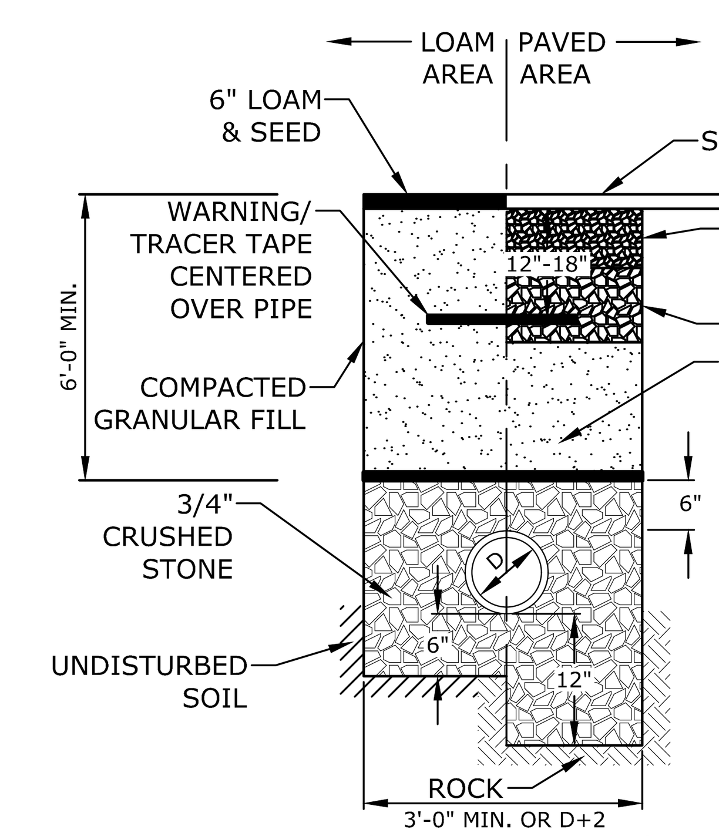
NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. SEE GRADING, DRAINAGE, AND EROSION CONTROL PLAN FOR LOCATIONS.

YARD DRAIN
NO SCALE



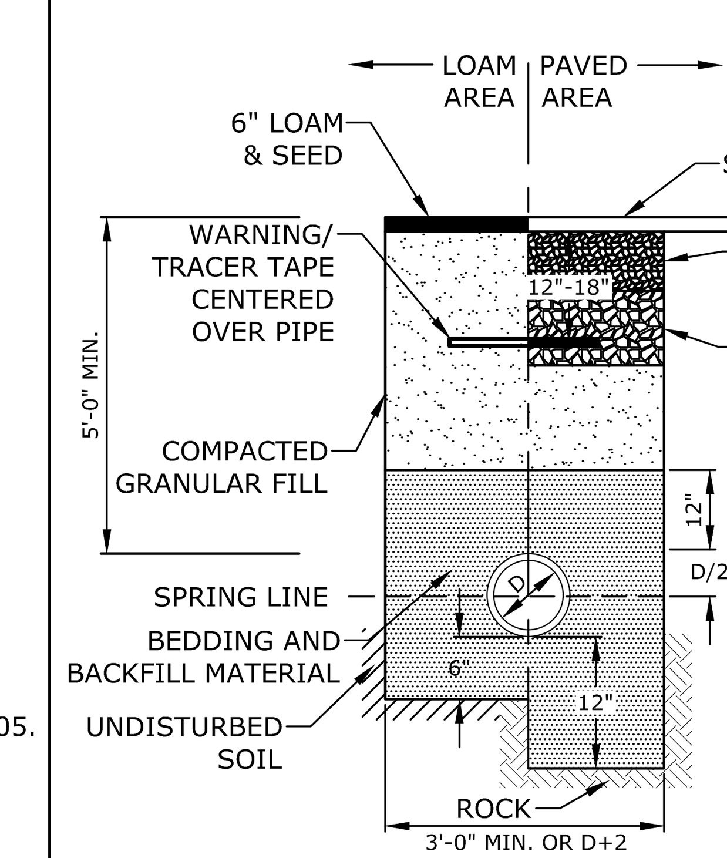
NOTE:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES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

STORM DRAIN TRENCH
NO SCALE



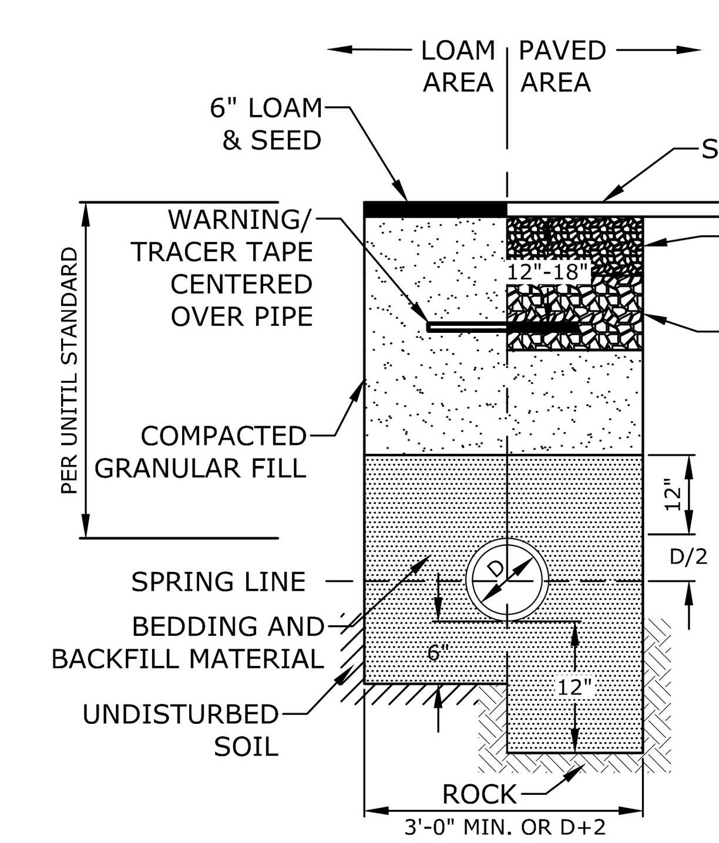
NOTE:
1. CRUSHED STONE BEDDING FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK. CRUSHED STONE SHALL ALSO COMPLETELY ENCASE THE PIPE AND COVER THE PIPE TO A GRADE 6" OVER THE TOP OF THE PIPE FOR THE ENTIRE WIDTH OF THE TRENCH.
2. COORDINATE ALL INSTALLATIONS WITH THE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

SEWER SERVICE TRENCH
NO SCALE



NOTES:
1. 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.

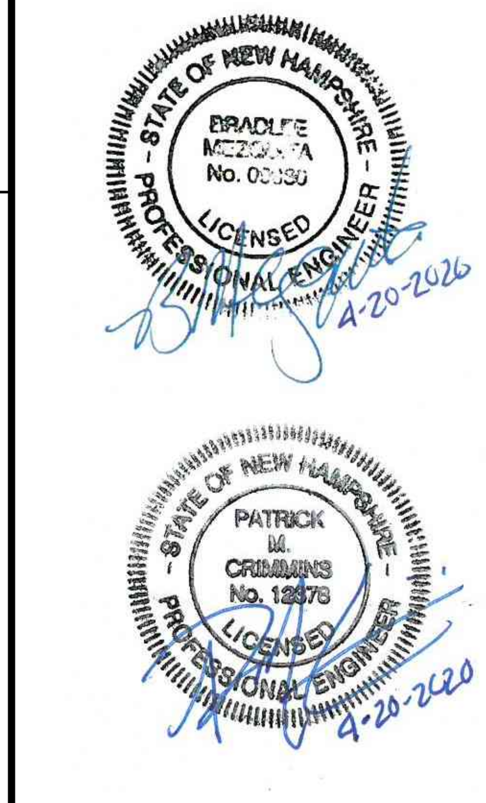
WATER TRENCH
NO SCALE



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

GAS TRENCH
NO SCALE

Tighe&Bond



Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

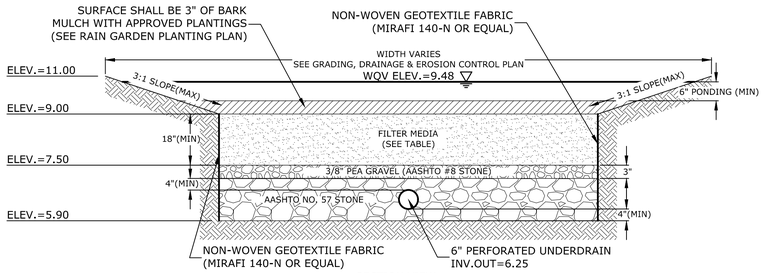
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

SCALE: AS SHOWN

C-504

Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-12:34pm By: BCurcio
Tighe & Bond:J:\C\C0960 Catharses\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg



SECTION VIEW

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

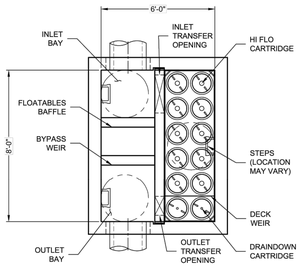
NOTES:
1. BARK MULCH SHALL BE AGED A MINIMUM OF 12 MONTHS AND SHALL NOT FLOAT.
2. RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
3. DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL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

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

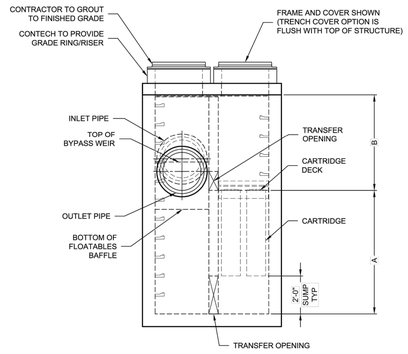
AASHTO #8 STONE (#8 to 3/8")	
SIEVE SIZE	% PASSING
1/2"	100
3/8"	85-100
#4	10-30
#8	0-10
#16	0-5

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

RAIN GARDEN
NO SCALE



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

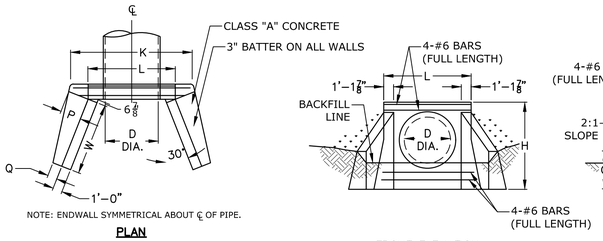
JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY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

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

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

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

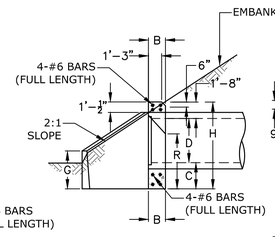
CONTECH JELLYFISH STORMWATER FILTER
NO SCALE



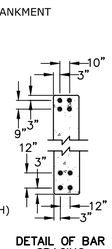
NOTE: ENDWALL SYMMETRICAL ABOUT ℄ OF PIPE.

PLAN

FRONT ELEVATION



SIDE ELEVATION

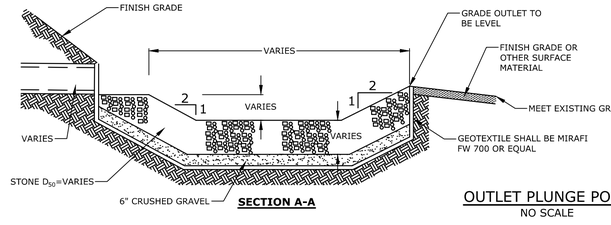


DETAIL OF BAR SPACING

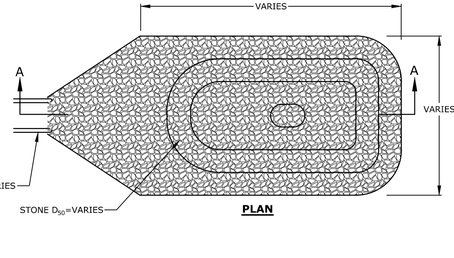
HEADWALL WITH WINGWALLS
NO SCALE

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

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

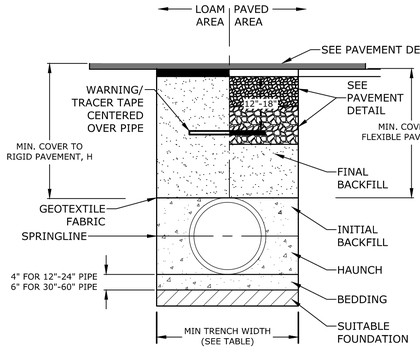


SECTION A-A



PLAN

OUTLET PLUNGE POOL
NO SCALE



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

TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

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

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

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

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

NOTES:

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

HP STORM TRENCH INSTALLATION DETAIL
NO SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

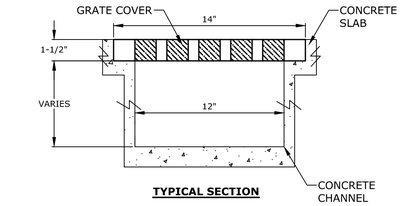
PROJECT NO:	C-0960-006
DATE:	April 20, 2020
FILE:	C-0960-006_C-DTLS.DWG
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	BML

DETAILS SHEET

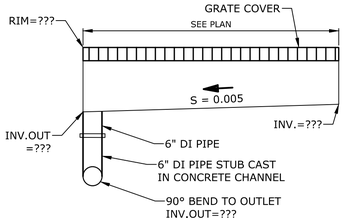
SCALE: AS SHOWN

C-505

Last Saved: 4/20/2020
Last Plotted: 4/20/2020 12:34pm By: BCurcio
Tighe & Bond: J:\C\C0960 Catharine\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg



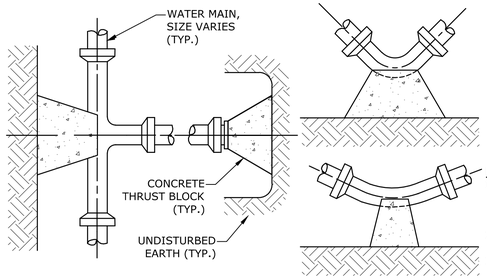
TYPICAL SECTION



TRENCH DRAIN PROFILE

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

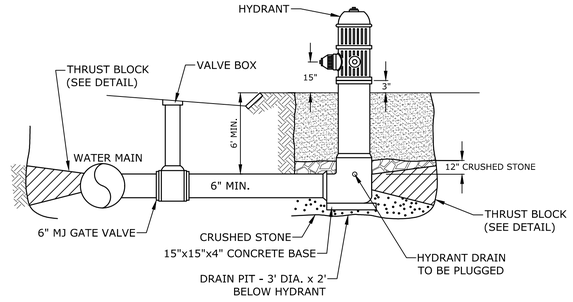
TRENCH DRAIN DETAIL
NO SCALE



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

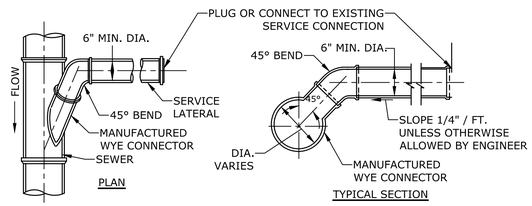
NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT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

THRUST BLOCKING DETAIL
NO SCALE

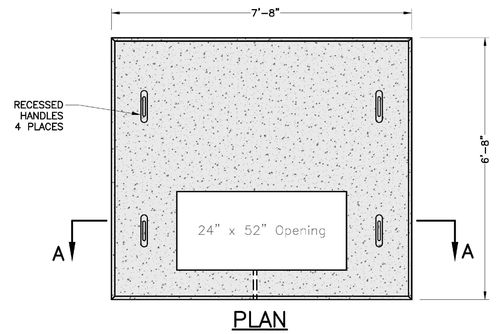


NOTE:
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION AND TESTING.

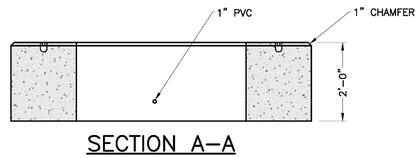
FIRE HYDRANT
NO SCALE



STANDARD SERVICE LATERAL CONNECTION
NO SCALE



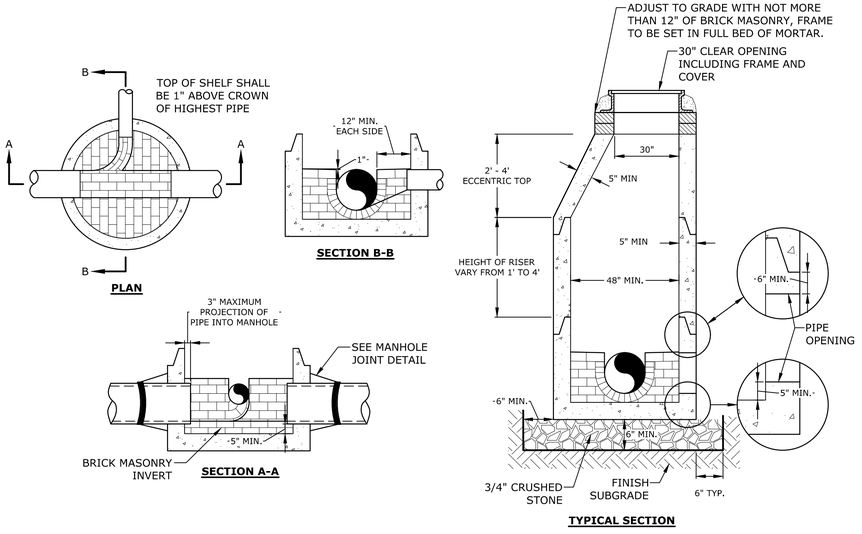
PLAN



SECTION A–A

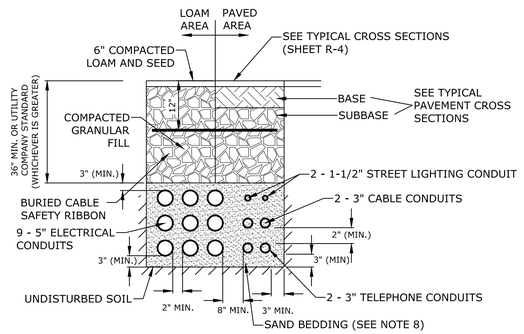
3-PHASE TRANSFORMER PAD
NO SCALE

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



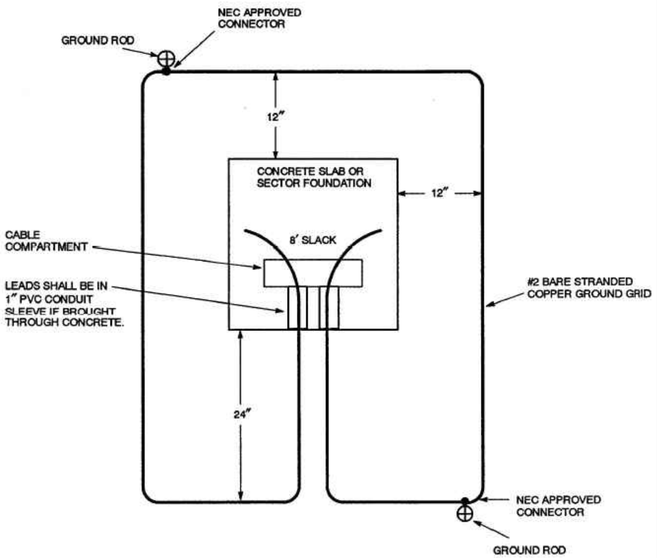
NOTES:
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
3. INVERT BRICKS SHALL BE LAID ON EDGE.
4. BITUMINOUS WATERPROOF COATING TO BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
5. FRAMES AND COVERS: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

SEWER MANHOLE
NO SCALE



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

ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE



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

PAD-MOUNTED EQUIPMENT GROUNDING GRID DETAIL
NO SCALE

Tighe&Bond

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

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

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

DETAILS SHEET

SCALE: AS SHOWN

C-506

Last Saved: 4/20/2020
Printed: Oct 29, 2020 - 12:34pm By: BCorcio
Tighe & Bond: J:\C\C0960 Cattartes\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-DTLS.dwg

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

Proposed Multi-Family Development

LANDSCAPE CONCEPT

105 Barlett Street Portsmouth, NH

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

L-1

Sheet x of X

PROPOSED DEVELOPMENT
105 BARTLETT STREET
PORTSMOUTH, NH

CONSTRAINTS PLAN

LEGEND

- EXISTING BUILDING
- EXISTING BUILDING TO BE RENOVATED OR REMOVED
- APPROXIMATE LOCATION OF HISTORIC ROUND HOUSE
- PROPOSED BUILDING
- ZONING LINE
- PROPERTY LINE

BUILDING CONSTRAINTS	AREA
PROPOSED DEVELOPMENT LOT	220,768 SF
APPROXIMATE LOCATION OF CITY UTILITIES	21,790 SF
NORTH MILL POND COMMUNITY SPACE AREA	55,192 SF
VIEW CORRIDOR	20,886 SF
15' MINIMUM RAILROAD SETBACK	9,793 SF

NORTH MILL POND

DOVER STREET VIEW CORRIDOR

CD4-W

CD4-L1

CABOT STREET VIEW CORRIDOR

BUILDING C

BUILDING B

BUILDING A

PROPOSED PROPERTY LINE

RELOCATED EXISTING BUILDING

RELOCATED EXISTING BUILDING

APPROXIMATE LOCATION OF EXISTING SEWER LINE

15' MINIMUM RAILROAD SETBACK

APPROXIMATE LOCATION OF EXISTING DRAIN LINE

APPROXIMATE LOCATION OF EXISTING WATER LINE

DOVER STREET

SALEM STREET

McDONOUGH STREET

CABOT STREET

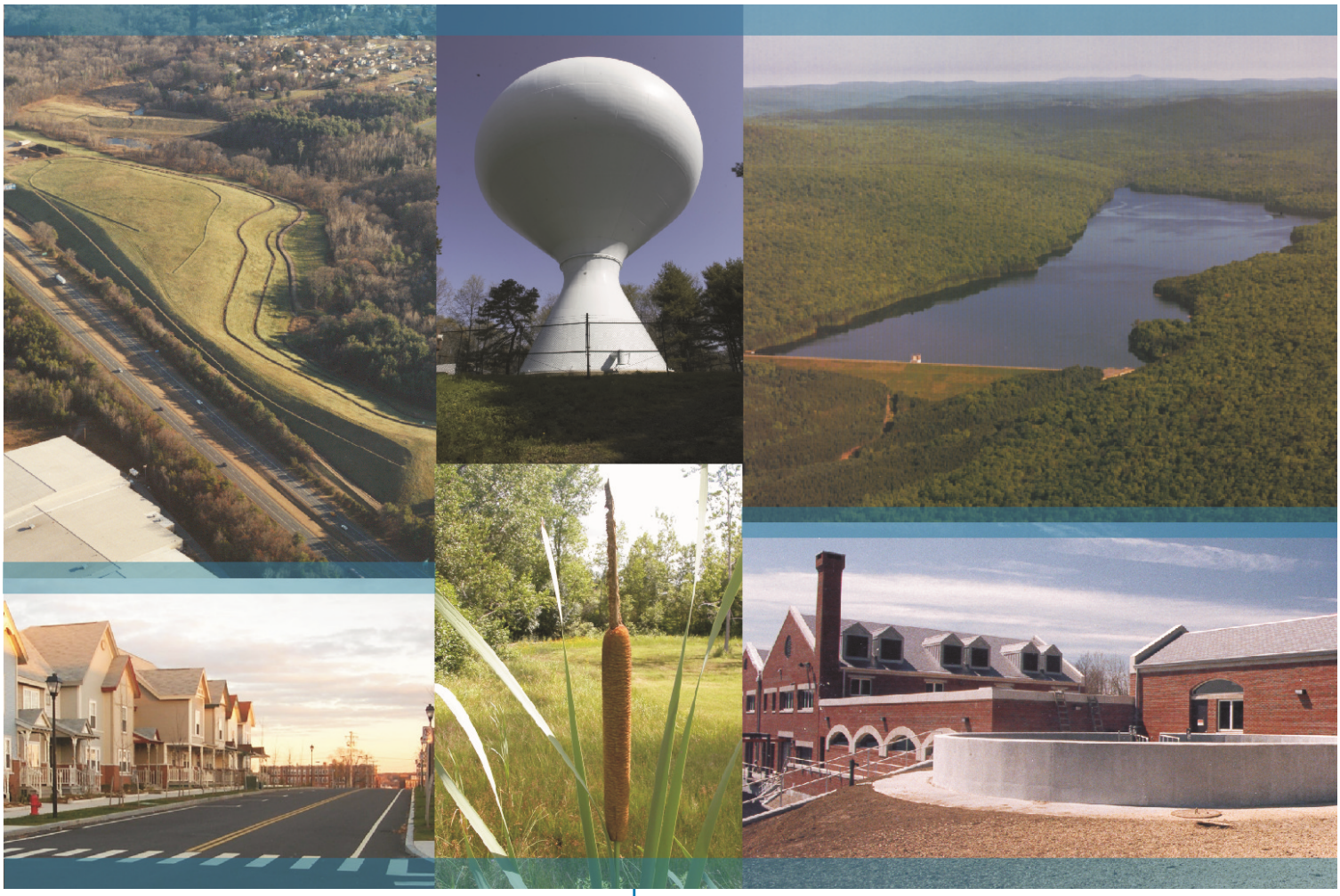
N

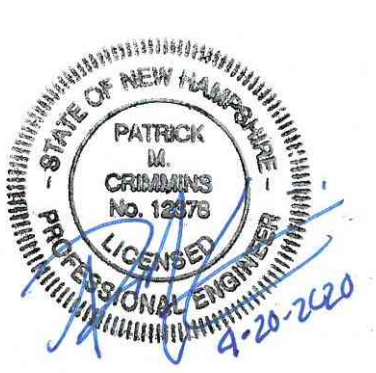
0 40' 80'

GRAPHIC SCALE

Tighe&Bond
Engineers | Environmental Specialists
177 Corporate Drive
Portsmouth, New Hampshire 03801
(603) 433-8818
February 26, 2020
C-0960-006_C-CONSTRAINTS_CLR.dwg

C-0960-006_C-CONSTRAINTS_CLR.dwg Date Plotted: Feb 26, 2020 - 3:05pm Plotted By: MAHANSEN





Tighe&Bond

Proposed Multi-Family Development
105 Bartlett Street
Portsmouth, NH

Drainage Analysis

Prepared For:

Iron Horse Properties LLC

April 20, 2020

Section 1
Project Description

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

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

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

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

The pre-development and post-development watershed areas have been analyzed at two points of analysis. While the points of analysis remained unchanged, their contributing sub-catchment areas varied between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant. For reference, PA-1 assesses flows that discharge directly to

North Mill Pond via overland flow or various outlets, and PA-2 assesses flows that discharge to the 36" brick sewer which runs through the development area. In the post-development condition, however, all stormwater flows have been separated from the brick sewer and are discharged to North Mill Pond after being treated. PA-2 would have no stormwater flows in the post-development condition, therefore removing the need to assess it.

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

1.1 Calculation Methods

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

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

References:

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

Section 2
Pre-Development Conditions

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

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

Point of Analysis (PA-1)

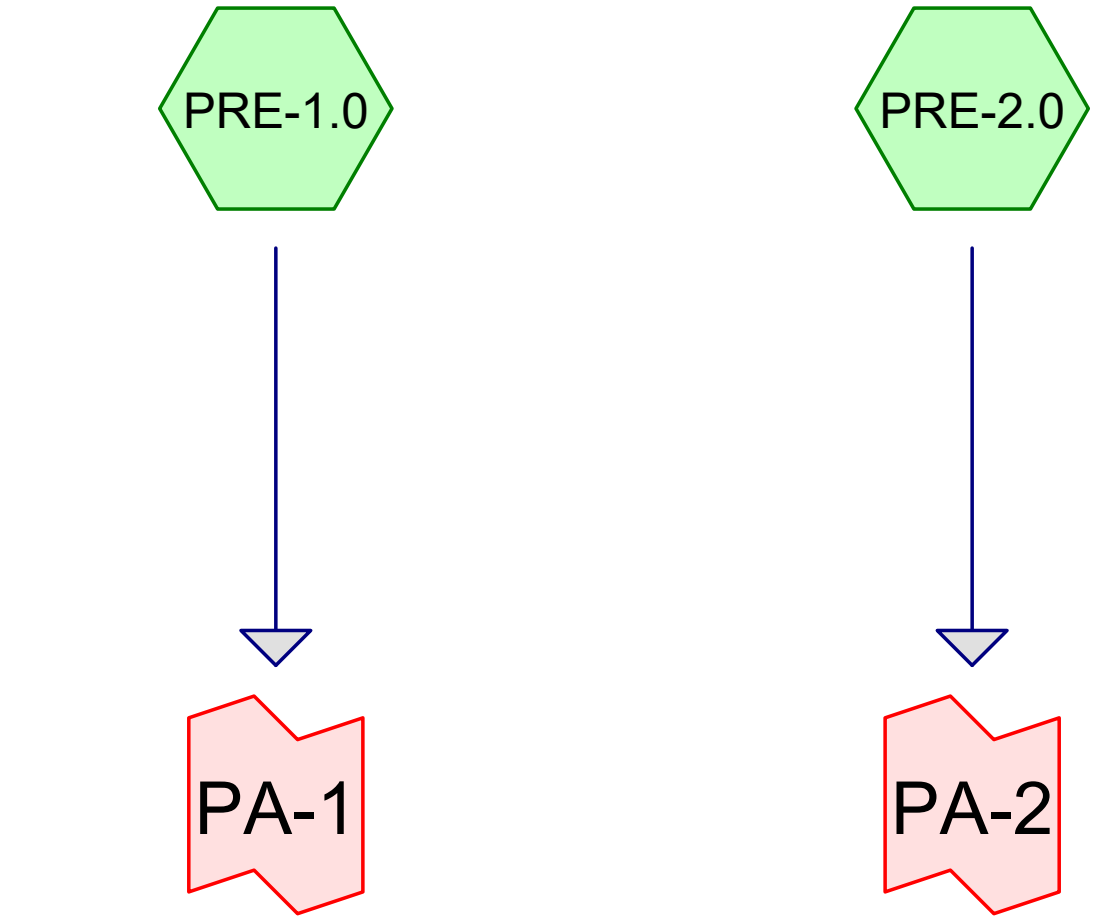
Pre-development Watershed 1.0 (PRE 1.0) is comprised of mostly impervious surfaces from paved parking and structures, as well as some disturbed forested areas to the northeast that surround a dilapidated roundhouse, former railroad turntable, and a machine shop. Banks along the shoreline of North Mill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

Point of Analysis (PA-2)

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

2.2.1 Pre-Development Calculations

2.2.2 Pre-Development Watershed Plans



Subcat Reach Pond Link

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

Area Listing (all nodes)

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

Soil Listing (all nodes)

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

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

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

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

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

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

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

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

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

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

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

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

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

Summary for Subcatchment PRE-1.0:

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

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

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

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

Summary for Subcatchment PRE-2.0:

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

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

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

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

Summary for Link PA-1: NORTH MILL POND

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

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

Summary for Link PA-2: COMBINED SYSTEM TO SEWER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

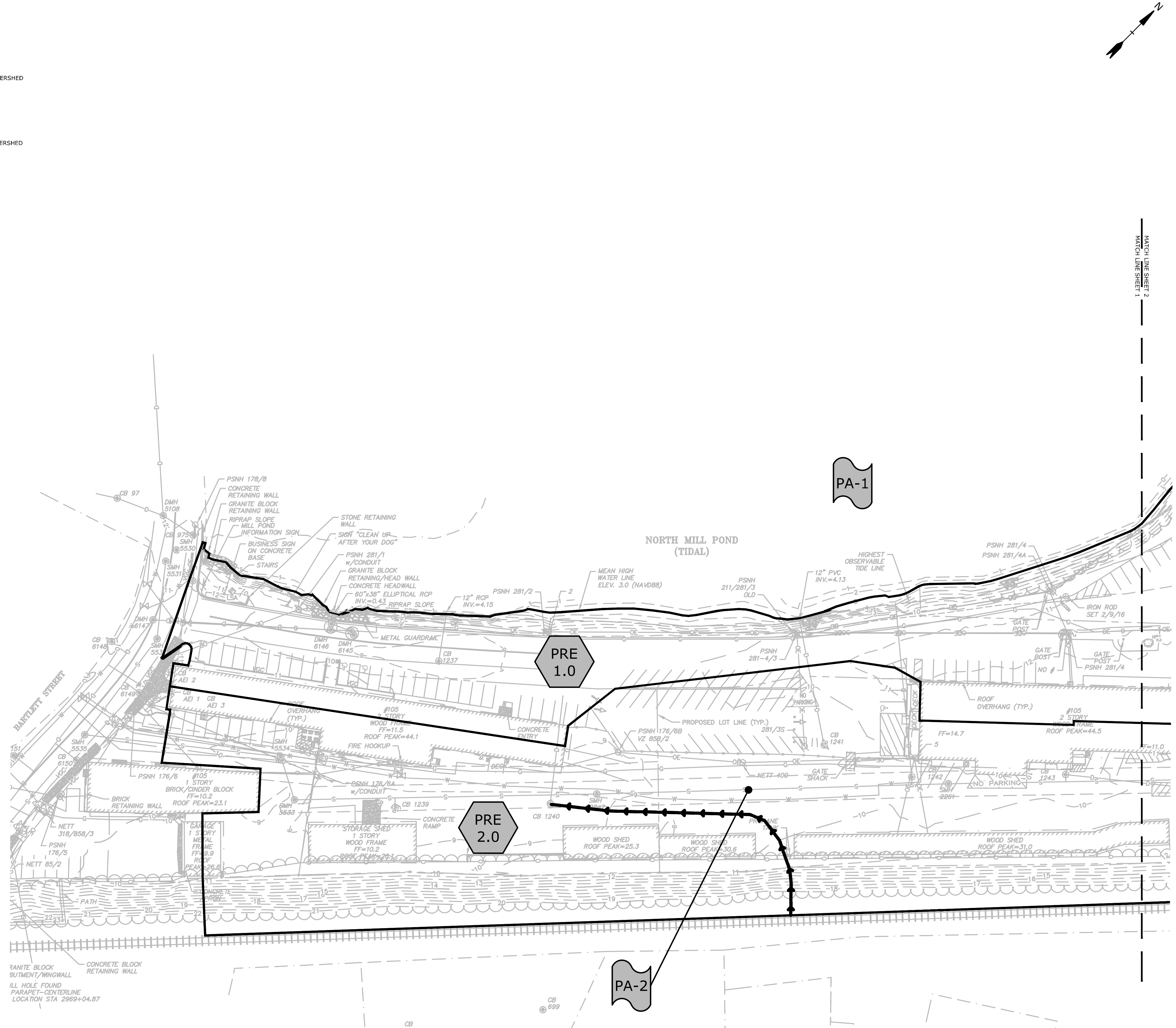
LEGEND

PRE-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

PA-1 — POINT OF ANALYSIS



0 40' 80'

GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

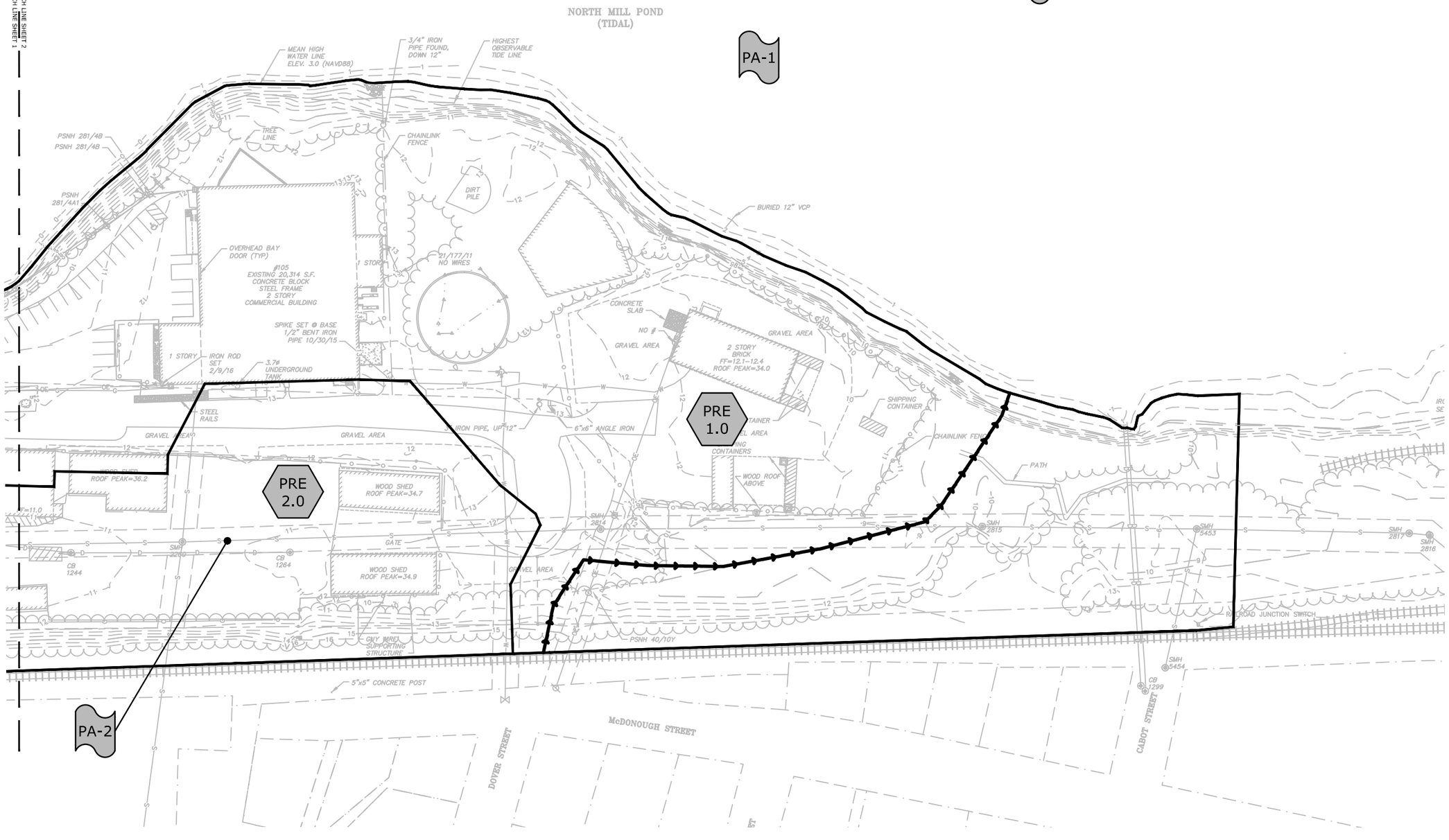
C-801.1

Last Saved: 4/19/2020
Plotted On:Apr 19, 2020-5:22pm By: BCurcio
Tighe & Bond:C:\Users\BCurcio\Desktop_LOCAL\Bartlett\C-0960-006_C-SITE.DWG

Tighe&Bond

LEGEND

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



0 40' 80'
GRAPHIC SCALE

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801.2

Last Saved: 4/19/2020
Printed: Monday, April 20, 2020 5:34pm By: BGurcio
Tighe & Bond: C:\Users\BGurcio\Desktop_LOCAL\Bartlett\C-0960-006_C-SITE.DWG

Post-development Watershed 3.1 (POST-3.1) is comprised of proposed parking, pavement, and forested grassy cover from the slope up to the railroad. Runoff from this watershed area travels via overland flow to deep-sump catch basins that tie into the drainage system described in POST-3.0, where it is treated (by JF-3) and exits via an outfall at North Mill Pond (PA-1).

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

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

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

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

Point of Analysis (PA-2)

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

3.3.1 Post-Development Calculations

3.3.2 Post-Development Watershed Plans

Section 3
Post-Development Conditions

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

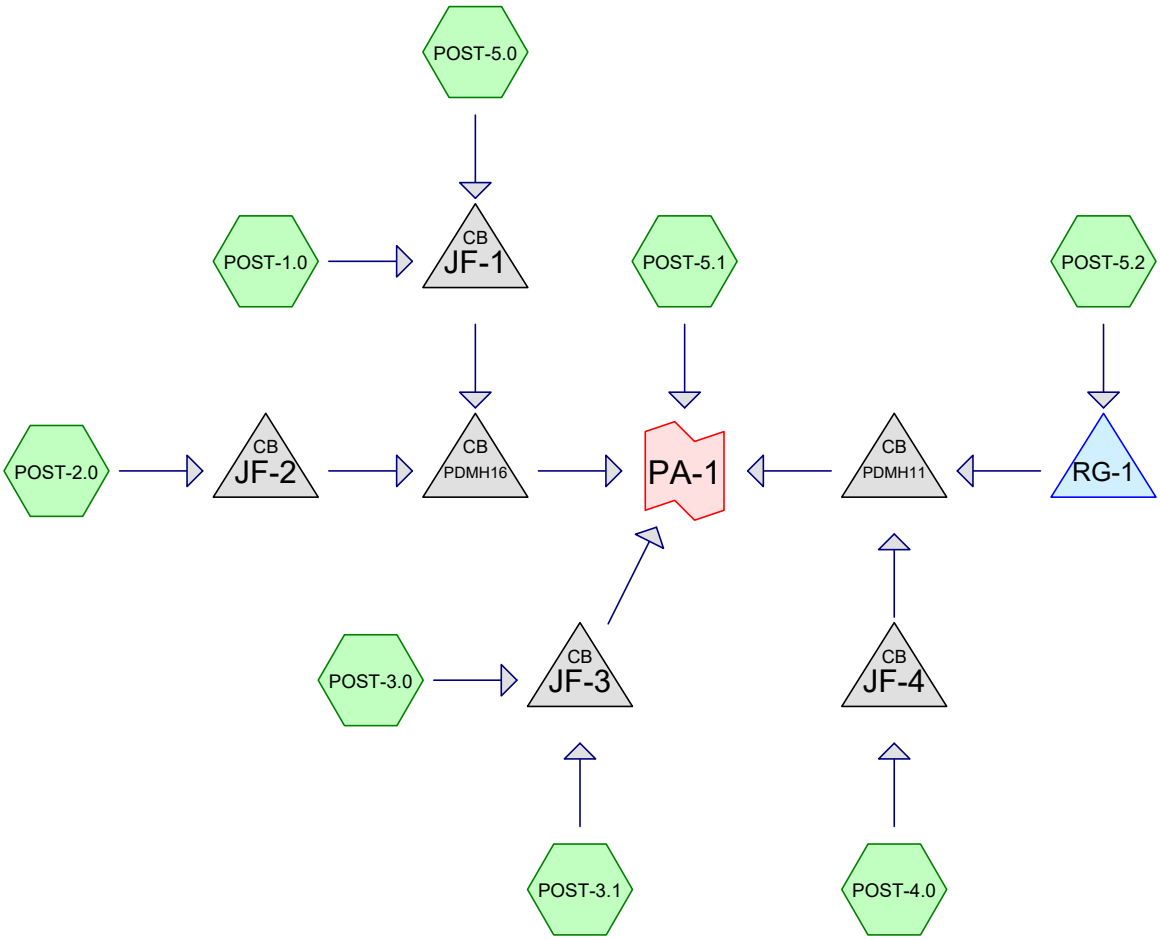
The point of analysis (PA-1) and its sub-catchment areas are depicted on the plans entitled "Post-Development Watershed Plan," Sheets C-802.1 and C-802.2. Each of the points of analysis and their contributing watershed areas are described below:

Point of Analysis (PA-1)

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

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

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



Subcat Reach Pond Link

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

Area Listing (all nodes)

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

Soil Listing (all nodes)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Summary for Subcatchment POST-1.0:

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

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

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

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

Summary for Subcatchment POST-2.0:

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

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

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

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

Summary for Subcatchment POST-3.0:

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

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

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

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

Summary for Subcatchment POST-3.1:

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

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

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

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

Summary for Subcatchment POST-4.0:

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

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

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

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

Summary for Subcatchment POST-5.0:

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

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

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

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

Summary for Subcatchment POST-5.1:

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

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

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

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

Summary for Subcatchment POST-5.2:

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

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

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

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

Summary for Pond JF-1:

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

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

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

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

Summary for Pond JF-2:

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

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

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

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

Summary for Pond JF-3:

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

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

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

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

Summary for Pond JF-4:

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

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

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

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

Summary for Pond PDMH11:

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

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

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

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

Summary for Pond PDMH16:

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

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

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

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

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

Summary for Pond RG-1:

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

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

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

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

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

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

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

Summary for Link PA-1:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

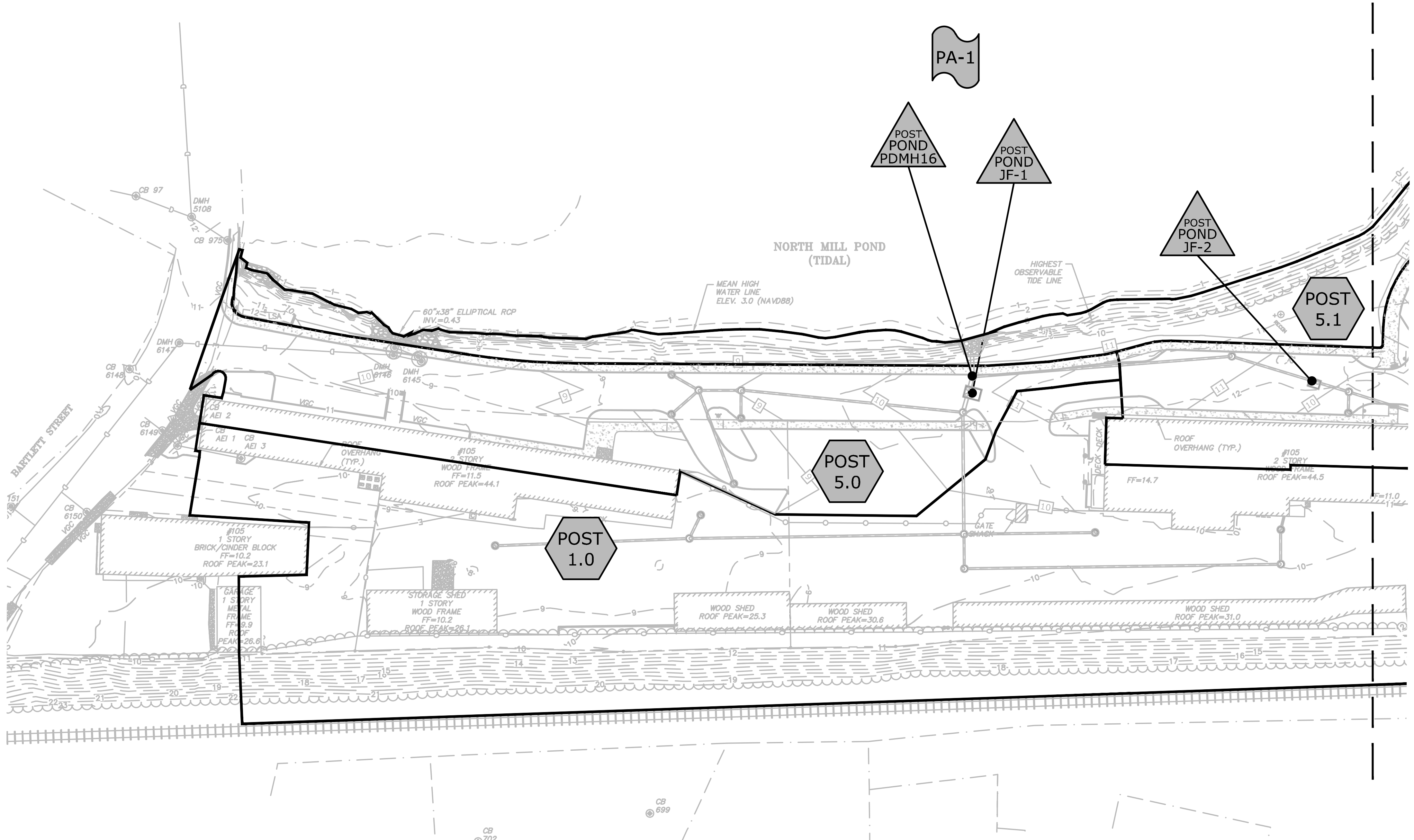
Pond RG-1: Peak Elev=10.79' Storage=3,397 cf Inflow=5.08 cfs 0.364 af
Outflow=3.96 cfs 0.347 af

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

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

LEGEND

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



0 40' 80'
GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

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

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

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802.1

Last Saved: 4/20/2020
Plotted On:Apr 20, 2020-4:13pm By: BCurcio
Tighe & Bond: J:\C\C0960 Catharses\C-0960-006 105 Bartlett Street\Drawings_Figures\AutoCAD\Sheet\C-0960-006_C-SITE.DWG

LEGEND

POST-DEVELOPMENT WATERSHED BOUNDARY

LONGEST FLOW PATH

POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION

POST POND 1 — POST-DEVELOPMENT POND DESIGNATION

PA-1 — POINT OF ANALYSIS

MATCH LINE SHEET 2
MATCH LINE SHEET 1

NORTH MILL POND (TIDAL)

MEAN HIGH WATER LINE ELEV. 3.0' (NAVD88)

HIGHEST OBSERVABLE TIDE LINE

BURIED 12" VCP

ROOF PEAK=36.2

POST POND JF-3

POST POND RG-1

POST POND PDMH11

POST POND JF-4

PA-1

POST 2.0

POST 3.0

POST 3.1

POST 4.0

POST 5.2

McDONOUGH STREET

DOVER STREET

CABOT STREET

CB 1299

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

Proposed Multi-Family Development

Iron Horse Properties, LLC

105 Bartlett Street
Portsmouth,
New Hampshire

MARK	DATE	DESCRIPTION
C	4/20/2020	TAC Submission
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-802.2

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

Section 5
BMP Worksheets and Sizing Memos

General Calculations - WQV and WQF (optional worksheet)

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

Water Quality Volume (WQV)

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

Water Quality Flow (WQF)

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

Designer's Notes: POST 1.0 & 5.0 combined

PEAK FLOW = 30.26 CFS (50 year)

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

Site Information

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

Mass Loading Calculations

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

Filter System

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

Jelly Fish Sizing

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

Method to Use **FLOW BASED**

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

General Calculations - WQV and WQF (optional worksheet)

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

Water Quality Volume (WQV)

0.73	ac	A = Area draining to the practice
0.63	ac	A_I = Impervious area draining to the practice
0.86	decimal	I = percent impervious area draining to the practice, in decimal form
0.82	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.60	ac-in	WQV= 1" x Rv x A
2,177	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

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

Designer's Notes: POST 2.0

PEAK FLOW = 5.11 CFS

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

Site Information

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

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

Mass Loading Calculations

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

Filter System

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

Jelly Fish Sizing

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

Method to Use **FLOW BASED**

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

General Calculations - WQV and WQF
(optional worksheet)

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

Water Quality Volume (WQV)

2.26	ac	A = Area draining to the practice
1.79	ac	A_I = Impervious area draining to the practice
0.79	decimal	I = percent impervious area draining to the practice, in decimal form
0.76	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.72	ac-in	WQV= 1" x Rv x A
6,258	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

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

Designer's Notes: POST 3.0, POST 3.1

PEAK FLOW =15.82 CFS

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

Site Information

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

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

Mass Loading Calculations

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

Filter System

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

Jelly Fish Sizing

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

Method to Use **FLOW BASED**

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

General Calculations - WQV and WQF
(optional worksheet)

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

Water Quality Volume (WQV)

1.30	ac	A = Area draining to the practice
1.04	ac	A_I = Impervious area draining to the practice
0.80	decimal	I = percent impervious area draining to the practice, in decimal form
0.77	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
1.00	ac-in	WQV= 1" x Rv x A
3,621	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

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

Designer's Notes: POST 4.0

PEAK FLOW = 9.16 CFS

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

Site Information

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

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

Mass Loading Calculations

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

Filter System

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

Jelly Fish Sizing

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

Method to Use **FLOW BASED**

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

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

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

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

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

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

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

If a bioretention area is proposed:

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

If porous pavement is proposed:

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

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

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

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

Designer's Notes:

Section 6
Long-Term Operation & Maintenance Plan

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

6.1 Contact/Responsible Party

Iron Horse Properties, LLC
105 Bartlett Street
Portsmouth, NH 03801

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

6.2 Maintenance Items

Maintenance of the following items shall be recorded:

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

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

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

6.3 Overall Site Operation & Maintenance Schedule

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

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

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

6.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

6.3.2 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). The property manager will be responsible for timely snow removal from all private sidewalks, driveways, and parking areas. Snow removal will be hauled off-site and legally disposed of when snowbanks exceed 6 feet in height. Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

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:				

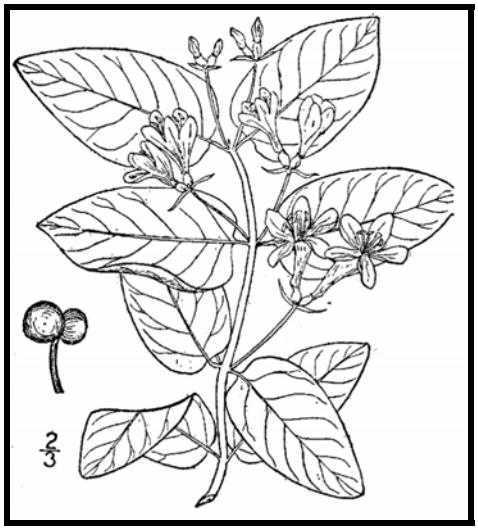
6.5 Invasive Species

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.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

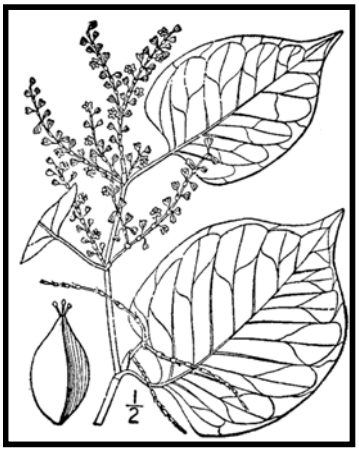
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

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

Suggested Disposal Methods for Non-Native Invasive Plants

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

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">garlic mustard
(Alliaria petiolata)
spotted knapweed
(Centaurea maculosa)
▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling.
black swallow-wort
(Cynanchum nigrum)
▪ May cause skin rash. Wear gloves and long sleeves when handling.
pale swallow-wort
(Cynanchum rossicum)
giant hogweed
(Heracleum mantegazzianum)
▪ Can cause major skin rash. Wear gloves and long sleeves when handling.
dame’s rocket
(Hesperis matronalis)
perennial pepperweed
(Lepidium latifolium)
purple loosestrife
(Lythrum salicaria)
Japanese stilt grass
(Microstegium vimineum)
mile-a-minute weed
(Polygonum perfoliatum)</td><td rowspan="2">Fruits and Seeds
  </td><td>Prior to flowering
Depends on scale of infestation
Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

Large infestation
▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting).
▪ Monitor. Remove any re-sprouting material.</td></tr>
<tr><td>During and following flowering
Do nothing until the following year or remove flowering heads and bag and let rot.

Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

Large infestation
▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting).
▪ Monitor. Remove any re-sprouting material.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>Fruits, Seeds, Plant Fragments
Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn’t materially influence disposal activities.</td><td>Small infestation
▪ Bag all plant material and let rot.
▪ Never pile and use resulting material as compost.
▪ Burn.

Large infestation
▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile.
▪ Monitor and remove any sprouting material.
▪ Pile, let dry, and burn.</td></tr>
</table>

January 2010

Managing Invasive Plants
Methods of Control

by Christopher Mattrick

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

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

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

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.

Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

4. **Dry it/cook it**—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. ***Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.*** Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

   ME: Department of Environmental Protection
   www.state.me.us/dep/blwq/docstand/nrpapage.htm

   NH: Department of Environmental Services
   www.des.state.nh.us/wetlands/

   VT: Department of Environmental Conservation
   www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

   MA: Consult your local town conservation commission

   RI: Department of Environmental Management
   www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

   CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

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