

2542.12

March 27, 2024

Ms. Samatha Collins, Chair
City of Portsmouth Conservation Commission
1 Junkins Avenue
Portsmouth, NH 03801

Re: *Conditional Use Permit Application Submittal*
Maplewood Avenue Drainage Improvements – North Mill Pond Outfall
Portsmouth, NH

Dear Ms. Collins:

On behalf of the City of Portsmouth, we are applying for a Conditional Use Permit (Wetland Impacts) for proposed improvements to one of the existing outfall on North Mill Pond (behind the cemeteries). This work is required as part of the City's ongoing efforts to continue sewer separation in the Fleet Street Area of downtown and capacity upgrades are required at the outfall to accommodate additional storm drain flows resulting from the separation work.

We have completed the City's permitting submittal process on the website and enclosed for the Commission's consideration and use is one (1) hard copy of documents submitted electronically as required.

The intent is to be included on the April 10th meeting agenda to present the project and application to the Commission so that recommendation can be obtained for planning board approval during their May meeting.

Please feel free to contact me if any additional information is required in advance of the meeting.

Very truly yours,

UNDERWOOD ENGINEERS, INC.



Daniel J Rochette, P.E (NH)
Project Manager

Encl.

cc: Dave Desfosses, City of Portsmouth (via e-mail)

**NARRATIVE STATEMENT
MAPLEWOOD AVENUE DRAINAGE INTERCEPTOR
PORTSMOUTH, NEW HAMPSHIRE**

BACKGROUND AND PURPOSE

The City of Portsmouth has been mandated by an EPA Administrative Order to mitigate combined sewer overflows (CSO's) around the City. The next project identified on the City's priority list is to complete sewer separation in the Fleet Street drainage area. Separation of stormwater from the sewer system will increase flows within the existing system. Hydraulic calculations show that once separation of the Fleet Street area is complete existing downstream drainage systems will be overwhelmed and capacities need to be increased.

PROJECT DESCRIPTION

Currently, a new drainage interceptor along Maplewood Avenue ultimately discharging next to the existing outfall at North Mill Pond is being proposed to provide the additional capacity desired to accommodate additional stormwater flows resulting from the separation work. Approximately 1,200 LF of 42" and 48" diameter RCP pipe is proposed along with a stormwater treatment unit.

New drainage piping also crosses below existing railroad tracks which will require trenchless installation methods so that existing tracks are not disturbed. The method of installation anticipated for the railroad crossing will be jack and bore to place a steel sleeve beneath the tracks for the drainage pipe to be inserted to.

Typical installations methods for the balance of the work will be open excavation with a trench width expected to vary between 6' and 8' wide dependent on pipe size and depth. Normal installations methods also include back filling excavations at the end of each work day.

ARCHITECTURAL AND ARCHAEOLOGICAL RESOURCES

In general, the impact areas will be contained to the area immediately surrounding the proposed work. Installation of new drainage piping will be linear in nature. Proposed alignments fall within existing roadways (Maplewood Avenue) or in locations previously disturbed by urban development (railroad access area).

Buildings abutting the road and sidewalks adjacent to the project area are all newer construction and have either been built within the last 20 years.

It is noted that work is proposed adjacent to the existing Old North Cemetery which is a known historic area. Existing conditions limited potential alignments for the proposed pipe. However, it is aligned so that the center of the pipe is approximately 19 feet (or more) from the existing fence line to the cemetery.

NARRATIVE STATEMENT
MAPLEWOOD AVENUE DRAINAGE INTERCEPTOR
PORTSMOUTH, NEW HAMPSHIRE

Where outfall improvements are proposed within jurisdictional wetland areas, impacts are generally limited to areas that have already been disturbed either by previous drainage system installations in the 1970's. Any excavation work completed beyond to existing outfall to place a stone apron and construct a permitted stabilized discharge will be limited to a depth of 2'.

Visual effects due to construction of the sewer line will be temporary in nature, as the infrastructure will be below ground and the area will be restored to existing conditions.

File Review

A file review was conducted using the EMMIT Database Search Tool on January 18, 2023.

The following files were found for an area where the project is being constructed:

- Eastern Railroad Linear Eastern District
 - **Impacts** – Proposed piping is being installed along the paved driveway to railroad access area. Impacts will consist of linear trench excavation as described above up to 8' in width and up to 13' depth. Upon completion the driveway will be paved and restored in kind.

The following files were found near the project area, but not within it:

- Old North Cemetery (POR149)
- Portsmouth Downtown historic District (POR0174)
- Col. George Boyd Tomb (POR1024)

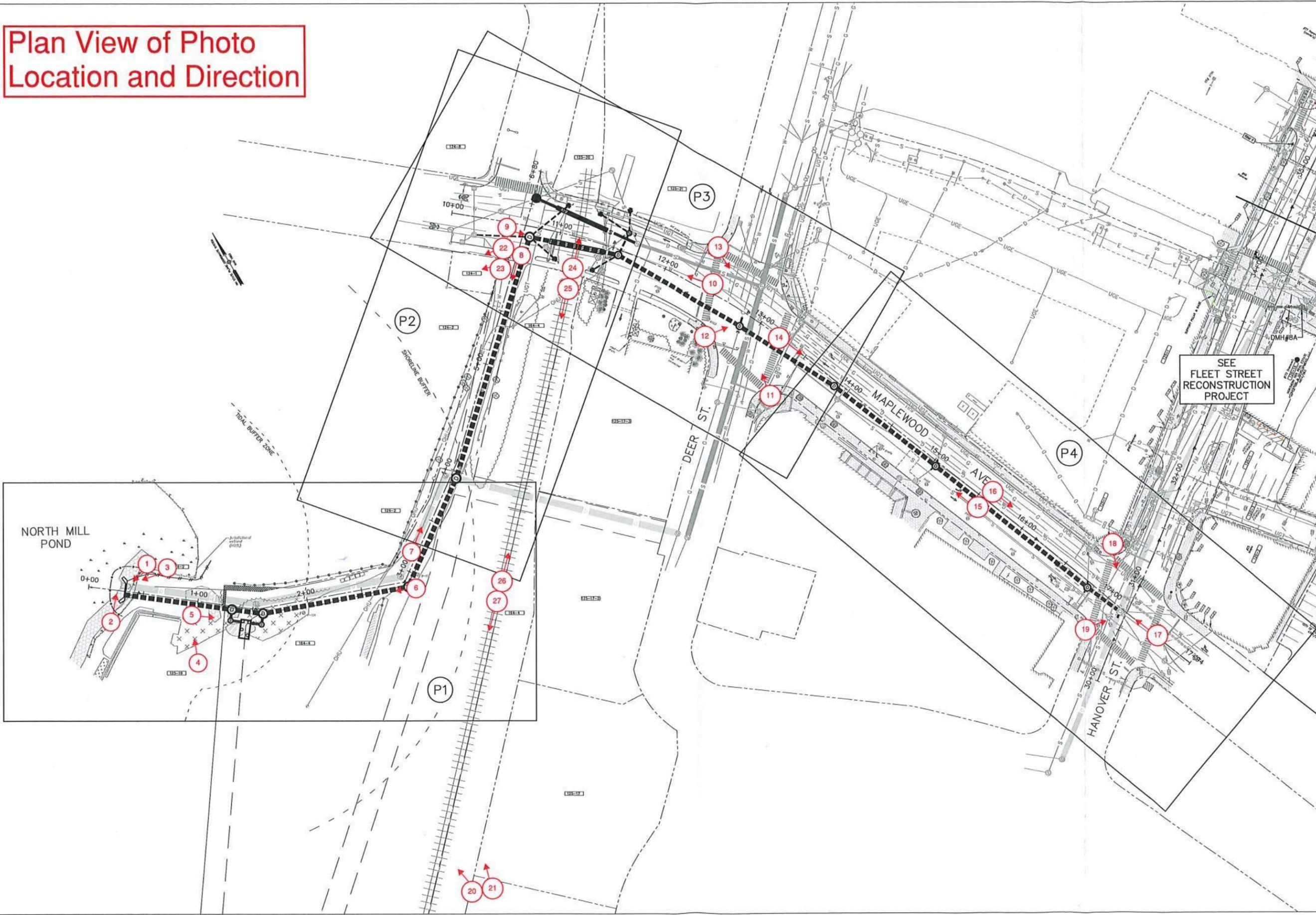
Previous Land Uses

No other previous uses are known.

Other Known Or Suspected Archaeological Resources Within The Project Area

No known or suspected archaeological resources within the project area.

Plan View of Photo Location and Direction



SEE
FLEET STREET
RECONSTRUCTION
PROJECT

FOR REVIEW
JAN. 2023
NOT FOR CONSTRUCTION



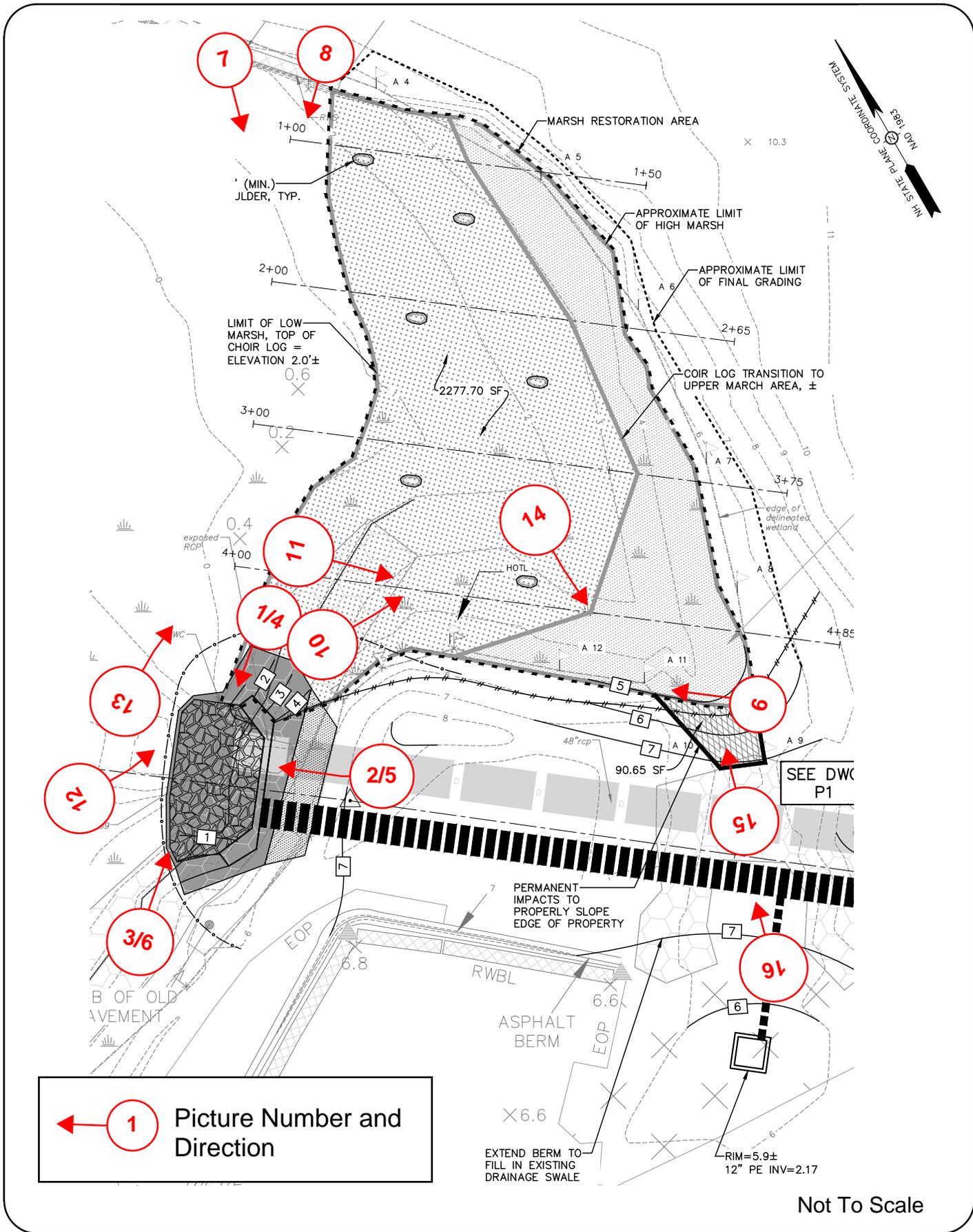
25 Vaughan Mill, Portsmouth, N.H. 03801
Tel. 603-436-6192 Fax. 603-431-4733

PLAN INDEX
MAPLEWOOD AVE - DRAINAGE INTERCEPT
CITY OF PORTSMOUTH
PORTSMOUTH, NEW HAMPSHIRE

ISSUE FOR	BIDDING	CONSTRUCTION	RECORD DRAWING
Date	By	Date	By

Drawn/CHK	RMG
Designed	PPM
Checked	
Approved	
Date	1/5/2022
Book No.	
Project No.	2542
Dwg. ID	2542-0000
Scale	

NO.	REVISIONS	APP'D



DATE 3-6-24	 <p>25 Vaughan Mall, Portsmouth, N.H. 03801 Tel. 603-436-6192 Fax. 603-431-4733</p>	<p align="center">Photo index</p> <p align="center">Outfall Improvements and Marsh Restoration</p> <p align="center">Portsmouth, New Hampshire</p>	FIG. 3.1
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Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 1 – Existing outfall headwall, exposed 48” RCP pipe, and tidal embankment looking west at approximate high tide.
Taken 9/28/22



Photo 2 – Existing outfall headwall and exposed 48” RCP pipe looking northwest at approximate high tide. Taken 9/28/22

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 3 – Existing outfall headwall, exposed 48” RCP pipe, and tidal embankment looking east at approximate high tide.
Taken 9/28/22



Photo 4 – Existing outfall headwall, exposed 48” RCP pipe, and tidal embankment looking west at approximate low tide.
Taken 9/29/22

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 5 – Existing outfall headwall and exposed 48” RCP pipe looking northwest at approximate low tide. Taken 9/29/22



Photo 6 – Existing outfall headwall, exposed 48” RCP pipe, and tidal embankment looking east at approximate low tide.
Taken 9/29/22

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 7 – Mitigation area, looking south at approximate low tide. Taken 3/20/24



Photo 8 – Mitigation area, looking southeast at approximate low tide. Note existing large rocks to be stockpiled for use on stabilized slope and ice breakers. Taken 3/20/24

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 9 – Small existing marsh area in mitigation area looking northwest at approximate low tide. Note proposed grading will work to include within the proposed high marsh area. Taken 3/20/24



Photo 10 – Mitigation area looking east at approximate low tide. Note undercut embankment below cemetery. Marsh restoration will provide revetement. Trees and vegetation on embankment to remain, tree canopy to be trimmed up approximately 20' from ground surface. Taken 3/20/24

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 11 – Small existing marsh area in mitigation area looking northwest at approximate low tide. Note proposed grading will work to include within the proposed high marsh area. Taken 3/20/24



Photo 12 – Existing outfall headwall with mitigation area in background looking east at approximate low tide. Taken 3/20/24

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 13 – Approximate location of proposed stabilized marsh sill, looking northeast at approximate low tide. Taken 3/20/24



Photo 14 – Eroded channel in mitigation area at outlet of drainage swale (to be eliminated), looking south at approximate low tide. Taken 3/20/24

Project Area Photos
Maplewood Avenue Outfall Improvements
Portsmouth, NH



Photo 15 – Existing drainage swale outlet (to be eliminated) and erosion in mitigation area looking north at approximate low tide. Taken 3/20/24



Photo 16 – Existing drainage swale (to be eliminated) looking north at approximate low tide. Taken 3/20/24

Maplewood Avenue Outfall Improvements and Marsh Restoration
Portsmouth, New Hampshire

Work Sequence Narrative

Note: The sequence of work provided below is a typical sequence for the work proposed. Bidding documents will require the contractor to provide a detailed sequence of work based on their preferred method of installation.

Pipe Installation

Temporary and permanent erosion control devices will be installed at the project site prior to the start of construction in accordance to the Contractor's Approved SWPPP. Silt booms will also be installed in accordance with the project plans in the vicinity of the work. It is anticipated that the contractor will complete all installations during low tide and low flow conditions and permanent flow diversions and engineered dewatering systems will not be required. Any trench dewatering that occurs during installation will be discharged to appropriate silt bags or haybale detention ponds.

The trench for the new proposed 48" reinforced concrete pipe will be excavated through the embankment at North Mill Pond in parallel to the existing 48" reinforced concrete pipe. Following the removal of the existing outfall headwall, a new headwall for the existing and proposed 48" pipes will be constructed in the embankment at low tide. The proposed 48" pipe will be installed in the finished trench and dewatering and daily gravel installation measures will be performed as stated on the project plans.

Site restoration efforts after the completion of the pipe installation will include filling excavations and stabilizing the embankment and other disturbed areas within the jurisdictional wetlands. The temporary and permanent erosion control measures will be removed from the site once vegetation is established and all disturbed areas are fully stabilized.

Marsh Restoration

Contractor will ensure the silt boom is installed across the entire marsh restoration area. Sequence his work to complete all grading and fill operation during low tide conditions. Planting shall be scheduled to occur immediately following the completion grading to begin establishing vegetation as soon as possible. Tree limb trimming as described on the drawings shall occur anytime prior to the planting of marsh vegetation

Following planting of vegetation, the marsh area shall be routinely monitored for erosion and vegetation establishment. Weather conditions will also be monitored so that vegetation is to be watered as required during times of drought. Monitoring will also be in place to ensure that geese and other waterfowl are not negatively impacting the newly planted areas. If waterfowl impacts are observed than measured shall be put in place to deter waterfowl until vegetation is established. Long term observation and maintenance will be conducted by a certified wetlands scientist as required by NHDES to ensure long term success of the mitigated area.

TES Environmental Consultants, LLC

March 30, 2021

Ref: TES JN 19-0168

Mr. William Doucet, President
Doucet Survey, Inc.
2 Commerce Drive, Suite 202
Bedford, NH 03110

Re: Environmental Services (Wetland Description and Functions and Values Assessment)
Maplewood Avenue Over North Mill Pond, Portsmouth, New Hampshire
NHDOT Bridge No. 231/103

Dear Mr. Doucet:

TES Environmental Consultants, L.L.C. (TES) has prepared this report to document the physical and biological characteristics of the wetlands and surrounding lands in the vicinity of the proposed replacement of the existing culvert at Maplewood Avenue Over North Mill Pond in Portsmouth, New Hampshire, and to evaluate the functions and values associated with those wetlands. These observations are provided in support of the Survey Scope of Services related to the proposed project.

An on-site investigation was performed by TES on February 28, 2020 to delineate the boundaries of wetlands in the vicinity of the culvert (Figure 1) and to observe the characteristics of the wetlands and the upland portion of the surroundings. The wetland delineation was performed according to the standards of the Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0, January 2012, US Army Corps of Engineers. All wetlands in the survey area consist of coastal resources, therefore the limits of jurisdictional wetlands were identified as the highest observable tide line (HOTL) as defined at Env-Wt 602.23. The observations made during this field effort were during the mid-incoming tide, and together with the following published information, form the basis for this wetland functional assessment:

- USGS Portsmouth, NH-ME Quadrangle, 7.5 minute series topographic map
- Aerial photographs from Google Earth and other sources
- USDA-NRCS Soil Survey of Rockingham County, New Hampshire (via Web Soil Survey)
- National Wetlands Inventory map
- The New Hampshire Department of Environmental Services (NHDES) Wetlands Permit Planning Tool (WPPT)
- NH Natural Heritage Program Datacheck Program
- US Army Corps of Engineers The Highway Methodology Workbook – Supplement

Site Characterization

Uplands. The upland areas in the vicinity of this survey area are primarily in urban residential (to the west) and commercial/industrial use to the east (Figure 2). Essentially no undeveloped land exists in the vicinity of the site, although North Cemetery lies approximately 500 feet to the southeast. Trees exist

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only in yards and small roadside spaces, with boxelder (*Acer negundo*) and weeping willow (*Salix babylonica*) predominant, and choke cherry (*Prunus virginiana*), black locust (*Robinia pseudoacacia*), and staghorn sumac (*Rhus typhina*) present as shrub species. Two invasive shrub species are present within the project site: glossy buckthorn (*Frangula alnus*) and multiflora rose (*Rosa multiflora*). Two invasive vines are also present – Oriental bittersweet (*Celastrus orbiculatus*), and black swallowwort (*Cynanchum louiseae*). Herbaceous species present in the upland areas include turf grasses and Canada goldenrod (*Solidago canadensis*).

Upland soils in the vicinity of the survey area are shown in the Soil Survey of Rockingham County as being Urban Land (699) to the east of the culvert, and Urban Land-Canton complex (799) to the west. Canton fine sandy loam is a sandy soil formed in loose glacial till deposits. Urban Land components are developed lands, most likely having soils similar to Canton.

Wetlands. On February 28, 2020 a TES wetland scientist delineated and flagged the boundaries of the HOTL within the project survey area with numbered pink and black striped flags for location by ground survey and depiction on site plans. The principal jurisdictional wetland feature within the survey area consists of North Mill Pond (Figures 3 and 4) which is identified as Estuarine Water on the WPPT, with small, limited fringe areas of Irregularly Flooded (Tidal) Marsh and Tidal Flats in the vicinity of the project area. The project site lies approximately 1,500 feet south of the Piscataqua River at the Sarah Mildred Long Bridge on US Route 1 Bypass. Tidal Flats predominate landward from Maplewood Avenue, and Estuarine Water occupies most of the seaward portion of North Mill Pond.

Under the U.S. Fish and Wildlife Service's Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979), the Tidal Flats would be classified as Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Flooded (E2US3N), and the Estuarine Water portions would be classified as Estuarine, Subtidal, Unconsolidated Bottom, Subtidal (E1UBL). The latter areas have a cobble bottom in the vicinity of the culvert, where tidal currents are strongest, and mud further away. Riprap is present along both sides of the Maplewood Avenue causeway, and rockweed (*Ascophyllum nodosum*) grows on the riprap and other rocky surfaces (Figure 5) in the project vicinity. Salt marsh cordgrass (*Spartina alterniflora*) grows in unconsolidated material (Figure 6) in the intertidal zone in only narrow strips in scattered areas near the project site. No eelgrass beds, shellfish beds, or oyster restoration beds are located near the project area.

No fish were observed within North Mill Pond, although various species such as winter flounder (*Pseudopleuronectes americanus*), juvenile (snapper) bluefish (*Pomatomus saltatrix*), and baitfish such as killifish (*Fundulus* spp.) and common mummichog (*Fundulus heteroclitus*) may be expected to occur seasonally. Various wading birds, shore birds, and waterfowl may also be expected to utilize North Mill Pond and its tidal flats seasonally.

Vernal Pool. No vernal pools were observed within the vicinity of the Maplewood Avenue Over North Mill Pond survey area, applying the following definition and methodologies: New Hampshire Department of Environmental Service definition of vernal pool at Env-Wt 101.106; delineation methods at Env-Wt 301.01(f); and guidelines for identifying and describing vernal pools given in "Identification and Documentation of Vernal Pools in New Hampshire" published by the New Hampshire Fish and Game Department. It is possible that vernal pool habitat is present in the forested floodplain wetlands

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further away from the survey corridor, although the depth of floodwaters during the field survey precluded observations in those areas.

Invasive Plant Species. The lands within the survey area for this project were investigated for the potential presence of invasive plants identified in the New Hampshire Department of Transportation (NHDOT) Best Management Practices for Roadside Invasive Plants. Four invasive plant species were observed in the survey area: Oriental bittersweet (*Celastrus orbiculatus*), glossy buckthorn (*Frangula alnus*), multiflora rose (*Rosa multiflora*), and black swallowwort (*Cynanchum louiseae*). Oriental bittersweet, glossy buckthorn, and multiflora rose are common in the uplands in the northwest quadrant of the survey area, and black swallowwort is present all along the north side of Maplewood Avenue. The extensive nature of the colonization of each of these invasive plants, along with the location of many of them on adjacent private property and along the shoreline extending well away from the project site, lead to a recommendation of no attempts to control these invasive species. Soil and plant material removed from this site, however, should not be re-used on site or on other sites, but rather should be disposed of in accordance with the New Hampshire Department of Transportation's Best Management Practices for Roadside Invasive Plants (2008).

Wetland Functional Assessment Methodology

Wetland functions and values, and their significance were evaluated using the US Army Corps Highway Methodology guidelines. The following is a list of the 14 wetland functions and values with a brief description of each.

1. **Groundwater Recharge** should relate to the potential for the wetland to contribute water to an aquifer (often combined with the following).
2. **Groundwater Discharge** should relate to the potential for the wetland to serve as an area where ground water can be discharged to the surface.
3. **Floodflow Alteration:** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.
4. **Fish and Shellfish Habitat:** This function considers the effectiveness of seasonal or permanent water bodies associated with the wetland in question for fish and shell fish habitat.
5. **Sediment/Toxicant/Pathogen Retention:** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.
6. **Nutrient Removal/Retention/Transformation:** This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
7. **Production Export:** This function relates to the effectiveness of the wetland to produce food or usable products for humans or other living organisms.
8. **Sediment/Shoreline Stabilization:** This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.
9. **Wildlife Habitat:** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and or migrating species must be considered.
10. **Recreation:** This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting and other active or

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passive recreational activities. Consumptive opportunities consume or diminish the plants, animals or other resources that are intrinsic to the wetland, whereas non-consumptive opportunities do not.

- 11. Educational/Scientific Value:** This value considers the effectiveness of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.
- 12. Uniqueness/Heritage:** This value relates to the effectiveness of the wetland or its associated water bodies to produce certain special values. Special values may include such things as archeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geological features.
- 13. Visual Quality/Aesthetics:** This value relates to the visual and aesthetic qualities of the wetland.
- 14. Threatened or Endangered Species Habitat:** This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

Wetland Functions and Values in the Survey Area

The functions and values of the wetland resources in the survey area are associated with North Mill Pond and contiguous wetlands landward and seaward from the site.

Of the 14 recognized potential functions and values of wetlands, 8 are considered to be present at some level at the location of this project, of which 4 rise to principal or significant levels within this wetland resource:

- sediment/toxicant retention,
- nutrient removal/transformation,
- sediment/shoreline stabilization, and
- visual quality/aesthetics.

Principal Functions and Values.

Sediment/toxicant retention potential is present at a principal level within the North Mill Pond wetland system due in large part to the low gradient of Pond bottom and extensive mud flats. The slow water flow present in most of the Pond (except at the Maplewood Avenue culvert) during incoming and outgoing tides, along with the Pond sediments, provide potential for settling of sediment and toxicants, as well as binding of toxicants to Pond sediment. Potential sources of sediment and toxicants are present within the Pond watershed.

Nutrient removal/transformation is also considered to be present at a principal level at this location. This function generally follows sediment/toxicant retention, as both require a wetland having a low gradient and slow flowing water. The North Mill Pond does generally lack sufficient vegetation to slow water flow, and to provide significant uptake of excessive nutrients, however. Potential sources of excess nutrients are present within the Pond watershed.

Sediment/shoreline stabilization is a function clearly provided to some degree by the wetlands along the banks of North Mill Pond, although mechanical stabilization including riprap and retaining walls are prominent in the vicinity of the Maplewood Avenue causeway. Stable bank soils contribute to reduced sediment entering downgradient channels with silt, maintaining their ability to convey flows and boat traffic.

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Visual quality/aesthetics is a value considered to be present at a significant level at this location due to the presence of expansive surface waters, and a public road elevated above the water offering an open vista. This affords the public opportunities to view the setting while travelling along Maplewood Avenue, the primary public viewing location.

Functions and Values Present at Moderate Levels. Four potential functions and values of wetlands are considered to be present at moderate but not principal levels at this location:

- fish and shellfish habitat,
- production export,
- wildlife habitat, and
- recreation.

Fish and shellfish habitat is considered to be present, or potentially present, at moderate levels within North Mill Pond due to the presence of permanent surface water connected to the Piscataqua River. Some marine or estuarine fish species may inhabit the Pond seasonally at some point in their life cycle, although the minimal submerged and emergent vegetation in the Pond limits potential food and cover. The existing Maplewood Avenue culvert is sufficiently wide to allow fish passage. No fish or shellfish were noted during the field investigation, but some examples of fish that may occur seasonally include winter flounder (*Pseudopleuronectes americanus*), juvenile (snapper) bluefish (*Pomatomus saltatrix*), and baitfish such as killifish (*Fundulus* spp.) and common mummichog (*Fundulus heteroclitus*). The sole tributary to North Mill Pond is Hodgson Brook, and no significant fresh surface waters exist along that drainageway, limiting potential for anadromous or catadromous fish usage.

Production export consists of the transport of vegetation or its decomposing material from a wetland to connected wetlands or surface waters. High potential for wetlands to perform production export is typically exemplified by high levels of vegetative production within a wetland coupled with a broad pathway for that production to be conveyed from that wetland to another wetland or water body. There is minimal vegetative growth with North Mill Pond or in wetlands along its shores, and therefore little export of vegetation occurs here, although a limited amount occurs from the small fringe marsh vegetation (primarily *Spartina alterniflora*) and submerged vegetation such as rockweed (*Ascophyllum nodosum*).

Wildlife habitat is a function related to all of the physical and biological elements of a wetland complex and its surrounding landscapes. The setting of North Mill Pond and associated wetlands within a highly-developed area corridor detracts greatly from its overall habitat potential. However, the significant open water (especially at high tide) provides potential resting areas for migrating waterfowl, and shorebirds and wading birds may find limited foraging habitat along the shore and on exposed mud flats. For the purposes of wetland function and values assessments, the function of wildlife habitat focuses on habitat for wildlife dependent on wetlands for part or all of their life cycles.

Recreation potential related to the wetland resources present at this location relate primarily to potential active recreation (fishing, canoe/kayak use) related to North Mill Pond, and passive recreation potentially provided by viewing the open vista or possibly birding from Maplewood Avenue, which has sidewalks along both sides. The primary limiting factor for both active and passive recreation in this location is the general lack of public access. Metered parallel parking is present off the eastern end of

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the survey corridor, although little visual interest is present for passive public recreation. The existing culvert appears to provide sufficient width and overhead clearance for the passage of small craft such as canoes or kayaks, although during peak tidal flow the current may be too strong to paddle against, and at high tide the overhead clearance may be insufficient for passage.

Functions and Values Absent or Present at Negligible Levels. Five potential functions and values of wetlands are considered to be absent or present at negligible levels at this location:

- groundwater recharge and discharge,
- floodflow alteration
- educational/scientific value,
- uniqueness/heritage value, and
- endangered species habitat.

Groundwater recharge and discharge are generally considered insignificant functions in Estuarine environments such as North Mill Pond. Coastal areas may have brackish groundwater, recharged by coastal surface waters. Fresh groundwater from inland areas “pushes” against this brackish groundwater, and the brackish front may push inland during periods of little rainfall, or seaward during periods of heavier rainfall. Over time, rising sea levels may increase saltwater intrusion into coastal aquifers that were previously exclusively or mostly freshwater, rendering that groundwater unpotable at least until freshwater recharge pushes out the salt intrusion. These occurrences are not so much related to the functions of the wetlands as they are to fluctuations, seasonal and long-term, in weather and climate variations.

Floodflow alteration can be considered a significant function in coastal wetlands such as where extensive salt marshes or dunes provide buffers to storm surges. The narrow and discontinuous marsh fringes along North Mill Pond provide negligible protection against storm surges, and constructed barriers such as riprap banks and retaining walls are the principal features providing such protection in the vicinity of Maplewood Avenue.

Potential for educational/scientific value associated with North Mill Pond at this site is limited by the minimal controlled public access to the Pond and adjacent wetlands. A sidewalk along both sides of Maplewood Avenue permits visual access, but physical access is obstructed by retaining walls, steep slopes, and adjacent private property. In general, the potential for limited use of the site as an “outdoor classroom” is present, and the educational opportunity provided by the view of the Pond and adjacent developed land is intriguing, but this value is deemed negligible due to access issues including limited parking and safety issues related to vehicular traffic.

Uniqueness/heritage value was determined to be negligible for this location. Although the area was developed during early colonial times, no historic or archaeological interests associated with the Pond or adjacent wetlands were observed at this location.

Endangered species habitat is a potential value of wetlands. A New Hampshire Natural Heritage Bureau preliminary online datacheck for this location was performed to assess the potential for the presence of threatened or endangered species in the vicinity. This preliminary datacheck resulted in a finding of no

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known occurrences of threatened or endangered species or exemplary natural communities in the vicinity of the project. Such datachecks consist of reviews of all known occurrences of such species or communities within one mile of a proposed project, and is subject to change over time as new occurrences are recorded. A complete review of this matter will be required during the New Hampshire wetland permitting process for this project, although it is considered unlikely that the proposed culvert replacement would be found to have an adverse impact on any such sensitive species or habitats.

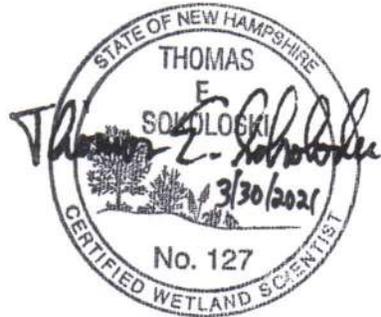
In general, the proposed project to replace the culvert at Maplewood Avenue over North Mill Pond would not be expected to cause any degradation of the functions and values associated with the Pond and the adjacent wetlands. Continued unrestricted passage of flows, sediment, and movement of fish and wildlife through the area will continue as under the present conditions. With the implementation of best management construction practices, the project would avoid potential construction-phase impacts related to sedimentation and erosion.

Please feel free to contact me with any questions or comments regarding this report.

Sincerely,



Thomas E. Sokoloski
New Hampshire Certified Wetland Scientist #127



Wetland Function-Value Evaluation Form

Total area of wetland ^{+/-} Access Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use Residential, Commercial, Industrial Distance to nearest roadway or other development 0 feet

Dominant wetland systems present Estuarine Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Tidal

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list) (Hodgson Brook)

Wetland I.D. North Mill Pond
 Latitude 43.0797 Longitude 70.7655
 Prepared by: TBS Date 3/27/2021
 Wetland Impact: Type TBD Area TBD

Evaluation based on: Field
 Corps manual wetland delineation completed? Y N (OHW)

Function/Value	Occurrence Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	<input checked="" type="checkbox"/>			Absent - tidal resource.
Floodflow Alteration	<input checked="" type="checkbox"/>			North Mill Pond has limited flood storage/desynchronization.
Fish and Shellfish Habitat	<input checked="" type="checkbox"/>	1,4		Limited known potential; no shellfish beds (WPPP)
Sediment/Toxicant Retention	<input checked="" type="checkbox"/>	1,2,3,4,8,9	<input checked="" type="checkbox"/>	Opportunity present; sediments provide toxicant retention.
Nutrient Removal	<input checked="" type="checkbox"/>	1,2,3,4,6,7	<input checked="" type="checkbox"/>	Sediment binding potential; minimal vegetative uptake.
Production Export	<input checked="" type="checkbox"/>			Limited vegetative production present in Pond overall.
Sediment/Shoreline Stabilization	<input checked="" type="checkbox"/>	1,2,3,10,11	<input checked="" type="checkbox"/>	Much of shoreline at road stabilized by riprap walls.
Wildlife Habitat	<input checked="" type="checkbox"/>	6,12,18		Modest habitat due to minimal vegetation and development.
Recreation	<input checked="" type="checkbox"/>	7,9		Limited accessibility and interest on Pond itself.
Educational Scientific Value	<input checked="" type="checkbox"/>			Generally inaccessible to public; high disturbance.
Uniqueness/Heritage	<input checked="" type="checkbox"/>	1,3,13,14,17		No observed unique/significant historic features.
Visual Quality/Aesthetics	<input checked="" type="checkbox"/>	2,6,12	<input checked="" type="checkbox"/>	Open water, mud flats, viewed from road.
Endangered Species Habitat	<input checked="" type="checkbox"/>			Preliminary NH NHB data check - negative results.
Other				

* Refer to back up list of numbered considerations.

TES

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FIGURE 1
Arch Culvert at Maplewood Avenue Over North Mill Pond, Portsmouth, View
Southwest of Seaward Side of Culvert from Shoreline (2/28/2020)

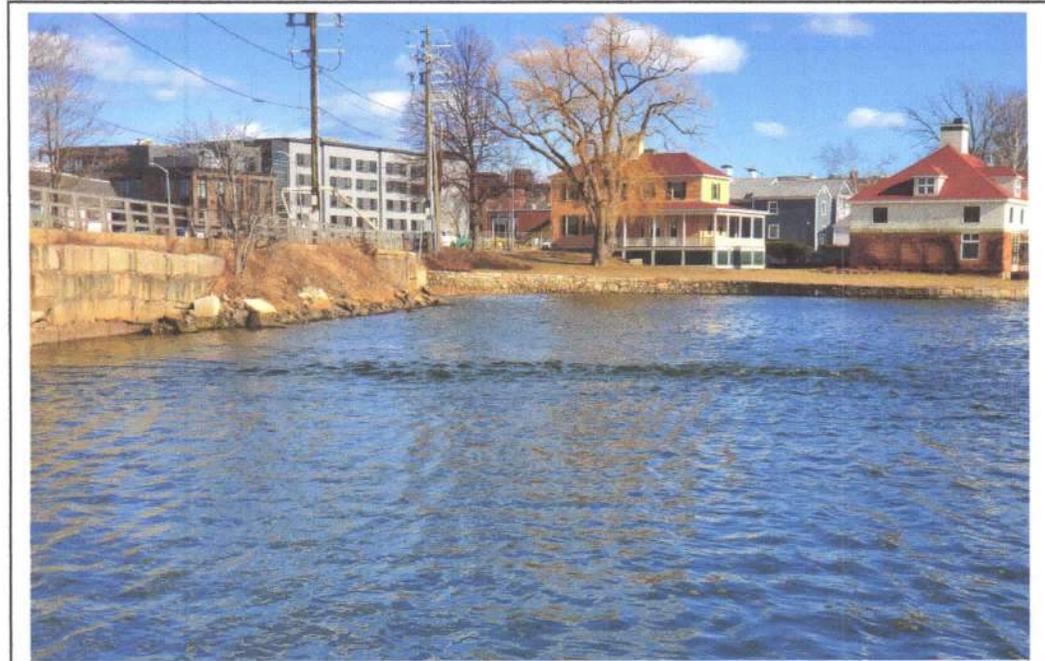


FIGURE 2
Residential and Commercial/Industrial Development on East Side of Project
Site, View East from Western Shoreline of North Mill Pond (2/28/2020)

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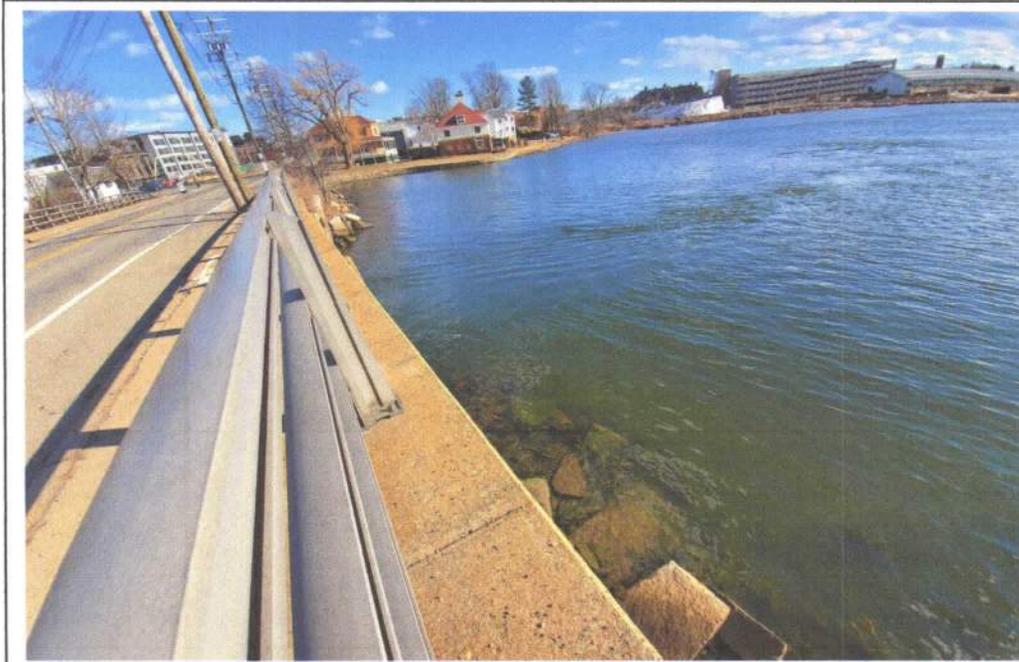


FIGURE 3
North Mill Pond, Landward Side, View Southeast from West Side of Culvert
in Maplewood Road, Mid-Incoming Tide (2/28/2020)

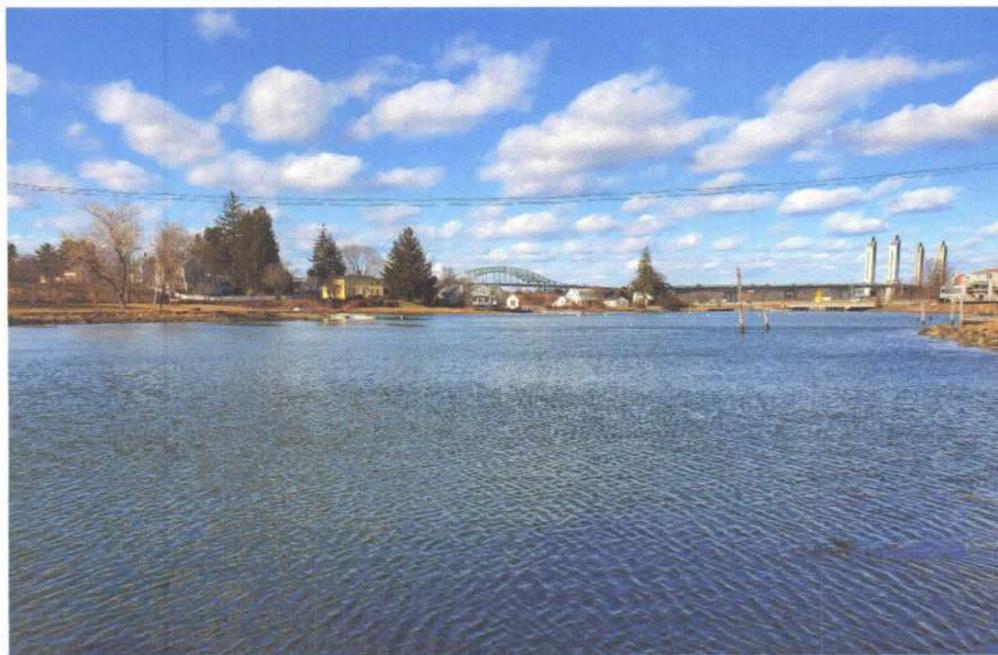


FIGURE 4
North Mill Pond, Seaward Side, View North from East Side of Culvert in
Maplewood Road, Mid-Incoming Tide (2/28/2020)

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FIGURE 5

Rockweed Growing on Stones and Riprap in the Subtidal and Lower Intertidal Areas Near the Maplewood Avenue Culvert Site (2/28/2020)



FIGURE 6

Remnants of Salt Marsh Cordgrass Growing within the Intertidal Zone Near the Maplewood Avenue Culvert Site (2/28/2020)

Environmental Planning & Permitting

Soil & Wetland Investigations

City of Portsmouth, New Hampshire

PERMIT APPLICATION DRAWINGS

MAPLEWOOD AVENUE - DRAINAGE INTERCEPT



LOCATION PLAN

PROJECT AREA



PREPARED BY
 UNDERWOOD ENGINEERS, INC.
 PORTSMOUTH, NEW HAMPSHIRE
 MARCH, 2024

FOR REVIEW
 MARCH, 2024
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VICINITY MAP

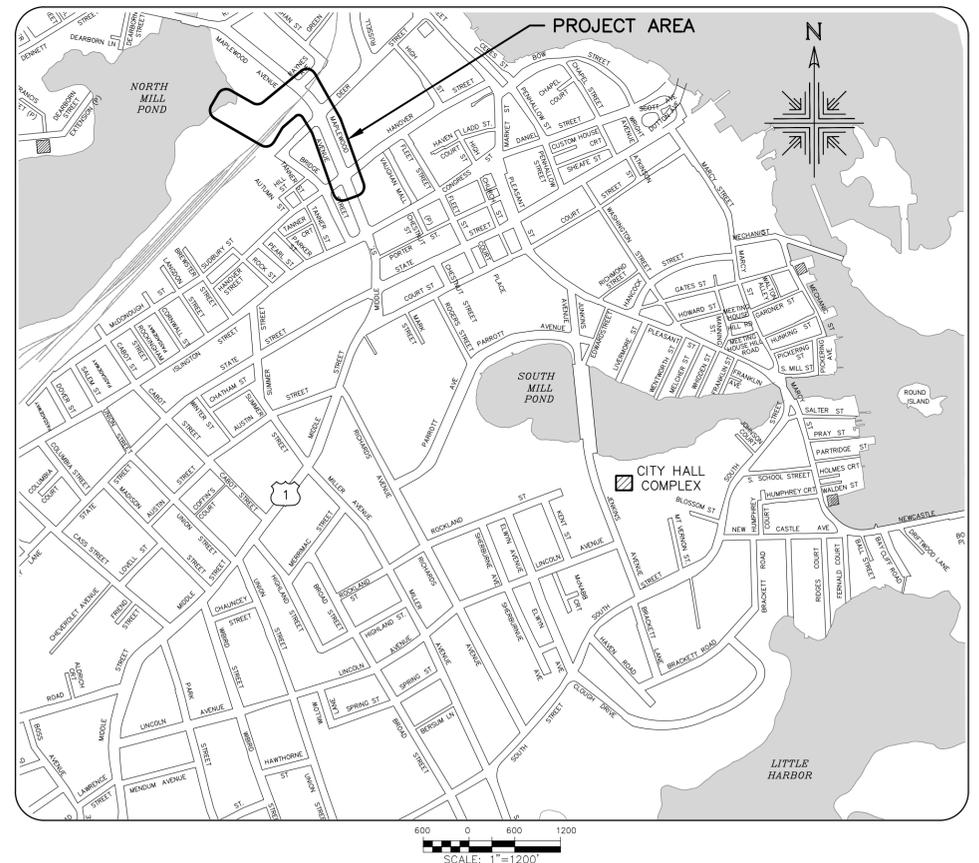
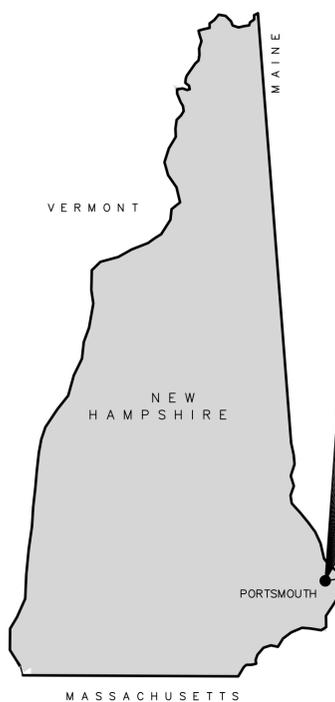


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TRAFFIC CONTROL SIGNS & PAVEMENT MARKINGS	D4	12
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LEGEND:

EXISTING	PROPOSED
	STRUCTURES/BUILDINGS
	APPROXIMATE PROPERTY LINE
	PAVED ROAD/DRIVE
	VERTICAL FACED GRANITE CURB
	MODULAR BLOCK RETAINING WALL
	MORTARED BRICK RETAINING WALL
	CONCRETE RETAINING WALL
	GRANITE RETAINING WALL
	GRANITE POST
	PARK METER KIOSK
	PARKING METER
	BOLLARD
	SIGN
	HANDICAP SPACE
	LIGHT POLE
	UTILITY POLE WITH ARM & LIGHT
	UTILITY POLE
	PUBLIC SERVICE CO. OF NH
	ELECTRICAL MANHOLE
	ELECTRICAL CONDUIT
	ELECTRICAL METER/BOX
	GAS METER
	GAS SHUT OFF
	GAS VALVE
	WATER GATE VALVE
	WATER SHUT OFF VALVE
	HYDRANT
	FIRE CONNECTION
	TEE CONNECTION
	FITTINGS (11.25', 22.5', 45')
	REDUCER
	THRUST BLOCK
	COUPLING
	CATCH BASIN (NEW)
	CATCH BASIN (REMOVE & REPLACE)
	DRAIN MANHOLE
	ROOF DOWNSPOUT
	SEWER MANHOLE
	SEWER CLEANOUT
	TELEPHONE MANHOLE
	TELEPHONE BOX
	CABLE MANHOLE
	FIRE ALARM
	DECIDUOUS TREE
	CONIFEROUS SHRUB
	DECIDUOUS SHRUB
	OVERHEAD UTILITIES
	WATER LINE
	SEWER LINE
	DRAIN LINE
	GAS LINE
	UNDERGROUND ELECTRIC
	UNDERGROUND COMMUNICATIONS
	CEMENT CONCRETE
	BRICK PAVERS
	LANDSCAPED AREA
	MULCHED AREA

LEGEND (cont.):

EXISTING	PROPOSED
	GRASS COVER
	SPOT GRADE
	ELEVATION TO MATCH/NOT EXCEED
	2' CONTOUR ELEVATION
	10' CONTOUR ELEVATION
	SIGN - SEE SIGNAGE TABLE
	TAX SHEET - LOT NUMBER
	ROCK
	POLE
	SEWER LATERALS APPROXIMATE LOCATION
	SEWER LATERALS ASSUMED DIRECTION OF EXIT
	WATER LATERALS APPROXIMATE LOCATION
	DRAIN LATERALS APPROXIMATE LOCATION
	RAILROAD SIGNAL
	RAILROAD TRACKS
	BORING
	SUBSURFACE REFUSAL
	SUBSURFACE NO REFUSAL
	SUBSURFACE GROUNDWATER
	SILT BOOM
	SILT FENCE

ABBREVIATIONS

AC/ACP	ASPHALT CONCRETE PIPE
CB	CATCH BASIN
CI/CIP	CAST IRON PIPE
CL 52	CLASS 52 PIPE
CMP	CORRUGATED METAL PIPE
DI	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
GIS	CITY OF PORTSMOUTH GIS SYSTEM
HDPE	HIGH DENSITY POLYETHYLENE PIPE
I	INVERT ELEVATION
PE	POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
R	RIM ELEVATION
RCP	REINFORCED CONCRETE PIPE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RCSC	ROCKINGHAM COUNTY SUPERIOR COURT
S	SLOPE (PIPE)
SMH	SEWER MANHOLE
UP	UTILITY POLE

SEWER TABLE

SMH# 5 RIM EL= 15.03 TOP OF TANK= 11.4± (GREASE SEPERATOR)
SMH# 6 RIM EL= 15.02 TOP OF TANK= 11.4± (GREASE SEPERATOR)
SMH# 1494 RIM EL= 10.62 CL FLOW= -1.16 (48" BRICK TUNNEL)
SMH# 1497 RIM EL= 11.04 (1) INV IN 10" ____ = 3.51 (2) INV IN 15" ____ = 2.98 (3) INV IN 8" ____ = 2.95 (4) INV OUT 15"VCP= 2.91
SMH# 1489 RIM EL= 9.39 (1) INV IN 12" ____ = 2.04
SMH# 1499 RIM EL= 15.61 (1) INV IN 48" BRICK= -1.84 (2) INV IN ____ = -0.99 (3) INV OUT 48" BRICK= -1.94 (48" BRICK TUNNEL)
SMH# 1500 NOT FIELD OBSERVED (STRUCTURE & LINE ABANDONED PER PORTSMOUTH DPW)
SMH# 1501 RIM EL= 13.38 (1) INV IN 21" ____ = -0.57 (2) INV OUT 24" ____ = -0.67
SMH# 1503 RIM EL= 15.13 (1) INV IN ____ = 0.53 (2) INV OUT ____ = ?
SMH# 1519 RIM EL= 13.30 (NO INVERT DATA)
SMH# 1570 RIM EL= 17.30 (1) INV IN 48" BRICK= (48" BRICK TUNNEL)
SMH# 2746 RIM EL= 14.67 (1) INV IN ____ = 5.4± (2) INV IN ____ = 5.3± (3) INV OUT ____ = 5.3± (STRUCTURE INACTIVE) (NO FLOW OBSERVED)

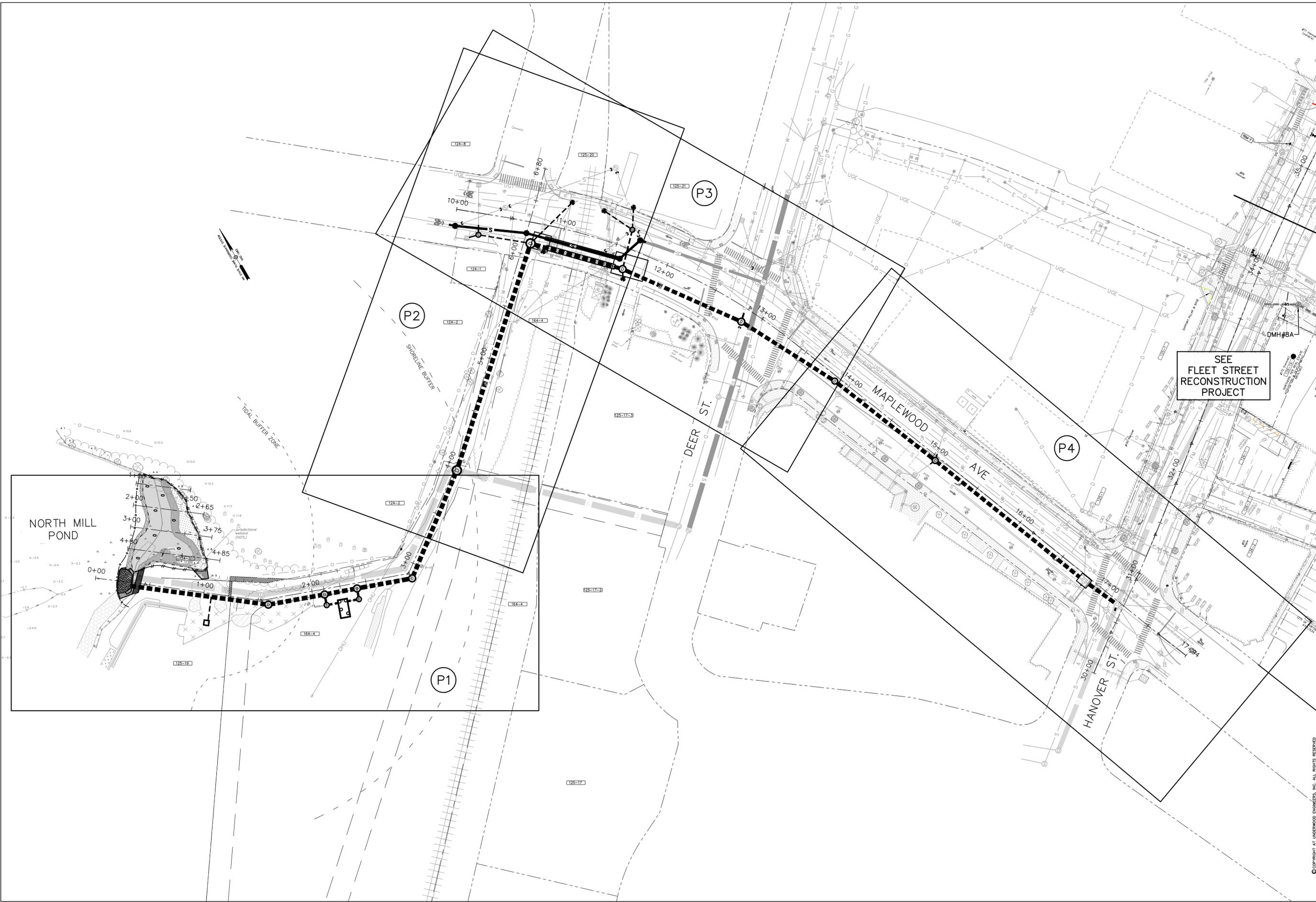
DRAIN TABLE

CB# 1352 RIM EL= 12.85 (1) INV IN 12"HDPE= 9.60 (2) INV OUT 12"HDPE= 9.50	DMH# 6 RIM EL= 13.65 (1) INV IN 18"RCP= 4.25 (2) INV IN 12"HDPE= 5.40 (3) INV OUT 18"RCP= 4.33	DMH# 5207 RIM EL= 13.01 (1) INV IN 12"RCP= 9.62 (2) INV IN 12"RCP= 5.56 (3) INV OUT 12"RCP= 5.56
CB# 3743 RIM EL= 12.83 (1) INV OUT 12"RCP= 9.58	DMH# 7 RIM EL= 14.29 (1) INV IN 6"PVC= 6.48 TOP OF CONCRETE WEIR= 9.96 (2) INV OUT 12"HDPE= 6.30	DMH# 5208 RIM EL= 13.00 (1) INV IN 12"RCP= 7.95 (2) INV IN 12"RCP= 5.78 (3) INV IN 12"RCP= 7.90 (4) INV OUT 12"RCP= 5.77
CB# 3750 RIM EL= 10.91 (1) INV OUT 12"RCP= 7.39	DMH# 8 RIM EL= 13.58 (1) INV IN 6"PVC= 9.83 TOP OF CONCRETE WEIR= 11.30 (2) INV OUT 12"HDPE= 9.68	DMH# 5209 RIM EL= 14.67 (1) INV IN 12"RCP= 10.39 (2) INV IN 12"RCP= 10.54 (3) INV OUT 12"RCP= 7.75
CB# 3761 RIM EL= 10.52 (1) INV OUT 12"RCP= 7.03	DMH# 4979 (4'X6' VAULT) RIM EL= 10.44 CL FLOW 48"RCP= *1.03 *RECORD GIS VALUE	DMH# 5404 RIM EL= 13.35 (1) INV IN 12"RCP= 9.45 (2) INV IN 12"RCP= 9.28 (3) INV OUT 12"RCP= 7.12
CB# 3771 RIM EL= 15.14 (1) 6"PVC (PLUGGED) (2) INV IN 6"PVC= 12.85 (3) INV OUT 12"RCP= 12.52	DMH# 4980 RIM EL= 10.58 (1) INV IN 18"RCP= 3.03 (2) NO INVERT DATA (3) INV OUT ____ = 1.46	DMH# 5438 (4'X6' VAULT) RIM EL= 12.79 CL FLOW 48"RCP= 1.24
CB# 3772 RIM EL= 16.01 (1) INV OUT 12"RCP= 12.08	DMH# 4984 RIM EL= 9.40 (1) INV IN 36"RCP= 4.15	DMH# 5439 (4'X6' VAULT) RIM EL= 7.21 CL FLOW 48"RCP= 0.76
CB# 3773 RIM EL= 13.64 (1) INVERT INACCESSIBLE	DMH# 5205 RIM EL= 15.81 (1) INV IN 12"RCP= 4.91 (2) INV IN 12"RCP= 12.26 (3) INV IN 18"HDPE= 8.71 (4) INV IN 12"RCP= 11.71 (5) INV OUT 18"RCP= 4.81	DMH# 5677 RIM EL= 11.07 (1) INV IN 12"RCP= 6.97 (2) INV IN 10"RCP= 6.47 (3) INV IN 12"RCP= 6.98 (4) INV OUT 12"RCP= 6.37
CB# 3774 RIM EL= 13.25 (1) INV OUT 12"RCP= 8.60	DMH# 5206 RIM EL= 13.32 (1) INV IN 12"RCP= 8.47 (2) INV IN 12"RCP= 9.29 (3) INV IN 12"RCP= 5.42 (4) INV OUT 12"RCP= 5.40	DMH# 5678 RIM EL= 11.32 (1) INV IN 12"RCP= 6.07 (2) FLOW LINE 36"RCP= 4.60 (3) INV IN 12"RCP= 7.48 (4) INV IN 12"RCP= 6.45 (5) INV IN 12"RCP= 7.88
CB# 3775 RIM EL= 12.97 (1) INV OUT 12"RCP= 9.87	CB# 3776 RIM EL= 12.93 (1) INV OUT 12"RCP= 8.25	
CB# 3776 RIM EL= 12.93 (1) INV OUT 12"RCP= 8.25	CB# 3777 RIM EL= 12.94 (1) INV OUT 12"RCP= 8.64	
CB# 3777 RIM EL= 12.94 (1) INV OUT 12"RCP= 8.64	CB# 3778 RIM EL= 14.59 (1) INV OUT 12"RCP= 11.09	
CB# 3778 RIM EL= 14.59 (1) INV OUT 12"RCP= 11.09	CB# 3779 RIM EL= 14.51 (1) INV OUT 12"RCP= 11.20	
CB# 25172 RIM EL= 15.28 (1) INV OUT 18"HDPE= 10.98		

ISSUE FOR BIDDING	Date	By	CONSTRUCTION	Date	By	RECORD DRAWING	Date	By
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Book No.			Project No.	2542	Dwg. ID	2542	Scale	
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<p>UNDERWOOD engineers</p> <p>25 Vaughan Mall, Portsmouth, N.H. 03801 Tel. 603-436-6192 Fax. 603-431-4733</p>								
<p>LEGEND & ABBREVIATIONS, EXISTING STRUCTURE TABLES</p> <p>MAPLEWOOD AVE - DRAINAGE INTERCEPT</p> <p>CITY OF PORTSMOUTH</p> <p>PORTSMOUTH, NEW HAMPSHIRE</p>								
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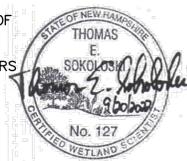


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PLAN INDEX MAPLEWOOD AVE – DRAINAGE INTERCEPT CITY OF PORTSMOUTH PORTSMOUTH, NEW HAMPSHIRE			
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DRAINAGE OUTFALL NOTES:

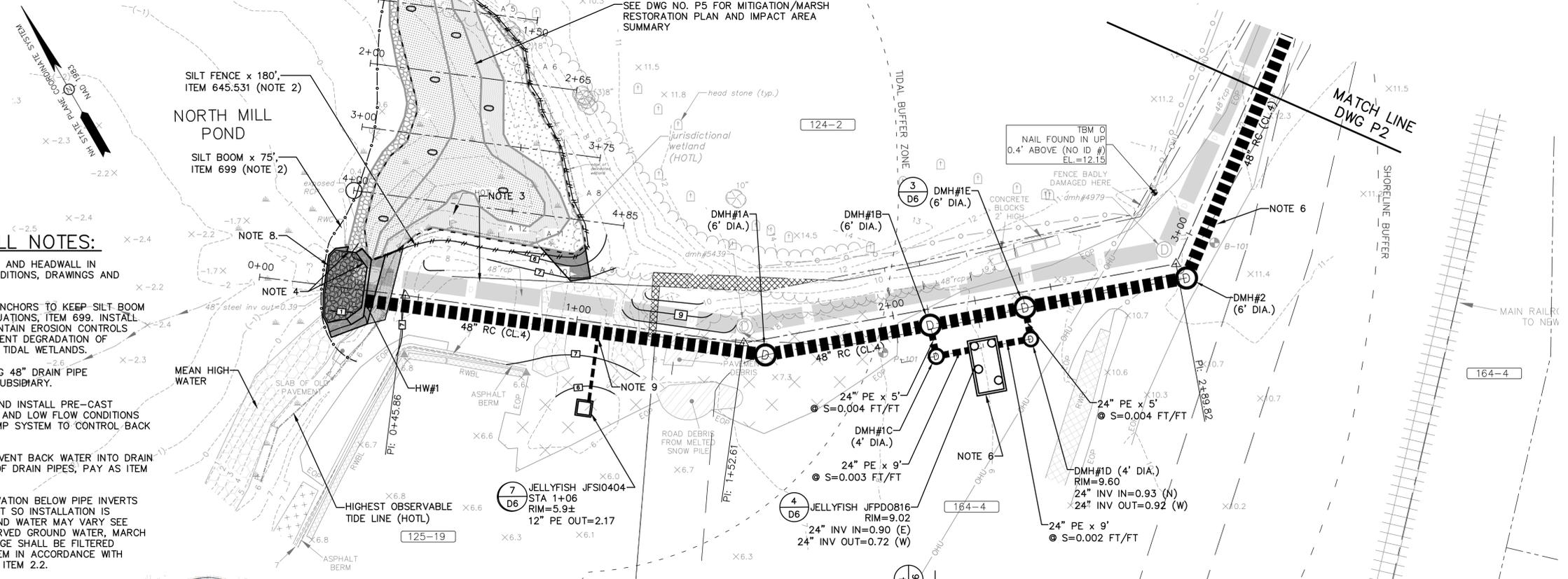
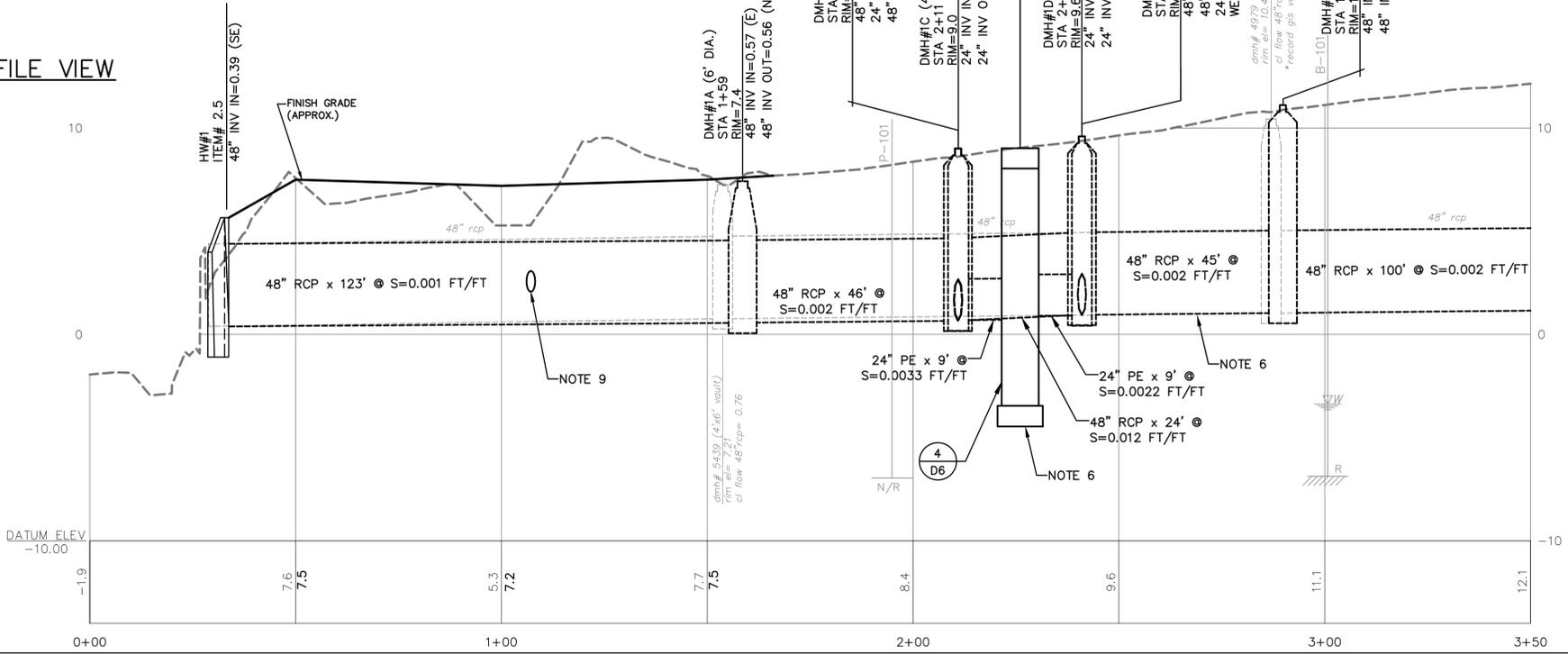
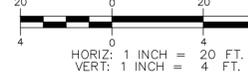
1. CONSTRUCT DRAINAGE OUTFALL AND HEADWALL IN ACCORDANCE WITH PERMIT CONDITIONS, DRAWINGS AND SPECIFICATIONS.
2. INSTALL SILT BOOM AND SET ANCHORS TO KEEP SILT BOOM IN PLACE DURING TIDAL FLUCTUATIONS, ITEM 699. INSTALL SILT FENCE, ITEM 645.531. MAINTAIN EROSION CONTROLS THROUGHOUT CONSTRUCTION, PREVENT DEGRADATION OF DOWNSTREAM PROPERTIES AND TIDAL WETLANDS.
3. MAINTAIN FLOW IN THE EXISTING 48" DRAIN PIPE THROUGHOUT CONSTRUCTION, SUBSIDIARY.
4. REMOVE EXISTING HEADWALL AND INSTALL PRE-CAST HEADWALL DURING LOW WATER AND LOW FLOW CONDITIONS OR INSTALL SHEETING AND PUMP SYSTEM TO CONTROL BACK WATER, PAY AS ITEM 2.5.
5. INSTALL TIDE VALVES AND PREVENT BACK WATER INTO DRAIN PIPES DURING CONSTRUCTION OF DRAIN PIPES, PAY AS ITEM 2.6.
6. MAINTAIN GROUND WATER ELEVATION BELOW PIPE INVERTS AND BOTTOM OF JELLYFISH UNIT SO INSTALLATION IS COMPLETED IN THE DRY. GROUND WATER MAY VARY SEE B-101, APPENDIX A FOR OBSERVED GROUND WATER, MARCH 2022. GROUND WATER DISCHARGE SHALL BE FILTERED THROUGH A CONTROLLED SYSTEM IN ACCORDANCE WITH CONTRACTORS SWPPP, PAY AS ITEM 2.2.
7. THOMAS SOKOLOSKI, CERTIFIED WETLAND SCIENTIST #127, OF TES ENVIRONMENTAL CONSULTANTS, L.L.C. OF BOW, NH, PERFORMED THE WETLAND IDENTIFICATION AND DELINEATION ON JUNE 28, 2022 ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012, US ARMY CORPS OF ENGINEERS.
8. CONSTRUCT STABILIZED OUTLET. SEE DETAILS (DWG D6).
9. CONNECT 12" PE TO 48" RCP WITH INSERT TEE TYPE CONNECTION. 12" PE INVERT=1.97, INCIDENTAL TO ITEM 603.82212.



NORTH MILL POND AREA PLAN VIEW



NORTH MILL POND AREA PROFILE VIEW



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CONSTRUCTION		
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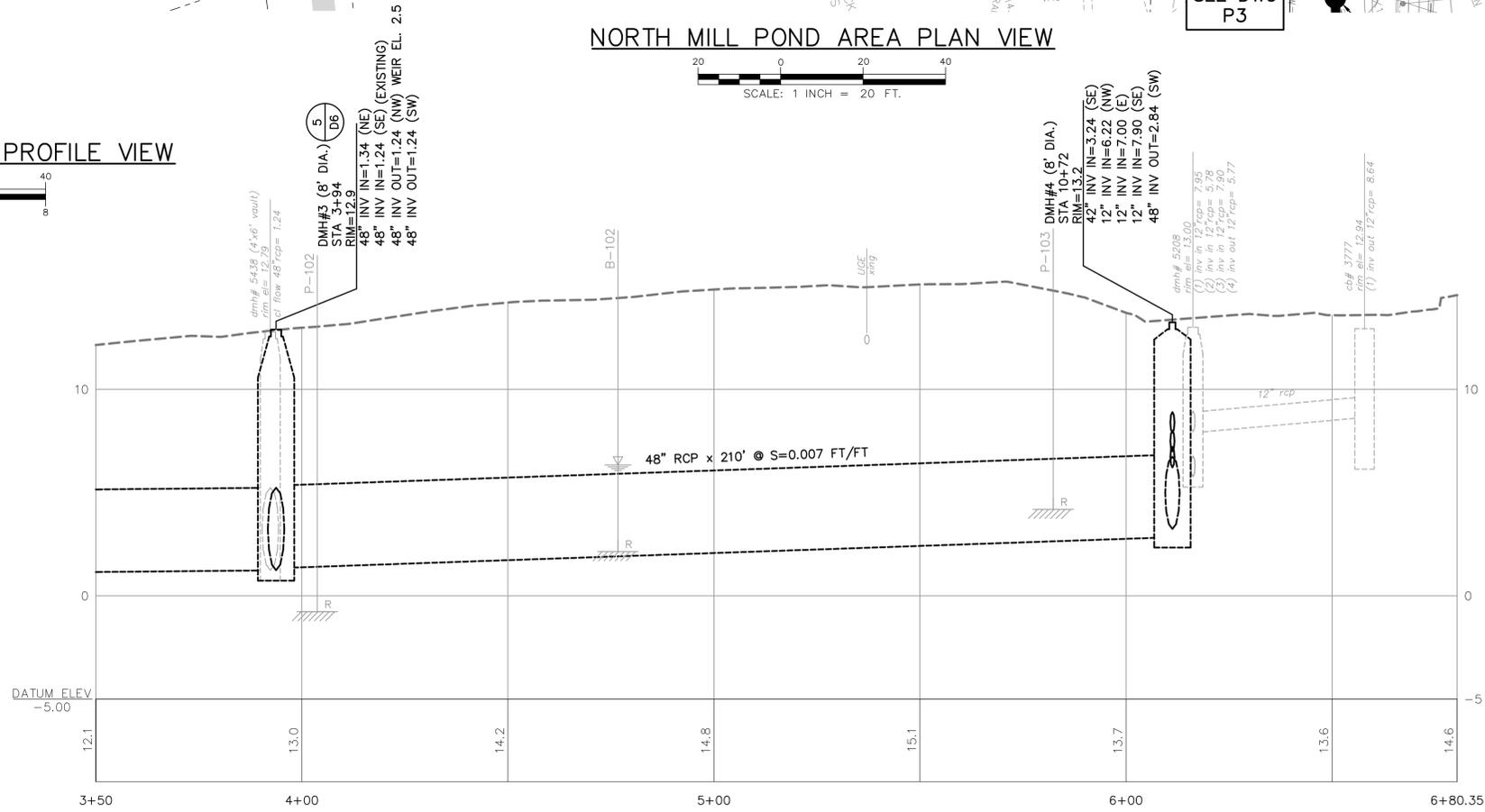
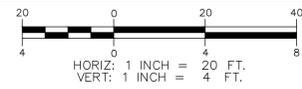
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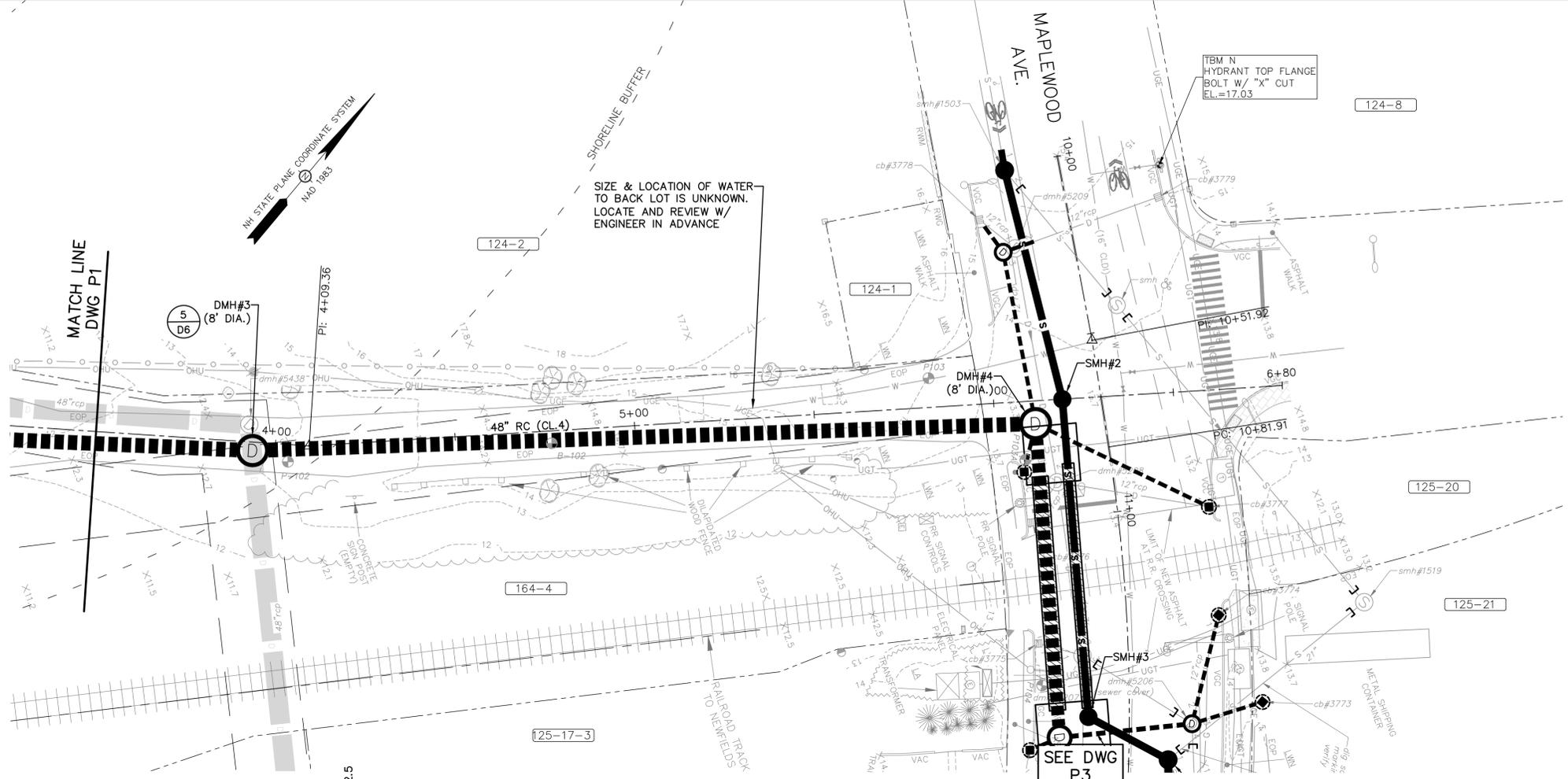
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**NORTH MILL POND DRAINAGE OUTFALL
 PIPE PLAN AND PROFILES**
 MAPLEWOOD AVE - DRAINAGE INTERCEPT
 CITY OF PORTSMOUTH
 PORTSMOUTH, NEW HAMPSHIRE

NORTH MILL POND AREA PROFILE VIEW

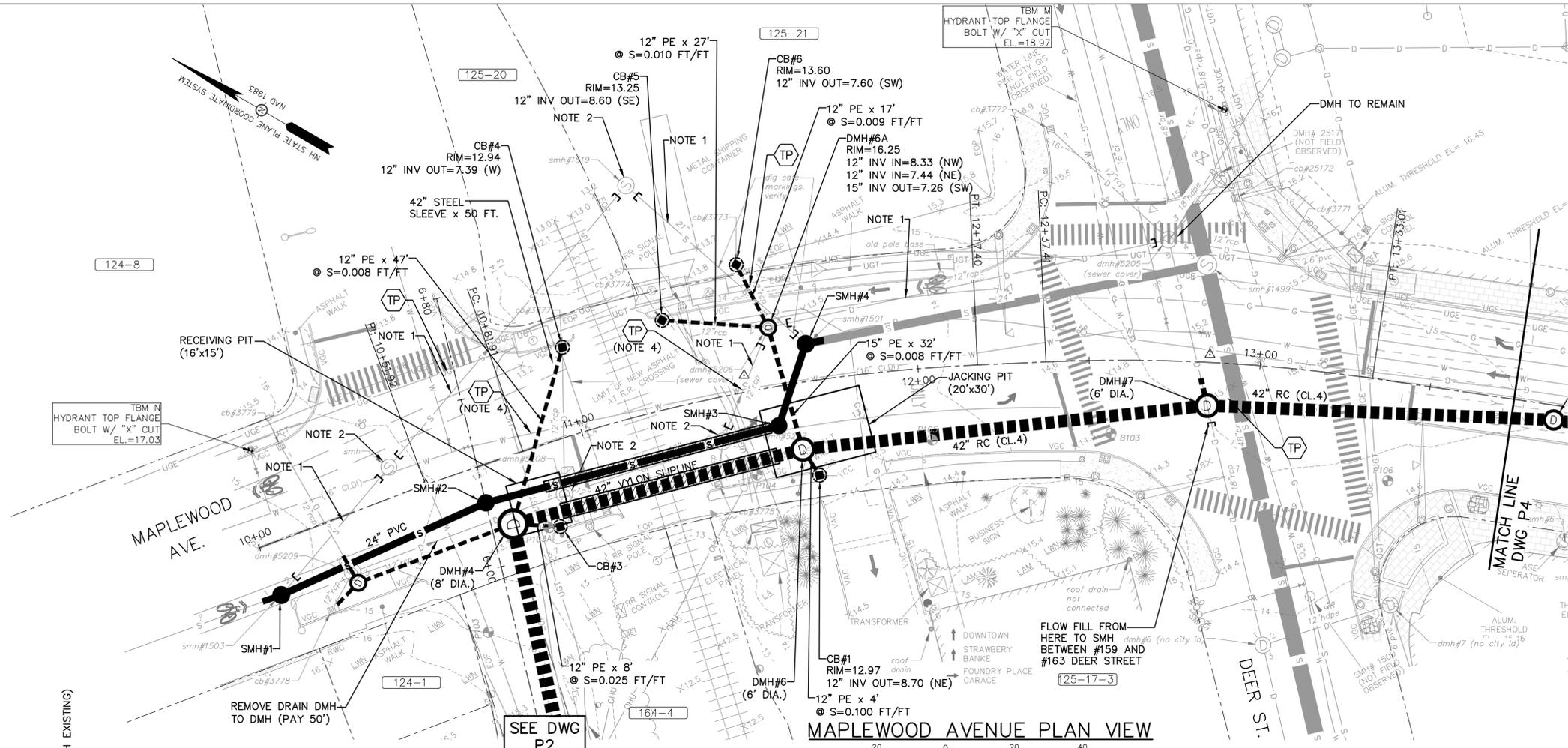


NORTH MILL POND AREA PLAN VIEW

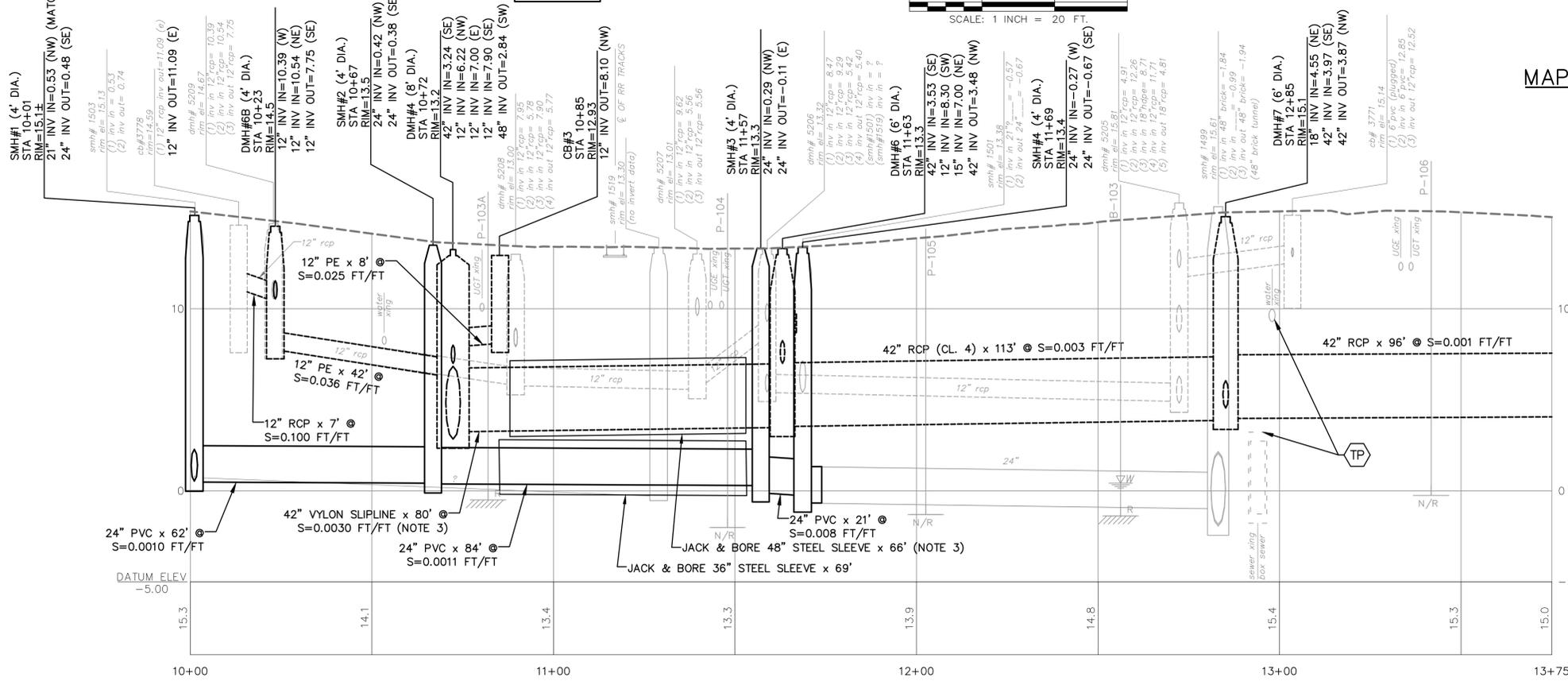


DWG NO P2		SHEET 6 OF 14	
NORTH MILL POND AREA PIPE PLAN AND PROFILES			
MAPLEWOOD AVE - DRAINAGE INTERCEPT			
CITY OF PORTSMOUTH PORTSMOUTH, NEW HAMPSHIRE			
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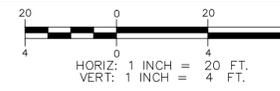
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MAPLEWOOD AVENUE PLAN VIEW



MAPLEWOOD AVENUE PROFILE VIEW



NOTES:

1. ABANDON EXISTING PIPES IN PLACE. PLUG AND CAP PIPE AT MANHOLES AND FILL WITH FLOWABLE FILL.
2. REMOVE EXISTING MANHOLE FOLLOWING INSTALLATION OF NEW SEWER.
3. DURING THE JACKING OPERATION THE FRONT OF THE CASING PIPE SHALL BE PROVIDED WITH MECHANICAL ARRANGEMENTS OR DEVICES THAT WILL POSITIVELY PREVENT THE AUGER FROM LEADING THE PIPE SO THAT NO UNSUPPORTED EXCAVATION IS AHEAD OF THE PIPE. CSXT PIPELINE SPECS. PAGE 23, ii, (c)
4. CONTRACTOR TO PERFORM TEST PIT TO CONFIRM LOCATION OF WATER MAIN PRIOR TO JACKING AND RECEIVING PIT EXCAVATION.

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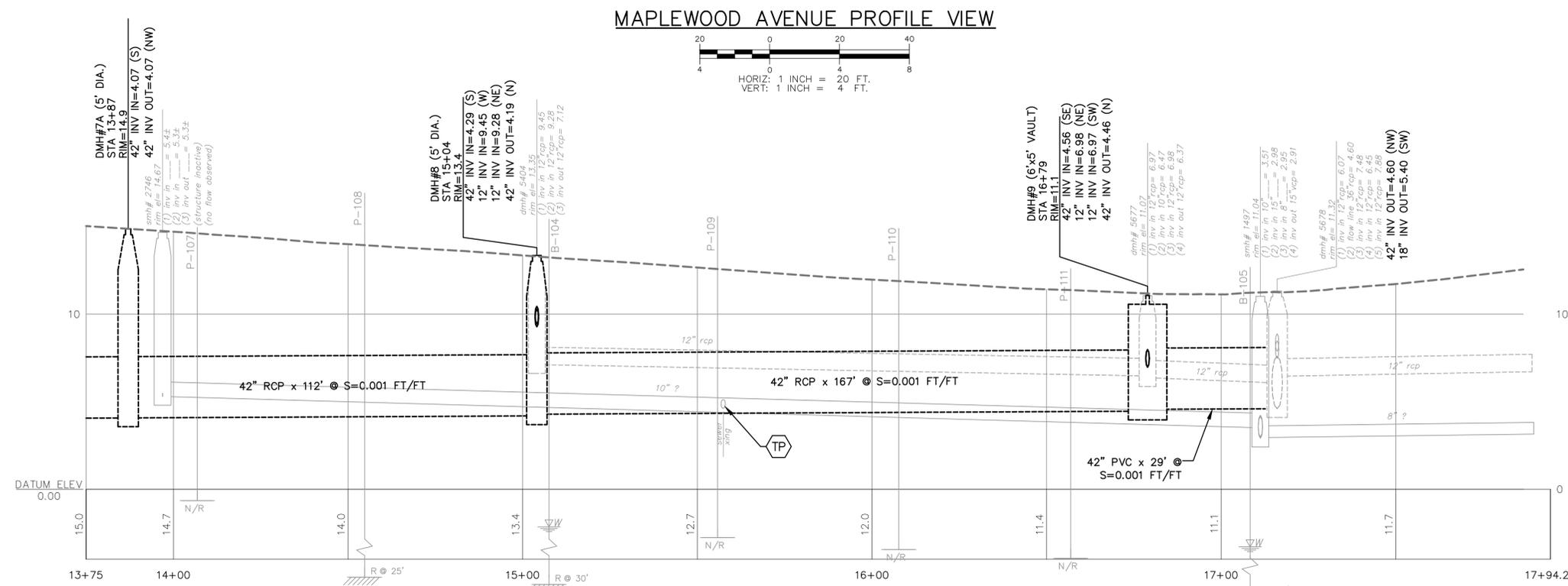
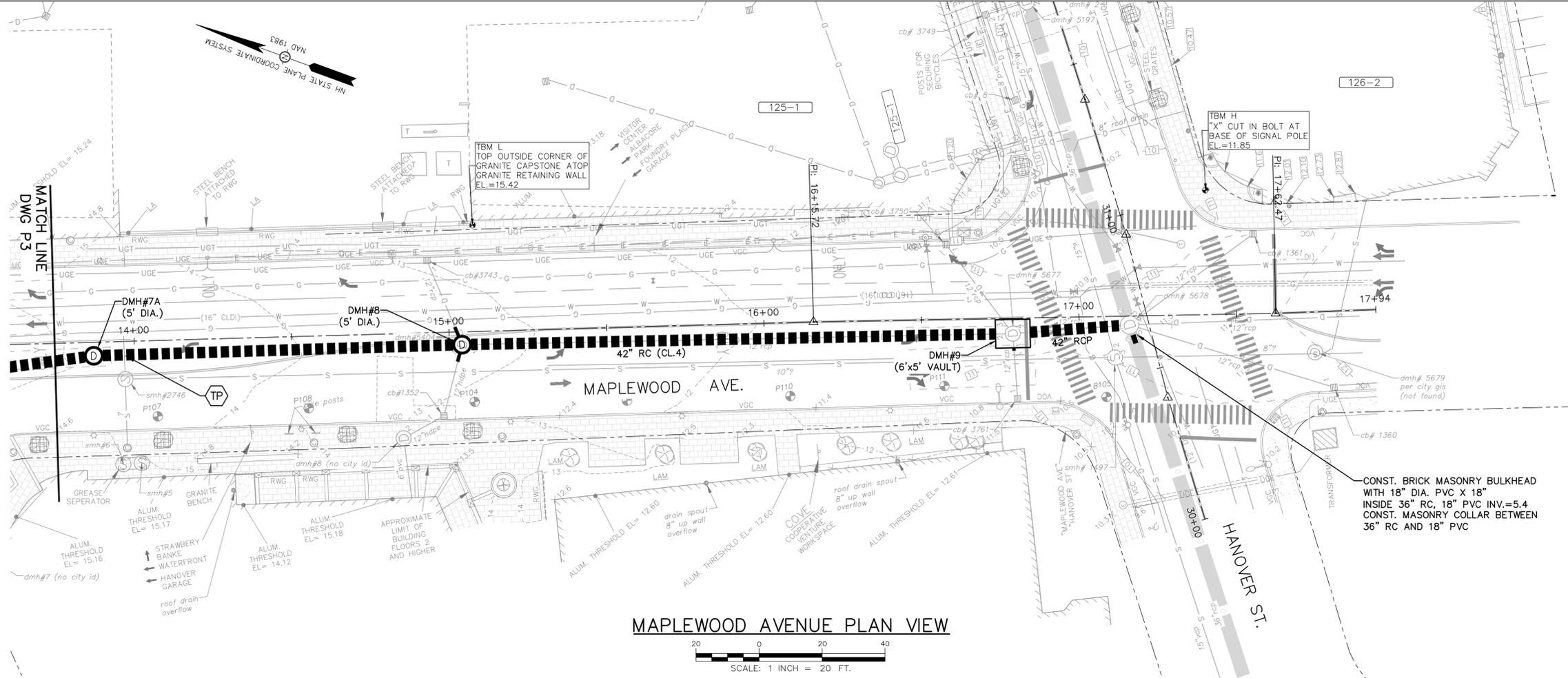
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MAPLEWOOD AVENUE
PIPE PLAN AND PROFILES

MAPLEWOOD AVE - DRAINAGE INTERCEPT

CITY OF PORTSMOUTH
PORTSMOUTH, NEW HAMPSHIRE



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MARCH 2024		MARCH 2024		MARCH 2024			
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**MAPLEWOOD AVENUE
PIPE PLAN AND PROFILES**

MAPLEWOOD AVE - DRAINAGE INTERCEPT

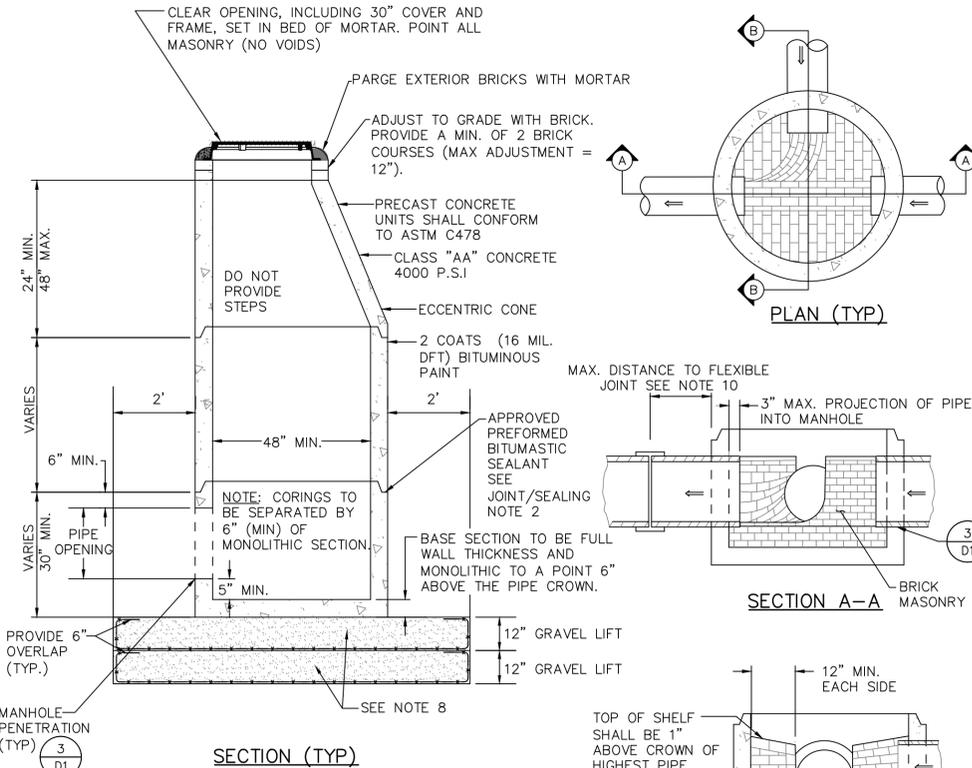
**CITY OF PORTSMOUTH
PORTSMOUTH, NEW HAMPSHIRE**

DWG NO	SHEET
P4	8 OF 14

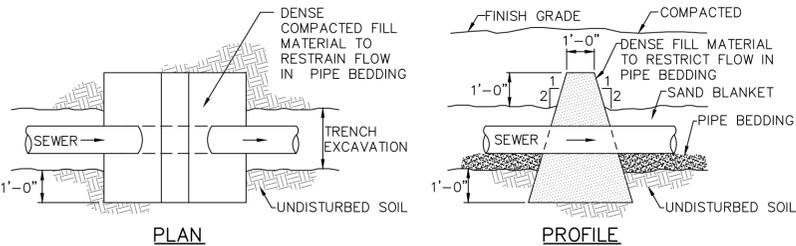
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STANDARD MANHOLE NOTES:

- GENERAL:** SEWER MANHOLES, INCLUDING ALL COMPONENT PARTS, SHALL BE ASSEMBLED OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H2O LOADING) WITHOUT FAILURE, AND TO PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
- BARRELS AND CONE SECTIONS:** SHALL BE PRECAST REINFORCED CONCRETE.
- PRECAST CONCRETE:** BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478.
- LEAKAGE TEST:** SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS. INVERT AND SHELF TO BE PRIOR TO BACKFILL PLACED AFTER TESTING.
- INVERTS AND SHELVES:** MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO AN ELEVATION OF 1" ABOVE THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
- FRAMES AND COVERS:** MANHOLE FRAMES AND COVERS SHALL BE CITY OF PORTSMOUTH STANDARD AND SHALL BE PICKED UP BY THE CONTRACTOR AT PORTSMOUTH DPW.
- BEDDING:** SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33. STONE SIZE NO. 67.
100% PASSING 1 INCH SCREEN
90-100% PASSING 3/4 INCH SCREEN
20-55% PASSING 3/8 INCH SCREEN
0-10% PASSING #4 SIEVE
0-5% PASSING #8 SIEVE
- WHERE THE MATERIAL BELOW MANHOLE STRUCTURE IS SOFT OR YIELDING, AND WHERE DIRECTED BY THE ENGINEER, INSTALL DOUBLE LAYER OF GEOGRID (TENSAR TX160 OR EQUAL). PAY AS ITEM 1.8B (Lfx2).
- SHALLOW MANHOLE:** IN LIEU OF A CONE SECTION, WHEN MANHOLE IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER HAVING AN ECCENTRIC ENTRANCE AND CAPABLE OF SUPPORTING H-20 LOADS MAY BE USED.
- FLEXIBLE JOINT:** A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
RCP AND CI PIPE - ALL SIZES - 48"
AC AND VC PIPE - UP THROUGH 12" DIA. - 18"
AC AND VC PIPE - LARGER THAN 12" DIA. - 36"
DI PIPE - NONE REQUIRED
PVC - UP THROUGH 15" DIA. - NONE REQUIRED
PVC - LARGER THAN 15" DIA. - 48"/60"
ABS (ASTM D2680) - ALL SIZES - SAME AS VC ABOVE.
- SPECIFICATIONS:** ADDITIONAL CONSTRUCTION SPECIFICATIONS ARE INCLUDED IN THE CONTRACT DOCUMENTS. THESE STANDARD MANHOLE DRAWINGS ARE NOT COMPLETE WITHOUT THESE SPECIFICATIONS.



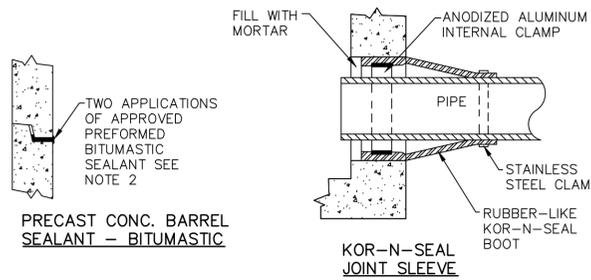
1 SEWER MANHOLE
D1 NOT TO SCALE



NOTES:
1. TRENCH DRAINS TO BE AT LOCATIONS SHOWN ON THE PLAN OR AS DIRECTED TO CONTROL BACK WATER IN STONE BEDDING, SUBSIDIARY.

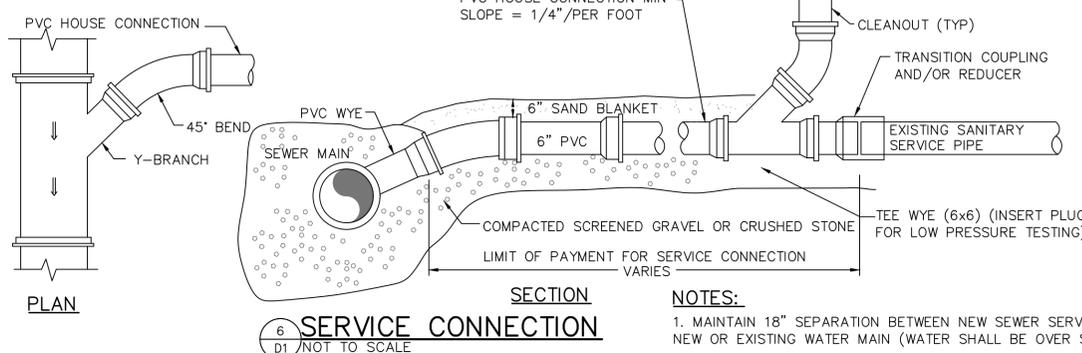
JOINTING AND SEALING NOTES

- PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL, WILL DEPEND UPON AN ELASTOMERIC SEALANT FOR WATERTIGHTNESS.
- FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY. APPROVED BITUMASTIC SEALANTS: RAM-NEK E Z KENT SEAL NO.2
- ALL GASKETS, SEALANTS, MORTAR, ETC., SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.



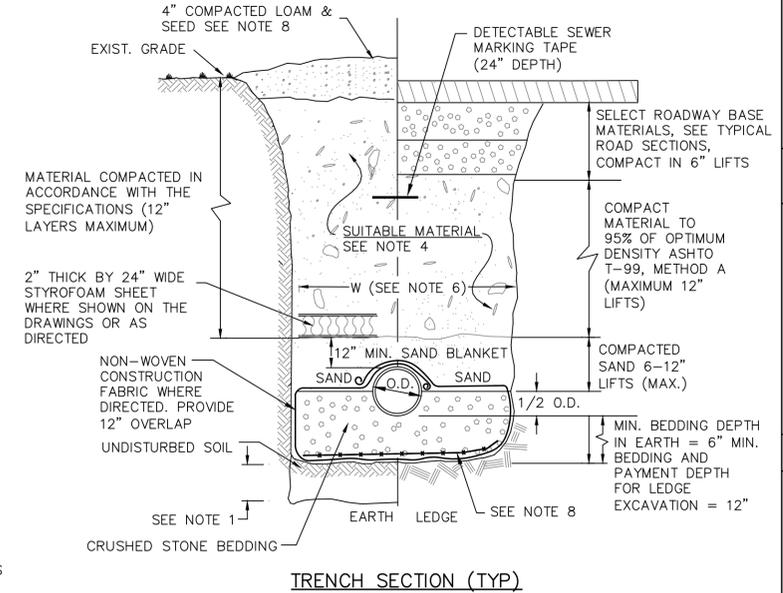
SERVICE CONNECTION NOTES:

- SEE DETAILS FOR SERVICE CONNECTION REQUIREMENTS.
- SERVICE CONNECTION SHALL BE INSTALLED BELOW WATER MAIN WHERE POSSIBLE.
- CLEANOUTS SHALL BE INSTALLED AT EACH SERVICE CONNECTION.
- REBAR SHALL BE PLACED AT SIDE OF CLEANOUT.
- CLEANOUT SHALL BE USED TO PLUG AND TEST ALL NEW LATERALS WITH MINIMAL INTERRUPTION TO OPERATION OF HOMEOWNER SANITARY SYSTEM.
- CLEANOUT RISER PIPE AND FITTINGS SHALL BE INCIDENTAL AND SHALL NOT BE CONSIDERED FOR PAYMENT.

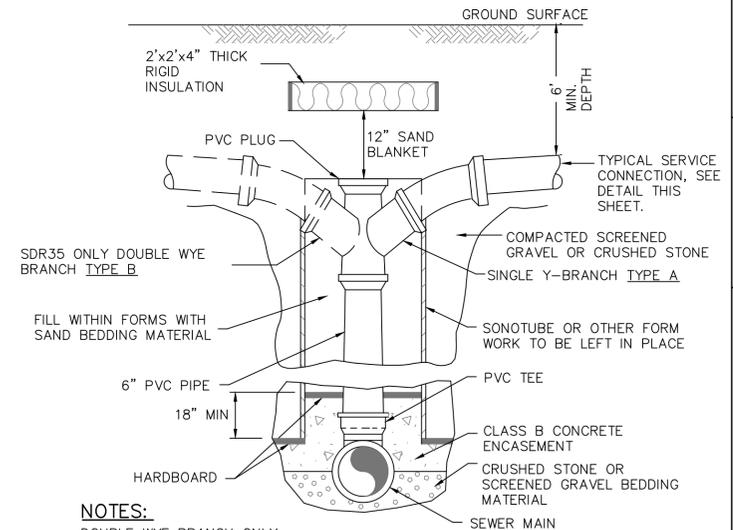


GRAVITY SEWER TRENCH NOTES:

- ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE:** BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWINGS.
- BEDDING:** SEE NOTE 7 OF STANDARD MANHOLE NOTES. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, GRADED SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1-1/2 INCH AND/OR THE USE OF GEOGRID FABRIC (ITEM 1.8B) MAY BE REQUIRED.
- SAND BLANKET:** CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90-100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
- SUITABLE MATERIAL:** IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR SOFT CLAY; ALL EXCAVATED LEDGE MATERIAL: ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS-COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER, FOR MAINTENANCE AND POSSIBLY RECONSTRUCTION, WILL BE PRESERVED.
- BASE COURSE AND PAVEMENT** SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
- W = MAXIMUM ALLOWABLE TRENCH PAYMENT WIDTH** FOR ROCK EXCAVATION, FOR ORDERED EXCAVATION BELOW GRADE AND HANDLING OF EXCAVATED CONTAMINATED SOILS. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.).
- CROSS COUNTRY CONSTRUCTION:** BACKFILL OR FILL SHALL BE MOUNDING TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- WHERE TRENCH BOTTOM IS SOFT OR YIELDING, AND WHERE DIRECTED BY THE ENGINEER, INSTALL SINGLE LAYER OF GEOGRID (TX160 OR EQUAL) ACROSS THE ENTIRE WIDTH OF TRENCH BOTTOM. PAY AS ITEM 1.8A (L.F.).

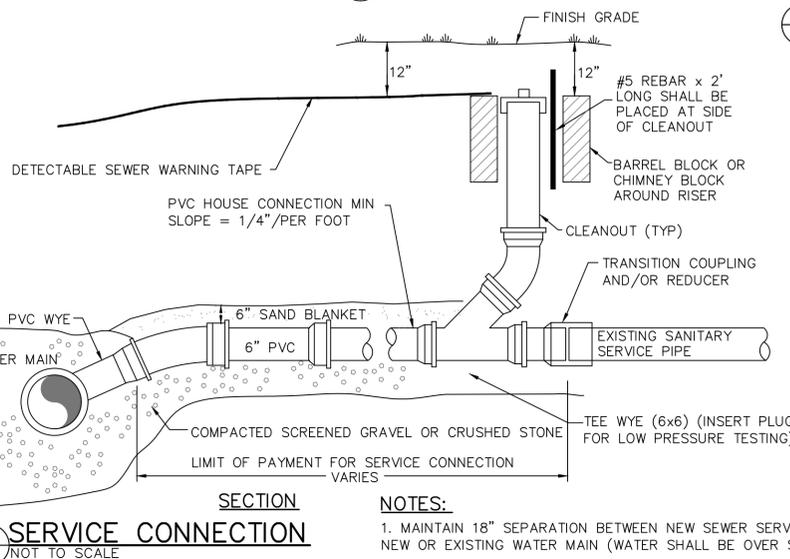


2 TRENCH - GRAVITY SEWER
D1 NOT TO SCALE



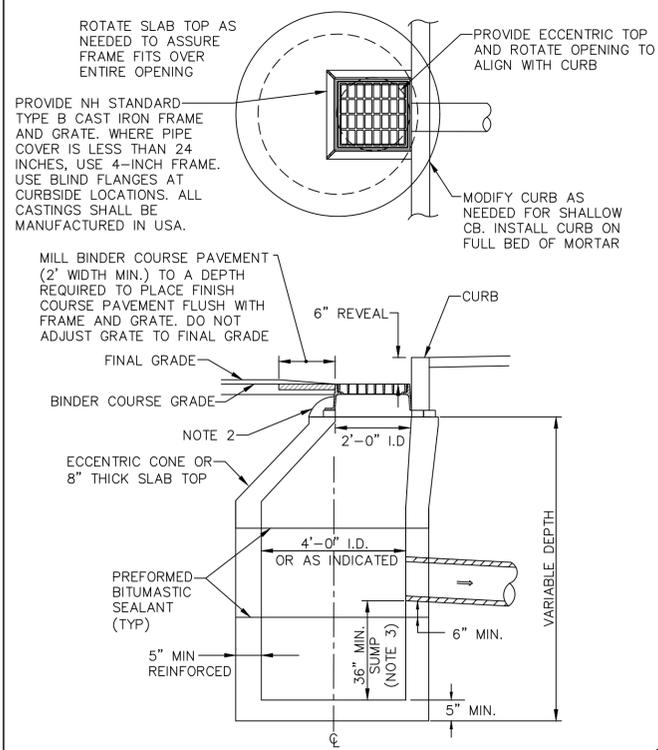
NOTES:
DOUBLE WYE BRANCH ONLY TO BE USED WHERE APPROVED BY ENGINEER

5 DROP MANHOLE
D1 NOT TO SCALE



NOTES:
1. MAINTAIN 18" SEPARATION BETWEEN NEW SEWER SERVICE AND NEW OR EXISTING WATER MAIN (WATER SHALL BE OVER SEWER).

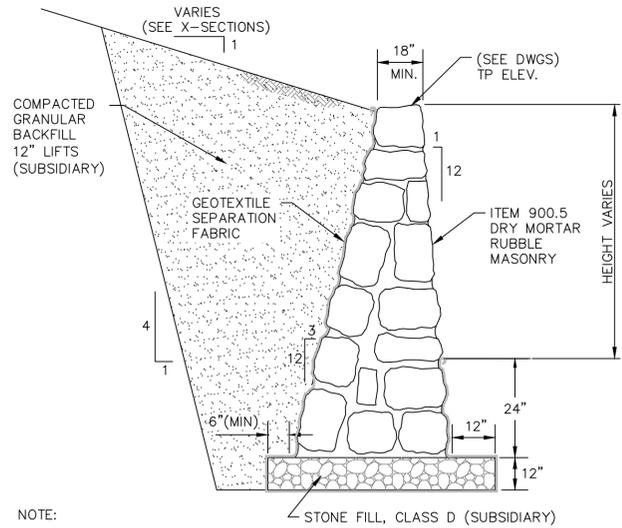
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						Dwg. ID	2542.dwg		
<p>FOR REVIEW MARCH 2024 NOT FOR CONSTRUCTION</p>									
<p>UNDERWOOD engineers</p> <p>25 Vaughan Mall, Portsmouth, N.H. 03801 Tel. 603-436-6192 Fax. 603-431-4733</p>									
<p>SEWER DETAILS</p> <p>MAPLEWOOD AVE - DRAINAGE INTERCEPT</p> <p>CITY OF PORTSMOUTH</p> <p>PORTSMOUTH, NEW HAMPSHIRE</p>									
DWG NO	D1							SHEET	9 OF 14



1 CATCH BASIN DETAIL
D2 NOT TO SCALE

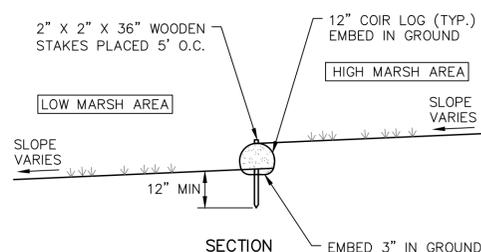
CATCH BASIN NOTES:

- ENTIRE STRUCTURE SHALL BE CAPABLE OF WITHSTANDING AN H - 20 LOAD DETAILS OF REINFORCEMENT TO BE FURNISHED BY MANUFACTURER.
- ADJUST FRAME AND GRATE TO BINDER COURSE ELEVATION, WITH BRICK SET IN A FULL BED OF MORTAR. POINT ALL MASONRY (NO VOIDS) AND PARGE EXTERIOR BRICK WITH MORTAR.
- WHERE SUMP IS OMITTED PROVIDE MASONRY INVERT PER DETAIL

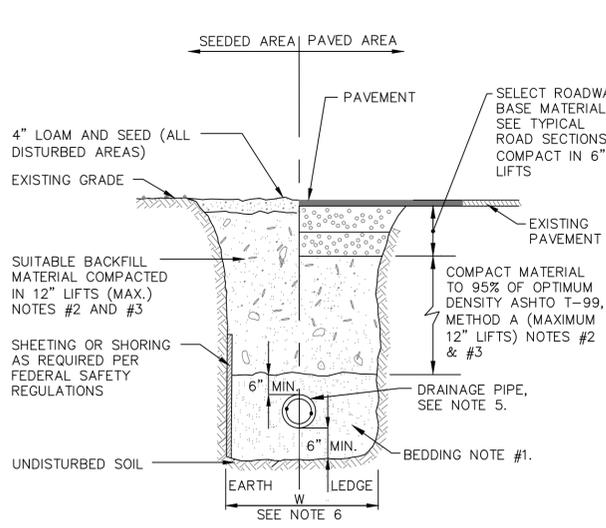


- NOTE:**
- THE CONTRACTOR MAY REUSE GRANITE FROM EXISTING HEAD WALL. RETAIN STABLE SECTIONS OF EXISTING HEADWALLS REVIEW RE-CONSTRUCTION LIMITS WITH THE ENGINEER BEFORE COMMENCING WITH THE WORK.
 - UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH STRUCTURAL FILL.
 - IF GROUNDWATER IS ENCOUNTERED, DEWATERING MEASURES WILL BE NECESSARY TO PREVENT DISRUPTANCE OF THE BEARING SOILS. PUMPING EQUIPMENT AND SUMP AREAS SHOULD BE LOCATED OUTSIDE. PUMP DISCHARGE SHALL BE PROPERLY FILTERED TO PREVENT THE DISCHARGE OF SILT TO WETLANDS.
 - WALLS SHALL BLEND INTO EXISTING SLOPES.

2 MORTAR RUBBLE MASONRY RETAINING DETAIL
D2 NOT TO SCALE



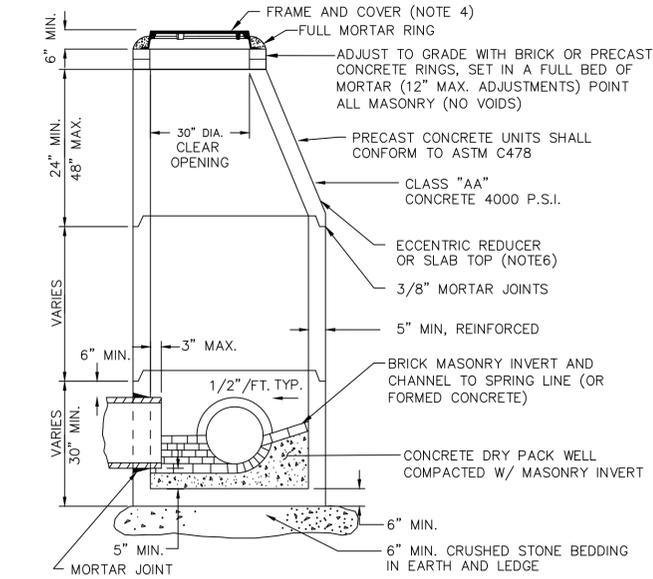
3 COIR LOG DETAIL
D2 NOT TO SCALE



3 TRENCH DETAIL - STORM DRAIN
D2 NOT TO SCALE

TRENCH NOTES - STORM DRAIN

- BEDDING:** BEDDING FOR PIPES SHALL CONSIST OF PREPARING THE BOTTOM OF THE TRENCH TO SUPPORT THE ENTIRE LENGTH OF THE PIPE AT A UNIFORM SLOPE AND ALIGNMENT. CRUSHED GRAVEL (NHDOT ITEM 304.3) OR CRUSHED STONE SHALL BE USED TO BED THE PIPE TO THE ELEVATION SHOWN ON THE DRAWINGS.
- COMPACTION:** ALL BACKFILL SHALL BE COMPACTED AT OR NEAR OPTIMUM MOISTURE CONTENT BY PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. BACKFILL BENEATH PAVED SURFACES SHALL BE COMPACTED TO NOT LESS THAN 95 PERCENT OF AASHTO T99, METHOD C.
- SUITABLE MATERIAL:** IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ROCKS OVER 6 INCHES IN LARGEST DIMENSION; FROZEN EARTH AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN SEEDING AREAS, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, ROCKS UNDER 12", FROZEN EARTH OR CLAY, IF HE/SHE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE PIPE WILL BE PRESERVED.
- BASE COURSE AND PAVEMENT:** SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
- DRAINAGE PIPE:** PIPE MATERIALS SHALL BE EITHER PVC SDR 35 OR POLYETHYLENE (PE).
- W=MAXIMUM ALLOWABLE TRENCH WIDTH:** FOR ROCK EXCAVATION, FOR ORDERED EXCAVATION BELOW GRADE AND HANDLING OF EXCAVATED CONTAMINATED SOILS. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.)



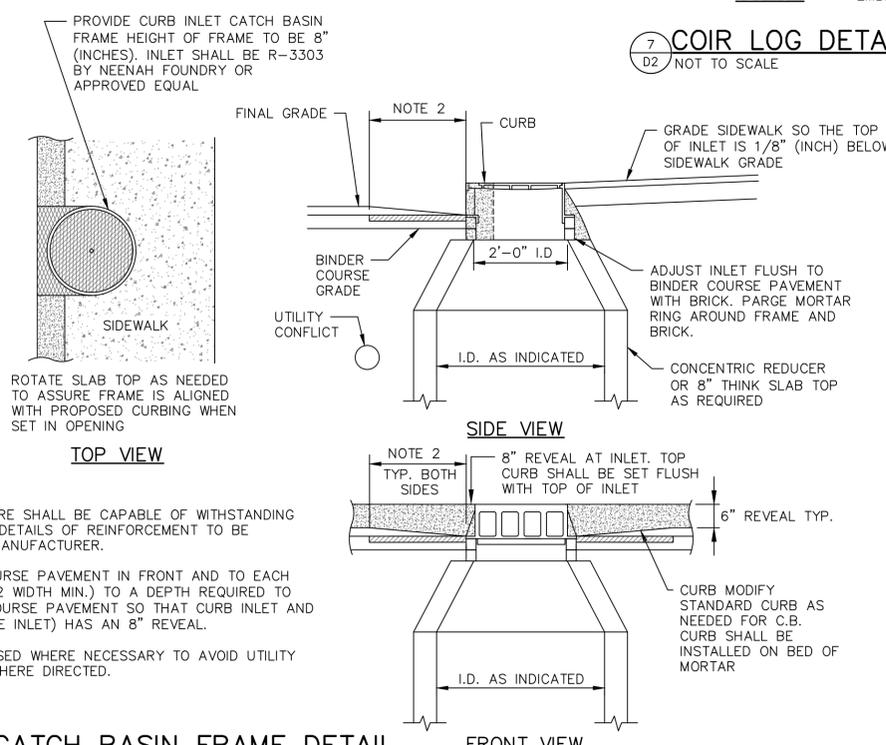
4 TYPICAL DRAINAGE MANHOLE
D2 NOT TO SCALE

DRAIN MANHOLE NOTES:

- BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE.
- PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478.
- INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT (OR FORMED CONCRETE), CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE INVERT. INVERT BRICKS SHALL BE LAID ON EDGE. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST POSSIBLE TANGENT TO THE CENTER LINE OF THE PIPES. SHELVES SHALL BE CONSTRUCTED TO AN ELEVATION OF 1/2 THE PIPE DIA. AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL.
- FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE HINGED, ERGO XL BY EAST JORDON IRON WORKS, AND PROVIDE A 30-INCH (MIN.) CLEAR OPENING. THE WORD "DRAIN" IN 3-INCH LETTERS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
- BEDDING:** SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33. STONE SIZE NO. 67.
100% PASSING 1 INCH SCREEN
90-100% PASSING 3/4 INCH SCREEN
20- 55% PASSING 3/8 INCH SCREEN
0-10% PASSING #4 SIEVE
0- 5% PASSING #8 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH OR USE OF GEOGRID FABRIC (ITEM 1.8B) MAY BE REQUIRED.

6. SLAB TOP COVERS: MAY BE APPROVED IN LIEU OF A CONE SECTION, WHEN MANHOLE IS LESS THAN 5 FEET AND FOR LARGE DIAMETER MANHOLES. SLAB TOP COVERS SHALL BE REINFORCED CONCRETE HAVING AN ECCENTRIC ENTRANCE AND CAPABLE OF SUPPORTING H-20 LOADS.

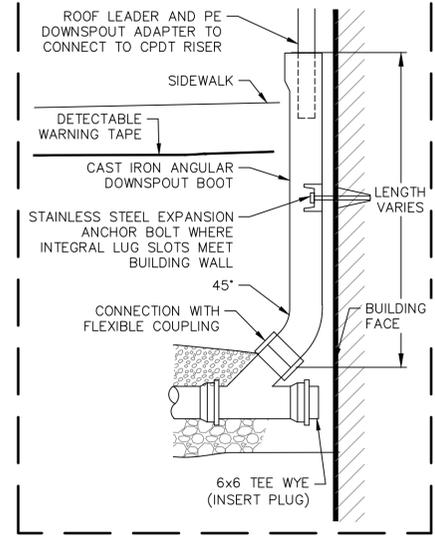
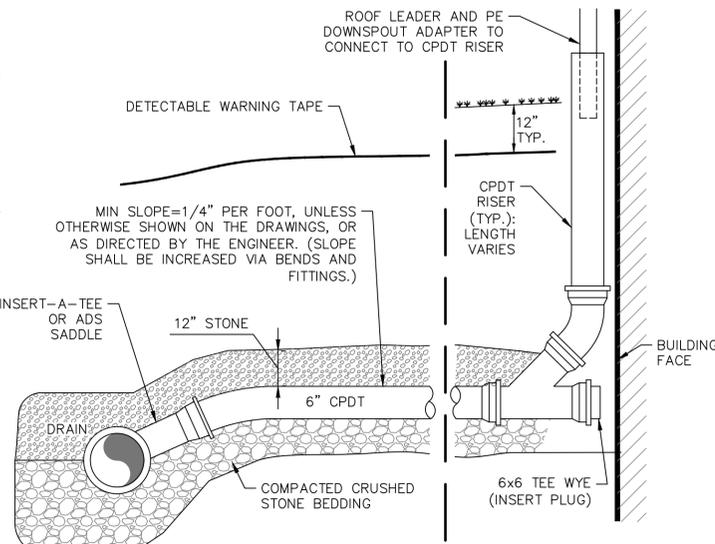


5 INLET CATCH BASIN FRAME DETAIL
D2 NOT TO SCALE

NOTES:

- SERVICE LATERALS WILL BE PROVIDED AT EACH DOWNSPOUT AS WELL AS A SEPARATE CLEANOUT FOR EACH PROPERTY TO FACILITATE PRIVATE SUMP PUMP /DRAIN SERVICE CONNECTIONS. CLEANOUTS SHALL BE INSTALLED AT THE PROPERTY LINE FOR EACH SERVICE LATERAL.
- REBAR OR 2X4 SHALL BE PLACED AT SIDE OF CLEANOUT.
- CLEANOUT RISER PIPE AND FITTINGS ARE INCIDENTAL AND WILL NOT BE CONSIDERED FOR PAYMENT.
- SERVICES SHALL BE ORIENTED @ 10:30 OR 1:30 (TYP.) UNDER NO CIRCUMSTANCES SHALL SERVICES BE LOCATED BETWEEN 3:00 AND 9:00.
- LOCATE ROOF LEADER CONNECTIONS AT ADJACENT BUILDING CORNERS, TWO DOWNSPOUTS MAY BE CONNECTED TO ONE LATERAL USING APPROPRIATE WYE (AND OTHER) FITTING(S).

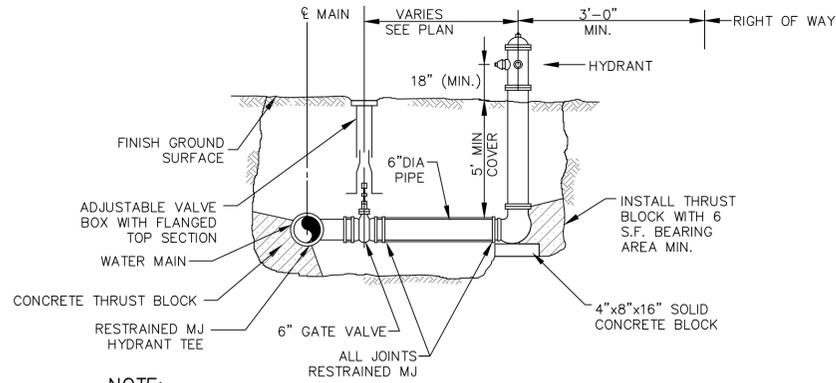
6 DRAIN LATERAL & ROOF LEADER CONNECTION
D2 NOT TO SCALE



7 DOWNSPOUT BOOT FOR ROOF LEADER AT BACK OF SIDEWALK OR PARKING LOT

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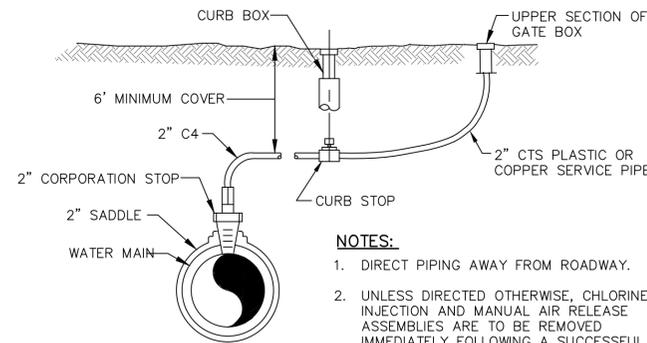


NOTE:

1. HYDRANTS SHALL BE DELIVERED FROM FACTORY W/O DRAIN HOLES.
2. HYDRANT ASSEMBLY INCLUDES MJ HYDRANT TEE.
3. HYDRANT SHALL BE KENNEDY K-81A GUARDIAN, PER CITY OF PORTSMOUTH STANDARDS.
4. LOCATE HYDRANTS A MINIMUM OF 18" BEHIND CURBING UNLESS OTHERWISE DIRECTED. REVIEW HYDRANT LOCATIONS WITH PROJECT REPRESENTATIVE PRIOR TO WATER MAIN INSTALLATIONS.

1 TYPICAL HYDRANT ASSEMBLY SECTION

D3 NOT TO SCALE

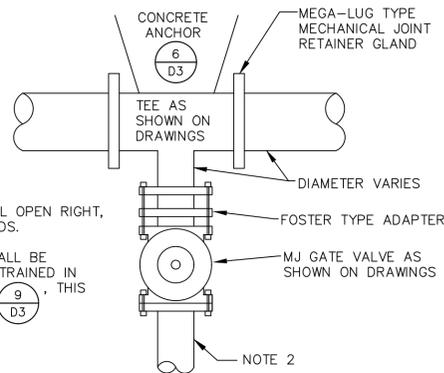


NOTES:

1. DIRECT PIPING AWAY FROM ROADWAY.
2. UNLESS DIRECTED OTHERWISE, CHLORINE INJECTION AND MANUAL AIR RELEASE ASSEMBLIES ARE TO BE REMOVED IMMEDIATELY FOLLOWING A SUCCESSFUL BACTERIA TEST. LEAVE THE CORPORATION STOP AND 12" LENGTH OF TUBING (WITH A CRIMPED END) IN PLACE.

2 TEMPORARY BLOW-OFF TAP ASSEMBLY

D3 NOT TO SCALE

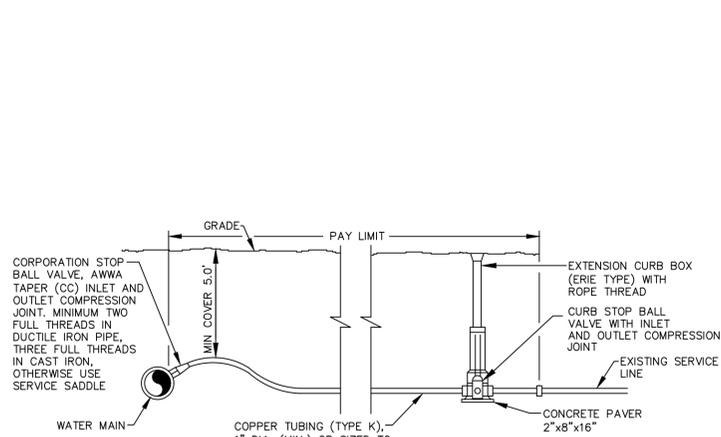


NOTE:

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED IN ACCORDANCE WITH THIS SHEET

5 TEE & GATE VALVE ASSEMBLY DETAIL (TYP.)

D3 NOT TO SCALE

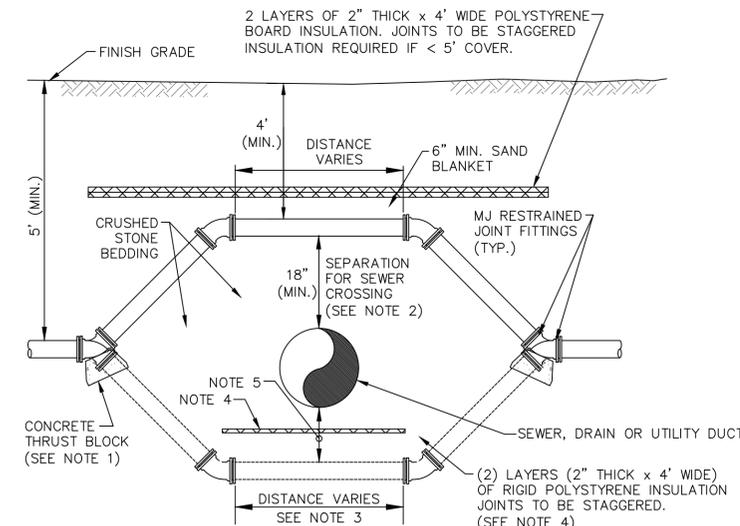


NOTES:

1. PROVIDE NEW LINE USING CONTINUOUS LENGTHS OF COPPER. NO COUPLING ALLOWED IN ROADWAY WITHOUT APPROVAL OF ENGINEER.
2. TAPS TO BE MADE AT APPROX. 2:00 AND 10:00.
3. PROVIDE FOR SERVICE LINE CONTRACTION AND EXPANSION BY INSTALLING "S" IN SERVICE LINE NEAR MAIN.
4. IF SERVICE IS INSTALLED WITH LESS THAN 5' COVER, INSULATE OVER LINE.
5. REMOVE EXISTING CURB STOP (SALVAGE AS IDENTIFIED IN SECT. 01611).
6. CONNECT CURB STOP TO EXISTING SERVICE LINE AT PROPERTY LINE OR AT LOCATION APPROVED BY THE ENGINEER (NO COUPLING WITHOUT APPROVAL OF ENGINEER) AFTER PRESSURE TESTING AND DISINFECTION.
7. SHUT OFF EXISTING CORPORATION AND REMOVE OR ABANDON EXISTING SERVICE LINE.
8. CURB BOX SHALL BE SET IN THE GRASS AREA BETWEEN CURB AND SIDEWALK UNLESS DIRECTED OTHERWISE.
9. 2" SERVICE CONNECTIONS SHALL USE A STAINLESS STEEL SERVICE SADDLE.
10. MAINTAIN 18" SEPARATION BETWEEN THE NEW WATER SERVICE AND THE NEW OR EXISTING SEWER MAIN (WATER SHALL BE OVER SEWER).

4 TYPICAL SERVICE CONNECTION

D3 NOT TO SCALE



NOTE:

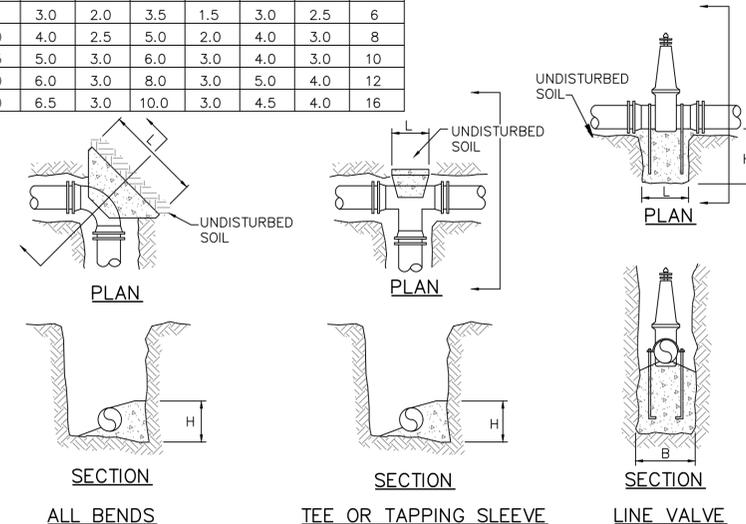
1. INSTALL (4) FOUR 45° MJ BENDS WITH RESTRAINED JOINT FITTINGS.
2. VERTICAL SEPARATION DEPTH BETWEEN WATER AND SEWER SHALL BE AT LEAST 18", WITH WATER ABOVE SEWER, PER NHDES ENV-Wq 704.12. VERTICAL SEPARATION OF LESS THAN 18" ALLOWED ONLY WITH WAIVER FROM NHDES. IF CONSTRUCTION OF WATER MAIN UNDER SEWER MAIN IS UNAVOIDABLE, SEWER MAIN SHALL BE CONSTRUCTED OF C900 PVC PIPE FROM MANHOLE TO MANHOLE.
3. CENTER CROSSING PIPE BETWEEN BELLS. SEWER PIPE JOINT SHALL BE A MINIMUM OF 6 FT. HORIZONTALLY FROM THE WATER MAIN.
4. PROVIDE INSULATION IF DRAIN CROSSES OVER WATER MAIN.
5. PROVIDE 8" TO 12" SEPARATION FOR DRAIN OR OTHER UTILITY CROSSINGS.

7 WATER MAIN CONFLICT - CROSSING DETAIL

D3 NOT TO SCALE

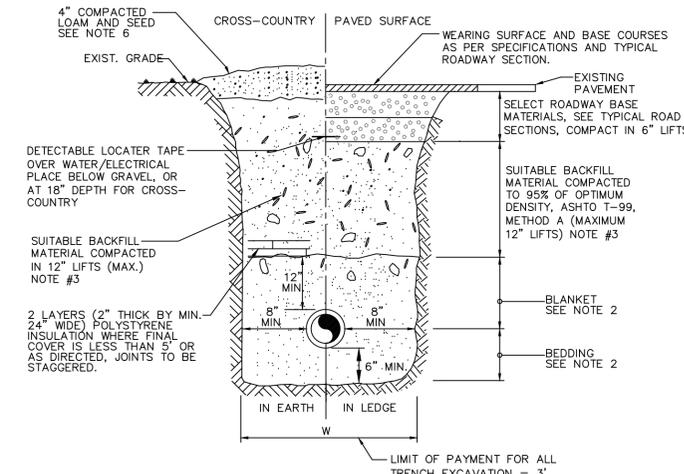
MINIMUM CONCRETE ANCHOR DIMENSIONS									
PIPE SIZE INCHES	TEE OR PLUG FT.		ALL BENDS FT.		ALL LINE VALVES FT.			PIPE SIZE INCHES	
	H	L	H	L	H	L	B		
6	1.5	3.0	2.0	3.5	1.5	3.0	2.5	6	
8	2.0	4.0	2.5	5.0	2.0	4.0	3.0	8	
10	2.5	5.0	3.0	6.0	3.0	4.0	3.0	10	
12	3.0	6.0	3.0	8.0	3.0	5.0	4.0	12	
16	3.0	6.5	3.0	10.0	3.0	4.5	4.0	16	

BASIS: SOIL BEARING CAPACITY OF 2000 PSF AND 5 FEET COVER IN GRANULAR SOIL. HEIGHT OF BLOCK MUST BE LESS THAN 1/2 DEPTH OF TRENCH. 6 MIL THICK POLYETHYLENE SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT. USE FOR HORIZONTAL OR DOWNWARD THRUST ONLY.



6 CONCRETE ANCHORS

D3 NOT TO SCALE



8 TYPICAL TRENCH DETAIL

D3 NOT TO SCALE

STANDARD TRENCH NOTES

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWINGS.
2. BEDDING AND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER (SECTION 02228). BLANKET MAY BE OMITTED FOR DUCTILE IRON AND REINFORCED CONCRETE PIPE, PROVIDED HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
3. BACKFILL MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
- IN CROSS-COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT, IF ENGINEER IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE PIPE LINE, FOR MAINTENANCE AND POSSIBLY RECONSTRUCTION, WILL BE PRESERVED.
4. MINIMUM COVER: NOT LESS THAN 5.5 FEET, 7 MAX, EXCEPT TO AVOID SUBSURFACE STRUCTURES.
6. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUND TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
7. DRIVEWAYS: CRUSHED GRAVEL IN DRIVEWAYS SHALL MATCH EXISTING WITH A MINIMUM OF 6". EXISTING GRAVEL SHALL BE REMOVED AND REPLACED AND SHALL NOT BE MEASURED FOR PAYMENT.

HORIZONTAL BENDS:

Nominal Pipe Diameter	90°	45°	22.5°	11.25°
4"	6'	3'	2'	1'
6"	9'	4'	2'	2'
8"	11'	5'	3'	2'
10"	13'	6'	3'	2'
12"	16'	7'	3'	2'
16"	20'	9'	4'	2'

TEES:

Nominal Pipe	Nominal Branch Diameter (Note 5)			
	8"	10"	12"	16"
8"	6'	-	-	-
10"	8'	11'	-	-
12"	1'	7'	16'	-
16"	1'	1'	9'	25'

NOTES:

1. ALL FITTINGS SHALL HAVE MECHANICAL RETAINING GLANDS AT ALL ENDS AND A MINIMUM OF ONE JOINT SHALL BE RESTRAINED BEYOND EACH SIDE OF FITTING.
2. PIPE EXTENDING FROM ALL FITTINGS SHALL BE MECHANICALLY RESTRAINED TO THE MINIMUM LENGTHS SHOWN.
3. ALL MINIMUM LENGTHS SHOWN ABOVE WERE CALCULATED USING THE EBAA IRON RESTRAINT LENGTH CALCULATOR VERSION 6.3 USING THE FOLLOWING ASSUMPTIONS: DUCTILE IRON PIPE, TYPE 4 TRENCH, 5 FOOT DEPTH OF BURY, A TEST PRESSURE OF 150 PSI AND SOILS CONSISTING OF WELL GRADED SANDS AND GRAVELLY SANDS WITH LITTLE OR NO FINES.
4. ENGINEER RESERVES THE RIGHT TO MODIFY RESTRAINT LENGTHS REQUIRED BASED ON VARYING TRENCH CONDITIONS, DEPTH OF BURY OR PIPE MATERIALS.
5. FOR REDUCERS, RESTRAINT LENGTH SHOWN IS FOR THE LARGER PIPE.
6. MECHANICALLY RESTRAIN ONE JOINT ON EITHER SIDE OF THE NOMINAL PIPE OF TEE AT A MINIMUM DISTANCE OF 5'.

REDUCERS:

Nom. Diameter of Large Pipe	Nominal Diameter of Small Pipe (Note 4)			
	4"	6"	8"	10"
8"	17'	10'	-	-
10"	23'	17'	10'	-
12"	29'	24'	18'	10'
16"	39'	36'	31'	28'

DEAD ENDS:

Nom. Pipe Diameter	Restraint Length (ft)
4"	13'
6"	18'
8"	23'
10"	28'
12"	33'
16"	43'

9 MECHANICAL JOINT RESTRAINT

D3 NOT TO SCALE

ISSUE FOR	By	Date
BIDDING		
CONSTRUCTION		
RECORD DRAWING		
APPROVED		
REVISIONS		
NO.		
Drawn/Chk.	RMG	
Designed	PDM	
Checked		
Approved		
Date	MARCH 2024	
Book No.	2542	
Project No.	2542	
Dwg. ID		
Scale		

FOR REVIEW
MARCH 2024
NOT FOR CONSTRUCTION

UNDERWOOD
engineers

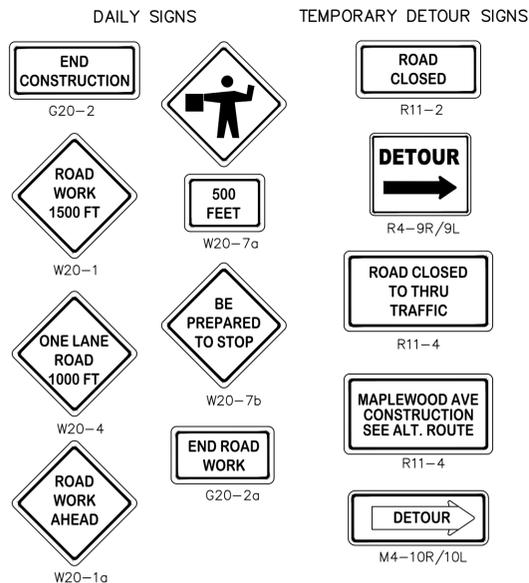
25 Vaughan Mall, Portsmouth, N.H. 03801
Tel. 603-436-6192 Fax. 603-431-4733

WATER DETAILS	MAPLEWOOD AVE - DRAINAGE INTERCEPT
CITY OF PORTSMOUTH	PORTSMOUTH, NEW HAMPSHIRE

DWG NO D3	SHEET 11 OF 14
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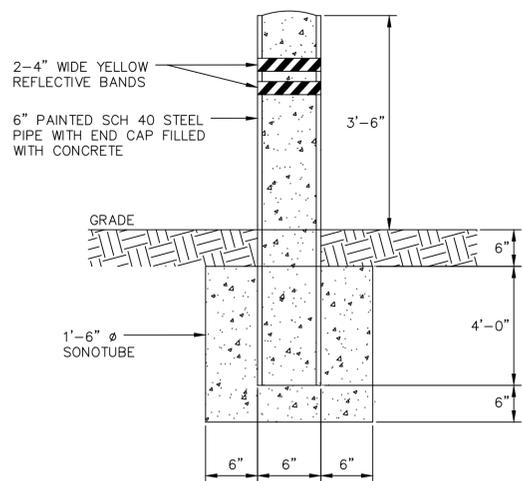
TRAFFIC CONTROL NOTES:

1. TYPICAL SIGN DETAILS ARE BASED ON THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND IS NOT INTENDED AS AN ALL-INCLUSIVE LIST. ALL SIGNAGE AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MUTCD (LATEST EDITION) AND NHDOT REQUIREMENTS.
2. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE TRAFFIC CONTROL PLAN AS SHOWN. ANY MODIFICATIONS MUST BE SUBMITTED IN WRITING FOR APPROVAL BY THE ENGINEER, CITY OF PORTSMOUTH AND THE NHDOT. SEE PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS.
3. CONTRACTOR SHALL ERECT ALL DAILY USE SIGNS IN THE MORNING PRIOR TO WORK BEGINNING AND REMOVE ALL DAILY USE SIGNS AT THE END OF EACH DAY.
4. DAILY SIGNS SHALL INCLUDE SIGNAGE NECESSARY TO ENSURE THE SAFETY OF THE PUBLIC (I.E. ROAD CLOSED, FLAGGER AHEAD, ONE LANE TRAFFIC, ETC).
5. DETOUR SIGNS ARE TO BE USED WITH PHASE I CONSTRUCTION (CULVERT INSTALLATION) ONLY. REFER TO PROSECUTION OF WORK ON SHEET G-1)
6. ALL SIGNS SHALL BE ERECTED AND PLACED IN ACCORDANCE WITH MUTCD (LATEST EDITION).

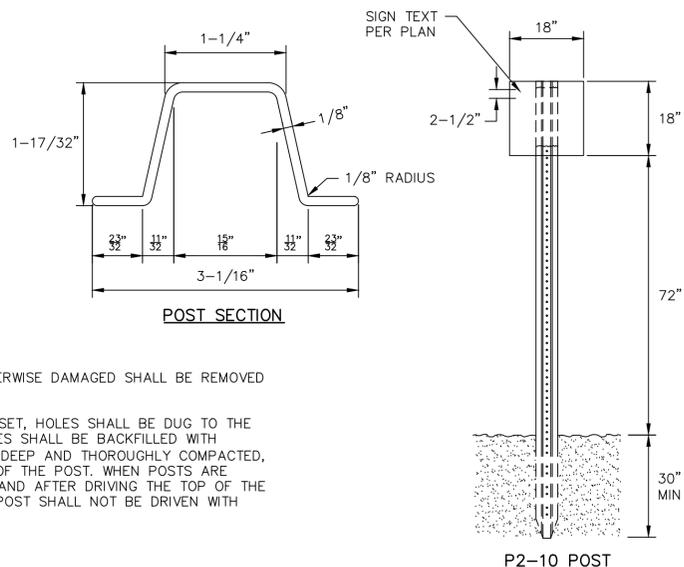


1 TRAFFIC CONTROL SIGNS
D4 NOT TO SCALE

3 STEEL BOLLARD DETAIL
D4 NOT TO SCALE



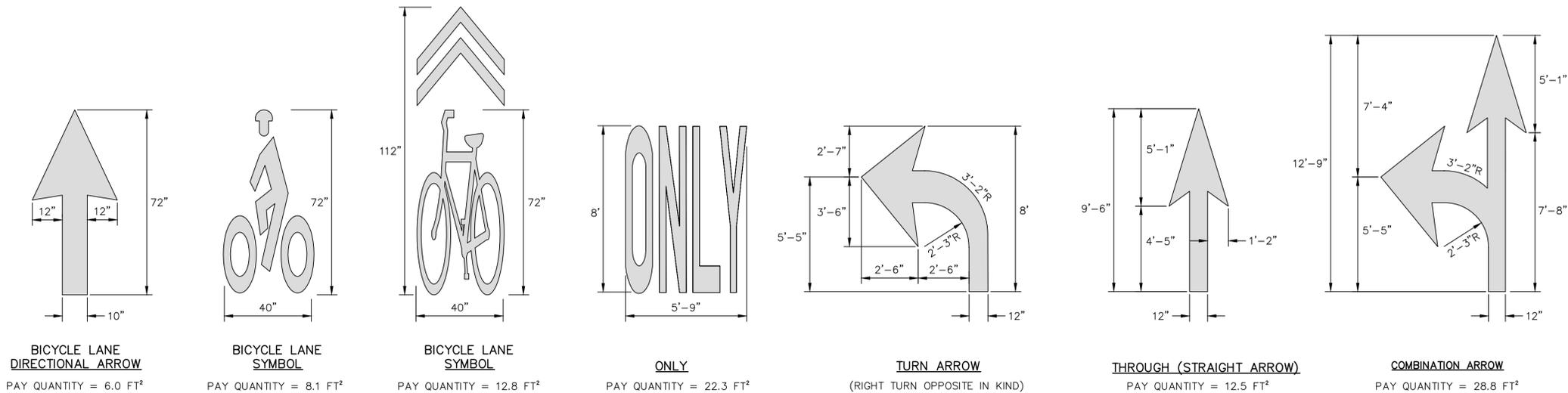
LENGTH (P2-10): 10'-0"
WEIGHT PER LINEAR FOOT: 2.00 LBS
HOLES: 3/8" DIA., 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (AISI C1060)
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MED. GREEN, BAKED PAINT OR AIR DRIED, PAINT OF WEATHER-RESISTANT QUALITY, ALL FABRICATION SHALL BE COMPLETED BEFORE PAINTING.



- NOTES:**
1. POSTS SHALL BE P2-10 AS REQUIRED.
 2. POSTS SHALL BE PLUMB; ANY POST BENT OR OTHERWISE DAMAGED SHALL BE REMOVED AND PROPERLY PLACED.
 3. POSTS MAY BE SET OR DRIVEN. WHEN POSTS ARE SET, HOLES SHALL BE DUG TO THE PROPER DEPTH; AFTER INSERTING POSTS, THE HOLES SHALL BE BACKFILLED WITH SUITABLE MATERIAL IN LAYERS NOT TO EXCEED 6" DEEP AND THOROUGHLY COMPACTED, CARE BEING TAKEN TO PRESERVE THE ALIGNMENT OF THE POST. WHEN POSTS ARE DRIVEN, A SUITABLE DRIVING CAP SHALL BE USED AND AFTER DRIVING THE TOP OF THE POST; BATTERING HEADS WILL NOT BE ACCEPTED. POST SHALL NOT BE DRIVEN WITH THE SIGN ATTACHED TO THE POST.

2 SIGN DETAIL
D4 NOT TO SCALE

- GENERAL NOTES:**
1. ALL WORDS AND SYMBOLS SHALL BE RETROREFLECTIVE WHITE AND SHALL CONFORM TO THE LATEST VERSION OF THE MUTCD.
 2. MULTI-WORD MESSAGES SHALL READ "UP"; THAT IS, THE FIRST WORD SHALL BE NEAREST THE APPROACHING DRIVER.
 3. THE WORD "ONLY" SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS, AND SHALL NOT BE USED ADJACENT TO A BROKEN LANE LINE. A WORD/SYMBOL SHALL PRECEDED THE WORD "ONLY".
 4. PREFORMED WORDS AND SYMBOLS SHALL BE PRE-CUT BY THE MANUFACTURER.
 5. WRONG-WAY ARROWS SHALL NOT BE SUBSTITUTED FOR THROUGH ARROWS.
 6. ALL STOP BARS, WORDS, SYMBOLS AND ARROWS SHALL BE THERMOPLASTIC.



4 PAVEMENT MARKING - WORD AND SYMBOLS
D4 NOT TO SCALE

ITEM 632.32

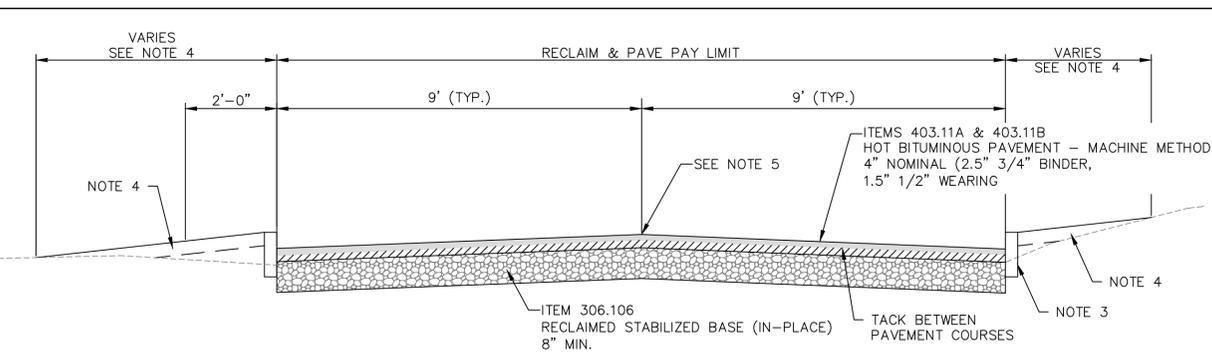
ISSUE FOR	By	Date
BIDDING		
CONSTRUCTION		
RECORD DRAWING		
REVISIONS	APP'D	NO.
Drawn/Chk. RMG	PDM	
Designed		
Checked		
Approved		
Date	MARCH 2024	
Book No.		
Project No.	2552	
Dwg. ID	2552_details_M	
Scale		

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UNDERWOOD engineers
25 Vaughan Mall, Portsmouth, N.H. 03801
Tel. 603-436-6192 Fax. 603-431-4733

TRAFFIC CONTROL SIGNS & PAVEMENT MARKINGS
MAPLEWOOD AVE - DRAINAGE INTERCEPT
CITY OF PORTSMOUTH
PORTSMOUTH, NEW HAMPSHIRE

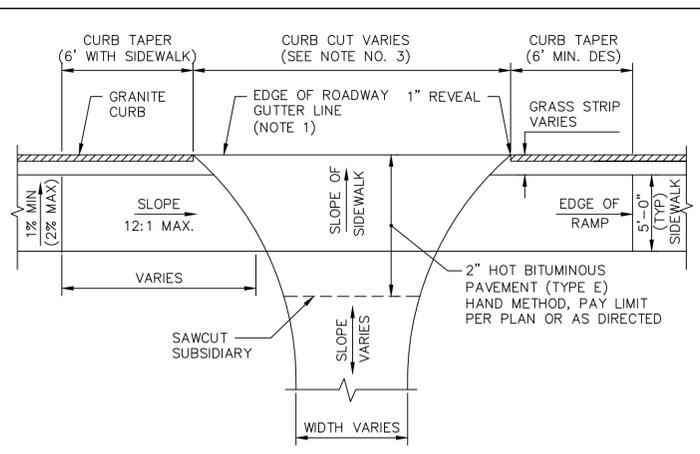
DWG NO	SHEET
D4	12 OF 14



ROAD RE-CONSTRUCTION NOTES:

1. SAWCUT DRIVEWAYS AND CONSTRUCT DRIVEWAY APRON FOLLOWING CONSTRUCTION OF PAVEMENT BINDER COURSE (SEE DRIVEWAY APRON DETAILS, THIS DRAWING).
2. GRADE RECLAIM (UNIFORMLY) TO MINIMIZE IMPACTS TO DRIVEWAYS AND SIDE SLOPES. REVIEW GRADING WITH ENGINEER IN ADVANCE OF RECLAIM. RECLAIM AT 10" DEPTH, REMOVE AND DISPOSE OF SURPLUS RECLAIM WHERE DIRECTED TO MINIMIZE GRADING IMPACTS, SUBSIDIARY. TYPICAL CROSS SLOPE = 3% UNLESS DIRECTED OTHERWISE.T. SUBSIDIARY.
3. INSTALL GRANITE CURB (WHERE DIRECTED), ITEM 609.01. SEE DETAIL **6 D5**.
4. LOAM, SEED & MULCH ROADSIDE SLOPES, PAY AS ITEM 912.
5. ALL SEAMS AND JOINTS SHALL BE RAKED AND LUTED PRIOR TO COMPACTION AND ROLLING.

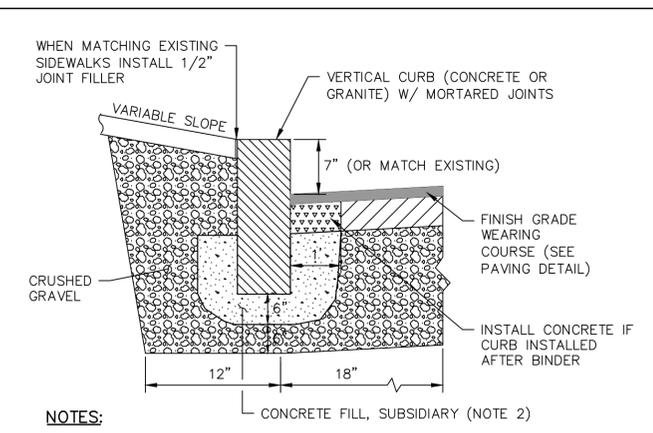
1 D5 TYPICAL ROADWAY SECTION - RAILROAD EASEMENT AREA
NOT TO SCALE



PLAN VIEW WITH SIDEWALK RAMP

NOTES:

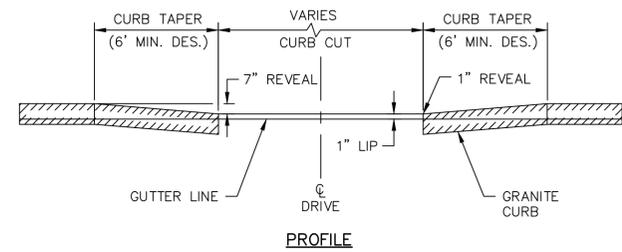
1. ALL PAVEMENT MATCHES AT DRIVEWAY SHALL BE SAWCUT AND KEYED FOR SMOOTH TRANSITION (SUBSIDIARY)



NOTES:

1. DAMAGED OR IMPACTED CURB (WHETHER GRANITE OR CONCRETE) IS TO BE REPLACED AT THE CONTRACTORS OWN EXPENSIVE, UNLESS OTHERWISE NOTED ON PLAN.
2. CLASS AA CONCRETE FILL SHALL BE PLACED IN VOIDS IN FRONT, BEHIND, AND BELOW CURBING PRIOR TO INSTALLATION OF GRAVEL BACKING AND FINISH GRADE WEARING COURSE PAVEMENT.

6 D5 VERTICAL CURB (NEW OR RESET) (GRANITE OR CONCRETE)
NOT TO SCALE

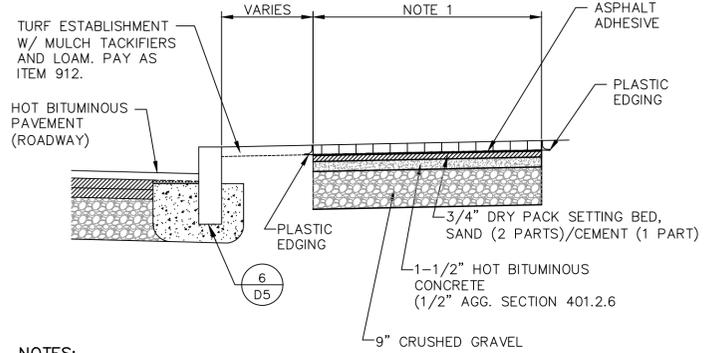


PROFILE

DRIVEWAY NOTES:

1. PAVEMENT & GRAVEL DEPTHS FOR RESIDENTIAL DRIVES SHALL BE 8" CRUSHED GRAVEL WITH 2" H.B.P. (HAND METHOD) SINGLE COURSE.
2. CURBING CAN BE FLARED TO FIT DRIVE RADII IF APPROPRIATE OR ENDED AS DETAILED ABOVE.
3. DRIVEWAY CURB CUTS SHALL MATCH EXISTING APRON WIDTHS UNLESS OTHERWISE DIRECTED.
4. FOR UNPAVED DRIVES, THE PAVED APRON NORMALLY ENDS AT THE RADIUS TANGENT POINT OR BACK OF SIDEWALK, WHICHEVER IS GREATER.

4 D5 DRIVEWAY APRON/CURB CUT (FINAL GRADING PLAN)
NOT TO SCALE



NOTES:

1. RE-CONSTRUCT CURB AND SIDEWALKS IMPACTED FROM CONSTRUCTION OR WHERE DIRECTED. CURB AND SIDEWALKS DAMAGED OUTSIDE TRENCH LIMITS (THREE- FEET FROM OUTSIDE OF PIPE) SHALL BE RESTORED AT CONTRACTOR'S COST AND WILL NOT BE MEASURED FOR PAYMENT.

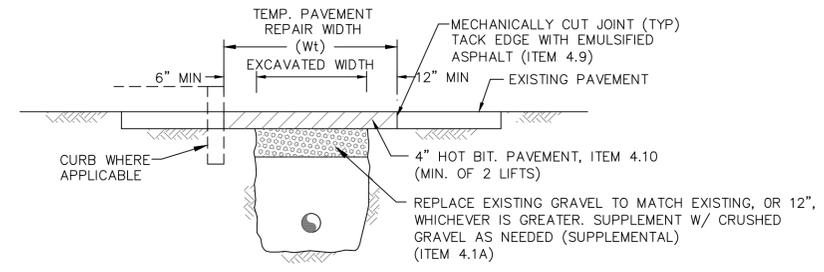
7 D5 BRICK SIDEWALK DETAIL (NEW OR RECONSTRUCT)
NOT TO SCALE

MINIMUM TRENCH PAVEMENT WIDTHS

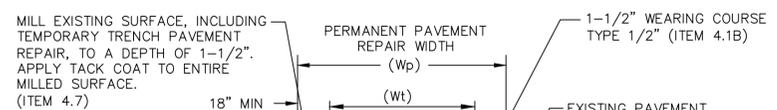
PIPE I.D.	Wt (INCHES)	Wp (INCHES)
1-21 INCHES	84	108
24-30 INCHES	96	120
> 30 INCHES	108	132

NOTE:

THE DIMENSIONS SHOWN SHALL BE CONSIDERED MAXIMUM PAVEMENT PAYMENT WIDTHS FOR 0-10' DEEP CONSTRUCTION. Wt AND Wp SHALL BE INCREASED BY 4'-0" FOR TRENCHES 10' TO 15' AND BY 8'-0" FOR TRENCHES 15' TO 20' IN DEPTH.



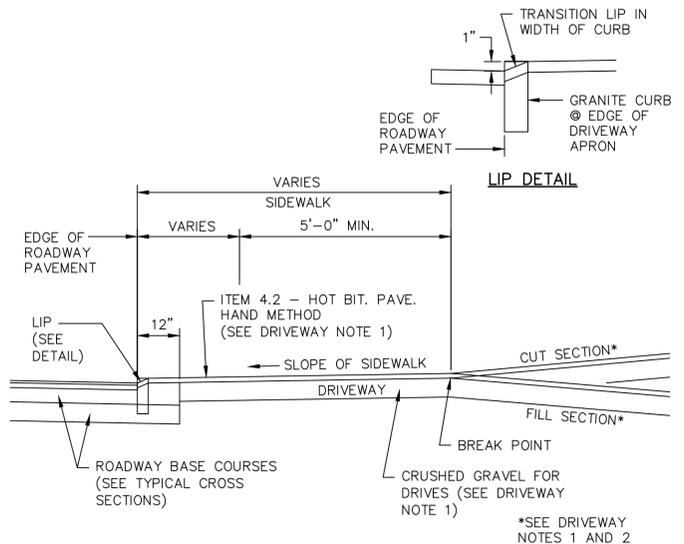
2 D-5 TEMPORARY TRENCH PAVEMENT REPAIR
NOT TO SCALE



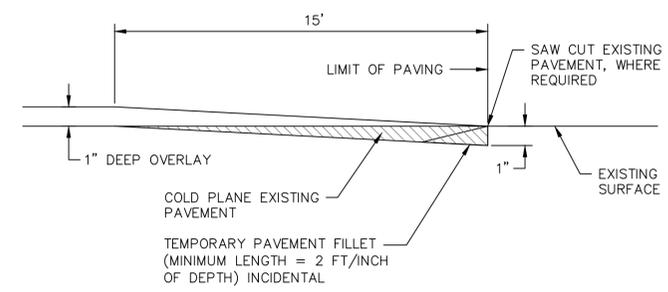
NOTES:

1. ALL PAVEMENT REMOVAL SHALL BE PRECEDED BY MACHINE CUTTING.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. SEE TABLE IN "TEMPORARY TRENCH PAVEMENT REPAIRS" FOR MINIMUM TRENCH WIDTHS.

3 D-5 PERMANENT TRENCH PAVEMENT REPAIR
NOT TO SCALE



5 D5 TYPICAL URBAN CURBED DRIVE IN CUT/FILL SECTION
NOT TO SCALE



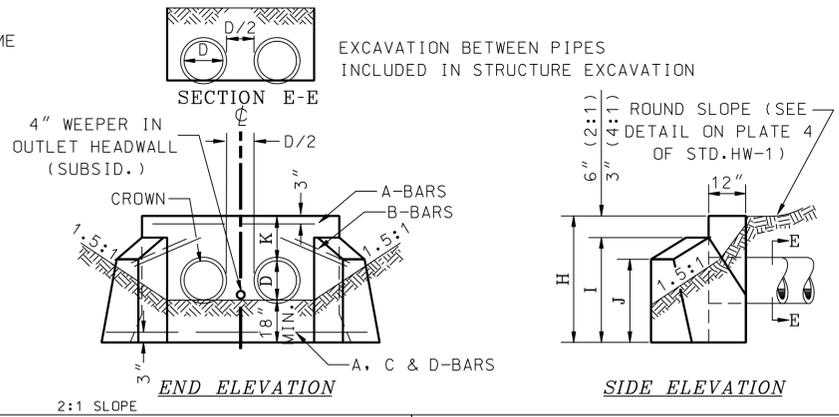
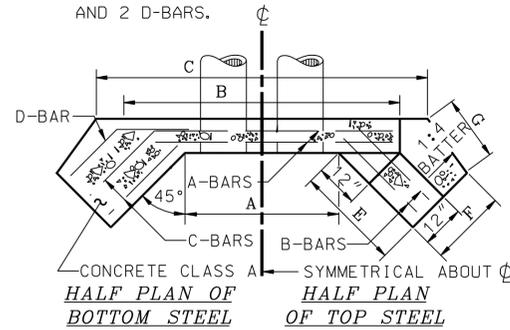
NOTES:

THE LENGTH OF THE TAPER MAY BE ADJUSTED AS ORDERED TO PROVIDE FOR VARYING FIELD CONDITIONS OR CHANGES IN SINGLE COURSE DEPTH.

8 D5 OVERLAY PAVEMENT MATCH
NOT TO SCALE

ISSUE FOR BIDDING	By	Date
CONSTRUCTION	By	Date
RECORD DRAWING	By	Date
REVISIONS	APP'D	
NO.		
Drawn/Chk. RMG	Designed PDM	Checked
Approved	Date MARCH 2024	Book No.
Project No. 2552	Dwg. ID 2542 details	Scale
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UNDERWOOD engineers		
25 Vaughan Mall, Portsmouth, N.H. 03801 Tel. 603-436-6192 Fax. 603-431-4733		
ROADWAY AND SIDEWALK DETAILS		
MAPLEWOOD AVE - DRAINAGE INTERCEPT		
CITY OF PORTSMOUTH		
PORTSMOUTH, NEW HAMPSHIRE		
DWG NO	SHEET	
D5	13 OF 14	

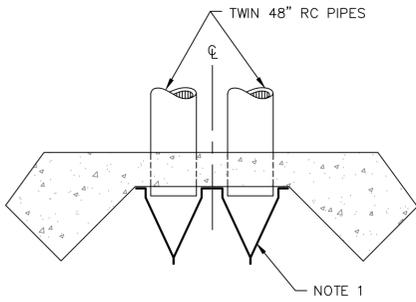
NOTE:
ALL LIKE BARS IN EACH HEADWALL ARE THE SAME SIZE. EACH STD. HEADER HAS 4 A, B & C-BARS, AND 2 D-BARS.



DIA. D INCHES	QUANTITIES PER HEADER			DIMENSIONS											REINFORCING STEEL										
	CONC. CU. YD.	STEEL LB.	EXC. FOR 1' DEPTH CU. YD.	A	B	C	E	F	G	H	I	J	K	D/2	SIZE	LENGTH				D-BARS, D1					
24	2.44	46	1.96	6'-0"	8'-10"	10'-0"	3'-0"	1'-11"	2'-3"	5'-0"	4'-6"	3'-10"	1'-6"	1'-0"	#4	8'-6"	3'-2"	3'-0"	4'-8"	2'-5"	2'-3"				
30	3.18	53	2.28	7-5	10-3	11-9	3-7	2-0	2-9	5-6	5-0	4-1	1-6	1-3	#4	9-11	3-9	3-7	5-3	2-6	2-9				
36	3.99	61	2.69	8-10	11-8	13-7	4-2	2-1	3-3	6-0	5-6	4-4	1-6	1-6	#4	11-4	4-3	4-1	5-10	2-8	3-2				
42	5.43	161	3.22	10-3	13-1	15-6	5-1	2-2	4-0	6-9	6-3	4-10	1-9	1-9	#6	12-9	5-3	4-11	7-10	3-10	4-0				
48	6.53	180	3.64	11-8	14-6	17-3	5-9	2-3	4-6	7-3	6-9	5-1	1-9	2-0	#6	14-2	5-11	5-7	8-5	3-10	4-7				
54	7.76	197	4.00	13-1	15-11	19-1	6-4	2-4	5-0	7-9	7-3	5-4	1-9	2-3	#6	15-7	6-7	6-1	9-2	4-1	5-1				
60	9.10	214	4.45	14-6	17-4	20-10	6-11	2-5	5-6	8-3	7-9	5-8	1-9	2-6	#6	17-0	7-1	6-8	9-9	4-1	5-8				
66	10.56	232	4.84	15-11	18-9	22-5	7-6	2-6	6-0	8-9	8-3	5-11	1-9	2-9	#6	18-5	7-8	7-3	10-5	4-2	6-3				
72	12.28	249	5.25	17-4	20-2	24-2	8-2	2-7	6-6	9-3	8-9	6-3	1-9	3-0	#6	19-10	8-3	7-10	11-0	4-3	6-9				

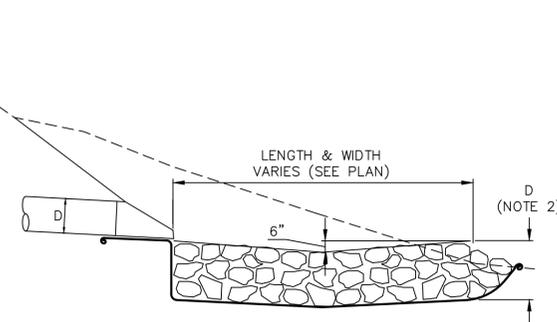
DIA. D INCHES	QUANTITIES PER HEADER			DIMENSIONS											REINFORCING STEEL										
	CONC. CU. YD.	STEEL LB.	EXC. FOR 1' DEPTH CU. YD.	A	B	C	E	F	G	H	I	J	K	D/2	SIZE	LENGTH				D-BARS, D1					
24	3.05	53	2.29	6'-0"	8'-10"	10'-0"	3'-11"	2'-1"	3'-2"	5'-0"	4'-9"	4'-3"	1'-6"	1'-0"	#4	8'-6"	4'-3"	4'-0"	5'-6"	2'-6"	3'-0"				
30	3.92	61	2.70	7-5	10-3	11-9	4-8	2-2	3-9	5-6	5-3	4-7	1-6	1-3	#4	9-11	5-0	4-8	6-3	2-8	3-7				
36	5.09	70	3.15	8-10	11-8	13-7	5-5	2-3	4-5	6-0	5-9	5-0	1-6	1-6	#4	11-4	5-9	5-4	7-1	2-10	4-3				
42	6.97	185	3.78	10-3	13-1	15-6	6-7	2-5	5-4	6-9	6-6	5-6	1-9	1-9	#6	12-9	6-11	6-5	9-3	4-0	5-3				
48	8.44	204	4.24	11-8	14-6	17-3	7-4	2-6	6-0	7-3	7-0	5-11	1-9	2-0	#6	14-2	7-8	7-1	10-1	4-2	5-11				
54	10.13	225	4.74	13-1	15-11	19-1	8-2	2-7	6-9	7-9	7-6	6-3	1-9	2-3	#6	15-7	8-6	7-10	10-11	4-3	6-8				
60	11.90	245	5.23	14-6	17-4	20-10	8-11	2-8	7-4	8-3	8-0	6-7	1-9	2-6	#6	17-0	9-3	8-8	11-9	4-4	7-5				
66	13.87	266	5.75	15-11	18-9	22-5	9-8	2-9	8-0	8-9	8-6	7-0	1-9	2-9	#6	18-5	10-0	9-5	12-8	4-7	8-1				
72	16.13	283	6.29	17-4	20-2	24-2	10'-6"	2'-10"	8'-8"	9'-3"	9'-0"	7'-4"	1'-9"	3'-0"	#6	19'-10"	10'-10"	9'-9"	13'-5"	4'-8"	8'-9"				

1 CONCRETE HEADWALLS WITH 45° WINGS FOR TWIN R.C. PIPE (48" DIA. W/4:1 SLOPE)
D6 NOT TO SCALE

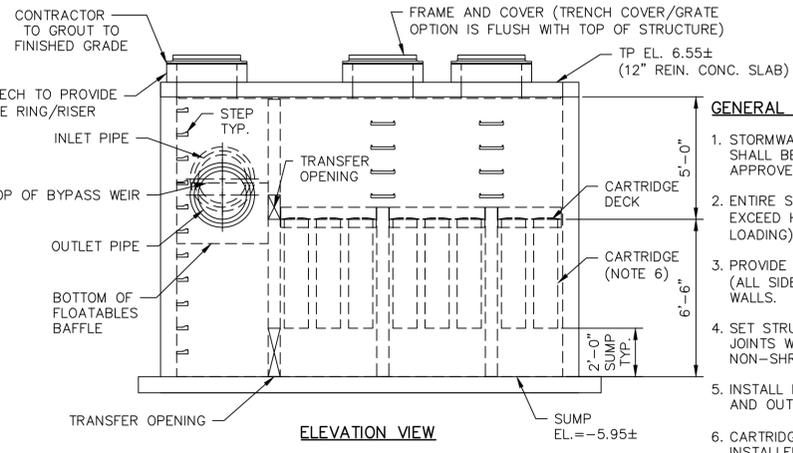
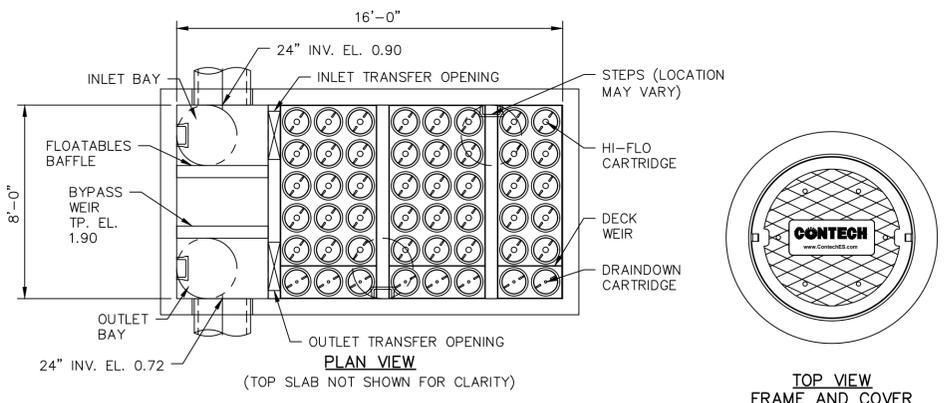


NOTES:
1. TIDE VALVES SHALL BE TIDE FLEX TF-1 OR APPROVED EQUAL. ATTACH DIRECTLY TO HEADWALL USING THIMBLE PLATE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. PROVIDE THIMBLE PLATE INSTALLATION DETAILS OR RECOMMENDED ALTERNATIVE. THE TIDE VALVES WILL BE MOUNTED TO THE HEADWALL

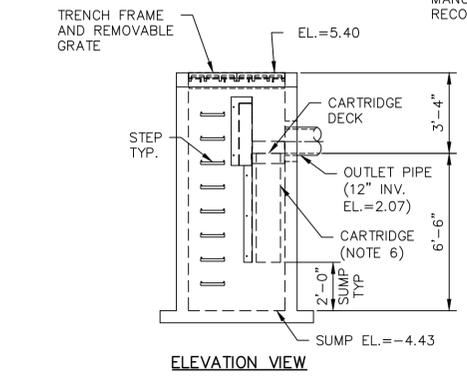
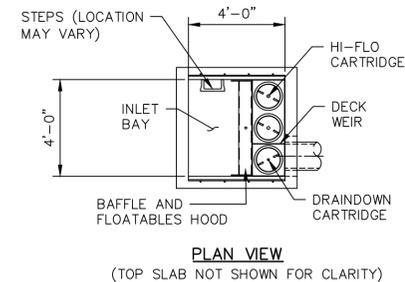
2 TIDE VALVE DETAIL
D6 NOT TO SCALE



6 STABILIZED DRAIN OUTLET
D6 NOT TO SCALE



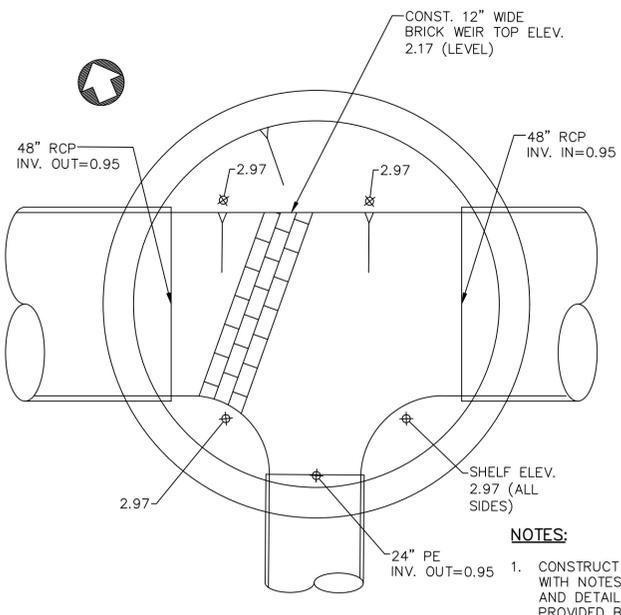
4 JELLYFISH (JFPD0816) DETAILS
D6 NOT TO SCALE



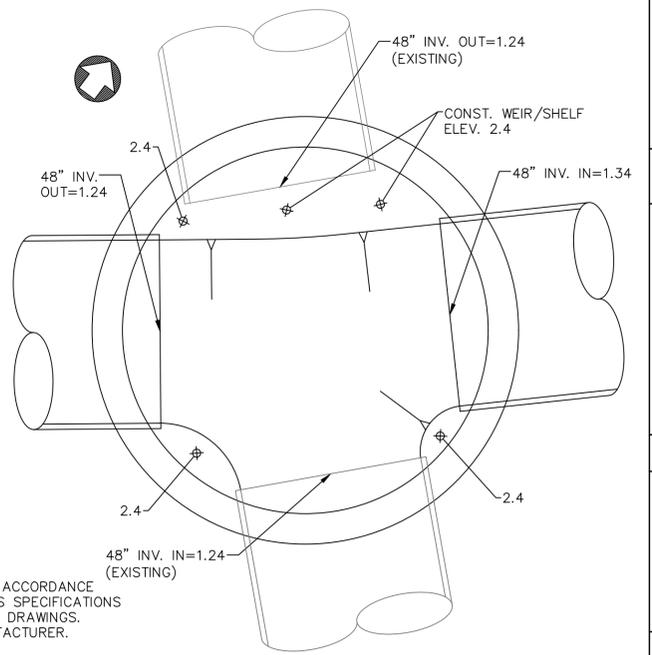
7 JELLYFISH (JFSI0404) DETAILS
D6 NOT TO SCALE

GENERAL NOTES:
1. STORMWATER TREATMENT STRUCTURE SHALL BE PROVIDED BY CONTECH OR APPROVED EQUIVALENT.
2. ENTIRE STRUCTURE SHALL MEET OR EXCEED HS-20 RATING (HEAVY LOADING).
3. PROVIDE ANTI-FLOTATION COLLARS (ALL SIDES), TO EXTEND 12" BEYOND WALLS.
4. SET STRUCTURE LEVEL. SEAL ALL JOINTS WITH APPROVED SEALANT OR NON-SHRINK GROUT.
5. INSTALL FLEXIBLE BOOT AT INLET AND OUTLET.
6. CARTRIDGE LENGTH SHALL BE 54", INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

GENERAL NOTES:
1. STORMWATER TREATMENT STRUCTURE SHALL BE PROVIDED BY CONTECH OR APPROVED EQUIVALENT.
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6. CARTRIDGE LENGTH SHALL BE 54", INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



3 DMH#1E
D6 NOT TO SCALE



5 DMH#3
D6 NOT TO SCALE

NOTES:
1. CONSTRUCT DMH IN ACCORDANCE WITH NOTES, DETAILS SPECIFICATIONS AND DETAILED SHOP DRAWINGS. PROVIDED BY MANUFACTURER.
2. FORM BRICK CHANNEL TO SPRING LINE AND CONSTRUCT SHELF TO ELEVATIONS PROVIDED.
3. CONST. BRICK WEIR OR REMOVABLE PLATE WEIR TO ELEVATION PROVIDED.

ISSUE FOR	By	Date	REVISIONS
BIDDING			
CONSTRUCTION			
RECORD DRAWING			

FOR REVIEW
MARCH 2024
NOT FOR CONSTRUCTION

DRAINAGE OUTFALL DETAILS
MAPLEWOOD AVE - DRAINAGE INTERCEPT
CITY OF PORTSMOUTH
PORTSMOUTH, NEW HAMPSHIRE