LONGMEADOW CONSERVATION COMMISSION

NOTICE OF INTENT (NOI) FILING INSTRUCTIONS

Under the Longmeadow Wetlands Bylaw, if you intend to "…remove, fill, dredge, alter or build upon or within 100 feet of any bank, fresh water wetland beach, flat marsh, wet meadow, bog, swamp or upon any or within 100 feet of any brook, creek, river, stream (intermittent or otherwise), pond or lake, or upon or within 100 feet of any land subject to flooding or inundation, or within 100 feet of the 100 year flood line…" you must first apply for a permit and, if received, abide by the conditions imposed by that permit.

Note that if the stream flows throughout the year, the Massachusetts Rivers Protection Act extends protection to 200 feet from the annual high-water line.

If in doubt about the applicability of the Wetlands Protection Act, you may submit a Request for Determination of Applicability (WPA Form 1) for the project site. Please see RDA Filing Instructions on our website.

All Notice of Intent (NOI) applications must be completed in order for the process to begin. eDEP Online Filing is recommended. Please use the checklist below to create the various sets of documents:

Set #1 for: Longmeadow Conservation Commission *20 Williams St.* *Longmeadow, MA 01106*	☑ Eight (8) Copies of a completed Notice of Intent (WPA Form 3 or Form 4), each accompanied by: o Narrative description of the work to be performed. o A U.S. Geological Map and a Town Map marked to show the project location. o Site maps and plans with distances and other measurements as required to reflect the location and scope of work and its proximity to the protected resource areas. ☑ Fees payable by check per the Wetlands Fee Transmittal Form: o One (1) copy of the check made payable to Commonwealth of Massachusetts (amount determined in transmittal form, the original check is to be mailed by the applicant per the transmittal form's instructions). o One (1) original plus one (1) copy of check made payable to Town of Longmeadow (amount determined in transmittal form). o One (1) original check payable to the Town of Longmeadow in the amount of $25 as required by the Town's Wetlands Bylaw. ☑ One (1) copy of the list of abutter names and addresses. ☑ One (1) copy of the completed "Notification to Abutters" form found on our website. ☑ One (1) copy of the completed "Affidavit of Service" form found on our website. NOTE: The applicant shall present either the certified mail receipts or certificate of mailing receipts for all abutters at the beginning of the public hearing.
Set #2 for: MA Department of Environmental Protection *PO Box 4062* *Boston, MA 02211*	☑ One (1) copy of a completed Wetland Fee Transmittal Form (WPA Appendix B, pages 1 and 2 only). ☑ Original check for the state fee as calculated in the Transmittal Form.

Set #3 for: MA DEP Western Region *436 Dwight St.* *Suite 500* *Springfield, MA 01103*	☑ One (1) copy of the completed Notice of Intent including supporting plans and documents, one copy of the NOI Wetland Transmittal Form and a copy of the state fee payment by certified mail or hand delivery.
Set #4 for each abutter of the property on which the work is to be performed.	☑ One (1) copy of the completed "Notification for Abutters" form. Obtain abutters' mailing addresses from Assessors' Department.
Set #5 if applicable, for: Natural Heritage & Endangered Species Program, Division of Fisheries and Wildlife *1 Rabbit Hill Rd* *Westborough, MA 01581*	☐ One (1) copy of the Notice of Intent.

If you have any questions or require further assistance, please call us at (413) 565-4100, Ext 1323 or contact us via e-mail at concom@longmeadow.org.

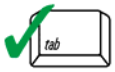
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Longmeadow
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Magnolia Circle (a. Street Address) | Longmeadow (b. City/Town) | 01106 (c. Zip Code)

Latitude and Longitude: 42.047013 (d. Latitude) | -72.561219 (e. Longitude)

(f. Assessors Map/Plat Number) | 3744 (g. Parcel /Lot Number)

2. Applicant:

Timothy (a. First Name) | Keane (b. Last Name)

Town of Longmeadow (c. Organization)

31 Pondside Road (d. Street Address)

Longmeadow (e. City/Town) | MA (f. State) | 01106 (g. Zip Code)

413-567-3400 x3204 (h. Phone Number) | (i. Fax Number) | tkeane@longmeadow.org (j. Email Address)

3. Property owner (required if different from applicant): ☐ Check if more than one owner

(a. First Name) | (b. Last Name)

(c. Organization)

(d. Street Address)

(e. City/Town) | (f. State) | (g. Zip Code)

(h. Phone Number) | (i. Fax Number) | (j. Email address)

4. Representative (if any):

Justin (a. First Name) | Skelly (b. Last Name)

DPC Engineering, LLC (c. Company)

22 Northfield Road (d. Street Address)

Longmeadow (e. City/Town) | MA (f. State) | 01106 (g. Zip Code)

203-605-3470 (h. Phone Number) | 413-451-1030 (i. Fax Number) | justin.skelly@dpcengineering.com (j. Email address)

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

EXEMPT (a. Total Fee Paid) | EXEMPT (b. State Fee Paid) | EXEMPT (c. City/Town Fee Paid)

Massachusetts Department of Environmental Protection
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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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A. General Information (continued)

6. General Project Description:

Replacement of approximately 25 linear feet (LF) of existing 8-inch drain pipe (with 12-inch drain pipe), 250 LF of existing 15-inch drain pipe, 225 LF of existing 18-inch drain pipe (with 24 and 30-inch drain pipe), four catch basins, and installation of one new drain manhole and concrete headwall at the outfall

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(3)(k)
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Hampden
a. County

b. Certificate # (if registered land)

20280
c. Book

0469
d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Massachusetts Department of Environmental Protection
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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	90 (1. linear feet)	90 (in-situ) (2. linear feet)
b. ☒ Bordering Vegetated Wetland	1,190 (1. square feet)	1,190 (in-situ) (2. square feet)
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Longmeadow Brook - Inland (1. Name of Waterway (if available) - **specify coastal or inland**)	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 5,720 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
4,510	590	3,920

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

0
a. number of new stream crossings

0
b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

August 2017
b. Date of map

If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area _____ percentage/acreage

(b) outside Resource Area _____ percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing.
a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☐ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☒ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☒ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

MAGNOLIA CIRCLE DRAINAGE IMPROVEMENTS PROJECT
a. Plan Title

DPC Engineering, LLC
b. Prepared By

David R. Prickett
c. Signed and Stamped by

August 4, 2020
d. Final Revision Date

1" = 10'
e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☐ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name

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Provided by MassDEP:

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Timothy F Lu 1. Signature of Applicant	8/5/2020 2. Date
3. Signature of Property Owner (if different)	4. Date
Justin Kelly 5. Signature of Representative (if any)	8/5/2020 6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

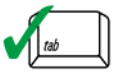
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

Magnolia Circle	Longmeadow
a. Street Address	b. City/Town
	EXEMPT
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Timothy	Keane	
a. First Name	b. Last Name	
Town of Longmeadow		
c. Organization		
31 Pondside Road		
d. Mailing Address		
Longmeadow	MA	01106
e. City/Town	f. State	g. Zip Code
413-567-3400 x3204		tkeane@longmeadow.org
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name	
c. Organization		
d. Mailing Address		
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee

Step 5/Total Project Fee: _____

Step 6/Fee Payments:

Total Project Fee: EXEMPT
a. Total Fee from Step 5

State share of filing Fee: _____
b. 1/2 Total Fee **less $**12.50

City/Town share of filling Fee: _____
c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Appendix A
Project Narrative

TABLE OF CONTENTS

1. INTRODUCTION

On behalf of the Town of Longmeadow (the Town) Department of Public Works (DPW), we are submitting this Notice of Intent (NOI) for the Magnolia Circle Drainage Improvements Project to fulfill the requirements of the Massachusetts Wetlands Protection Act (MGL Ch. 131, S.40) and its regulations (310 CMR 10.00). An Order of Conditions is required for this Project, as the work will occur within the Riverfront Area of the Longmeadow Brook perennial stream, Bordering Vegetated Wetlands, and Inland Bank.

Copies of WPA Form 3 and the Town of Longmeadow NOI Checklist are provided prior to Appendix A. A site plan (Figure 1) illustrating the subject site and surrounding area is provided in Appendix B.

1.1 PROJECT BACKGROUND AND SUMMARY

The existing drainage system located on Magnolia Circle consists of 8-inch VC, and 15 and 18-inch RCP that contributes stormwater flows into the Longmeadow Brook. Based on performance of the existing drainage system during high flow conditions it is evident that the existing drainage system is undersized, resulting in restrictions to flow conveyance and causing upstream flooding and washouts at the outfall.

The replacement of the drainage system is necessary in order to prevent failure of the roadway/easement and utilities, including water, sewer, and gas lines. Failure of the roadway would almost certainly affect all these services simultaneously, resulting in an extreme emergency situation.

Road restoration, slope stabilization and maintaining access for all residents and emergency vehicles during construction will be an important aspect of the Project. The proposed plan consists of replacement of approximately 25 linear feet (LF) of existing 8-inch drain pipe (with 12-inch drain pipe), 250 LF of existing 15-inch drain pipe, 225 LF of existing 18-inch drain pipe (with 24 and 30-inch drain pipe), four catch basins, installation of one new drain manhole and concrete headwall at the outfall, and construction of a gravel access road for maintenance activities.

Throughout the construction process, the utilities (water, sewer, drain, gas) will remain in service and access will be maintained for residents, school buses, and emergency vehicles. Any pavement/landscape disturbed due to construction will be returned to the original condition once the Project has been completed.

The following sections describe the existing and proposed conditions, including protective measures consistent with standard engineering practices.

2. EXISTING ENVIRONMENT

2.1 GENERAL

This section provides a site description and resource area characterization for the Project area. Land use in the general vicinity of the Project area was determined based on direct observations made during site inspections and a review of information available through the Massachusetts Geographic Information System (MassGIS).

All work proposed in this NOI is located entirely in the Town of Longmeadow, in a residential neighborhood. The Town owns a permanent 50' easement for the portion of the Project area that is off of the paved roadway.

The United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey of Hampden County, Massachusetts, Central Part depicts the Project area as being comprised solely of Urban, Hinckley and Windsor soils.

2.2 METHODOLOGY OF RESOURCE AREA INVESTIGATIONS

An evaluation of wetland resource areas was conducted by Jim McManus of JMM Wetland Consulting Services, LLC in August 2019. Resource areas in the vicinity of the proposed work were delineated in accordance with Massachusetts Department of Environmental Protection (MADEP) guidelines and 310 CMR 10.00. A copy of the delineation report is included as Appendix D. Wetland resource area flag locations were located using traditional survey.

According to FEMA Flood Insurance Rate Map (FIRM) No. 25013C0416E (effective date: July 16, 2013), the Project site is not within the 100-year flood zones.

2.3 DESCRIPTION OF WETLAND RESOURCE AREAS

Wetland resource areas observed near the Project area consist of a perennial stream (Longmeadow Brook) and associated Riverfront Area, Inland Bank and Bordering Vegetated Wetland (BVW). Descriptions of these resource areas are provided in the following sections.

2.4 RARE SPECIES

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas, 14th edition, effective August 1, 2017, and MassGIS online mapping (data updated August 2017) were consulted during the preparation of this NOI. According to these sources, the proposed Project area is not located within the limits of mapped Priority Habitats of Rare Species or Estimated Habitats of Rare Wildlife, and there are no Certified Vernal Pools with the vicinity of the Project. The proposed Project area in relation to the NHESP Priority Habitats of Rare Species is shown in Figure 2 in Appendix B.

3. PROPOSED ACTIVITIES

3.1 PROPOSED WORK

The proposed plan to upgrade the existing undersized drainage system consists of the replacement of approximately 25 linear feet (LF) of existing 8-inch drain pipe (with 12-inch drain pipe), 250 LF of existing 15-inch drain pipe, 225 LF of existing 18-inch drain pipe (with 24 and 30-inch drain pipe), four catch basins, installation of one new drain manhole and concrete headwall at the outfall, an construction of a gravel access road for maintenance activities. Portions of the existing drain pipes are located in and off of the road on Magnolia Circle, and along an easement toward Longmeadow Brook.

Throughout the construction process, the utilities (water, sewer, drain and gas) will remain in service and access will be maintained for residents, school buses, and emergency vehicles. Any landscaping disturbed due to construction will be returned to the original condition once the Project has been completed.

The construction sequence is anticipated as follows:

- Install all erosion control measures and notify DigSafe. Notify Conservation Commission of the commencement of work.
- Remove all vegetation as needed in the work zone.
- Remove all vegetation and debris from existing drainage system as required to perform the work.
- Perform removal and replacement of undersized drain piping, replacement of catch basins and installation of new drain manhole.
- Install new concrete headwall structure.
- Repair slopes.
- Install riprap as shown.
- Construction gravel access road.
- Loam and seed all disturbed areas, and install erosion control fabric.
- In-situ restoration of wetlands resource areas.
- Remove construction vehicles and restore disturbed areas to the pre-construction condition.
- Remove erosion control measures after site has been fully stabilized.

The above sequence may change and some tasks may be performed concurrently. The final sequence of construction will be determined by the selected contractor and advising parties. Full-size Project plans illustrating the proposed activities have been provided as part of this NOI under separate cover.

3.2 PROTECTIVE MEASURES

Wetland resource areas at the site will be protected by appropriate sedimentation and erosion controls. Erosion control details are provided on the Project drawings, which have been submitted under separate cover. After vegetation removal and grading is complete, the disturbed areas will be loamed and seeded. Erosion controls will be removed after the area has adequately stabilized with vegetation. If invasive species are encountered, they will be removed and replaced with native species. The overall Project will improve the quality and capacity of the Magnolia Circle

drainage system, improve safety for area residents, and protect the Longmeadow Brook perennial stream.

3.3 MITIGATION

3.3.1 Mitigation Plan

The design of this Project includes the restoration of all wetland resource areas to their existing pre-construction conditions, with no adverse impacts to existing resource areas expected. In order to offset the temporary impacts that will be incurred by the Project (i.e. construction vehicle mat laydown areas), in-situ restoration and enhancement of resource areas is proposed.

Mitigation at this location shall consist of the in-situ improvement of the riparian buffer along and in the Longmeadow Brook perennial stream. The area will be seeded with native erosion control seed mixes suited to the appropriate hydrologic regime. The seed mixes will be hand broadcast at a rate of 1.5 times the recommended application rate. If invasive species are encountered, they will be removed and replaced with native species.

The subsections to follow outline the technical approach for ensuring that the restoration will conform to the applicable requirements of the MADEP's Inland Wetland Replication Guidelines. As no net loss of wetlands will occur, no creation of a separate functioning wetland system is proposed.

3.3.1.1 Proposed Hydrology

No changes in the existing hydrology of the Project area is proposed. Pre-existing wetlands hydrology will be preserved through careful placement of backfill and grading to ensure consistency with pre-construction micro-topography and substrate composition.

3.3.1.2 Proposed Soil Structure

Soil structure and composition will be restored through methodical segregation of the soil profile during excavation. Stream bottom characteristics will be restored. Soils will be side-cast immediately adjacent to each section of pipe to be installed, and soils will be backfilled once the pipe is tested for integrity.

3.3.1.3 Proposed Plant Community

A single habitat type is proposed for the restored BVW areas: palustrine emergent. The plant communities of the restored areas will be consistent with the existing communities exhibited. Due to the fact that thick, woody vegetation is largely incompatible with routine inspection and maintenance of the underground utilities, herbaceous communities are proposed for all BVW restoration areas. No seeding other than annual rye is proposed, as it is anticipated the seed bank of the on-site soils will yield a plant community consistent with the existing soil chemistry and hydrologic regime. The annual rye is intended for soil stabilization only.

3.3.1.4 Proposed/Anticipated Functions & Values

Successful restoration of the Project area will protect the statutory interests that are currently provided by these areas:

- Groundwater supply
- Prevention of pollution
- Protection of wildlife habitat

3.3.1.5 Proposed Abiotic and Biotic Components

Slash generated from vegetation removal in the Project area will be preserved for re-use. Small diameter material (i.e., less than two-inch) will be neatly stacked at the edge of the cleared Project area to provide cover habitat for small mammals, reptiles, and birds. Material generated greater than two inches in diameter will be cut to approximately five-foot lengths and randomly scattered on the ground surface of the Project area within BVW and adjacent uplands. The placement of this coarse woody debris is intended to provide cover and basking habitat for small mammals, amphibians, and reptiles. Any stones generated from excavation will be placed in the same manner as the coarse woody debris, and at the discretion of the Contractor so as not to preclude vehicle movement.

3.3.2 Mitigation Schedule & Sequence

The proposed mitigation will be implemented while construction of the replacement drainage system, other utilities and other site features occurs. The designated wetlands specialist will monitor all phases of the restoration activities in the field. The anticipated sequence and timing of wetlands replication is described in the subsections to follow.

3.3.2.1 Excavation, Backfill and Grading

Prior to any earthwork, silt fence and silt socks will be installed around the perimeter of the proposed work area to limit the degree of disturbance from heavy machinery. Soils will be excavated to the specified grades with care taken to segregate topsoil from subsoils. Soils will be side-cast in dry areas of the Project area only. Above-grade vegetative material of invasive plants within the BVW will be physically removed from the Project area prior to the grubbing of additional vegetation and temporary side-casting of soils. After installation of the proposed utilities, backfill (sand bed) will be spread evenly to the specified depths. Following this, the surface soils originally removed from the area will be replaced. The final surface elevation of all wetlands/waterways crossings will correspond to pre-construction grades and natural surrounding topography. Any excess soil left over from these activities will be transported off-site for re-use or appropriate disposal.

Backfill will be spread using low-pressure equipment (likely the bucket of a mechanical excavator) so as not to excessively compact the top 12 inches of placed hydric soil. Slight changes to the planned final surface elevation of restored wetland areas may be made at the discretion of the wetland restoration specialist, depending on field conditions.

3.3.2.2 Mulching

At the discretion of the wetlands restoration specialist, hay bales will be broken apart, and a light coating (i.e., < 1.0”) of hay will be broadcast over exposed soils and seeded areas. It is anticipated that mulching will also serve to detract songbirds from foraging for the broadcast seed.

3.3.2.3 Protection

Upon completion of construction activities within the wetlands restoration area, barricades such as snow fencing will be placed around the restored wetland areas to prevent their disturbance.

3.3.2.4 Post-Construction Monitoring

Post-construction monitoring will be implemented to determine whether restoration efforts are successful in meeting the intent of the specific mitigation objectives and the MassDEP standards and guidelines. Any area not naturally re-vegetating, will again be seeded with a wetland seed mix to stabilize exposed soils. It is intended that the finished substrate and surface conditions of the proposed restoration will mimic pre-construction conditions.

The proponent shall monitor post-construction restoration of the BVW, and shall monitor the status of the restored BVW for up to two (2) consecutive years following construction.

4. REGULATORY COMPLIANCE

4.1 MASSACHUSETTS WETLANDS PROTECTION ACT (MAWPA)

4.1.1 Limited Project Status

The proposed activities qualify and are being submitted for consideration as a Limited Project per 310 CMR 10.53(3)(k):

> *The routine maintenance and repair of road drainage structures including culverts and catch basins, drainage easements, ditches, watercourses and artificial water conveyances to insure flow capacities which existed on the effective date of 310 CMR 10.51 through 10.60 (April 1, 1983).*

The existing drainage structures and pipes were originally constructed in 1955, per plans provided by the Town, dated March 7, 1955.

4.1.2 Performance Standards

The proposed Project includes work within Riverfront Area, Bordering Vegetated Wetlands, Inland and Bank. The General Performance Standards established in the MAWPA regulations for each resource area have been satisfied to the extent possible with the design of this Project. All resource areas will be restored to their existing conditions and no adverse impacts to these areas are expected.

4.1.3 Stormwater Management

This Project is not categorically exempt from the MADEP's Stormwater Management Standards. However, since no new untreated stormwater discharges will occur within jurisdictional areas or the 100-foot Buffer Zone, we believe the Standards are not applicable to this Project. Protective measures to manage erosion and sedimentation during construction have been included in the design of this Project.

4.1.4 Abutter Notification

Abutters were notified in accordance with the Massachusetts Wetlands Protection Act. A copy of the list of abutters and the abutter notification form are provided in Appendix C.

4.2 ALTERNATIVES ANALYSIS

The following project alternatives were considered during the planning and design phases of the proposed project:

Alternative 1: No action. This alternative would not meet the Town's desire to improve the existing drainage system which has experienced historical flooding issues and failures. The replacement of the drainage system is necessary in order to prevent failure of the roadway and utilities, including water, sewer and gas. Complete failure of the drainage system would almost certainly affect all these services simultaneously, resulting in an emergency situation.

Alternative 2: Replacement of the existing drainage system. This alternative will correct deficiencies with the existing drainage system, avoiding imminent failure of the drainage system and surrounding utilities, and reducing frequency of flooding events, all while improving the quality of the Longmeadow Brook perennial stream with in-situ mitigation/replacement of existing wetlands resource areas.

In addition, the preferred alternative was reviewed relative to costs, logistics, the proposed use, and the most current technology.

Costs: The costs associated with the proposed project are commensurate with the proposed activities (i.e. construction of a replacement drainage system and associated utilities) and project purpose.

Logistics: The Town owns the existing drainage system and maintains permanent utility easements. Further, the Town can legally construct underground utilities within public roadway rights-of-way.

Proposed Use: The activities are necessary to fulfill the purpose of the Town's proactive approach to correcting deficiencies with the existing drainage system to avoid failure of existing facilities.

Current Technology: The materials selected for construction are in conformance with the latest engineering best practices and will ensure the continued operation of utilities.

Appendix B
Figures

0 50 100 200 300 Feet

#26 Magnolia Circle

#36 Magnolia Circle

PRIMROSE DRIVE

MAGNOLIA CIRCLE

#200 Merriweather Drive

#15 Magnolia Circle

#46 Magnolia Circle

#51 Magnolia Circle

#218 Merriweather Drive

#189 Magnolia Circle

#56 Magnolia Circle

#65 Magnolia Circle

MERRIWEATHER DRIVE

#181 Magnolia Circle

#77 Magnolia Circle

#64 Magnolia Circle

#230 Merriweather Drive

GLEN BROOK LANE

#246 Merriweather Drive

#95 Magnolia Circle

#84 Magnolia Circle

#296 Kenmore Drive

#94 Magnolia Circle

KENMORE DRIVE

Merriweather Drive Rear

Legend

- Approximate Limits of Proposed Project
- Approximate 200 ft Buffer
- Parcel

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Town of Longmeadow, MA

Figure 1
Magnolia Circle Drainage Improvments
Approximate Project Limits

DPC Engineering, LLC

JOB NO: LONGMEADOW	DRAWN BY: GF
DATE: July 2020	

0 500 1,000 2,000 3,000 Feet

Legend

- NHESP Priority Habitats of Rare Species
- Approximate Limits of Proposed Project
- Parcel

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Town of Longmeadow, MA

Figure 2
Magnolia Circle Drainage Improvements
Priority Habitats of Rare Species

DPC Engineering, LLC

JOB NO: LONGMEADOW	DRAWN BY: GF
DATE: July 2020	

Appendix C
Abutter Information

Progressive solutions for municipal infrastructure

DPC Engineering, LLC
22 Northfield Road
Longmeadow, MA 01106

Phone: 413-567-6310
Fax: 413-451-1030
www.DPCengineering.com

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

(to be submitted to the Massachusetts Department of Environmental Protection and the Longmeadow Conservation Commission when filing a Notice of Intent)

I, James Rivers, hereby certify under the pains and penalties of perjury that on 8/5/2020 (date), I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the DEP Guide to Abutter Notification in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act by the Town of Longmeadow, with the Longmeadow Conservation Commission on 8/5/2020 (date) for the area located on and off of Magnolia Circle adjacent to Longmeadow Brook.

The form of the notification and a list of the abutters to whom it was given and their addresses are attached to this Affidavit of Service.

Name: _____ Date: 8/5/2020

Progressive solutions for municipal infrastructure

DPC Engineering, LLC
22 Northfield Road
Longmeadow, MA 01106

Phone: 413-567-6310
Fax: 413-451-1030
www.DPCengineering.com

Notification to Abutters Under the Massachusetts Wetlands Protection Act

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, you are hereby notified of the following:

A. The name of the applicant is Town of Longmeadow.

B. The applicant has filed a Notice of Intent with the Longmeadow Conservation Commission seeking permission to remove, fill, dredge or alter an area subject to protection under the Wetlands Protection Act (General Laws Chapter 131, Section 40).

C. The address of the lot where the activity is proposed is Magnolia Circle adjacent to Longmeadow Brook.

D. The work proposed is replacement of approximately 25 linear feet (LF) of existing 8-inch drain pipe (with 12-inch drain pipe), 250 LF of existing 15-inch drain pipe, 225 LF of existing 18-inch drain pipe (with 24 and 30-inch drain pipe), four catch basins, and installation of one new drain manhole and concrete headwall at the outfall.

E. Copies of the Notice of Intent may be examined at the Longmeadow Conservation Commission, Town Hall, 20 Williams St., Longmeadow, MA between the hours of 9:00 a.m. to 4:00 p.m., Monday through Friday.

F. Copies of the Notice of Intent may be obtained from either (check one) the applicant ✓ or the applicant's representative ___, by calling this telephone number 413-567-3400 between the hours of 7:30 a.m. and 4:00 p.m. on the following days of the week: Monday through Friday.

G. Information regarding the date, time and place of the public hearing may be obtained from the Longmeadow Conservation Commission by calling 413-565-4100 Ext. 344 between the hours of 9:00 a.m. to 4:00 p.m. Monday through Friday.

NOTE: Notice of the public hearing, including its date, time and place, will be published at least five (5) days in advance in the Springfield Republican.

NOTE: Notice of the public hearing, including its date, time and place, will be posted in the Longmeadow Town Hall not less than forty-eight (48) hours in advance.

NOTE: You may also contact the Longmeadow Conservation Commission at 413-565-4100 Ext. 1323 or the nearest Department of Environmental Protection (DEP) Regional Office for more information about this application or the Wetlands Protection Act. To contact DEP, call:

Central Region: 508-792-7650

Northeast Region: 978-661-7600

Southeast Region: 508-946-2700

Western Region: 413-784-1100

DPC Engineering, LLC
22 Northfield Road
Longmeadow, MA 01106

Phone: 413-567-6310
Fax: 413-451-1030
www.DPCengineering.com

Abutter Names and Addresses

15 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3755 Owner: Natalie Rafferty Owner address: 15 Magnolia Circle	**26 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3739** Owner: Bozorgzadeh Balakhanpour Owner address: 26 Magnolia Circle
36 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3740 Owner: William Dupont Owner address: 36 Magnolia Circle	**46 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3741** Owner: Cort Duda Owner address: 46 Magnolia Circle
51 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3756 Owner: Meryl Darling Owner address: 51 Magnolia Circle	**56 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3742** Owner: Robert Newman Owner address: 56 Magnolia Circle
64 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3743 Owner: Carmela Trustee Daniel Owner address: 64 Magnolia Circle	**65 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3757** Owner: Xuesong Lu Owner address: 65 Magnolia Circle
77 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3758 Owner: Marybeth Bergeron Owner address: 497 Inverness Lane, Longmeadow MA	**84 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3744** Owner: Jon Schoonmaker Owner address: 84 Magnolia Circle
94 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3745 Owner: Gregory Traub Owner address: 94 Magnolia Circle	**95 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3759** Owner: Meyer Weiss Owner address: 95 Magnolia Circle
181 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3763 Owner: Aimee Lynn Leonard Owner address: 181 Magnolia Circle	**189 Magnolia Circle, Longmeadow MA 01106 – Parcel ID 3764** Owner: Theodore Maresh Owner address: 189 Magnolia Circle
200 Merriweather Drive, Longmeadow MA 01106 – Parcel ID 4125 Owner: sunil Sharma Owner address: 200 Merriweather Drive	**218 Merriweather Drive, Longmeadow MA 01106 – Parcel ID 4126** Owner: Adi Scheidle Owner address: 218 Merriweather Drive
230 Merriweather Drive, Longmeadow MA 01106 – Parcel ID 4127 Owner: Ziv Corber Owner address: 230 Merriweather Drive	**246 Merriweather Drive, Longmeadow MA 01106 – Parcel ID 4128** Owner: Brian Schulkin Owner address: 246 Merriweather Drive
Merriweather Drive Rear, Longmeadow MA 01106 – Parcel ID 4150 Owner: John McGowan Owner address: 296 Kenmore Drive, Longmeadow MA	**296 Kenmore Drive, Longmeadow MA 01106 – Parcel ID 3100** Owner: John McGowan Owner address: 296 Kenmore Drive

Appendix D
Wetlands Delineation Report

JMM WETLAND CONSULTING SERVICES, LLC

23 Horseshoe Ridge Road
Newtown, CT 06482
Phone: 203-364-0345
Mobile: 203-994-3428
james@jmmwetland.com
jmmwetland.com

September 22, 2019

Mr. Andrew Krar, P.E.
Town of Longmeadow
31 Pondside Road
Longmeadow, MA 01106

RE: ***Wetland Delineations***
Magnolia Circle, Longmeadow, Massachusetts

JMM Job # 19-2478-MA-1

Dear Mr. Krar:

Pursuant to your request, JMM Wetland Consulting Services, LLC (JMM) conducted a site visit at the above-referenced study site on August 2nd, 2019. The purpose of the site inspection was to delineate regulated resource areas in accordance with both the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40), and its implantation regulations (310 CMR 10.00 et seq.), and the Town of Longmeadow Wetlands By-law and Regulations. Mr. James McManus, Certified Professional Soil Scientist with JMM performed the resource delineations. JMM reviewed an area along Magnolia Circle approximately 300-feet to the north from the proposed drainage pipe repair, and roughly 250 feet southeasterly of Magnolia Circle to the existing outfall of the aforementioned drainage pipe (i.e., JMM study area; see Figure 1, attached).

The delineated resources, which occur at the southeastern section of the study area, is characterized by an existing ditched watercourse. The pipe outfall has collapsed and has resulted in moderately severe erosion in an around the drainage pipe (see photos 1-3). JMM-#-series wetland boundary markers (i.e., JMM-1 through JMM-13, open line) delineate a Bordering Vegetated Wetland (BVW) (10.55) resource area. Typical vegetation observed within the JMM-#-series BVW included such species as red maple (*Acer rubrum*),

elm (*Ulmus americana*), ironwood (*Carpinus caroliniana*), honeysuckle (*Lonicera* sp.), skunk cabbage (*Symplocarpus foetidus*), cinnamon fern (*Osmundastrum cinnamomeum*), jewelweed (*Impatiens capensis*), enchanter's nightshade (*Circaea lutetiana*), clearweed (*Pilea pumila*), pachysandra (*Pachysandra* sp.), woodfern (*Dryopteris* sp.), Asiatic bittersweet (*Celastrus orbiculatus*), and scouring rush (*Equisetum hyemale*), to name a few.

In addition to the delineated BVW, JMM delineated the limits of the regulatory resource area Bank (10.54) with flags #1 through #6 (south side), and flags #7 through #10 (north side).

We note that just easterly of the delineated resource areas within the JMM study area, the delineated watercourse flows to a perennial stream, namely Longmeadow Brook, which flows southwesterly towards the Connecticut River (see photo 4).

Please call us if you have any questions on the above or need further assistance.

Respectfully submitted,

JMM WETLAND CONSULTING SERVICES, LLC

James M. McManus, MS, CPSS
Certified Professional Soil Scientist (No. 15226)

Attachments: Figure 1, Photos 1-4, NRCS Web Soil Survey Map

FIGURE 1: Magnolia Circle, Longmeadow, MA
Google Earth Aerial Photo Showing the Approximate Location of JMM Study Area

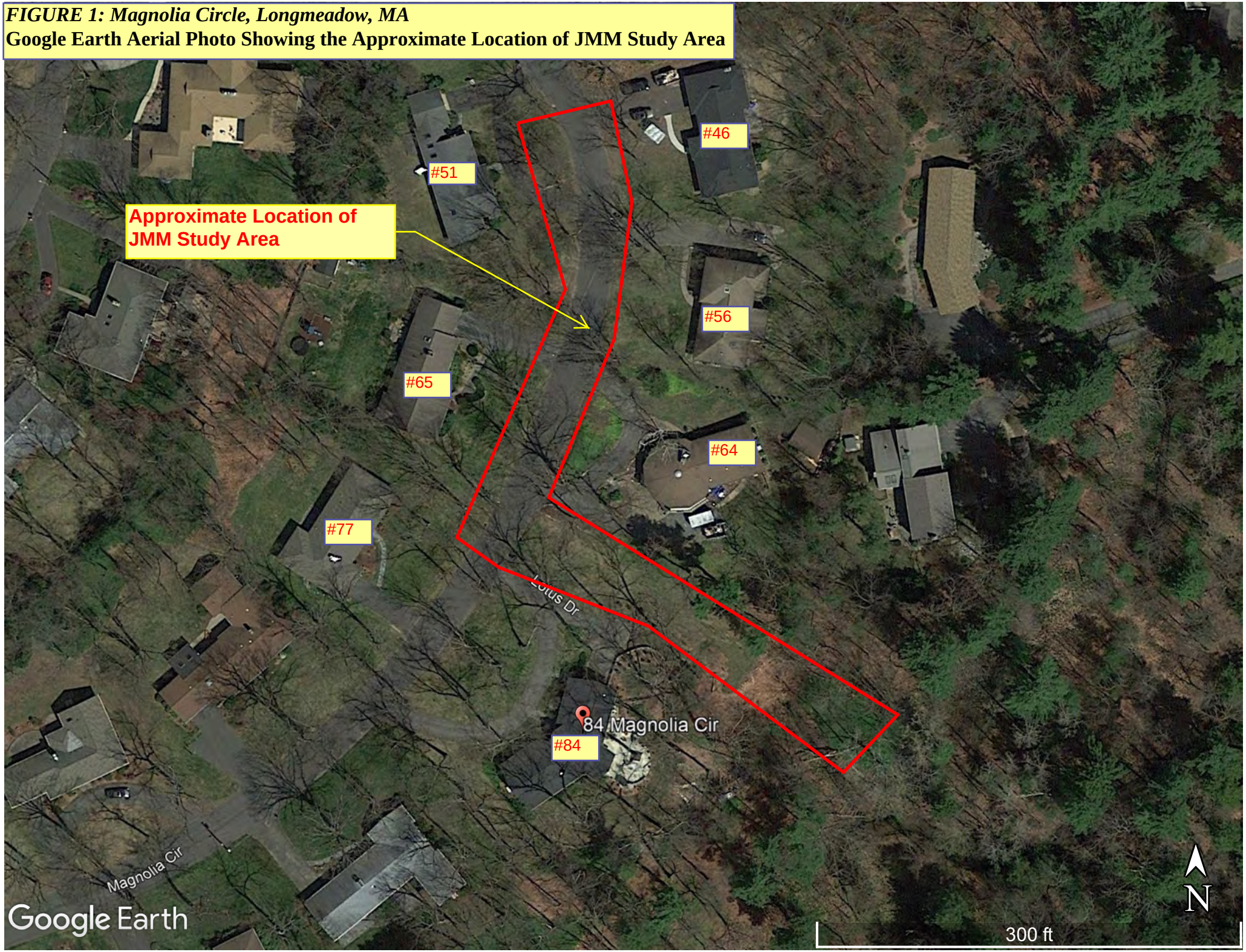


Photo 1: View of collapsed drainage pipe within the western part of JMM Study Area (JMM photo taken 8/2/19); facing northwesterly

Photo 2: View of downstream of collapsed drainage pipe (JMM photo taken 8/2/19); facing southeasterly

Photo 3: View of BVW within JMM Study Area (JMM photo taken 8/2/19); facing southeasterly

Photo 4: View of perennial watercourse east JMM Study Area (JMM photo taken 8/2/19); facing southeasterly

Soil Map—Hampden County, Massachusetts, Central Part
(Magnolia Circle, Storm Drainage Improvements, Longmeadow, MA)

Map Scale: 1:4,980 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 12, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 25, 2013—Sep 9, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
739C	Urban land-Hinckley-Windsor association, 0 to 15 percent slopes	88.5	100.0%
Totals for Area of Interest		**88.5**	**100.0%**

SECTION 00800

ATTACHMENT C – TOWN OF LONGMEADOW CONSERVATION COMMISSION ORDER OF CONDITIONS

To be replaced via Addendum.

SECTION 00800

ATTACHMENT D – SECTOR SPECIFIC WORKPLACE SAFETY STANDARDS FOR CONSTRUCTION SITES TO ADDRESS COVID-19

WORKPLACE SAFETY STANDARDS FOR

CONSTRUCTION SITES TO ADDRESS COVID-19

Per bid form Section 00410, bid line item 34, for the 'Compliance with COVID-19 Safety Requirements per lump sum', shall require the awarded contractor supply and enforcement during the entire construction process from commencement through project completion to include the following

1. All PPE (Personal Protective Equipment supply.
2. All disinfectants and sanitizers.
3. All sanitization and sanitization process.
4. Supply of all wash stations.
5. Per the Commonwealth of Massachusetts 'Workplace Safety Standards for Construction Sites to Address Covid-19', comply with the awarded contractor's responsibilities as outlined in Section A.- Enforcement and Oversight; Section B- Employee Health Protection; and Section D- Worker Infection Protocol.

A. Enforcement and Oversight

- The awarded contractor shall supply and designate their own site-specific COVID-19 Officer (who may also be the Health and Safety Officer) shall be designated for every site except as provided below for construction and remodeling in 1-3 family residences

- The awarded contractor's site-specific project COVID-19 Officer shall submit a written daily report to the Owner's Representative. The COVID-19 Officer shall certify that the contractor and all subcontractors are in full compliance with sections B to D, inclusive (the "COVID-19 Construction Safety Guidance")

- For large, complicated construction projects a city or town may additionally require the awarded contractor to develop and submit a site-specific risk analysis and enhanced COVID-19 safety plan, which may include additional requirements to address risks specific to the project or type of project. The city or town shall review and approve such plan and may require such projects to pause construction until such a risk analysis and plan is submitted and approved. Once such an enhanced COVID-19 safety plan is approved, a violation of the plan shall be treated the same as a violation of the COVID-19 Construction Safety Guidance

- The awarded contractor of the project is required to notify the municipality where the work is taking place whenever a site is shut down or of any violations of the COVID-19 Construction Safety Guidance and the resulting corrective action plan, as well as to provide copies of the COVID-19 Officer's written daily reports upon request. While the awarded contractor has the lead responsibility for enforcement, cities and towns retain the authority to take enforcement action against public projects found not in compliance with the COVID-19 Construction Safety Guidance, including the authority to order the project to shut down until a corrective action plan is developed, approved and implemented.

- Cities and towns are authorized to enforce the COVID-19 Construction Safety Guidance using their public health staff, building inspectors or any other appropriate official or contractor.

- Cities and towns may enforce the safety and distance protocols including, if multiple violations are found, requiring the Owner and / or awarded contractor to safely secure the site and pause construction activities until a corrective action plan is prepared, submitted and approved by the city or town.

- The city or town may require the awarded contractor of a large, complicated private project to pay for an independent, third party inspector or inspection firm (or to pay into a pool to pay for such inspections). The third party inspector shall be accountable solely to the city or town and shall be responsible for enforcement on behalf of the city or town. A city or town may require private projects to pause construction until such a third-party inspector has been secured

B. Employee Health Protection – ZERO Tolerance
The awarded contractor to enforce with their employees and sub-contractors.

ZERO TOLERANCE FOR SICK WORKERS REPORTING TO WORK. IF YOU ARE SICK, STAY HOME! IF YOU FEEL SICK, GO HOME! IF YOU SEE SOMEONE SICK, SEND THEM HOME!

If you are exhibiting any of the symptoms below, you are to report this to your supervisor (via phone, text or email) right away, and head home from the job site or stay home if already there

If you notice a co-worker showing signs or complaining about such symptoms, he or she should be directed to their supervisor (via phone, text or email) and asked to leave the project site immediately

COVID-19 Typical Symptoms:

- Fever
- Cough
- Shortness of Breath
- Sore Throat

Self-certify prior to shift

Prior to starting a shift, each employee will self-certify to their supervisor that they:

- Have no signs of a fever or a measured temperature above 100.3 degrees or greater, a cough or trouble breathing within the past 24 hours
- Have not had "close contact" with an individual diagnosed with COVID-19. “Close contact” means living in the same household as a person who has tested positive for COVID-19, caring for a person who has tested positive for COVID-19, being within 6 feet of a person who has tested positive for COVID-19 for about 15 minutes, or coming in direct contact with secretions (e.g., sharing utensils, being coughed on) from a person who has tested positive for COVID-19, while that person was symptomatic

- Have not been asked to self-isolate or quarantine by their doctor or a local public health officials.
- Employees exhibiting symptoms or unable to self-certify should be directed to leave the work site and seek medical attention and applicable testing by their health care provider. They are not to return to the work site until cleared by a medical professional

General On-the-Job Guidance to Prevent Exposure & Limit the Transmission of the Virus. Maintained and enforced by the awarded contractor.

- No handshaking
- Wash hands often with soap for at least 20 seconds or use an alcohol-based hand sanitizer with at least 60% ethanol or 70% isopropanol
- Each jobsite should develop cleaning and decontamination procedures that are posted and shared. These Procedures must cover all areas including trailers, gates, equipment, vehicles, etc. and shall be posted at all entry points to the sites, and throughout the project site.
- A "No Congregation" policy is in effect, individuals must implement social distancing by maintaining a minimum distance of 6-feet from other individuals
- Avoid face to face meetings – critical situations requiring in-person discussion must follow social distancing
- Conduct all meetings via conference calls, if possible. Do not convene meetings of more than 10 people. Recommend use of cell phones, texting, web meeting sites and conference calls for project discussion
- All individual work crew meetings / tailgate talks should be held outside and follow social distancing
- Please keep all crews a minimum of 6 feet apart at all times to eliminate the potential of cross contamination
- At each job briefing / tool box talk, employees are asked if they are experiencing any symptoms, and are sent home if they are
- Each jobsite should have laminated COVID-19 safety guidelines and handwashing instructions supplied and posted by the awarded contractor.
- All restroom facilities / porta-potties should be cleaned and handwashing stations must be provided with soap, hand sanitizer and paper towels
- All surfaces should be regularly cleaned, including surfaces, door handles, laptops, etc.
- All common areas and meeting areas are to be regularly cleaned and disinfected at least once a day but preferably twice a day
- Be sure to use your own water bottle, and do not share
- To avoid external contamination, we recommend everyone bring food from home
- Please maintain Social Distancing separation during breaks and lunch
- Cover coughing or sneezing with a tissue, then throw the tissue in the trash and wash hands, if no tissue is available then cough into your elbow
- Avoid touching eyes, nose, and mouth with your hands

- To avoid sharing germs, please clean up after Yourself. DO NOT make others responsible for moving, unpacking and packing up your personal belongings
- If you or a family member is feeling ill, stay home!

Work Site Risk Prevention Practices to be provided and maintained by the awarded contactor:

- At the start of each shift, confirm with all employees that they are healthy
- We will have a 100% glove policy from today going forward. All construction workers will be required to wear cut-resistant gloves or the equivalent
- Use of eye protection (safety goggles / face shields) is recommended
- In work conditions where required social distancing is impossible to achieve affected employees shall be supplied PPE including as appropriate a standard face mask, gloves, and eye protection
- All employees should drive to work site / parking area in a single occupant vehicle. Cont ractors / State staff should not ride together in the same vehicle
- When entering a machine or vehicle which you are not sure you were the last person to enter, make sure that you wipe down the interior and door handles with disinfectant prior to entry
- In instances where it is possible, workers should maintain separation of 6 feet from each other per CDC guidelines
- Multi person activities will be limited where feasible (two person lifting activities)
- Large gathering places on the site such as shacks and brea k areas will be eliminated and instead small break areas will be used with seating limited to ensure social distancing.
- Contact the cleaning person for your office trailer or office space and ensure they have proper COVID- 19 sanitation processes. Increase their cleaning visits to daily
- Clean all high contact surfaces a minimum of twice a day in order to minimize the spread of germs in areas that people touch frequently. This includes but is not limited to desks, laptops and vehicles

Wash Stations to be provided and maintained by the awarded contractor:

All site-specific projects with outside construction sites without ready access to an indoor bathroom
MUST install Wash Stations.

- Install hand wash stations with hot water, if possible, and soap at fire hydrants or other water sources to be used for frequent handwashing for all onsite employees
- All onsite workers must help to maintain and keep stations clean
- If a worker notices soap or towels are running low or out, immediately notify supervisors

- Garbage barrels will be placed next to the hand wash station for disposal of tissues / towels

Do all you can to maintain your good health by: getting adequate sleep; eating a balanced, healthy diet, avoid alcohol; and consume plenty of fluids.

Please Note: This document is not intended to replace any formalized procedures currently in place with the General Contractor.

Where these guidance does not meet or exceed the standards put forth by the General Contractor, everyone shall abide by the most stringent procedure available.

A site-specific COVID-19 Officer (who may also be the Health and Safety Officer) shall be designated for every site.

The Contractor's site specific project COVID-19 Officer shall submit a written daily report to the Owner's Representative of the Town. The COVID-19 Officer shall certify that the contractor and all subcontractors are in full compliance with these guidelines.

Any issue of non-compliance with these guidelines shall be a basis for the suspension of work. The contractor will be required to submit a corrective action plan detailing each issue of non-conformance and a plan to rectify the issue(s). The contractor will not be allowed to resume work until the plan is approved by the Owner. Any additional issues of non-conformance may be subject to action against the contractor's prequalification and certification status.

Limiting Exposures

Workers should follow the General On-the-Job Guidance to Prevent Exposure & Limit the Transmission of the Virus of the COVID-19 Employee Health, protection, guidance and prevention guide.

In addition, Contractors should advise workers of best practice to limit exposures off the construction site.

When leaving a construction site for breaks, lunch, or other reasons are required to wash hands with soap for at least 20 seconds or use an alcohol-based hand sanitizer with at least 60% ethanol or 70% isopropanol before leaving the site and must maintain social distancing and wear face coverings if traveling to other locations off the construction site. Frequent use of handwashing or alcohol-based hand sanitizers should be encouraged and handwashing facilities and / or alcohol-based hand sanitizers should be made readily available at work sites.

C. Deleted Section
(omitted)

D. Worker Infection Protocol

As stated above, there is a zero tolerance for sick workers reporting to work. Employees should be instructed that even those with mild symptoms of respiratory infection (cough, shortness of breath, sore throat) or fever should stay off work. Contractors shall take immediate steps to limit infections at the
job site in the event that a worker discovered to have tested positive for COVID-19 or has COVID-19 related symptoms.

Although it is understood that contractors are enforcing Work Site Risk Prevention Practices includin g social distancing rules and use of PPE, consistent with guidelines it is also recognized that there may be occasions where someone who has tested positive for COVID-19 or who has COVID-19 symptoms has been present in a work area.

Prompt identification and isolation of potentially infectious individuals is a critical step in protecting workers, vendors, visitors, and others at a worksite.

Identification of Exposure

The Contractor shall direct workers with COVID-19 related symptoms to leave the jobsite immediately and contact their healthcare provider. The Massachusetts Department of Health (DPH) or a local board
of health will make appropriate notifications to those who had direct prolonged contact with the COVID-
19 positive workers.

The Contractor shall work with the local board of health to identify any potential job site exposures, including:

- Other workers, vendors, inspectors, or visitors to the work site with close contact to the individual
    - Work areas such as supply cabinets and designated work stations or rooms
    - Work tools and equipment
    - Common areas such as break rooms and tables, vending machines, and sanitary facilities

Notification and Quarantine Requirements

As provided by law, the identity of the worker must be kept confidential

Upon learning of an infection, the contractor must immediately notify the designated COVID-19 safety officer, the site safety officer, and the owner

Sanitation Requirements

After a worker with COVID-19 related symptoms has been asked to leave the job site, the c Contractor shall take immediate steps to sanitize common areas and direct work places. This includes all on-site bathrooms facilities, any break facilities, and any other common areas on the job site that may have been in close contact with the infected worker.

Sanitation will be conducted with personnel, equipment, and material approved for COVID-19 sanitization.

Identified areas should remain isolated from workers until sanitation process has been completed and area is deemed safe for use.

Returning to Work

All impacted workers should follow CDC and DPH recommended steps concerning return to work. Workers who are considered close contacts to a COVID-19 case by public health authorities should not return for 14 days and are subject quarantine by public health.

Workers who leave during the work day due to COVID-19 symptoms and develop COVID-19 as confirmed by laboratory testing or diagnosis by a healthcare provider shall not return to the site until either released from isolation by healthcare provider or public health official.

In All Cases

- Keep all employee names confidential as required by law
- Other employees may be sent home while a workspace is being cleaned but will return to work after cleaning unless advised otherwise by a health care provider
- Other employees should be asked to contact their health provider if they have any questions
- Remind other employees to continue to practice proper sanitation and monitor for flu like symptoms

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Work of the Contract is shown and described in a Project Manual entitled:

Magnolia Circle Drainage Improvements Project
Town of Longmeadow
August 25, 2020

2. The Work includes the following work related to drainage improvements on Magnolia Circle:

a. Replacement of approximately 250 linear feet (LF) of existing 15-inch RCP drain with 18-inch polypropylene drain pipe

b. Replacement of approximately 25 LF of existing 8-inch VC drain with 12-inch polypropylene drain pipe

c. Replacement of approximately 225 LF of existing 18-inch RCP drain with 24 and 30-inch polypropylene drain pipe

d. Replacement of 4 catch basins and installation of 1 new precast concrete drain manhole

e. Installation of 1 catch basin and approximately 5 LF or 12-inch polypropylene drain pipe

f. Installation of approximately 620 LF of bituminous concrete curbing and bituminous concrete driveway repair

g. Site restoration, riprap, grading and slope stabilization

3. Additive Alternate No. 1 includes construction of a gravel access road for maintenance activities.

4. Additive Alternate No. 2 includes milling of approximately 950 square yards of bituminous concrete.

5. Additive Alternate No. 3 includes overlay of approximately 950 square yards of bituminous concrete.

B. Related Sections

1. Section 00520 - Agreement

2. Section 00800 - Supplementary Conditions

1.2 SUBMITTALS

A. Informational Submittals

1. Submit copies of permits or approvals required for the Work, prior to initiating the Work.

1.3 PROJECT/SITE CONDITIONS

A. Complete all Work within the Contract Time as set forth in Section 00520.

B. Permits

1. Obtain the permits and approvals listed below:

a. Town of Longmeadow Road Opening and Trench Permit

b. Permits and licenses of a temporary nature necessary for the prosecution of the Work.

c. Permits for disposal of construction wastes.

d. Other permits or licenses required for the Contractor's operations or required elsewhere in the Contract Documents and not included herein.

2. Comply with the permits and approvals listed below:

a. Notice of Intent and Town of Longmeadow Conservation Commission Order of Conditions. A copy of the Notice of Intent and Order of Conditions is included in Section 00800.

3. Obtain permits and approvals from appropriate jurisdictional agencies and property owners for use of premises not furnished by the Owner, and for all off-site areas.

4. Submit copies of permits prior to performance of Work authorized by permits.

C. Existing Conditions

1. Use of Premises and Off-site Work

a. The Work shall occur on the Owner's property within the limits of Work shown in the Contract manual.

b. Obtain permits and approvals for use of any land and access thereto that is deemed necessary for the Work, where such land is not available for use by the Owner, including land for temporary construction facilities, access and egress, or for storage of materials. Confine apparatus and storage to such additional areas.

c. Obtain permits and written approvals from appropriate jurisdictional agencies for the use of premises not available for use by the Owner, including all offsite staging areas, borrow pits and waste areas. Submit copies of all permits and approvals to the Owner prior to using areas.

d. Provide for the disposal of waste materials off-site in accordance with all applicable laws.

e. Adhere to the limits of Work as indicated, to minimize obstruction to traffic and inconvenience to the Owner, general public, and residents in the vicinity of the Work, and to protect people and property. Keep fire hydrants on or adjacent to the Work accessible to fire fighting equipment at all times.

f. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.

g. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.

PART 2 PRODUCTS

2.1 MATERIALS FURNISHED BY OWNER

A. The Owner will not furnish any materials, labor or equipment under this Contract.

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01140

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Work Schedule
2. Construction Constraints
3. Available Work Area
4. Site Usage Plan

B. Related Requirements

1. Section 01325 - Scheduling of Construction

1.2 SUBMITTALS

A. Incorporate the requirements of this Section in the project schedule submitted under Section 01325.

B. Action Submittals

1. Submit proposed access plan for the Magnolia Circle Drainage Improvements within 14 days of the Notice to Proceed.

1.3 WORK SCHEDULE

A. Conduct the Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 5:00 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CONSTRUCTION CONSTRAINTS

A. The following are constraints for the Work. Incorporate these constraints into the schedule required to be submitted under Section 01325.

1. All components of the existing storm drain systems must remain in operation throughout the lining work. If necessary, drainage flows shall be pumped around work zones as needed.

3.2 AVAILABLE WORK AREA

A. Limits of construction are defined in the Contract Manual. No work will be permitted to be performed outside these boundaries. As such, only the public travel ways are to be utilized for work areas during cleaning, television and lining work.

3.3 SITE USAGE PLAN

A. Submit a site usage plan showing all proposed access areas, staging areas, locations of all equipment and storage trailers, and material laydown areas. The site usage plan should be a drawing showing the proposed locations and shall include any on-site traffic modifications and temporary utilities as may be applicable.

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 DIVISION 0 AND DIVISION 1 WORK INCIDENTAL TO THE CONTRACT PRICE

A. No separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.

B. Division 2 Work will be measured and paid for at the Contractor's unit Bid price or lump sum item cost as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

1.2 MOBILIZATION AND DEMOBILIZATION (ITEM 1)

A. Measurement

1. There will be no measurement for the mobilization and demobilization to the Site as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be paid in two equal installments. The first installment will occur at the time the first payment requisition is submitted after the Contractor has initiated full-time construction activity. Payment for the second installment will be included in the first payment request after Substantial Completion has been reached and all equipment has been removed from the Site. In no case will the total of both installments exceed 5 percent of the base Bid price.

1.3 TRAFFIC CONTROL (EXCLUDES POLICE) (ITEM 2)

A. Measurement

1. There will be no measurement for traffic control as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the traffic control Work. This item excludes police details. Police, if required, to be scheduled by the Contractor and paid directly by the Owner.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

1.4 CLEARING AND GRUBBING (ITEM 3)

A. Measurement

1. Measurement for clearing and grubbing will be on a square yard basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for clearing and grubbing will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

1.5 TEST PITS (ITEM 4)

A. Measurement

1. Measurement for test pits will be on a cubic yard basis as approved and measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for test pits will be full compensation for all cutting of surfaces, excavation, backfill, compaction, dewatering, sheeting and bracing, required measurements, and all labor, equipment and materials required for incidental to the Work.

1.6 UNSUITABLE MATERIAL EXCAVATION (ITEM 5)

A. Measurement

1. Measurement for excavation of unsuitable material will be on a cubic yard basis of earth excavated to install the pipeline as approved and measured by the Engineer. Measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for excavation will be full compensation for all excavation, removal and proper off-site disposal of the material, placing and removing sheeting or bracing, and all labor, equipment and materials required for or incidental to the Work.

1.7 GRAVEL BORROW (ITEM 6)

A. Measurement

1. Measurement for gravel borrow will be on a cubic yard basis. The depth of gravel borrow will be the actual depth placed in the completed Work, but in no case shall this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for gravel borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and include all labor, equipment and materials required for or incidental to the Work.

1.8 CRUSHED STONE BORROW (ITEM 7)

A. Measurement

1. Measurement for crushed stone borrow will be on a cubic yard basis. The depth of crushed stone will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

2. Crushed stone borrow that the Contractor uses as a method to control groundwater is at the Contractor's expense and will not be paid for under this item.

3. ¾ inch crushed stone used for pipe bedding is to be included under the appropriate pipe items and will not be paid for under this item.

B. Payment

1. Payment of the Bid price for crushed stone borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and include all labor, equipment, and materials required for or incidental to the Work.

1.9 ORDINARY BORROW (ITEM 8)

A. Measurement

1. Measurement for ordinary borrow will be on a cubic yard basis. The depth of ordinary borrow will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for ordinary borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.

1.10 SAND BORROW (ITEM 9)

A. Measurement

1. Measurement for sand borrow will be on a cubic yard basis. The depth of sand will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for sand borrow will be full compensation for furnishing, hauling, placing, spreading, compacting including all labor, equipment, and materials required for or incidental to the Work.

1.11 SILTATION FENCING (ITEM 10)

A. Measurement

1. Measurement for siltation fence will be on a linear foot basis. The length of siltation fence will be the actual approved length of siltation fence measured in place by the Engineer.

2. Siltation fencing used by the Contractor for staging areas and stockpiles shall not be measured.

B. Payment

1. Payment of the Bid price for siltation fence will be full compensation for installation and removal of the siltation fence, and the restoration of the area disturbed by its placement including all labor, equipment and materials required for or incidental to the Work.

1.12 SILTATION SOCKS (ITEM 11)

A. Measurement

1. Measurement for siltation socks will be on a linear foot basis. The length of siltation socks will be the actual approved length of siltation socks measured in place by the Engineer.

B. Payment

1. Payment of the Bid price for siltation socks will be full compensation for installation and removal of the siltation socks, and the restoration of the area disturbed by its placement including all labor, equipment and materials required for or incidental to the Work.

1.13 CATCH BASIN SEDIMENTATION CONTROL (ITEM 12)

A. Measurement

1. Measurement for catch basin sedimentation control will be a count of the catch basins where sedimentation control measures are implemented as approved by the Engineer.

B. Payment

1. Payment of the Bid price for sedimentation control at each catch basin will be full compensation for installation, maintenance and removal of the haybales and filter fabric, thorough cleaning of the catch basins after the controls are removed, and all labor, equipment and materials required for or incidental to the Work.

1.14 60-INCH PRECAST CONCRETE MANHOLE (ITEM 13)

A. Measurement

1. Measurement for new 60-inch concrete manholes will be a count of the number provided.

B. Payment

1. Payment of the Bid price will be full compensation for the structure, frame and cover, invert, installation, testing, adjustment of frame and cover prior to paving, and all labor, equipment and materials required for or incidental to the Work.

1.15 CATCH BASINS (ITEM 14)

A. Measurement

1. Measurement for new catch basins will be a count of the number provided.

B. Payment

1. Payment of the Bid price for each new catch basin will be full compensation for removal and proper disposal of the old top slab and base structure; providing the new top slab/inlet structure, catch basin base structure, frame and grate; installation; adjustment of frame and grate prior to paving; and all labor, equipment and materials required for or incidental to the Work.

1.16 POLYPROPYLENE DRAIN PIPE (ITEMS 15 THROUGH 18)

A. Measurement

1. Measurement for polypropylene drain pipe will be on a linear foot basis and will be along the ground surface above and parallel to the pipeline from and to the inside face of structures. No deductions will be made for the length of fittings.

B. Payment

1. Payment of the Bid price for polypropylene pipe will be full compensation for providing and testing of all pipes, excavation and bedding, bypass pumping, warning tape, backfill and compaction, and all labor, equipment and materials required for or incidental to the Work.

1.17 DRAIN MAINLINE CONNECTIONS (ITEM 19)

A. Measurement

1. Measurement for drain mainline connections will be a count of the number provided.

B. Payment

1. Payment of the Bid price for connections and tie-ins will be full compensation for all excavation, backfilling, compaction, couplings, removal and disposal of existing mains cut during the connection and tie-in, and all labor, equipment and materials required for or incidental to the Work.

1.18 MAINLINE PIPE DEWATERING (ITEM 20)

A. Measurement

1. Measurement for mainline pipe dewatering will be as measured along the horizontal projection centerline of the mainline pipe, where the static groundwater level is at or above the invert of the pipe at the time of active construction.

B. Payment

1. Payment of the Bid price for mainline pipe dewatering will be full compensation for all labor, tools, equipment, materials, services, installation and testing required for or incidental to the Work.

1.19 BITUMINOUS CONCRETE TRENCH REPAIR (ITEM 21)

A. Measurement

1. Measurement for permanent bituminous concrete trench repair will be on a square yard basis as measured in the field by the Engineer. The length of the repair will be the actual length of the trench repaired. The width will be the actual width of repair made, but in no case will payment be made for trench repair greater in width than that shown on the Drawings.

B. Payment

1. Payment of the Bid price for 3” trench repair will be full compensation for saw cutting, preparation of the sub base, and furnishing, hauling, placing, spreading, and compacting the bituminous concrete, including all labor, equipment and materials required for or incidental to the Work.

1.20 BITUMINOUS CONCRETE CURBING (ITEM 22)

A. Measurement

1. Measurement for bituminous concrete curbing will be on a linear foot basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for bituminous concrete curbing, including gravel base and all required backup material (gravel or loaming and seeding) will be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.21 BITUMINOUS DRIVEWAY REPAIR (ITEM 23)

A. Measurement

1. Measurement for bituminous driveway repair will be on a square yard basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for bituminous driveway repair will be full compensation for all labor, equipment and materials required for or incidental to the Work, including furnishing and preparation of gravel base, placement and compaction of bituminous concrete as specified in the Contract Documents shown within the limit of work on the drawings.

1.22 OUTFALL- AREA RESTORATION AND SLOPE GRADING/STABILIZATION, INCLUDING RIPRAP EMBANKMENT (ITEM 24)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be compensation for backfill material, grading, providing and installing erosion control fabric and soil fill, seeding, and providing and placing riprap embankment, including all labor, equipment, and materials required for or incidental to the Work.

1.23 LOAM AND SEED (ON EASEMENT ADJACENT TO ROADWAY) (ITEM 25)

A. Measurement

1. Measurement for loam and seed will be on a square yard basis as measured in the field by the Engineer.

2. Measurement for payment under this item will be for loam and seed Work as required for lawn restoration and/or for "lawn quality" restoration of disturbed areas.

3. Loam and seed for wetlands replication or for the culvert side slopes is not included under this item.

B. Payment

1. Payment of the Bid price for loam and seed will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

1.24 COMPLIANCE WITH COVID-19 SAFETY REQUIREMENTS (ITEM 26)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

1.25 GRAVEL BASE ACCESS ROAD (ADDITIVE ALTERNATE NO. 1)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price for gravel base access road will be full compensation for all labor, tools, equipment, materials, services, installation and testing required for or incidental to the Work.

1.26 BITUMINOUS PAVEMENT MILLING (COLD PLANING) (ADDITIVE ALTERNATE NO. 2)

A. Measurement

1. Measurement for milling will be on a square yard basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for milling will be for all labor, tools, equipment, materials, and services inherent to the Work to mill the roadway as specified in the Contract Documents, complete including: saw cutting, removal and disposal of pavement, adjusting of roadway castings/structures, providing a broom-clean surface for new pavement, and other incidental Work. Payment under this item will not be made for milling keyways at the interface between new and existing pavement surfaces.

1.27 BITUMINOUS PAVEMENT OVERLAY (ADDITIVE ALTERNATE NO. 3)

A. Measurement

1. Measurement for milling will be on a square yard basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for overlay will be for all labor, tools, equipment, materials, services, installation, and testing inherent to the Work to furnish and install overlay asphalt pavement as specified in the Contract Documents, complete in place including: keyway construction, adjusting of roadway castings/structures, transition keyways, and all required backup materials (gravel or loaming and seeding) along the edges of the completed overlay, placement and compaction of bituminous concrete, restoring pavement markings, and other incidental Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01310

COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Coordinate progress of the Work to minimize interference with the operation of the existing storm drain, water, sewer and gas systems.

2. Perform all coordination necessary to complete the work while maintaining the operation of the existing systems.

B. Related Sections

1. Section 01325 – Scheduling of Construction

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 SEQUENCE OF CONSTRUCTION

A. Constructing the proposed improvements while maintaining existing operations will require a detailed sequence of construction. The Contractor will be allowed as much flexibility as possible in scheduling the details of the project. The Contractor shall provide a detailed schedule as required in Section 01325.

B. The Contractor shall incorporate the following project scheduling requirements into development of the schedule submitted as required in Section 01325:

1. The existing storm drain, water, sewer, and gas systems must remain in operation throughout construction.

3.2 TEMPORARY CONSTRUCTION

A. The Contractor shall be responsible for providing and maintaining all temporary flow diversion facilities, including bypass pumping equipment and temporary pipe/hose, as required to complete the work of this Contract.

END OF SECTION

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SECTION 01325

SCHEDULING OF CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Progress Schedule

B. Related Requirements

1. Section 01140 - Work Restrictions

2. Section 01310 - Coordination

1.2 REFERENCES

A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, an Associated General Contractors (AGC) of America publication.

1.3 PROGRESS SCHEDULE

A. Network Analysis

1. Prepare an electronic network analysis using the critical path method under concepts and methods outlined in the current edition of AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry."

B. Graphically show the order and interdependence of activities, sequence of Work, how the start of a given activity depends on completion of preceding activities, and how completion of an activity may restrain the start of subsequent activities.

C. The Work shall be planned by the Contractor and his Project field superintendent in coordination with all Subcontractors and Suppliers whose Work is shown on the Progress Schedule.

D. Include, at a minimum, the following activities on the Progress Schedule:

1. Project mobilization

a. Submittal and approval of Shop Drawings

b. Procurement of equipment and critical materials

c. Installation of equipment and critical materials

d. Fabrication of special equipment and material, and its installation and testing

e. Final inspecting and testing

f. Punchlist

g. Final cleanup

h. Other activities that may be critical to the Progress Schedule

i. All activities of the Owner and the Engineer which affect progress and/or affect required dates for completion of the Work

E. Take into consideration Shop Drawing submittal and approval time, the delivery times of equipment and materials, Subcontractors' Work, availability and abilities of workmen, weather conditions, any restrictions in operations at the Work site, and all other items that may affect completion of the Work within the Contract Time.

F. The Progress Schedule shall reflect Work restrictions outlined in Section 01140.

G. Show information in such detail that duration times of activities will range from one to 15 days. The selection and number of activities shall be subject to the approval of the Owner and Engineer.

H. The Progress Schedule should show preceding and following event numbers for each activity, description of each activity, and activity duration in calendar days.

I. Submit the Progress Schedule on maximum sheet size 30-inches high by the width required.

1.4 SUBMITTALS

A. Informational Submittals

1. Submit two prints of the preliminary Progress Schedule prepared in accordance with Article 2.05 of Section 00700 and the requirements of this section. Progress schedule must be submitted within 10 days after the Effective Date of the Agreement. Progress Schedule must be approved by the Owner and Engineer before the first progress payment will be made.

2. Revised analyses - Within 10 days after receipt of the review comments, submit two prints of the Progress Schedule revised in accordance with those comments.

3. Periodic reports - On the first progress meeting of each month, submit two prints of the updated Progress Schedule, as well as a report of construction activities in the prior month.

4. Before initiating the Work, submit an estimated monthly rate of Contractor payments for the project. If the payment schedule deviates from the original projection, submit a revised rate of expenditure schedule.

1.5 PERIODIC REPORTS

A. At the first scheduled progress meeting of each month, present two copies of a construction report which details the Work performed during the preceding period. The report shall include the following at a minimum:

1. Actual progress of Work. Update the Progress Schedule accordingly.

2. The Progress Schedule, or revised Progress Schedule, should show the portions of the Progress Schedule impacted by the Work progress.

3. Activities or portions of activities completed during the reporting period, and their total value as basis for Contractor's periodic request for payment. Payment made will be based on the total value of such activities completed or partially completed after verification by the Engineer.

4. State the percentage of the Work actually completed and scheduled as of the report date, and the progress along the critical path in terms of days ahead of or behind the dates defined in the Progress Schedule.

5. If the Work is behind the dates set forth in the Progress Schedule, also report progress along other paths with negative slack.

6. Include a narrative which includes:

   a. A description of problem areas, anticipated and current

   b. Delaying factors and their impact

   c. An explanation of corrective actions taken or proposed

7. Show the date of latest revision.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Schedule the sequence of work to limit the number of times a street or area is disturbed.

END OF SECTION

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Action Submittals

2. Informational Submittals

1.2 DEFINITIONS

A. Action Submittals – includes written and graphic information submitted by Contractor that requires Engineer's approval.

B. Informational Submittals – includes information submitted by Contractor that does not require Engineer's approval. The Engineer will acknowledge receipt of such documents and provide comments when the submittals lack the detail required by the Contract Documents.

1.3 ACTION SUBMITTALS

A. Shop Drawings

1. Shop Drawings as defined in the General Conditions, and as specified in individual work sections include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation drawings, schedule information, piece part drawings, actual shopwork manufacturing instructions, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certification, as applicable to the Work.

2. Shop Drawings shall be of standardized sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard size drawings shall be

a. 24-inches by 36-inches

b. 22-inches by 34-inches

c. 11-inches by 17-inches

d. 8.5-inches by 11-inches

3. Submit Shop Drawings at the proper time so as to prevent delays in delivery of materials. Coordinate submittals for related or interdependent equipment.

4. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.

5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or otherwise in error shall be returned to the Subcontractors or Suppliers for correction before submission to the Engineer. Drawings that are current shall be marked with the date, name, and approval stamp of the Contractor.

6. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.

7. Detailed installation drawings (sewers, equipment, piping, electrical conduits and controls, HVAC work, and plumbing, etc.) shall be drawn to scale and fully dimensioned.

8. No material or equipment shall be purchased or fabricated until the required Shop Drawings have been submitted and approved. Materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by the Shop Drawings.

9. Until the necessary approval has been given, do not proceed with any portion of the work, the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.

10. If submitted equipment requires modifications to the structures, piping, layout, or other details shown on the Drawings, details of the proposed modifications must also be submitted for approval. If such equipment and modifications are approved, perform all Work necessary to make such modifications at no additional cost to the Owner.

B. Product Data: Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.

C. Samples and color selection charts: Provide sample, when requested by individual Specification to establish conformance with the Specifications, and as necessary to define color, texture and pattern selections available.

D. Product Substitutions: In accordance with Section 01630.

E. Operation and Maintenance Manuals: In accordance with Section 01770.

F. Site Usage Plan: In accordance with Section 01140.

1.4 INFORMATIONAL SUBMITTALS

A. Schedule of Submittals

1. Submit a preliminary Schedule of Submittals within 10 days of the Effective Date of the Agreement in accordance with Article 2.05 of Section 00700.

B. Schedule of Manufacturers and Suppliers

1. Submit a schedule of manufacturers and Suppliers within 7 days after Notice to Proceed including the names and addresses of the manufacturers and Suppliers of materials and equipment to be incorporated into the Work.

C. Schedule of Major Products

1. Submit a schedule of major products within 30 days after Notice to Proceed including a complete list of major products proposed for use, with specification section number, name of manufacturer, trade name, and model number of each product.

D. Product Listing and Manufacturers Qualifications

1. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards. Specifically identify the products, the anticipated schedule for delivery and storage, and the estimated value thereof for materials which the Contractor intends to request approval for off-site storage.

E. Certificates of Compliance

1. General:

a. Submit sworn certificates from the manufacturer or material supplier that the materials and fabrications provided under the Specification section conform with the Contract Documents.

b. Certificates shall be signed by an officer of the manufacturer's corporation and witnessed by a Notary Public.

2. Welding: Submit in accordance with individual Specification sections.

3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.

4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency, or when specified in individual Specification sections.

6. Manufacturer's Certificate of Compliance: In accordance with individual Specification sections.

F. Application for Payment

1. Submit applications for payment in accordance with Section 01270, Measurement and Payment.

2. Submit schedule of stored materials when requesting payment for materials not yet installed.

G. Contract Closeout Submittals: In accordance with Section 01770.

H. Contractor Design Data

1. Written and graphic information

2. List of assumptions

3. List of performance and design criteria

4. Summary of loads or load diagram

5. Calculations

6. List of applicable codes and regulations

7. Name and version of software

8. Information requested in individual Specification section

I. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.

J. Schedules - Submit construction progress schedules and schedule updates in accordance with Section 01325.

K. Statement of Qualifications: Submit evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty subcontractor, trade, specialist, consultant, installer, and other professionals.

L. Submittals Required by Laws, Regulations, and Governing Agencies

1. Submit promptly notifications, reports, certifications, payrolls, and other required information as may be required, directly to the applicable federal, state, or local governing agency or their representative.

2. Transmit to Engineer for Owner's records, one copy of correspondence and transmittals (including enclosures and attachments) between Contractor and governing agency.

M. Test and Inspection Reports

1. Submit test and inspection reports as required by individual Specification sections.

2. Test and inspection reports shall contain signature of person responsible for test or report.

3. Reports shall include identification of product and Specification, project name, date and time of test, type of test, location, test results, corrective action required if report indicates test is not in compliance with Contract Documents, interpretation of test results, and other information as required in individual Specification sections.

N. Testing and Start-up Data: Prepare and submit testing procedures proposed to perform testing required by individual Specification sections.

O. Vendor Training Plan: At least two weeks prior to scheduling training of Owner's personnel, submit lesson plans for vendor training in accordance with individual Specification section and manufacturer's Operations and Maintenance Manuals.

P. Health & Safety Plans: When specified in individual Specification sections, prepare and submit a Health and Safety Plan modified or supplemented to include job-specific considerations.

Q. Submittals stamped by another Professional Engineer: When specified in individual Specification sections, prepare and submit calculations and/or drawings stamped by a Professional Engineer licensed in the State where the work is being performed.

R. Coordination Drawings: When specified in individual Specification sections, prepare and submit drawings to show how multiple system and interdisciplinary work will be coordinated. Examples are conduit routing diagrams, duct layouts, utility coordination drawings, sprinkler plans etc.

S. Work Plans: When specified in individual Specification sections, prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities.

T. Erosion Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of erosion control plans.

U. Traffic Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of traffic control plans.

V. Shutdown Requests: Submit notification of any outages required (electrical, flow processes, etc.) as may be required to tie-in new work into existing facilities. Unless otherwise specified, provide outage requests a minimum of 7 days notice shall be provided.

1.5 PROCEDURES

A. Coordination

1. Prepare and submit documentation in advance of fabrication and product manufacturer, so that the installation will not be delayed, other related work can be properly coordinated, and there is adequate time for review and resubmission, if required.

2. Provide no less than 30 days for review of submittals from the time received by the Engineer. For submittals of major equipment, that require more than 30 days to review, due to complexity and detail or those requiring review by multiple engineering disciplines, Engineer will notify Contractor of the circumstances and identify the anticipated date when the submittal will be returned.

3. Re-submittals will be subject to same review time.

4. No extension of time will be authorized due to failure to provide approvable submittals sufficiently in advance of the Work.

B. Review Shop Drawings, product data, and samples prior to submission and verify and determine:

1. Field measurements

2. Conformance with the Contract Documents. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.

3. Delete or strike out information that is not applicable to the Work.

C. Submit the following number of copies:

1. Submittals – Unless otherwise noted in the individual Specification section, provide 6 sets of submittals.

   a. 3 will be retained by the Engineer: 1 for Owner, 1 for Engineer's file, and 1 for Engineer's construction observer

   b. 3 for Contractor

   c. At the Contractor's request, the Engineer may allow electronic submissions provided by the Contractor in PDF format.

2. Samples – Provide one unless otherwise noted in the individual Specification section. Sample will be retained by Engineer in the field.

3. A maximum of 3 submittals will be returned by the Engineer with notations to the Contractor via First Class United States Postal Service or ground service by other carriers. At the Contractor's request, the Engineer may allow electronic submissions provided by the Contractor in PDF format.

D. Numbering: Submissions shall be accompanied by a transmittal form referencing the project name and applicable Specification section. Submittals shall be referenced with consecutive numbering. Resubmittals shall bear the same transmittal number with a sequential letter suffix commencing with "A".

E. Provide a copy of the Submittal certification form (copy attached at the end of this section) which shall be attached to every copy of each Shop Drawing as required under Article 6.17 C.2 of Section 00700. Apply the Contractor's stamp and initials or signature certifying that the submission has been thoroughly reviewed for completeness, compliance with the Contract Documents, coordination with adjacent construction and dimensional compatibility. Items submitted without the stamp or that are incomplete will be returned by the Engineer for rework and resubmission.

F. Provide a copy of the P.E. certification form (copy attached at the end of this section) which shall be attached to every copy of each Submittal stamped by another Professional Engineer. Items submitted without the completed certification form will be returned by the Engineer for resubmission.

G. Distribute copies of reviewed submittals along with the Engineer's transmittal to concerned parties with instructions to promptly report any inability to comply with the provisions or integrate the requirements with interfacing work.

H. Partial and Incomplete Submittals

1. Shop Drawings shall be submitted as a complete package by Specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials, and samples associated with each Specification section be included as a single submittal for the Engineer's review.

2. Engineer will return entire submittals if preliminary review deems it incomplete including:

    a. Missing or incomplete Submittal certification form

    b. Insufficient number of copies

    c. Missing content

3. Partial submittals may be considered, at Engineer's option, only when necessary to expedite the Project.

4. Partial submittals shall be clearly identified as such on the transmittal to identify missing components.

I. Submittals not required by the Specification will be returned without review or action code.

J. Resubmission

1. Make corrections and modifications required by the Engineer and resubmit until approved.

2. Clearly identify changes made to submittals and indicate other changes that have been made other than those requested by the Engineer.

3. A maximum of two re-submissions of each shop drawing will be reviewed, checked and commented upon without charge to the Contractor (total of 3 submittals). Any additional submissions which are required by the Engineer to fulfill the stipulations of the Contract Documents will be charged to the Contractor.

K. Distribution

1. Distribute approved Shop Drawings and approved product data to the Project Site and elsewhere as required to communicate the information to Suppliers, Subcontractors, and field personnel.

2. Samples will be retained by the Engineer at the Site.

1.6 ENGINEER'S REVIEW

A. The Engineer will review submittals for design, general methods of construction and detailing. The Engineer's review and approval of submittals shall not be construed as a complete check nor does it relieve the Contractor from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Engineer's attention to such deviations at the time of submission. It will not extend to means, methods, technique, sequences, or procedures of construction (except where specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.

B. The Engineer's review of the submittals shall not relieve the Contractor from the responsibility for proper fitting of the Work, or the responsibility of furnishing any work required by the Contract Documents which may not be indicated on the submittals. The Contractor shall be solely responsible for any quantities shown on the submittals.

C. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall provide written notice to the Engineer at least 7 working days prior to release for manufacture.

D. When the submittals have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

E. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:

1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.

2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.

3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.

4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.

F. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:

1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.

2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SUBMITTAL CERTIFICATION FORM

PROJECT:_____
ENGINEER:_____ENGINEER'S PROJECT NO.:_____
CONTRACTOR:_____ CONTRACTOR'S PROJECT NO.:_____

TRANSMITTAL NO.:_____ SUBMITTAL NO.:_____
SPECIFICATION NO.:_____ DRAWING NO:_____
DESCRIPTION:_____
MANUFACTURER:_____

The above referenced submittal has been reviewed by the undersigned and I/we certify that the materials and/or equipment meets or exceeds the project specification requirements; that field measurements, dimensions, quantities, specified performance criteria, installation requirements, materials, catalog numbers and related materials have been verified; that all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the work has been determined and verified; that review includes all information related to the contractor's sole responsibility for means, methods, techniques, sequences, and procedures of construction and safety; and item has been coordinated with the overall project with:

☐ NO DEVIATIONS

☐ A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

_____
_____
_____
_____
_____
_____

SUBMITTED BY:_____ DATE:_____

GENERAL CONTRACTOR'S STAMP

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a professional engineer registered in the Commonwealth of Massachusetts and that he/she has been employed by

_____ to design
(Name of Contractor)

_____
(Insert P.E. Responsibilities)

In accordance with Specification Section _____for the

_____
(Name of Project)

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

_____(Insert
Name of Owner)

or Owner's representative within seven days following written request therefor by the Owner.

_____	_____
P.E. Name	Contractor's Name
_____	_____
Signature	Signature
_____	_____
Title	Title
_____	_____
Address	Address

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SECTION 01350

HEALTH & SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Furnish all labor, equipment and materials and perform all operations in connection with monitoring air quality, decontaminating equipment and providing worker health and safety protection for all Contractor personnel and buildings or structures in the work area, if necessary.

2. Develop a site specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered. This plan shall meet all OSHA requirements.

3. Review the requirements and data presented and supplement the program with any additional measures deemed necessary to fully comply with regulatory requirements and adequately protect personnel on the site and buildings or structures in the work area, if necessary.

1.2 REFERENCES

A. OSHA Regulation 29 CFR 1910.120

B. OSHA Regulation 29 CFR 1926.62

1.3 DEFINITIONS

A. Site Safety Official (SSO) - The individual located on a hazardous waste site who is responsible to the Contractor and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

B. Uncontrolled Hazardous Waste Site means an area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal, state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both.

1.4 SUBMITTALS

A. Submit the following to the Owner within seven days after execution of the Agreement.

1. Site-specific Health and Safety Plan including the Emergency Response Plan, including provisions for decontamination and a contingency plan for unforeseen emergencies. The Owner’s review is only to determine if the Plan meets basic regulatory requirements and the minimum requirements of this Section. The review will not determine the adequacy of the plan to address all potential hazards, as that remains the sole responsibility of the Contractor.

2. Current certification of employee's health and safety training and certification of employee's baseline medical exam status

3. Certification of additional required health and safety training for Supervisors

4. Qualifications and experience of the SSO for approval

B. Submit minutes of weekly safety meetings at periodic progress meetings.

1.5 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor and anyone directly or indirectly employed by any of them as well as occupants of any buildings or structures adjacent to the work.

B. Work under this contract is not being performed on an "Uncontrolled Hazardous Waste Site," as defined in 29 CFR1910.120. Develop and follow a site specific Health & Safety Plan (H&SP) in accordance with the requirements of paragraph 1.6.

C. Provide a full-time SSO regardless of whether or not the Work is at a defined Uncontrolled Hazardous Waste Site.

D. Pre-arrange emergency medical care services at a nearby hospital, including establishment of emergency routes of travel.

E. Conduct weekly safety meetings with all site personnel, documenting attendance and topics covered.

F. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR 1910.120.

G. In areas where contaminated media are likely to be encountered, or created during the work, monitor air quality in and around work area or areas of concern using appropriate air monitoring equipment, as indicated in Part 2. Record all readings and maintain record on site. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded and take all other necessary mitigation actions. Ensure that degree and type of respiratory protection provided is consistent with the monitored concentrations and individual chemical parameters. Lawfully dispose of all contaminated clothing and equipment that cannot be decontaminated.

H. At all times, prevent oil or other hazardous substances from entering the reservoir, ground, sewers, drainage areas, piping systems, buildings and structures.

1.6 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

A. The following items shall be addressed in the HASP:

1. Safety and health hazard assessment

2. Procedures for emergency medical treatment and first aid

3. Map indicating route to hospital for emergency medical care

4. Equipment decontamination procedures

5. Air monitoring procedures and action levels

6. Personal protective equipment and decontamination
7. Physical hazard evaluation and abatement including:
    a. Equipment operation
    b. Confined space entry
    c. Slips and falls
    d. Building collapse
    e. Falling debris
    f. Encountering unmarked utilities
    g. Cold and heat stress
    h. Hot work (cutting and welding)
    i. Excavation entry
8. Training requirements
9. Recordkeeping requirements
10. Emergency response plan that includes
    a. Names of three Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the Contractor intends to use in the event of an emergency
    b. Evacuation routes and procedures
    c. Emergency alerting and response procedures

1.7 CONTINGENCY MEASURES & NOTIFICATIONS

A. The potential for encountering hazardous buried objects or materials that could pose a threat to human health or the environment exists in areas outside the defined hazardous areas. In the event that potentially hazardous materials are encountered during the work under this contract, the responsibilities of the Contractor and the Owner are described herein.

B. The procedures and protocols to be used by the SSO in defining materials that are potentially hazardous include screening with a photoionization detector, odor, visual appearance of a material, and obvious oil or chemical contaminated materials.

C. Upon encountering suspected hazardous buried objects or materials as described above, cover the excavation immediately if no imminent danger, as defined by the SSO, is present. If there is an imminent danger, as defined by the SSO, evacuate the area immediately. The SSO shall then notify the Owner of the situation.

D. Establish, properly barricade, and mark the area as an exclusion zone under the direction of the SSO. The SSO shall establish the exclusion zone boundaries based upon air quality monitoring using a photoionization detector and other equipment as appropriate. The exclusion zone shall be established at a minimum 50-foot radius around the location where the potentially hazardous material is encountered. Work within the exclusion zone shall be discontinued until the hazardous condition has been remediated and testing indicates that a hazard does not exist. Other activities of the site, outside the limits of the exclusion zone shall continue. Ambient air quality monitoring shall be performed by the SSO to demonstrate that ambient air quality in other portions of the site is not adversely impacted by the exclusion zone condition.

E. Notify the Owner regarding the presence of potentially hazardous materials. The Owner may direct the Contractor to notify regulators and to obtain necessary regulatory approvals for remediation.

F. Mobilize the appropriate equipment and personnel to sample and test the hazardous material within the exclusion zone to determine the remedial action required, subject to the Engineer's direction. The Contractor may be directed to remove and legally dispose of the material. Compensation for the removal and disposal of hazardous material will be as a Change in Work and Change in Contract Price in accordance with the General Conditions, if not covered under a specific bid item.

PART 2 PRODUCTS

2.1 AIR MONITORING EQUIPMENT

A. Provide and maintain portable photoionization detector or organic vapor analyzer capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 PPM level.

B. Provide and maintain an oxygen analyzer to measure oxygen concentration in any trench or confined space prior to entry, as determined by the SSO.

C. Provide and maintain an explosimeter whenever the potential for accumulation of explosive gases exists, as determined by the SSO.

D. All air monitoring equipment shall remain the property of the Contractor.

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01520

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Temporary sanitary facilities

2. First aid station

1.2 QUALITY ASSURANCE

A. Maintain temporary construction facilities in proper and safe condition throughout the progress of the Work.

1.3 TEMPORARY SANITARY AND FIRST AID FACILITIES

A. Provide suitably enclosed chemical or self-contained toilet(s) for the use of the labor force employed on the Work. Toilet(s) shall be located near the Work site(s) and secluded from observation insofar as possible. Toilet(s) shall be serviced weekly, kept clean and supplied throughout the course of the Work.

B. Contractor shall enforce proper use of sanitary facilities.

C. Use of the Owner's sanitary facilities by the Contractor is prohibited.

D. Provide a first aid station at the site.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01550

TRAFFIC REGULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Traffic requirements

2. Traffic officers

1.2 PAYMENT PROCEDURES

1. Refer to Section 01270, Measurement and Payment for procedures relating to payment for the Work.

2. Owner will pay for traffic officers if they are required. Contractor is responsible for scheduling the traffic officers, with Owner's approval, and for providing all documentation.

3. Owner will deduct from monies due Contractor for the following abnormal and unreasonable expenses:

a. Contractor caused delays in the prosecution of work that result in hiring traffic officers for more hours than would have been required during normal prosecution of work.

b. Reconstruction and/or reinstallation of any portions of the work, as a result of improper initial installation or defective material, for which traffic officers are required.

c. Traffic officers required at a site where Contractor is not working or outside of Contractor's standard work day as a result of obstructions to traffic that remain in the traveled way.

d. All other incidents resulting from Contractor's operations requiring traffic officers that would not normally be encountered during the progress of a well-organized project employing proper construction methods.

e. When traffic officers are requested for the convenience of Contractor and are not otherwise considered necessary to the work.

1.3 REFERENCES

A. Manual of Uniform Traffic Control Devices, U.S. Department of Transportation

1.4 TRAFFIC REQUIREMENTS

A. Arrange construction activity so that all streets shall remain open to at least one-way traffic during periods of actual work, and to unimpeded, two-way traffic during all other periods.

B. Provide a traffic control plan to Engineer for approval showing traffic control signs, barrels, cones, traffic officers, including detour signs, meeting the

approval of Engineer, Owner and local Police Departments in accordance with the Manual of Uniform Traffic Control Devices.

C. Determine the location of each day's work and implement the approved traffic control plan. If the plan requires the use of traffic officers, notify the Police Department.

D. Contractor shall have no claim of delay if he does not notify the Police Department of his scheduled location in time to arrange for traffic officers.

E. Hand deliver written notice to individual houses affected by driveway and side road closings or detours a minimum 24 hours in advance. A recommended parking area outside the work limits shall be included in the notice.

1.5 TRAFFIC OFFICERS

A. Uniformed traffic officers shall be required at locations deemed necessary by Owner, working in conjunction with local Police and Fire Departments, for the protection of the public.

B. The Police Chief or his representative, in consultation with Owner's representative, will determine the number of officers required for the work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01570

TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Dust control
2. Drainage and erosion control
3. Siltation Fence and Siltation Socks
4. Catch Basin Inlet Protection
5. Daily Cleanup

B. Related Sections

1. Section 02920 – Lawns and Grasses

C. Contractor shall comply with the requirements of the Notice of Intent and Town of Longmeadow Conservation Commission Order of Conditions, attached to Section 00800.

1.2 TEMPORARY DUST CONTROL

A. Exercise particular care to control dust both during and after construction. A mechanical street sweeper shall be used as needed.

B. Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be properly policed and controlled so as to prevent spreading of the material.

C. Control dust during and after construction using calcium chloride and/or salt. The Engineer may direct the Contractor to employ sprinkling of water in lieu of calcium chloride for dust control.

D. During and after construction, all paved road and driveway surfaces are to be scraped and broomed free of excavated materials on a daily basis. The surfaces are to be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface is to be exposed.

1.3 DRAINAGE AND EROSION CONTROL

A. Install and maintain sediment trapping system.

B. Discharge surface runoff from any disturbances to the site into silt containment basins. Siltation prevention measures utilizing geotextile fences and siltation socks for containment shall be taken before discharge to drainage systems.

1.4 DAILY CLEANUP

A. The Contractor shall furnish and install in a manner satisfactory to the Engineer and local police all barricades and warning signs and lights.

B. The Contractor shall confine his operations to the shortest possible distance and must clean up his work area.

PART 2 PRODUCTS

2.1 FILTER FABRIC

A. Filter fabric siltation fencing shall be a woven filter fabric having a weight of at least 2.5 ounces per square yard, a thickness of at least 17 mils, a coefficient of permeability of not less than 0.0009 centimeters per second and allows a water flow rate of a minimum 40 gallons per minute per square yard. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics. The material shall be equal to 100x as manufactured by Mirafi, Inc., Charlotte, North Carolina.

2.2 CATCH BASIN INLET PROTECTION

A. Provide catch basin inlet erosion control measures.

PART 3 EXECUTION

3.1 SILTATION SOCKS

A. Control of erosion and siltation during the construction is expected to require mulching, siltation socks, siltation fencing, diversion and control of storm water run-off, ponding areas and similar methods.

B. Install siltation socks in accordance with manufacturer's recommendations. Deteriorated siltation socks shall be replaced at the direction of the Engineer. Remove and dispose of the siltation socks following the successful growth of vegetation in the areas disturbed by the construction. The removal of the siltation socks will be at the direction of the Engineer. On embankment areas and on flat areas adjacent to wetland areas, the siltation socks shall be installed continuously between the construction site and the wetland area as directed by the Engineer.

3.2 SILTATION FENCE

A. Install a filter fabric siltation fence in addition to the siltation socks, prior to construction and remove after full surface restoration has been achieved. Install the siltation fence parallel and immediately adjacent to the siltation socks in conformance with the Drawings. Install as follows:

1. Hand shovel excavate a small trench on the upstream side of the desired fence line location.

2. Unroll the siltation fence system, position the post in the back of the trench (downhill side), and hammer the post at least 1½ feet into the ground.

3. Lay the bottom 6 inches of the fabric into the trench to prevent undermining by storm water run-off.

4. Backfill the trench and compact. Compaction is necessary to prevent the run-off from eroding the backfill.

B. Control surface waters within the construction area through the use of temporary culverts or other means.

3.3 RESTORATION

A. Provide temporary stabilization of disturbed areas inactive greater than 14 consecutive days to minimize erosion. Methods to minimize erosion may include but are not limited to:

1. Spreading straw and/or providing temporary planting stabilization.

2. Installing jute netting.

3. Preparing surfaces to increase the runoff flow path, reduce the runoff flow velocity, or create small storage pockets to retain surface flows. Methods of accomplishing this include using mechanical devices such as track equipment or sheep's foot rollers.

B. Restoration of the ground surface in areas that are brush and/or woodlands prior to the start of construction is expected to require machine spreading of existing stripped surface soils (loam and humus), lime, fertilizer, seed and mulch, and jute netting where required by steep slopes.

C. Salvage existing loam and topsoil and stockpile this material for re-spreading where originally removed. On backfilling, grading shall be returned to preconstruction contours as much as possible and the stockpile of loam shall be spread over areas disturbed during construction activities.

D. Place approved mulch on seeded areas to help with erosion control. Use jute netting on areas having a slope greater than 3 horizontal to 1 vertical, to anchor the mulch until a satisfactory growth is obtained. If seeding is not possible because of the time of the year, apply mulch and netting to stabilize the area until such time as seed can be sown.

E. Maintain the restored areas until such time as the Work is accepted by the Owner. Maintenance shall include all grading, refertilizing, reseeding, remulching and/or netting which may be necessary.

F. Seed shall be as specified under Section 02920.

3.4 CLEANING

A. Remove any sediment that builds up around the siltation socks or catch basins.

B. Catch basins that collect sediment as a result of the Work shall be thoroughly cleaned.

END OF SECTION

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SECTION 01580

TEMPORARY BYPASS PUMPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Temporary bypass pumping for storm drain system (if needed)

1.2 SUBMITTALS

A. Informational Submittals

1. Submit a specific, detailed description of the proposed pumping system.
2. Submit references for prior projects.
3. Submit qualifications of bypass pumping company.
4. Submit detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements specified in the Contract Documents. No construction shall begin until all provisions and requirements have been approved.
5. The drawings shall include but not be limited to details of the following:
    a. Staging areas for pumps
    b. Pipe plugging method and types of plugs
    c. Number, size, material, location and method of installation of suction piping
    d. Number, size, material, method of installation and location of installation of discharge piping
    e. Bypass pump sizes, capacity, number of each, and size to be on site and fuel/power requirements
    f. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted)
    g. System curve with suction lift performance
    h. Standby power generator size, location
    i. Downstream discharge plan
    j. Method of protecting discharge manholes or structures from erosion and damage

k. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill

l. Method of noise control for each pump and/or generator

m. Any temporary pipe supports and anchoring required

n. Design plans and computation for access to bypass pumping locations indicated on the drawings

o. Calculations for selection of bypass pumping pipe size

p. Schedule for installation of and maintenance of bypass pumping lines

q. A plan showing the location of bypass pumping equipment, and suction and discharge piping

1.3 QUALITY ASSURANCE

A. Employ the services of a company that specializes in the design and operation of temporary bypass pumping systems. Demonstrate that the bypass pumping equipment is automated and is capable of functioning without the assistance of an operator.

B. Provide at least 5 references of projects of similar size and complexity in wastewater applications performed within the past three years within New England.

C. The bypass pumping company shall have a minimum experience of 15 years designing and supplying wastewater bypass systems.

D. Demonstrate sufficient inventory to perform normal rentals, including this project, and maintain at least 100% reserve equipment for this project for immediate delivery.

E. Demonstrate sufficient service and repair parts in stock to fulfill any service or repair of all rental equipment within 3 hours of any service call.

F. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

G. Obtain required approvals for placement of the temporary pumping equipment and piping system adjacent to the existing main.

H. No construction shall begin until the related project submittals are approved and all provisions of the work have been coordinated with the Owner and Engineer.

1.4 SYSTEM REQUIREMENTS

A. Design, install, operate, and subsequently remove a temporary bypass pumping system to divert the existing flows around the work area for the duration of the project.

B. Bypass pumping equipment shall be automated and capable of functioning without the assistance of an operator.

C. Pumping equipment shall be capable of operating for an extended period of time running dry. After this period of time, the pump shall have the capability of pulling a 25 inch Hg vacuum without adjustment or repair.

D. The entire bypass system including all pumps, pipe, hose, valves, and fittings shall be provided by one bypass pumping company who is responsible for the operation of the entire system.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Pumps shall be centrifugal, end suction, fully automatic self-priming low noise pumps that do not require the use of foot-valves, vacuum pumps, diaphragm pumps, or isolation valves in the priming system. Pumps must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flow pumps and shall immediately develop 25 inch Hg vacuum without adjustment or repair or employ level control devices to regulate on/off or variable speed of the pump. Hydraulic, submersible, electric, or wellpoint type pumps are prohibited. Pumps shall be low noise sound attenuated, critically silenced units.

B. Seals shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding suction pressures to 100 psi running. The mechanical seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for extended periods of time. All metal parts shall be of stainless steel. Elastomers shall be Viton. Pump end shall be manufactured to meet ISO 9002 certifications.

C. The primary pumps shall be electric/diesel powered via a temporary electrical service. Temporary electrical service to be provided by the Contractor at his expense.

D. Back-up pumps and/or standby electric generator system may be fossil fuel engine driven.

E. Provide the necessary start/stop controls for each pump.

F. Include one stand-by pump of each size to be maintained on site and a standby power source.

G. Back-up pumps shall be on-line, isolated from the primary system by a valve.

H. Pump shall not be connected by a common suction manifold. The use of PVC or Steel Pipe with Dresser Couplings will not be accepted. All pipe or hose will be rated for 25 inch Hg Vacuum.

I. In order to prevent the accidental spillage of flows, all discharge systems must be constructed of high density polyethylene pipe with fused joints or quick disconnect pipe with positive restrained joints, and leak proof connections. Discharge hose will only be allowed by specific permission of the engineer. PVC pipe with glued joints, aluminum “irrigation pipe”, steel pipe or PVC pipe with Dresser couplings will not be accepted. All joints must be 100% restrained. All discharge pipe must have a minimum working pressure of 50 psi. All force main connections shall be made by using flanged composite hose with a working pressure of 150 psi.

J. Allowable piping materials will be fused, high density polyethylene pipe, acceptable disconnect pipe, or flanged composite pressure class hose. SDR of discharge piping shall be suitable for the calculated discharge pressures. The vendor fusing the pipe must have a minimum of 5 years experience fusing HDPE pipe of the same diameter required for the project.

2.2 SYSTEM DESCRIPTION

A. Design Requirements:

1. Bypass pumping systems shall have sufficient capacity to pump a peak flow equal to the capacity of the existing pipes. The following information is provided for informational purposes only:

   a. The existing catch basin storm drain pipes should be relatively low-flowing during dry weather flows.

2. Provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the section to be repaired. Bypass pumping systems will be required to be operated during television and pipe lining operations.

3. Have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure. Also, a back-up power supply source shall be provided.

4. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work area as necessary for satisfactory performance of work.

5. Make all arrangements for bypass pumping during the time when the pump station is shut down for any reason. System must overcome any line pressure on discharge.

B. Performance Requirements:

1. There must be no interruption in the flow throughout the duration of the Project. Provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interfere with the Work, carry it past the Work and return it to the existing pipe downstream of this work.

2. Provide all necessary means to safely convey the flows past the work area. The Contractor will not be permitted to stop or impede the main flows under any circumstances.

3. Maintain flow around the work area in a manner that will not cause surcharging of pipes, damage to pipes and that will protect public and private property from damage and flooding.

4. The bypass system shall not require excavation to reduce the suction lift without the specific approval of the engineer prior to the bid.

5. Protect water resources, wetlands, and other natural resources in accordance with the appropriate project permits.

6. Meet noise limits of 69dbA @ 30 feet. All diesel driven standby pumps and/or back-up power supplies shall be sound attenuated. The use of Critical Silenced Canopy pumps or acoustical enclosures for sound attenuation is required.

7. The pumps shall not be benched down to make the suction lift unless approved by the Engineer prior to bid.

PART 3 EXECUTION

3.1 PREPARATION

A. Precautions

1. Locating existing utilities in the area where the Contractor selects to locate the bypass pipelines. Locate bypass pipelines to minimize any disturbances to existing utilities and obtain approval of the pipeline locations from the Owner, Engineer, and property owners. Pay all costs associated with relocating utilities and obtaining all approvals.

2. During all bypass pumping operation, protect the existing pipes, pump station, force main, and all pipelines from damage inflicted by any equipment. Be responsible for all physical damage to the existing facilities caused by human or mechanical failure.

3.2 FIELD QUALITY CONTROL AND MAINTENANCE

A. Test:

1. Perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. Give the Engineer 24 hour notice prior to testing.

B. Inspection:

1. Inspect the bypass pumping system regularly (every 2 hours) to ensure that the system is working correctly.

C. Maintenance Service:

1. Ensure that the temporary pumping system is properly maintained and a responsible operator is on hand at all times when pumps are operating.

D. Extra Materials:

1. Keep spare parts for pumps and piping on site as required.

2. Maintain adequate hoisting equipment for each pump and accessories on the site.

E. INSTALLATION AND REMOVAL

1. Make connections to the existing pipes and construct temporary bypass pumping structures only at locations approved by the submittals.

2. Plugging or blocking of flows shall incorporate primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

3. When working inside manhole or force main, exercise caution and comply with OSHA requirements when working in the presence of harmful gases, combustible oxygen-deficient atmospheres, and confined spaces.

4. The pipeline must be located off streets and sidewalks and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the contractor must place the bypass pipelines in trenches and cover with temporary pavement. Adhere to any and all applicable project permits.

5. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, remove all the piping, restore all structures, pipelines and property to pre-construction condition, and restore all pavement surfaces. Adhere to any and all applicable project permits.

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Products and Materials
2. Product Delivery Requirements
3. Packaging, Handling and Storage Requirements
4. Inspection of Offsite Work

1.2 QUALITY ASSURANCE

A. Review all contract Drawings and Specifications with respect to specific system characteristics, applicability of materials and equipment for the intended purposes, sizes, orientation, and interface with other systems, both existing and proposed, and certify that the materials and equipment proposed will perform as specified prior to submitting shop drawings.

B. Provide sworn certificates as to quality and quantity of materials where specified or requested by the Engineer.

C. Obtain concurrence of the Engineer prior to processing, fabricating, or delivering material or equipment.

1.3 PRODUCTS AND MATERIALS

A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by a single manufacturer unless specified otherwise.

B. Use only new and first quality material in the Work. Material shall conform to the requirements of these Specifications and be approved by the Engineer. If, after trial, it is found that sources of supply that have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved materials from other approved sources.

C. Immediately remove defective materials and equipment from the site, at no additional cost to the Owner. The Contractor may be required to furnish sworn certificates as to the quality and quantity of materials before materials are incorporated in the Work.

D. Engineer has the right to approve the source of supply of all material prior to delivery.

1.4 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer’s instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. Progressively deliver materials and equipment to the Site so there will be neither delay in progress of the Work nor an accumulation of material that is not to be used within a reasonable time.

E. Deliver products to the Site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to the manufacturer, grade, quality, source, and other pertinent information.

1.5 PACKAGING, HANDLING AND STORAGE REQUIREMENTS

A. Provide storage and handling of all materials and equipment required for the Work.

B. Except as otherwise indicated in the Contract Documents, determine and comply with the manufacturer's recommendations on product storage, handling, and protection. Provide manufacturer's documentation on recommended storage procedures when requested by the Engineer.

C. Properly store and protect all equipment immediately upon its arrival. All equipment shall be stored in a clean, dry, heated, secured, and insured indoor facility satisfactory to the Engineer. Equip drive motors with thermostatically controlled strip heaters. Outdoor storage with plastic, canvas, plywood or other cover will not be allowed except where specific approval for designated items not containing electrical components or bearings is obtained from the Engineer. This approval does not relieve the Contractor of responsibility for proper protection of materials.

D. Familiarize workmen and subcontractors with hazards associated with materials, equipment, and chemicals specified herein and take all necessary safety precautions.

E. Areas available on the construction site for storage of material and equipment shall be as shown on the Drawings or approved by the Owner.

F. Materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier, and Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

G. Protect finished surfaces including floor surfaces, stairs, joints, and soffits of passageways from damage until accepted by the Engineer.

H. Promptly remove materials from the site of the Work which have become damaged or are unfit for the use intended or specified. The Contractor will not be compensated for the damaged materials or their removal costs.

I. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required. Provide suitable and adequate storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished, until the final completion and acceptance of the Work.

J. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

K. All materials and equipment to be incorporated in the Work shall be placed so as to not damage any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Keep materials and equipment neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to the Owner.

L. No material or equipment will be permitted to be stored in any of the Owner's facilities, unless otherwise approved by the Engineer.

M. Do not store material or equipment in any wetland or environmentally sensitive area. Stockpile sites shall be level, devoid of mature stands of natural vegetation, and removed from drainage facilities and features, wetlands, and stream corridors.

N. Contractor shall be fully responsible for loss or damage to stored materials and equipment.

O. No item judged rusty, corroded or otherwise damaged during storage will be accepted. Any electrical or instrumentation item determined by the Engineer to be damaged shall be removed from the Site and replaced by a completely new item in first class condition. Items not properly stored will not be considered for any partial payment.

P. Provide protective and preventive maintenance during storage consisting of manually exercising equipment where required, inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer as necessary for its protection and other precautions as necessary to assure proper protection of equipment stored.

Q. Treat ferrous surfaces not receiving finish coats of paint with rust preventive coating, and protect non-ferrous metal work and devices with suitable wrappings.

1.6 INSPECTION OF OFFSITE WORK

A. The Owner and Engineer will inspect Work performed away from the construction site during fabrication, manufacture, or testing, or before shipment. Give 2 weeks written notice regarding the place and time where such fabrication, manufacture, testing, or shipping will be done.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01630

PRODUCT SUBSTITUTION DURING CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Product substitution procedures

1.2 CONTRACTOR'S OPTIONS

A. For materials or equipment (hereinafter products) specified only by performance or reference standard, select product meeting that standard, by any Supplier. To the maximum extent possible, provide products of the same generic kind from a single source.

B. For products specified by naming several products or manufacturers, select any one of the products or Suppliers named, which fully complies with the Drawings and Specifications. Another “or-equal” product can also be considered by the Engineer if it complies with the provisions of Article 6.05, Section 00700. If a product proposed by the Contractor does not qualify as an “or-equal” item, then it can be considered as a proposed substitute item, and the Contractor must comply with the requirements of Article 6.05.A.2, Section 00700.

C. For products specified by naming products or manufacturers and followed by words indicating that no “or-equal” item or substitution is permitted, there is no option and no substitution will be allowed.

D. Where more than one choice is available as a Contractor's option, select product that is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

A. If in the Engineer’s sole discretion a product proposed by the Contractor does not qualify as an “or-equal” item under the provisions of Article 6.05.A.1 of Section 00700, it can be considered a proposed substitute item. Submit information required under Article 6.05.A.2, Section 00700 for proposed substitutes.

B. The Engineer will consider written requests from the Contractor for substitutions within 30 days after the Notice to Proceed. After this period, requests will be considered only in case of unavailability of product or other conditions beyond control of the Contractor.

C. Submit 5 copies of request for substitutions. Submit a separate request for each proposed substitution. In addition to the submittal requirements outlined in Article 6.05.A.2 of Section 00700, include the following in each substitution request:

1. For products or Suppliers:

    a. Product identification, including Supplier & manufacturer's name and address.

    b. Manufacturer's literature with product description, performance and test data, and reference standards.

    c. Samples, if appropriate.

    d. Name and address of similar projects on which product was used, and date of installation.

2. For construction methods (if specified):

    a. Detailed description of proposed method.

    b. Drawings illustrating method.

3. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, Supplier or method specified.

D. The substitution request shall include written certification and statements that are outlined in Article 6.05.A.2 of Section 00700.

E. A request constitutes a representation that Contractor:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.

2. Will provide same or better guarantees, warranties or bonds for proposed substitution as for specified product.

3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

4. Waives all claims for additional costs or time extension which may subsequently become apparent.

5. Will reimburse Owner for review or redesign services associated with re-approval by authorities having jurisdiction.

F. A proposed substitution will not be accepted if:

1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.

2. It will delay completion of the Work.

3. It is intended or implied on a Shop Drawing and is not accompanied by a formal request for substitution from the Contractor.

G. The Contractor is responsible for all costs relating to substitution requests.

H. Approval of a substitution does not relieve the Contractor from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01720

FIELD ENGINEERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Establishment of lines, benchmarks, and elevations required to layout and construct the Work

2. Property line survey and delineation

1.2 SUBMITTALS

A. Informational Submittals

1. Submit the qualifications of the Registered Professional Engineer and/or Registered Land surveyor to be hired to perform various portions of the Work, as applicable.

2. Submit documentation verifying the accuracy of field engineering work.

3. Submit 4 copies of final record drawings of field engineering layouts and as-built survey.

4. Submit certificate signed by registered (licensed) engineer or surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain deviations.

1.3 RECORDS

A. Maintain a complete, accurate log of control and survey work as it progresses.

1.4 QUALITY ASSURANCE

A. Employ a qualified engineer, registered with the Commonwealth of Massachusetts as a Professional Engineer or a competent surveyor, registered with the Commonwealth of Massachusetts as a Land Surveyor, as required for the particular characteristics of the work being performed.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROCEDURES

A. The Registered Professional Engineer or Land Surveyor provided shall establish and maintain lines, elevations and reference marks needed during the progress of the Work and shall re-establish stakes and marks placed by the Engineer that are lost or destroyed through the course of the Work. Verify such work by instrument or other appropriate means.

B. The Engineer shall be permitted at all times to check the lines, elevations and reference marks, set by the Contractor, who shall correct any errors disclosed by such check. Such a check shall not be construed to be an approval of the Contractor's work and shall not relieve or diminish the responsibility of the Contractor for the accurate and satisfactory construction and completion of the entire Work.

C. Make, check, and be responsible for measurements and dimensions necessary for the proper construction of and the prevention of misfittings in the Work.

D. Furnish all protective stakes and temporary structures for marking and maintaining points and lines for the building of the Work, and give the Engineer such facilities and materials for verifying said lines and points as he may require.

E. Revisions to the layout and elevations of the Work as defined by the Contract Documents shall be approved by the Engineer.

F. Maintain and prepare final record drawings of field engineering layouts and as-built survey conducted after completion of the Work.

END OF SECTION

SECTION 01725

PRESERVATION AND RESTORATION OF PROJECT FEATURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Protection and replacement of trees, shrubs, signs, property markers, fences, and related project features.

2. Taking precautions, providing programs, and taking actions necessary to protect public and private property and facilities from damage.

1.2 DEFINITIONS

A. Underground Structures

1. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, and manholes, chambers, electrical and signal conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.

2. Underground structures known to the Engineer are shown on the Drawings to the extent that locations are available. This information is shown for the assistance of the Contractor in accordance with the best information available, but is not guaranteed to be correct or complete. The Contractor shall be responsible for checking on the actual locations of water, sewer, gas electric and telephone service connection lines to avoid potential interferences.

B. Surface Structures

1. Surface structures are defined as existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 REPAIR/RESTORATION

A. Trees, shrubs, and similar items shall not be removed except where approved by the Engineer. Items to be removed shall be clearly marked as directed by the Engineer. If objects not to be removed are damaged or removed, they shall be repaired or replaced to their original condition.

B. Trees and shrubs on private property, which are removed or damaged by the Contractor shall be replaced in kind.

C. Signs, fences, property markers, walls, guard rails and other public or private property shall be replaced in kind if damaged. Supports and protective devices required shall be provided.

D. Underground and Surface Structures

1. In the event of damage, injury or loss to existing utilities and structures, whether shown on the Drawings or not, make all reasonable efforts to facilitate repairs and to mitigate the impact of such events upon the utility or structure owner's normal operations. Restore the existing utility or structure to the condition required by the owner of the utility or structure or at least to the condition found immediately prior to the Work. In the event that the utility owner elects to make the repairs, provide all reasonable access and assistance, and reimburse the utility owner for the cost of repairs. If utility service is interrupted due to damage to facilities, alternate facilities shall be provided.

2. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers and curbs which are temporarily removed to facilitate the Work shall be replaced and restored to their original condition at the Contractor's expense unless otherwise indicated in other sections of these specifications.

3. Wherever water, sewer, gas or petroleum mains, electric or telephone lines, cables or other utilities and structures are encountered and may be in any way interfered with, inform the Engineer and the appropriate utility company. Cooperate with the Engineer and utility company in the protection, removal, relocation, and replacement of structures and facilities.

4. Prior to proceeding with any construction, notify in writing owners of utilities and structures within the vicinity of the proposed Work.

5. Work affecting water distribution systems, which will take fire hydrants out of service, must be coordinated with the local fire department. The Contractor shall be prepared to restore fire flows in the event of an emergency or to provide for temporary fire flow service in accordance with the requirements of the local fire department.

6. Materials used for relocation or replacement of utilities and structures shall be of an equivalent material, type, class, grade and construction as the existing or as approved by the respective owners thereof, unless otherwise shown or specified.

7. When any survey monument or property marker, whether of stone, concrete, wood or metal, is in the line of any trench or other construction work and may have to be removed, notify the Engineer in advance of removal. Under no circumstances shall any monument or marker be removed or disturbed by the Contractor or by any of his Subcontractors, employees or agents, without the permission of the Engineer. Monuments or markers removed or disturbed shall be reset by a land surveyor licensed in the State where the Work is located at the Contractor's expense. Should any monuments or markers be destroyed through accident, neglect or as a result of the Work under this Contract, the Contractor shall, at his own expense, employ a land surveyor licensed in the State where the Work is located to re-establish the monument or marker.

3.2 PROTECTION

A. The construction of certain portions of the project may require excavation within the root systems of trees. Roots with a diameter of 2 inches or more within the excavation shall not be cut. If necessary, excavation shall be made with small powered equipment or by hand to comply with this requirement. It may be necessary to excavate from more than one direction to avoid damage to the roots.

B. The trunks of trees that are to remain and are within the swing radius of the excavating machine bucket when fully extended shall be wrapped with burlap and 2-inch by 4-inch protective wood slats (8-inch spacing maximum) wired around the circumference of the trees to protect them from damage.

C. Tree limbs shall not be cut except upon written approval of the Owner and the Engineer. Tree limbs cut shall be painted with approved forestry paint manufactured specifically for that purpose.

D. Underground and Surface Structures

1. Sustain in their places and protect from direct or indirect injury underground and surface structures within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.

2. Pay utility service company charges related to the temporary support of utility poles if required to complete the Work.

3. Assume risks associated with the presence of underground and surface structures within or adjacent to the limits of the Work. The Contractor shall be responsible for damage and expense for direct or indirect injury caused by his Work to any structure. Immediately repair damage caused by the Work to the satisfaction of the owner of the damaged structure.

END OF SECTION

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SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Documentation required for the transfer of the completed Work to the Owner

2. Final Cleaning

1.2 SUBMITTALS

A. Closeout Submittals

1. Evidence of payment and release of liens

2. List of Subcontractors, service organizations, and principal vendors

1.3 SUBSTANTIAL COMPLETION

A. Refer to Article 14.04 in 00700, General Conditions, for procedures relating to obtaining Substantial Completion. Refer to 00520, Agreement, for Contract Times.

1.4 PROJECT CLOSEOUT DOCUMENTS

A. Provide warranties and bonds for items so listed in pertinent sections of the Project Manual.

B. Provide evidence of compliance with requirements of governmental agencies having jurisdiction.

C. Provide evidence of payment and release of liens.

D. Provide list of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

1.5 FINAL PAYMENT

A. Refer to Article 14.06 and 14.07 in 00700, General Conditions, for procedures relating to final inspection and payment.

B. The Contract shall be considered complete and final payment made, only when:

1. All provisions of the Contract Documents have been strictly adhered to.

2. The project and premises have been left in good order, including removal of all temporary construction, Contractor-owned and extraneous materials.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEANING

A. Remove and entirely dispose of material or debris that has washed, flowed or has been placed in existing watercourses, ditches, gutters, drains, pipe, or structures, for work done under the Contract work limits. Leave ditches, channels, drains, pipes, structures, and watercourses in a clean and neat condition upon completion of the Work.

B. Restore or replace any public or private property damaged or removed during the course of the Work. Property shall be returned to a condition at least equal to that existing immediately prior to the beginning of operations. Complete all highway or driveway, walk, and landscaping work using suitable materials, equipment and methods. Perform restoration of existing property, signs or structures promptly as work progresses; do not leave restoration work until the end of the Contract Time.

END OF SECTION

SECTION 02075

GEOSYNTHETICS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Non-woven geotextiles

2. Permanent non-degradable erosion control blankets

1.2 REFERENCES

A. Data Sheet DS1 - Non-Woven Geotextiles

B. ASTM D3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics: Diaphragm Bursting Strength Tester Method

C. ASTM D4491 - Test Methods for Water Permeability of Geotextiles by Permittivity

D. ASTM D4533 - Test Method for Trapezoid Tearing Strength of Geotextiles

E. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles

F. ASTM D4751 - Test Method for Determining the Apparent Opening Size of a Geotextile

G. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles Geomembranes and Related Products

H. ASTM D5261 - Test Method for Measuring Mass per Unit Area of Geotextiles

1.3 SUBMITTALS

A. Product data for all geosynthetics proposed for use on this project.

B. Manufacturer-approved construction quality assurance/quality control manual for all of the geosynthetics proposed for use on this project.

C. Manufacturing quality control testing data specified. Submit certification of required performance testing on all geosynthetics by an independent laboratory and label and identify all geosynthetic products delivered to the site.

D. Manufacturer's recommended installation and fastening details for the erosion control blankets. The following details are required:

1. Typical stapling pattern and spacing. List staple density in terms of staples per square yard.

2. Anchoring details for channels and slopes.

3. Transverse blanket lap splice details, as well as longitudinal lap splice details if parallel blankets are to be installed.

4. Termination details for the origin and termination of the channels and slopes.

1.4 QUALITY ASSURANCE

A. Obtain from the geosynthetic product manufacturers a warranty that their products are free from defects in materials and workmanship at the time of delivery to the project site.

B. Material found to be defective or which does not conform to these specifications will be rejected.

1.5 DELIVERY, STORAGE AND PROTECTION

A. The Engineer reserves the right to reject and require replacement of any damaged materials delivered to the site, at no additional cost to the Owner.

B. Stockpile and store the materials in accordance with the manufacturer's recommendations.

C. Label and bag all geosynthetic rolls in packing that is resistant to photo degradation by ultraviolet (UV) radiation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Group 2 Non-Woven Geotextile

1. "4506" as manufactured by Amoco Fabrics and Fibers

2. "FX-60HS" as manufactured by Carthage Mills

3. "160N" as manufactured by Mirafi Inc.

4. Or equal

B. Permanent Non-Degradable Erosion Control Blankets

1. "P300" as manufactured by North American Green

2. "LANDLOK TRM 450" as manufactured by SI Geosolutions, Inc.,

3. Or equal

2.2 MATERIALS

A. Non-woven geotextiles shall be manufactured from a continuous polypropylene filament. A needle punching process shall achieve bonding.

B. Permanent, non-degradable ECBs shall consist of a three-dimensional matrix of UV-stabilized polypropylene encased between two polypropylene nets. The blanket shall be cross-stitched on two inch centers maximum with polypropylene thread

1. Each of the polypropylene nets shall have a mass per unit area of at least three pounds per one thousand square feet.

2. Permanent, non-degradable ECBs shall be recommended by the manufacturer for use on 1:1 slopes and in drainage channels, and shall have a minimum, limiting shear stress of eight pounds per square foot, measured over 50 hours.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect all products prior to the installation for any defects that may have been the result of storage and handling. The Engineer reserves the right to reject and require replacement of any damaged product, at no additional cost to the Owner.

3.2 INSTALLATION

A. Install geosynthetic products in accordance with the approved manufacturer's QA/QC manuals, project details, and pertinent sections of these Specifications.

3.3 QUALITY CONTROL

A. The Engineer may remove a sample (i.e. a strip that is 3 feet long by the entire roll width) from a maximum of 1 roll of each 10 rolls of all geosynthetic materials delivered to the project, and submit the samples to an independent laboratory for analysis of the product to ensure that the geosynthetics meet the specifications herein.

END OF SECTION

(DATA SHEETS FOLLOW)

Data Sheet DS1 - Non-Woven Geotextile Mechanical Properties								
Property	Test Method	Units	Testing Frequency	Value				
				Group 1	Group 2	Group 3	Group 4	Group 5
Mass per Unit Area	ASTM D5261	oz/yd^2	1/150,000 ft^2	4	6	8	12	16
AOS	ASTM D4751	US Sieve	1/150,000 ft^2	70	70	100	100	100
Permitivity	ASTM D4491	$gal/min/ft^2$	1/150,000 ft^2	140	90	80	70	50
Puncture Strength	ASTM D4833	lbs	1/150,000 ft^2	60	90	130	195	245
Mullen Burst Strength	ASTM D3786	lbs/in^2	1/150,000 ft^2	225	350	400	650	800
Trapezoidal Tear Strength	ASTM D4533	lbs	1/150,000 ft^2	35	65	80	115	145
Grab Tensile/Elongation	ASTM D4632	lbs(%)	1/150,000 ft^2	95 (50)	150 (50)	200 (50)	300 (50)	400 (50)

SECTION 02200

SITE PREPARATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes

1. Clearing and grubbing
2. Grading
3. Stripping and stockpiling of soil and sod

1.2 SUBMITTALS

A. Submit construction methods and equipment that will be utilized for the clearing, grubbing, and waste material disposal specified within this Section.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

A. Except as otherwise directed, cut, grub, remove and dispose of all trees, stumps, brush, shrubs, roots and any other objectionable material within the limits of the Work on the site and where required to construct the work.

B. Protect trees or groups of trees, designated by the Engineer to remain, from damage by all construction operations by erecting suitable barriers, or by other approved means. Conduct clearing operations to prevent falling trees from damaging trees designated to remain.

1. All damage done to the trees by the Contractor's operation shall be trimmed and painted where cut as directed or as necessary to provide adequate vertical clearance for construction activities. The dressing or paint shall be applied no later than two days after the cuts are made.
2. Use all necessary precautions to prevent injury to other desirable growth in all areas. Contractor shall assume full responsibility for any damage.

C. Protect areas outside the limits of clearing from damage. No equipment or materials shall be stored in these areas.

D. No stumps, trees, limbs, or brush shall be buried in fills or embankments.

3.2 DISPOSAL OF MATERIALS

A. Remove all tree trunks, limbs, roots, stumps, brush, foliage, other vegetation and objectionable material from the site and dispose of in a legal manner.

B. Burning or direct burial of cleared and grubbed materials on-site will not be permitted.

3.3 GRADING

A. In preparation for placing loam, paved drives and appurtenances, perform grading to the lines, grades and elevations shown on the Drawings, and otherwise directed by the Engineer and perform in such a manner that the requirements for formation of embankments can be followed. All material encountered, regardless of its nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, maintain the subgrade in such condition that it will be well drained at all times. Install temporary drains and drainage ditches to intercept or divert surface water that may affect the work when necessary.

B. If at the time of grading it is not possible to place material in its final location, stockpile material in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses.

D. Stones or rock fragments larger than 4 inches in their greatest dimensions will not be permitted in the top 12 inches of the finished subgrade of all fills or embankments except along the access roadways and rip-rap where shown on the Drawings.

E. In cuts, loose or protruding rocks on the excavated slopes shall be barred loose or otherwise removed to line or finished grade of slope. Cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the Engineer.

3.4 DUTCH ELM WOOD

A. Dutch Elm diseased wood shall be disposed of in accordance with any local regulations.

B. Where the work includes the removal of elm trees or the limbs of elm trees, such trees or limbs thereof shall be disposed of immediately after cutting or removal and in such a manner as to prevent the spread of Dutch Elm disease. This shall be accomplished by covering them with earth to a depth of at least 6 inches in areas outside the right-of-way locations where the Contractor has arranged for disposal.

C. Where the work includes the removal and disposal of stumps of elm trees, such stumps shall be completely disposed of immediately after cutting in the manner specified above.

3.5 CLEANING UP

A. During construction, maintain the Project Site and adjacent areas clean and free of all rubbish, debris, surplus materials and unnecessary construction equipment.

B. Where material or debris has washed, flowed or in any way accumulated in watercourses, ditches, gutters, drains, pipes or structures during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of as necessary, and upon completion of the work shall be cleaned, flushed and left in neat conditions to the satisfaction of the Engineer.

C. Restore or replace, when and as directed, any public or private property damaged by the Work to a condition at least equal to that existing immediately prior to the beginning of operations. All drainage structures, curbstones, signs, guardrails, fences and stone walls which are removed or damaged as a result of the work under this contract shall be reset or replaced as required.

END OF SECTION

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SECTION 02210

SUBSURFACE INVESTIGATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Soils subsurface investigation at the site, the use of data resulting from the investigation, and conditions warranting additional soils investigation.

2. Pipe and utility subsurface investigations that are required in order to properly locate, plan for and/or connect to the various existing pipelines.

B. Related Sections

1. Section 00300 – Geotechnical Data

2. Section 02920 - Lawns and Grasses

3. Section 02315 - Excavation, Backfill, Compaction, and Dewatering

4. Section 02740 - Bituminous Concrete Pavement

1.2 REFERENCES

A. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.560 through 1926.562 including Appendices A through F

B. MGL Chapter 82 Section 40

1.3 QUALITY ASSURANCE

A. The entire test pit excavation must be observed by the Engineer.

1.4 SITE CONDITIONS

A. Soils Investigation

1. Copies of the soil boring logs are included in Section 00300. Exploration locations are shown on the Drawings.

2. Use of the Data

a. The Drawings indicate conditions as they are believed to exist based upon limited subsurface explorations. Investigations and field tests must be conducted to verify the conditions that exist which may affect the Work. All investigations must be conducted under the Engineer's observation.

B. Pipeline and Utility Investigations

1. The Drawings show available data relative to existing underground pipe and utilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PREPARATION

A. Obtain all available information on buried structures and utilities in the vicinity of the investigation.

B. Coordinate Work such that all affected property, structure, and utility owners are aware of the Work prior to its commencement.

C. Schedule subsurface investigations such that they do not interfere with other Work or traffic and in advance of other Work in that location.

D. Provide the Engineer with 24-hour notice prior to commencement of subsurface investigations.

3.2 SUBSURFACE INVESTIGATIONS

A. Prior to test pitting operations, delineate the general scope of the excavation or boring on the paved surface of the ground using white paint, or stakes or other suitable white markings on non-paved surfaces and coordinate with the appropriate agencies in accordance MGL Chapter 82 Section 40. Pre-marking will not be acceptable if such marks can interfere with traffic or pedestrian control or are misleading to the general public.

B. Excavate test pits as indicated, or as requested by the Owner. Expose the top of the pipeline, and adjacent utilities, at each test pit location.

C. Contactor may, at his expense and with permission by the Owner, perform additional explorations not ordered by the Engineer.

D. Perform test pits in accordance with the requirements of Section 02315. Excavate the bottom 2 feet of the test pit (or in close proximity to known or anticipated utilities) by hand. Excavate to top of pipelines by hand. Test pits shall be braced, sheeted and dewatered or as otherwise required for safe excavation and examination of the structure or utility to be exposed.

E. Measure the depth to the top of the pipeline, as well as to adjacent utilities, from the ground surface, at each test pit location. Record location, depth and size of pipelines and utilities uncovered during the test pits. Record any other pertinent information which is learned as a result of excavating the test pit.

F. Excavate test pits of an appropriate size with equipment suitable for the location and character of the pit to be excavated.

G. All subsurface investigations shall be conducted in accordance 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F.

H. After observation by the Engineer, backfill and compact the test pits in accordance with Section 02315.

I. Borings or other drilled probes shall be filled in their entirety with grout upon completion.

J. Repair damage to any structure, utility, or private or public property or Site feature damaged during the Work to the satisfaction of the Engineer.

K. Repair paved surfaces in accordance with Section 02740.

L. Repair lawn areas or grass surfaces in accordance with 02920.

END OF SECTION

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SECTION 02315

EXCAVATION, BACKFILL, COMPACTION AND DEWATERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation, backfill and compaction for subsurface utilities
2. Removal, handling and disposal of rock
3. Temporary dewatering systems

B. Related Sections

1. Section 01570 - Temporary Controls
2. Section 02210 - Subsurface Investigations
3. Section 02320 - Borrow Materials

1.2 REFERENCES

A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

B. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

C. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

D. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

E. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F

F. 520 CMR 14.00 Excavation and Trench Safety

G. 780 CMR 1705.0 Requirements for Structural Tests and Inspections

H. Commonwealth of Massachusetts Highway Department “Standard Specifications for Highways and Bridges,” 1988 Edition as amended

1.3 DEFINITIONS

A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.

C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

F. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

G. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

H. Temporary Dewatering System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.

I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

1.4 SUBMITTALS

A. Drawings and calculations for each Earth Retention System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Earth Retention Systems.

1. Submit calculations and drawings for Earth Retention Systems prepared, signed and stamped by a Professional Engineer registered in the state where the work is performed.

B. Performance data for the compaction equipment to be utilized

C. Construction methods that will be utilized for the removal of rock

D. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:

1. For suitable soil materials removed during Excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.

2. For borrow materials; perform tests at frequency specified in Section 02320, Borrow Materials.

E. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled or at a minimum of one test per lift. The Engineer will determine the locations and lifts to be tested. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.

1. Methods and equipment proposed for compaction shall be subject to prior review by the Engineer. Compaction generally shall be done with vibrating equipment. Static rolling without vibration may be required by the Engineer on sensitive soils that become unstable under vibration. Displacement of, or damage to existing utilities or structure shall be avoided. Any utility or structure damaged thereby shall be replaced or repaired as directed by the Engineer.

2. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.

a. Any costs associated with correcting and retesting as a result of a failure to meet compaction requirements shall be borne by the Contractor.

3. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than the project requirements, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.

4. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where trenches are so narrow that trench walls impact the attenuation of the gamma radiation, when adjacent to concrete that impacts the accuracy of determining moisture content, or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.

F. Dewatering plan for the excavation locations.

1.5 QUALITY ASSURANCE

A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P), 520 CMR 14.00, and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

1.6 PROJECT CONDITIONS

A. Notify Dig Safe and obtain Dig Safe identification numbers.

B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.

C. Make explorations and Excavations to determine the location of existing underground utilities and other underground facilities in accordance with Paragraph 3.2.D of this Section.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.

B. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, SW, and SP. Additional requirements are included in Section 02320.

C. Satisfactory fill materials shall not contain trash, refuse, vegetation, masses of roots, individual roots more than 18 inches long or more than 1/2 inch in diameter, or stones over 6 inches in diameter. Unless otherwise stated in the Contract Documents, organic matter shall not exceed minor quantities and shall be well distributed.

D. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.

E. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction. In no case shall salvaged materials be substituted for the required gravel base.

2.2 CONTROLLED DENSITY FILL

A. Controlled density fill shall be flowable, excavatable and shall require no vibration for placement. Compressive strength at 28 days shall be 30 to 80 psi and the slump shall be 10 to 12 inches.

2.3 DEWATERING MATERIALS

A. Provide haybales and silt fence in accordance with Section 01570.

B. Provide silt filter bags (Dandy Dewatering Bag, Dirtbag, JMP Environ-Protection Filter Bag, or equal) of adequate size to match flow rate.

PART 3 EXECUTION

3.1 PREPARATION

A. Public Safety and Convenience

1. Adhere to the requirements of 520 CMR 14.00 for all excavation work.

2. Take precautions for preventing injuries to persons or damage to property in or about the Work.

3. Provide safe access for the Owner and Engineer at site during construction.

4. Do not obstruct site drainage, natural watercourses or other provisions made for drainage.

3.2 CONSTRUCTION

A. Earth Retention Systems

1. Provide Earth Retention Systems necessary for safety of personnel and protection of the Work, adjacent work, utilities and structures.

2. Maintain Earth Retention Systems for the duration of the Work.

3. Sheeting

a. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.

b. Drive sheeting ahead of and below the advancing excavation to avoid loss of materials from below and from in front of the sheeting.

c. Sheeting is to be driven to at least the depth specified by the designer of the earth retention system, but no less than 2 feet below the bottom of the Excavation.

4. Remove earth retention system, unless designated to be left in place, in a manner that will not endanger the construction or other structures. Backfill and properly compact all voids left or caused by the withdrawal of sheeting.

a. Remove earth retention systems, which have been designated by the Engineer to be left in place, to a depth of 3 feet below the established grade.

B. Excavation

1. Perform excavation to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section.

2. Excavate with equipment selected to minimize damage to existing utilities or other facilities. Hand excavate as necessary to locate utilities or avoid damage.

3. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction.

4. Perform excavation in such a manner as to prevent disturbance of the final subgrade. The Engineer or Owner may require the final six inches

of excavation be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost if subgrade disturbance is considered excessive as judged by the Engineer or Owner.

5. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.

    a. Excavated material not required or not suitable for backfill shall be removed from the site.

    b. Perform grading to prevent surface water from flowing into the excavation.

    c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.

    d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.

6. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.

7. Make pipe trenches as narrow as practicable and keep the sides of the trenches undisturbed until backfilling has been completed. Provide a clear distance of 12 inches on each side of the pipe.

8. Perform the excavation in such a manner as to prevent disturbance of the final subgrade. If excessive subgrade disturbance is occurring, as judged by the Owner or Engineer, then the final 6 inches of the excavation shall be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner.

    a. Grade the excavation bottom to provide uniform bearing and support for the bottom quadrant of each section of pipe.

    b. Excavate bell holes at each joint to prevent point bearing.

    c. Remove stones greater than 6 inches in any dimension from the bottom of the trench to prevent point bearing.

9. If satisfactory materials are not encountered at the design subgrade level, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the material. Backfill the resulting extra depth of excavation with satisfactory fill materials and compact in accordance with the provisions of this Section.

C. Backfill and Compaction

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.

2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.

3. Prior to backfilling or placement of structures, excavated subgrades shall be proof compacted with either 10 passes of a 10-ton vibratory drum roller for open excavations or 6 passes of a large, reversible, walk behind vibratory compactor capable of exerting a minimum force of 2,000 pounds in trench or pit excavations. Soft or weak spots shall be over-excavated and replaced with compacted Granular Fill or compacted Crushed Stone wrapped in a non-woven geotextile, as directed by the Owner or their representative. If proof compaction will prove detrimental to the subgrade due to the presence of groundwater, static rolling may be allowed at the discretion of the Engineer or Owner.

4. Soil bearing surfaces shall be protected against freezing and the elements. If construction is performed during freezing weather, structures shall be backfilled as soon as possible after they are constructed. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.

5. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.

    a. Use borrow material if there is no excess of excavated material available at other portions of the Project.

6. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.

7. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.

8. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. In no case shall loose lift height for backfilling exceed 3 feet.

9. Do not drop large masses of backfill material into the trench endangering the pipe or adjacent utilities.

10. Install pipe in rock excavated trenches on a dense graded stone bedding with a minimum depth of 6 inches. Shape the stone bedding at the pipe bells to provide uniform support. Encase the pipe in the dense graded

crushed stone bedding to a grade 6 inches over the top of the pipe and 12 inches on each side of the pipe.

11. Backfill from the bottom of the trench to the centerline of the pipe with the specified material. This initial backfill is to be placed in layers of no more than 6 inches and thoroughly tamped under and around the pipe. This initial backfilling shall be deposited in the trench for its full width on both sides of the pipe, fittings and appurtenances simultaneously.

12. Where excavation is made through permanent pavements, curbs, paved driveways, or paved sidewalks, or where such structures are undercut by the excavation, place the entire backfill to sub-grade with granular materials and compact in 6 inch layers. Use approved mechanical tampers for the full depth of the trench. If required, sprinkle the backfill material with water before tamping so as to improve compaction. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required to correct the problem, and shall then be refilled and properly compacted with the surface restored to required grade at no additional expense.

13. The Contractor shall not place backfill against or on structures until they have attained sufficient strengths to support the loads to which they will be subjected, without distortion, cracking, or other damage. As soon as possible after the structures are adequate, they shall be backfilled with suitable backfill material.

14. Place and compact backfill around manholes, catch basins, gate boxes or other structures in six inch layers, from a point one foot over the pipe. Exercise care to protect and prevent damage to the structures.

D. Test Pit Excavation

1. General requirements of test pits are specified in Section 02210.

E. Dewatering

1. Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.

2. Conduct operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work.

3. Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

4. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.

5. Exercise care to ensure that water does not collect in the bell or collar holes to sufficient depth to wet the bell or collar of pipes waiting to be jointed.

6. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches for drainage. Upon completion of the work, all areas shall be restored to original condition.

7. Brace or otherwise protect pipelines and structures not stable against uplift during construction.

8. Do not excavate until the dewatering system is operational and the excavation may proceed without disturbance to the final subgrade.

9. Unless otherwise specified, continue dewatering uninterrupted until the structures, pipes, and appurtenances to be installed have been completed such that they will not float or be otherwise damaged by an increase in groundwater elevation.

10. Temporarily lower the groundwater level at least two feet below excavations to limit potential “boils,” loss of fines, or softening of the ground. If any of these conditions are observed, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred.

11. When subgrades are soft, weak, or unstable due to improper dewatering techniques, remove and replace the materials in accordance with Section 02320 at no cost to the Owner.

12. Notify the Engineer immediately if any settlement or movement is detected of survey points adjacent to excavations being dewatered. If settlement is deemed by the Engineer to be related to the dewatering, submit a modified dewatering plan to the Engineer within 24 hours. Implement the approved modified plan and repair any damage incurred to the adjacent structure at no cost to the Owner.

13. Dewatering discharge:

    a. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.

    b. Do not discharge water into any sanitary sewer system.

    c. Provide separately controllable pumping lines.

    d. The Engineer reserves the right to sample discharge water at any time.

14. Removal

a. Do not remove dewatering system without written approval from the Engineer.

b. Backfill and compact sumps or ditches with screened gravel or crushed stone in accordance with Section 02320.

c. Remove well points and deep wells. Backfill abandoned well holes with cement grout having a water cement ratio of 1 to 1 by volume.

3.3 PROTECTION

A. Protection of Existing Structures

1. All existing foundations, conduits, wall, pipes, wires, poles, fences, property line markers and other items which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. Should such items be damaged, they shall be restored by the Contractor to at least as good condition as that in which they were found immediately before the Work began.

B. Accommodation of Traffic

1. Streets and drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep the street or road open and safe for two-way traffic unless otherwise indicated.

2. Construct and maintain such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. Provide substantial barricades at crossings of trenches, or along the trench to protect the traveling public.

3. Where deemed necessary, such additional passageways as may be directed shall be maintained free of such obstructions. All material piles, open excavations, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, signage, or guards as necessary.

4. All traffic controls shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.

C. Erosion and Sedimentation Control

1. Take all necessary steps to prevent soil erosion.

2. Plan the sequence of construction so that only the smallest practical area of land is exposed at any one time during construction.

3. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during construction as judged by the Engineer.

END OF SECTION

SECTION 02317

UNDERGROUND WARNING TAPE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Underground Warning Tape

1.2 SUBMITTALS

A. Shop Drawing Submittals

1. Product Data

PART 2 PRODUCTS

2.1 MATERIALS

A. Metallic warning tape for underground piping shall be polyethylene tape with metallic core for easy detection and location of piping with a metal detector.

B. Tape shall be 6 inches wide.

C. Tape shall be as manufactured by Seton Name Plate Corp., New Haven, CT; Presco Detectable Underground Warning tape, Sherman, Texas; Blackburn Manufacturing, Neligh, NE; Mercotape, Hachensach, NJ; or equal.

D. The warning tape shall be heavy gauge 0.004 inch polyethylene and shall be resistant to acids, alkalis and other soil components. It shall be highly visible in the following colors with the associated phrases stamped in black letters and repeated at a maximum interval of 40 inches.

Type of Utility	Color	Warning Message
Sanitary Sewer	Green	CAUTION – SANITARY SEWER BURIED BELOW
Storm Drain	Green	CAUTION – STORM DRAIN BURIED BELOW
Water	Blue	CAUTION – WATER LINE BURIED BELOW
Gas	Yellow	CAUTION – GAS LINE BURIED BELOW

E. The tape shall be of the type specifically manufactured for marking and locating utilities.

PART 3 EXECUTION

3.1 INSTALLATION

A. All buried pipe and fittings shall be installed with metallic-lined underground warning tape located no more than 24 inches below final grade to allow detection by a metal detector.

END OF SECTION

SECTION 02320

BORROW MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Gravel Borrow
2. Processed Gravel Borrow for Pavement Sub-base
3. Sand Borrow
4. Stone Borrow
5. Ordinary Borrow

B. Related Sections

1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

B. ASTM C117 - Standard Test Method for Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing

C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./ft3)

E. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head)

F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)

G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

H. AASHTO – Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended

I. Commonwealth of Massachusetts Highway Department “Standard Specification for Highways and Bridges,” 1988 Edition as amended

1.3 SUBMITTALS

A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.

B. Provide sieve analysis (ASTM C136) and permeability analysis (ASTM D2434) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 1,500 c.y. of borrow material placed.

C. Provide modified proctor analysis (ASTM D1557) from certified soils testing laboratory for all borrow materials.

1. Take and test a sample of low permeability soil for each 5,000 cy of material placed, or as directed by the Engineer.

2. All other borrow materials shall be tested once unless more frequent testing is deemed necessary by the Engineer or Owner due to material variation.

D. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.

1.4 QUALITY ASSURANCE

A. No borrow shall be placed prior to the approval of Samples by the Engineer.

1.5 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. Comply with any environmental requirements and restrictions.

2. Keep all public and private roadway surfaces clean during hauling operations and promptly and thoroughly remove any borrow or other debris that may be brought upon the surface before it becomes compacted by traffic. Frequently clean and keep clean the wheels of all vehicles used for hauling to avoid bringing any dirt upon the paved surfaces.

PART 2 PRODUCTS

2.1 GRAVEL BORROW

A. Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

Gradation requirements for Gravel Borrow shall be determined by AASHTO-T11 and T27 and shall conform to the following:

Sieve	Percent Passing
½ inch	50 – 85
No. 4	40 – 75
No. 50	8 – 28
No. 200	0 - 10

Maximum size of stone in Gravel Borrow shall be 2 inches.

2.2 PROCESSED GRAVEL BORROW FOR PAVEMENT SUBBASE

A. The compacted Processed Gravel Borrow to be used for gravel access roads and pavement subbase, or other area where a firm, free-draining subgrade is needed shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

B. Gradation requirements shall conform to the following:

Sieve	Percent Passing
3”	100
1 ½”	70 – 100
¾”	50 – 85
No. 4	30 – 60
No. 200	0 - 10

C. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

2.3 SAND BORROW

A. Sand Borrow material shall be supplied from an off-site borrow area approved by the Engineer. Testing of the off-site Sand Borrow shall be at the Contractor’s expense.

B. Sand Borrow shall consist of clean, inert, hard, durable grains of quartz or other hard, durable, rock, free from loam or clay, surface coatings and deleterious materials. The allowable amount of material passing a No. 200 sieve as determined by ASTM-C117 shall not exceed 10% by weight.

C. Material shall consist of a clean, non-plastic, granular material conforming to the requirements of a SW, SP or SM under the Unified Soil Classification System (USCS) (ASTM D2487).

D. The material shall have the characteristics that when placed and compacted, the soil particles will bind together so as to form a solid, stable surface capable of supporting rubber-tired vehicular traffic during wet weather periods as well as extended dry weather periods. The borrow material shall not contain fines to the extent that the surface layer becomes “greasy” when wet.

E. The material shall not contain stones larger than 3/8 inch in diameter.

F. Material consisting of frozen clogs, ice and snow will be rejected.

G. All sand borrow material to be used shall be subject to approval by Engineer, and Engineer reserves the right to reject any borrow material from the job that does not meet the above requirements.

2.4 STONE BORROW

A. Crushed Stone Borrow

1. Crushed stone borrow shall consist of one of the following materials:

   a. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated or other objectionable pieces. A detrimental quantity will be considered as any amount in excess of 15% of the total weight. Thin stones shall be considered to be such stones whose average width exceeds 4 times their average thickness. Elongated stones shall be considered to be stones whose average length exceeds 4 times their average width.

   b. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 8 inches.

2. The crushed stone shall be free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.

3. The crushed stone shall have a maximum percentage of wear as determined by the Los Angeles Abrasion Test (AASHTO-T-96) as follows:

   a. For Class 1 Bit. Conc. 30%**

   b. For Cement Concrete Aggregate 45%***

   c. Crushed Stone for Subbase 45%

   **Crushed stone for this use shall consist of crushed or shattered natural rock only. Crushed gravel stone will not be permitted.

   ***Except for 5000 psi or greater cement concrete and prestressed concrete which shall be 30%.

4. The crushed stone shall conform to the grading requirements shown in the following grading Table.

	Percent by Weight Passing Through	
Sieve Size	**Minimum**	**Maximum**
1 ½" Crushed Stone		
2"	100	--
1 ½"	95	100
1"	35	70
¾"	0	25
¾" Crushed Stone		
1"	100	--

¾”	90	100
½”	10	50
3/8”	0	20
No. 4	0	5

5. Stone gradations shall vary depending on field use and shall be determined by Engineer.

B. Dense Graded Stone Borrow

1. The crushed stone used for backfill shall be a dense graded mixture and conform to the following gradation requirements.

Sieve Size (Square Openings)	Percent by Weight Passing Through	
	Minimum	Maximum
5/8″	100	100
½″	85	100
3/8″	15	45
#4	0	15
#8	0	5

C. Stone Riprap

1. Stone Riprap shall consist of hard, durable, and sound angular stone which is resistant to weathering. Rounded stones, boulders, elongated, thin or flat pieces whose breadth or thickness is less than one-third its length will not be allowed. The parent rock for riprap stones shall be igneous or metamorphic rock. Sedimentary rock types such as shale, sandstone, or similar soft stone will not be allowed. The stone shall be free of ice, snow, overburden, spoil, silt, clay, loam, organics and other deleterious matter.

2. Riprap stone shall have a minimum dry unit weight of 165 pounds per cubic foot.

3. Gradations of riprap stone material shall be based upon the thickness of the riprap layer as shown on the plans. Riprap layer thickness shall be defined as the typical layer thickness as measured perpendicular to the ground surface or slope. In all cases, no more than 5 percent by weight shall pass a 2-inch sieve. Diameter refers to the equivalent-volume spherical stone diameter as defined by the U.S. Army Corps of Engineers in EM 1110-2-1601.

a. Riprap Type 1

Percent of Stones Smaller	Diameter (in.)	Percentage of Stones Weighing Less Than	Weight (lbs.)
D_{100}	36	100	2,330
D_{50}	24	50	690
D_{15}	18	15	345

b. Riprap Type 2

Percent of Stones Smaller	Diameter (in.)	Percentage of Stones Weighing Less Than	Weight (lbs.)
D_{100}	24	100	690
D_{50}	16	50	200
D_{15}	12	15	100

4. Riprap material shall be well graded as a material without gaps in the gradation curve. The uniformity ratio (D_{85}/D_{15}) shall be between 1.5 to 3.0.

5. All riprap stone placed at the site shall be of the same parent rock from the same quarry and shall be visually similar.

D. Dumped Riprap Borrow

1. Stone used for dumped riprap shall be hard, durable, subangular in shape, resistant to weathering and shall meet the gradation requirement specified. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders will not be accepted unless authorized by the Engineer. Stone shall be free from overburden, spoil, shale, or organic material and shall meet the gradation requirement as specified.

Size of Stone	**Maximum Percent of Total Weight Smaller Than Given Size**
400 lb.	100
300 lb.	80
200 lb.	50
*25 lb.	10

*No more than 5% by weight shall pass a 2” sieve.

2. Each load of riprap shall be reasonably well graded from the smallest to the maximum size specified. Stones smaller than the specified 10% size and spall will not be permitted in an amount exceeding 10% by weight of each load.

E. Modified Rockfill

1. Stone used for modified rockfill shall meet the requirements of Article M2.02.4 “Modified Rockfill” as detailed in the “Massachusetts Specifications for Highways and Bridges”, 1988 edition and any revisions thereto. Modified rockfill shall consist of hard, durable, angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone and similar soft stone or relatively thin slabs will not be acceptable. Stone shall be free from overburden, spoil, shale, and organic material and shall conform to the following gradation requirements:

	Percent Passing Through	
Stone Size	**Minimum**	**Maximum**
8″	95	100
4″	0	25
2½″	0	5

2.5 ORDINARY BORROW

A. Ordinary borrow shall have the physical characteristics of soils designated as type GW, GP, GM, SW, SP or SM, under USCS and shall not be specified as gravel borrow, sand borrow, special borrow material or other particular kind of borrow. It shall have properties such that it may be readily spread and compacted for the formation of embankments. The borrow shall not include rocks with a major dimension greater than 8 inches.

PART 3 EXECUTION

3.1 INSTALLATION

A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents, and approved by the Engineer.

B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.

C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.

D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.

E. Utilize gravel borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.

F. Processed gravel for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.

G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.

H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.

I. Place all borrow to keep it free of other materials and to prevent segregation.

END OF SECTION

SECTION 02503

TESTING OF STORM DRAINAGE SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Testing of Storm Drainage Systems

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 TESTING OF STORM DRAINAGE SYSTEMS

A. Inspect storm drainage pipes included in the Work to ensure that pipes are straight between structures, correctly sloped, clean of debris and sediment, and generally free flowing. Alignment shall meet the requirements of Paragraph 3.1.E of this Section.

B. Visually inspect all storm drainage structures included in the Work to ensure that all structures are clean of debris and sediment, and have frames, covers, grates, inverts, sumps, and other required appurtenances.

C. All flexible pipe types including polyvinyl chloride (PVC), high-density polyethylene (HDPE), or polypropylene (PP) shall be tested for deflection in accordance with Paragraph 3.1.D of this Section at least forty five (45) days after it has been backfilled.

D. Allowable Deflection Test for flexible pipe types including polyvinyl chloride (PVC), high-density polyethylene (HDPE), or polypropylene (PP)

1. Pipe deflection measured not less than 45 days after the backfill has been completed shall not exceed 5 percent. Deflection shall be computed by multiplying the amount of deflection (average outside diameter less twice the average wall thickness diameter when measured) by 100 and dividing by the nominal diameter of the pipe.

2. Deflection shall be measured with a rigid mandrel (Go-No-Go) device cylindrical in shape and constructed with a minimum of nine or ten evenly spaced arms or prongs. Submit drawings of the mandrel with complete dimensions for each diameter of pipe to be tested. Hand-pull the mandrel through all sewer and drain lines.

3. Uncover any section of pipe not passing the mandrel and replace the bedding and backfill to prevent excessive deflection. Replace sections of the pipe as necessary. Retest repaired pipe immediately upon backfilling of trench until acceptable.

4. Retest the repaired section of pipeline again, from manhole to manhole, after the 45-day backfill period, until acceptable.

E. Alignment of Gravity Sewers and Drains

1. Lay drains accurately to line and grade.

2. After the pipe is laid and backfill complete, TV inspect the interior of the pipe from manhole to manhole. If excessive deviation in either the horizontal or vertical alignment is observed by the Engineer, the alignment is considered unacceptable.

3. If the alignment is unacceptable due to horizontal displacement, the Contractor will be allowed to construct intermediate manholes at his own expense. If the alignment is unacceptable due to vertical displacement, remove and replace the pipe to the proper grade.

END OF SECTION

SECTION 02516

POLYPROPYLENE PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Polypropylene (PP) pipe for:

a. Storm drainage and culvert lines

B. Related Sections

1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

2. Section 02320 – Borrow Material

3. Section 02503 – Testing of Storm Drainage Systems

1.2 REFERENCES

A. AASHTO M330 – Polypropylene Pipe 300-- 1500-mm (12-- to 60-in.) Diameter

B. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

C. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

D. ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials

E. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

F. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

G. ASTM F1417 – Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air

H. ASTM F2487 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines

I. ASTM F2764 – Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non--Pressure Sanitary Sewer Applications

J. ASTM F2881 – Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non--Pressure Storm Sewer Applications

K. ASTM F3058 – Standard Practice for Preliminary Field Testing of Thermoplastic Pipe Joints for Gravity Flow (Non-Pressure) Sewer Lines

1.3 SUBMITTALS

A. Submit product data on the pipe, fittings, and accessories.

B. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the appropriate ASTM standards specified herein.

1.4 DELIVERY, STORAGE AND HANDLING

A. When lifting with slings, only wide fabric choker slings capable of safely carrying the load shall be used. Wire rope or chain shall not be used to handle pipe.

B. All pipe and fittings shall be delivered to the site and unloaded with handling that conforms to the manufacturer's instructions for reasonable care. Pipe shall not be rolled or dragged over gravel or rock during handling. The Contractor shall take necessary precautions to ensure the method used in lifting or placing the pipe does not induce undue stress fatigue in the pipe.

C. In addition to deficiencies not covered by ASTM F2764, ASTM F2881, or AASHTO M330 pipe which has any of the following visual defects, will not be accepted.

1. Pipe with cracks, structural dents, or delamination, when not approved by ENGINEER.

2. Pipe that has been damaged during shipment or from handling even if previously approved before shipment.

3. Acceptance of the pipe at point of delivery shall not relieve CONTRACTOR of full responsibility for any defects in materials due to workmanship.

D. Pipe shall be handled in a manner intended to prevent damage to the pipe ends or to any coating or lining. Pipe shall not be skidded or rolled against adjacent pipe. Damaged coatings or lining shall be repaired by CONTRACTOR, at CONTRACTOR's expense, in accordance with the recommendations of the manufacturer and in a manner satisfactory to ENGINEER. Physical damage to the pipe or accessory shall be repaired by CONTRACTOR, at CONTRACTOR's expense, and in a manner satisfactory to ENGINEER.

E. Gasket Storage: All gaskets shall be stored in a cool place, preferably at a temperature less than seventy degrees Fahrenheit (70°F.), and in no case shall the gaskets be stored in the open, or exposed to the direct rays of the sun.

PART 2 PRODUCTS

2.1 MANUFACTURER – GENERAL

A. The manufacturer shall have manufacturing and quality assurance facilities capable of producing and assuring the quality of the pipe and fittings required by these specifications.

B. Pipe and fittings from different manufacturers shall not be interchanged for the same type of pipe and application.

2.2 PIPE IDENTIFICATION

A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding five-feet:

1. Appropriate ASTM Specifications.

2. Name and/or trademark of the pipe manufacturer.

3. Nominal pipe size, class, and wall.

4. Dimension ratio.

5. A production code from which the date and place of manufacture can be determined.

2.3 POLYPROPYLENE PIPE

A. Approved manufacturers include Advanced Drainage Systems, Inc (ADS)-SaniTite HP pipe.

B. 12--inch through 60--inch (300 through 1500 mm) pipe shall be smooth interior and annular exterior corrugated polypropylene (PP) pipe meeting the requirements of ASTM F2764, ASTM F2881 or AASHTO M330 Type S (double--wall) or D (triple--wall), for respective diameters.

C. Material for 12-- through 60--inch pipe and fitting production shall be an impact modified copolymer meeting the material requirements of ASTM F2764, ASTM F2881 and AASHTO M330, for respective pipe diameters.

2.4 JOINT PERFORMANCE

A. Watertight joints shall be bell--and--spigot meeting the watertight requirements of ASTM D3212. Gaskets shall comply with the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

2.5 FITTINGS

A. Fittings shall conform to ASTM F2764, ASTM F2881 or AASHTO M330, with the exception of meeting the watertight joint performance requirements of ASTM D3212. Gasketed bell & spigot connections shall utilize a spun--on, welded or integral bell and spigot with gaskets meeting ASTM F477.

B. Repair couplers may be utilized to connect field--cut pipe.

PART 3 EXECUTION

3.1 PREPARATION

A. The Contractor shall verify that the surface has been prepared to the proper line and grade by shooting invert elevation grades.

3.2 INSTALLATION

A. Open-Cut Installations

1. Polypropylene pipe and fittings shall be installed in accordance with ASTM Standards, and the manufacturer’s recommendations.

2. Pipe is to be lifted or rolled into position, not dragged over the prepared bedding.

3. The pipe is to be set at the slope and grades indicated on the plans. Ensure pipe remains at proper grades.

4. Prepare the area in accordance with Section 02315 – Excavation, Backfill, Compaction and Dewatering.

5. No single piece of pipe shall be laid unless it is generally straight. Laying instructions of the manufacturer shall be explicitly followed.

6. Install piping and fittings true to alignment and grade. If necessary, each length of pipe shall be cleaned out before installation.

B. Couplings

1. Couplings shall be installed in accordance with manufacturer's recommendations.

3.3 PIPE JOINTING

A. Joints shall be constructed as described herein and in accordance with manufacturer's installation instructions.

B. All Bell--and--Spigot pipe joints shall be thoroughly cleaned prior to joining.

C. Protective gasket wrap must be removed just prior to joint insertion to reduce the risk of introduction of foreign materials.

D. Joints with gaskets not pre--installed by the manufacturer must be clean and free of foreign materials prior to gasket installation.

E. Joint lubricant, supplied by the manufacturer, shall be applied to the interior of bell and the leading edge of the gasket on spigot prior to assembly.

F. Joints shall be assembled by inserting the spigot into the bell to prevent foreign materials from being trapped in the joint connection.

G. After initial assembly of the joint, CONTRACTOR shall verify line and grade of pipe. Prior to backfill and after final check of line and grade, the CONTRACTOR must verify the joint is fully inserted and properly sealed.

3.4 TESTING

A. All sections of polypropylene drain pipe shall be tested in accordance with Section 02503.

END OF SECTION

SECTION 02530

MANHOLES AND CATCH BASINS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Precast concrete manholes
2. Precast concrete catch basins
3. Cast iron manhole frames and covers
4. Cast iron catch basin frames and grates

1.2 REFERENCES

A. AASHTO – American Association of State Highway and Transportation Officials, Standard Specifications for Highways and Bridges, most recent edition

B. ASTM C32 - Standard Specification for Sewer and Manhole Brick (made from clay or shale)

C. ASTM A48 – Standard Specification for Gray Iron Castings

D. ASTM C150 – Standard Specification for Portland Cement

E. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes

F. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections

G. ASTM C443 – Standard Specification for Joints for Circular Concrete Sewer and Culvert Piping Using Rubber Gaskets

H. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals

I. ASTM C990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

1.3 SUBMITTALS

A. Submit Shop Drawings, showing all details of construction, including, but not limited to, structure dimensions, reinforcing, joints, and pipe connections to structures.

B. Submit on all materials and products included in this specification, including, but not limited to, manhole rungs, manhole frames and covers, brick masonry, mortar, non-shrink water-proof grout, and catch basin frames and grates.

C. Submit weights of manhole frames and covers and catch basin frames and grates.

D. Submit design calculations including verification of adequate anti-flotation features and lateral earth pressures. Calculations shall verify that the manhole structure has been designed to withstand the burial depth, submergence due to flooding, flotation, and dead and live loads.

1.4 QUALITY ASSURANCE

A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer, or other representative of the Owner. Such inspection may be made at the place of manufacture, or at the Site after delivery, or at both places, and the materials shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Material rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. Materials which have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced, at no additional cost to the Owner.

B. At the time of inspection, the materials will be carefully examined for compliance with the latest ASTM designation specified and these Specifications, and with the approved manufacturer's drawings. Manhole sections will be inspected for general appearance, dimension, "scratch-strength," blisters, cracks, roughness, and soundness. The surface shall be dense and close-textured.

C. Imperfections in manhole sections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs will be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at 7 days and 5,000 psi at 28 days, when tested in 3 inch by 6 inch cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.

D. Personnel shall have confined space entry training as appropriate for the work to be performed.

E. Manholes and catch basins shall be designed for lateral earth pressures and to resist flotation.

PART 2 PRODUCTS

2.1 PRECAST CONCRETE MANHOLE AND CATCH BASIN SECTIONS

A. Precast concrete barrel sections and transition top sections, shall conform to ASTM C478 and the following requirements:

1. The wall thickness shall not be less than 5 inches for 48 inch diameter reinforced barrel sections, 6 inches for 60 inch diameter reinforced barrel sections and 7 inches for 72 inch diameter reinforced barrel sections.

2. Top sections shall be eccentric except that flat top sections shall be used where shallow cover requires a top section less than 4 feet as shown on the Drawings.

3. Barrel sections shall have tongue and groove joints.

4. All sections shall be cured by an approved method and shall not be shipped nor subjected to loading until the concrete compressive strength has attained 3,000 psi and not before 5 days after fabrication and/or repair, whichever is longer.

5. Precast concrete barrel sections with precast top slabs and precast concrete transition sections shall be designed for a minimum of AASHTO HS20-44 loading plus the weight of the soil above at 120 pcf.

6. The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on each precast section.

7. Precast concrete bases shall be monolithically constructed. The thickness of the bottom slab of the precast bases shall not be less than the barrel sections or top slab whichever is greater. Precast concrete bases shall be constructed with a 6 inch extended base, unless otherwise shown on the Drawings.

8. Knock out panels for piping shall be provided in precast sections at the locations shown on the Drawings. They shall be integrally cast with the section, 2½ inches thick and shall be sized as shown on the Drawings. There shall be no steel reinforcing in knock out panels.

9. The side wall height of the base section shall be a minimum of 12 inches above the top of the pipe coming into the manholes and catch basins.

10. A 4’-0” deep sump shall be provided below catch basin outlet pipes.

2.2 BRICK MASONRY

A. Bricks shall be good, sound, hard and uniformly burned, regular and uniform in shape and size, of compact texture. Underburned or salmon brick will not be acceptable and only whole brick shall be used unless otherwise permitted. In case bricks are rejected by the Engineer, they shall be immediately removed from the site of the work and satisfactory bricks substituted, at no additional cost to the Owner.

1. Bricks for the channels and shelves shall comply with the latest specifications of ASTM C32 for Sewer Brick, Grade SM.

2. Bricks for building up and leveling manhole frames shall conform to ASTM C32 Grade MS.

3. Poured concrete inverts will not be allowed.

B. Mortar used in the brickwork shall be composed of one part Type II portland cement conforming to ASTM C150 to two parts sand to which a small amount of hydrated lime not to exceed 10 lbs. to each bag of cement shall be added.

C. Sand used shall be washed, cleaned, screened, sharp and well graded as to different sizes and with no grain larger than will pass a No. 4 sieve. Sand shall be free from vegetable matter, loam, organic or other materials of such nature or of such quantity as to render it unsatisfactory.

D. Hydrated lime shall conform to ASTM C207, Type S.

2.3 MANHOLE FRAMES AND COVERS

A. Manhole frames and covers shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind. Manhole covers and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30B or ASTM A48, Class 35B.

B. Manhole covers shall have a diamond pattern, pickholes and the word "SEWER" or “DRAIN”, as appropriate, cast in 3 inch letters. Manhole frame and covers shall be manufactured by East Jordan Iron Works; Mechanics Iron Foundry; Neenah Foundry or equal.

C. Manhole frames and covers shall comply with the detail shown on the Drawings.

D. Manhole frames and covers shall be designed for a minimum of AASHTO HS20-44 loading.

2.4 CATCH BASIN FRAMES AND GRATES

A. Catch basin frames and grates shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Grate and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30B or ASTM A48, Class 35B.

B. The catch basin frames and grates shall comply with the details shown on the Drawings.

C. Catch basin frames and grates shall be designed for a minimum of AASHTO HS20-44 loading.

2.5 JOINTING PRECAST MANHOLE SECTIONS

A. Tongue and groove joints of precast manhole sections shall be sealed with a preformed flexible joint sealant. The preformed flexible joint sealant shall conform to ASTM C990.

2.6 MANHOLE RUNGS

A. Manhole rungs shall be drop front design, 14 inches wide with an abrasive step surface, steel reinforced, copolymer, polypropylene, plastic. Manhole rungs shall conform to OSHA requirements.

2.7 FLEXIBLE PIPE TO-STRUCTURE CONNECTORS

A. The flexible pipe-to-structure connectors shall be designed to provide a positive seal between the connector and the structure wall and between the connector and the pipe.

B. The flexible boot shall be manufactured of EPDM synthetic rubber in accordance with ASTM C443 and C923 and shall be 3/8 inch thick or greater.

C. The external bands shall be made entirely of 304 series non-magnetic stainless steel.

D. The flexible connectors shall be provided with a wedge-type or toggle-type expander to secure the pipe in the structure opening.

E. The flexible connectors shall meet the following criteria, in accordance with ASTM C923:

1. Shall not leak when subjected to a head pressure of 10 psi for 10 minutes.

2. Shall have the ability to deflect 7 degrees in any direction without leakage under the head pressure conditions described above.

3. Shall not leak when subject to a load of 150 lbs./in. pipe diameter and the head pressure conditions described above.

2.8 NON-SHRINK, WATER-PROOF GROUT

A. Non-shrink, water-proof grout shall be Hallemite; Waterplug; Embeco; or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation

1. Construct manholes and catch basins to the dimensions shown on the Drawings and as specified. Protect all work against flooding and flotation.

2. Set precast concrete barrel sections so as to be plumb and with sections in true alignment with a ¼ inch maximum tolerance to be allowed.

3. Install the precast sections in a manner that will result in a watertight joint. Seal the joints of precast concrete barrel sections with the preformed flexible joint sealant used in sufficient quantity to fill 75% of the joint cavity. Fill the outside and inside precast section joints with non-shrink grout and finish flush with the adjoining surfaces. Plug holes in the concrete barrel sections required for handling or other purposes with a non-shrink, water-proof grout or concrete and rubber plugs, and finish flush on the inside.

4. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides.

B. Pipe Connections

1. For pipes with smooth exterior surfaces (PVC, ductile iron, HDPE pressure pipe, steel, etc), use flexible pipe-to-structure connectors.

2. Where flexible pipe-to-structure connectors cannot be used, such as pipes with rough, irregular or corrugated exterior surfaces (concrete, corrugated metal, HDPE drainage pipe, etc):

   a. After the new pipe has been set in place, completely fill the hole around the new pipe and structure with non-shrink, water-proof grout.

   b. Place a 6 inch thick concrete encasement a total of 12 inches in length around the pipe stub adjacent to the exterior wall of the structure. Concrete shall have a 28 day compressive strength of 3,000 psi.

C. Manhole Rung Installation

1. Steel reinforced copolymer polypropylene plastic steps shall be press fitted by hand driven hammer into preformed holes in cured precast sections, on 12 inch centers, by the precast concrete manufacturer.

D. Brickwork

1. Mix mortar only in such quantity as may be required for immediate use and use before the initial set has taken place. Do not retain mortar for more than one and one-half hours and constantly work over with a hoe or shovel until used. Anti-freeze mixtures will not be allowed in the mortar. No masonry shall be laid when the outside temperature is below 40°F unless provisions are made to protect the mortar, bricks, and finished work from frost by heating and enclosing the work with tarpaulins or other suitable material. The Engineer's decision as to the adequacy of protection against freezing shall be final.

2. Construct channels and shelves of brick as shown on the Drawings. The brick channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Construct brick surfaces exposed to sewage flow with the nominal 2 inch by 8 inch face exposed (i.e., bricks on edge).

3. Set manhole covers and frames and catch basin frames and grates in a full mortar bed and bricks, a maximum of 12 inches thick for conical tops and 6 inches thick for flat top sections, utilized to assure frame and cover are set to the existing grade. Reset the manhole frames and covers and catch basin frames and grates to final grade prior to placement of final paving.

3.2 CLEANING

A. Clean new manholes and catch basins of silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

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SECTION 02670

CONSTRUCTION IN WETLANDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Timber mats for access during construction
2. Removing and salvaging loam and topsoil
3. Restoration of wetlands

1.2 RELATED SECTIONS

A. Section 01140 – Work Restrictions

B. Section 01570 – Temporary Controls

C. Section 02200 – Site Preparation

D. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.3 REFERENCES

A. Contractor shall comply with the requirements of the Notice of Intent and *Town of Longmeadow Conservation Commission Order of Conditions*, attached to Section 00800.

1.4 SUBMITTALS

A. Submit a description of methods, sequence of construction, and types of equipment proposed for completing the Work in this Section to ensure compliance with Permits.

B. Submit proposed timber mat product intended for use, and include manufacturer and literature with product description and performance. Include procedure for cleaning mats before and after use. Also include the names and addresses of similar projects on which timber mats were used and dates of use.

1.5 WORK RESTRICTIONS

A. Work associated with permits shall not begin until the applicable municipal, state and federal agencies have been notified in accordance with the permit conditions.

B. Open trenches within wetland areas are restricted to a maximum of three pipe lengths at any one time.

C. Equipment refueling is not permitted within 100 feet of wetland areas.

D. The placement of soil stockpiles is restricted within 50 feet of wetland areas.

E. Comply with all requirements of the Town of Longmeadow Conservation Commission Order of Conditions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Haybales, siltation fencing, silt sacks and other erosion control products referred to in this section are detailed on the Drawings and specified in Section 01570, Temporary Controls.

B. Silt bags described for use during dewatering in this section are specified in Section 02315, Excavation, Backfill, Compaction and Dewatering .

C. Provide timber construction mats for access to the Work in wetland areas, as described in this section and shown on the Drawings.

1. Timber construction mats shall be a maximum of 16 feet wide.

2. Timber construction mats shall be a hardwood, interlocking mat system manufactured by K.W. Reese, Inc., Northern Tree Services, Inc., American Mat & Timber Co., Empire Mat, or equal.

D. Provide wetland seed mixture for wetland restoration activities. Seed mixture shall be New England Wetmix, as manufactured by New England Wetland Plants, Inc.

E. Provide erosion control blankets for wetland restoration activities.

1. Erosion control blanket shall be a short-term single net 100% straw blanket with photodegradable netting on one side.

2. Erosion control blanket shall meet requirements established by the Erosion Control Technology Council (ECTC) Specification, the U.S. Department of Transportation and the Federal Highway Administration's (FHWA) Standard Specification for Type 2.C Short-term Single Net Erosion Control Blanket.

3. Erosion control blanket shall be North American Green S75®, GreenfiX® America WS05, SI Geosolutions Landlok® S1 or equal.

PART 3 EXECUTION

3.1 GENERAL

A. Limit storage of equipment and materials in the buffer zone, where possible.

B. Servicing equipment in wetland areas is prohibited. Limit equipment servicing in the buffer zone, where possible.

C. Do not use calcium chloride or other chemicals for dust control in wetland areas or buffer zones. Use water only for dust control.

3.2 TIMBER MAT USE

A. Determine whether the use of timber mats will be required to minimize the rutting of wetland soils. Work completed during sufficiently dry or frozen conditions may not warrant the use of timber mats.

B. Prior to installation inspect for and remove all vegetative matter.

C. Install timber mats in accordance with manufacturer's instructions.

D. Remove loose soils from mats on a daily basis and dispose in upland areas.

E. Remove timber mats immediately upon completion of work.

3.3 SOIL REMOVAL AND RE-USE

A. Segregate topsoil/muck from mineral subsoil and stockpile separately within upland area.

B. Backfill excavation initially with mineral subsoil.

C. Place wetland topsoil/muck over subsoils and grade to existing contours.

3.4 WETLAND RESTORATION

A. Rough grade soils with construction equipment.

B. Final grade soils by hand so that contours correspond with adjacent non-impacted wetland contours and are restored to preconstruction conditions.

C. Spread and incorporate wetland seed mix over wetland area, as shown on the Drawings.

1. Seed the impacted wetland areas by hand broadcasting, at an application rate of one pound of seed per 2,500 square feet.

D. Install Erosion Control Blanket across extent of restored wetland area, as shown on the Drawings

1. Install erosion control blanket in accordance with the manufacturer's instructions.

2. Staple the blanket to ensure that it stays in the proper position to maximize protection capacities.

E. Seed, mulch and stabilize all disturbed areas within one week of disturbance.

F. Do not drive over restored wetlands.

G. Remove all erosion controls upon establishment of vegetation.

END OF SECTION

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SECTION 02740

HOT MIX ASPHALT (HMA) PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Trench Repair
2. Milling (Full-Width)
3. Overlay (Full-Width)
4. Driveway Aprons
5. Curbing

B. For the purposes of this Section, Hot Mix Asphalt (HMA) and bituminous concrete have the same meaning.

C. Related Requirements

1. Section 02315 - Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

A. Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 Edition as amended

B. ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

C. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1990 Edition, as amended

D. AASHTO M 320

E. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual

F. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual

1.3 SUBMITTALS

A. Job mix formula for each mix specified under this Section.

B. Certificate indicating the mixes specified meet or exceed the requirements specified herein.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 Edition as amended.

B. Mixing Plant: Conform to Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 Edition as amended.

C. Obtain materials from same source throughout.

PART 2 PRODUCTS

2.1 MATERIALS

A. General

1. Bituminous materials shall conform to the requirements of these Specifications.

2. Bitumen delivered to a project or to a mix plant must be accompanied by a proper certificate signed by the producer's authorized representative. Shipments of material not accompanied by a certificate will not be accepted for use in the Work.

B. Hot Mix Asphalt Paving shall be Class I, Type I-1, as specified in Sections 460 and M3.11.0 of the above referenced Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 edition, as amended.

C. Hot Mix Asphalt

1. Hot Mix Asphalt materials shall meet the requirements of M3.11.0 of the above referenced Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 edition, as amended.

2. Only Performance Graded Asphalt Binder grades PG 64-28 or PG 52-34 will be used as modifiers and shall meet the requirements of AASHTO M 320.

PART 3 EXECUTION

3.1 PAVING – GENERAL

A. Maintain pavement under this Contract during the guarantee period of one year and promptly (within 3 days of notice given by the Engineer) refill and repave areas which have settled or are otherwise unsatisfactory for traffic.

B. All pavement thicknesses referred to herein are compacted thicknesses. Place sufficient mix to ensure that the specified thickness of pavement results.

C. Regardless of temperature, no permanent mix conforming to the requirements of these specifications shall be placed after October 31 or before May 1 of any year.

D. When the air temperature falls below 50ºF, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials and placing and compacting the mixtures.

E. Existing drainage patterns shall not be altered by the new pavement construction unless otherwise shown on the Drawings.

F. Furnish and spread calcium chloride on disturbed surfaces to control dust conditions when necessary, or upon direction of the Engineer.

G. In no case will pavement be placed until the gravel base is dry and compacted to at least 92.0% maximum density at optimum moisture content.

H. All pavement edges that have been damaged shall be sawcut again if necessary to re-establish a straight clean line between the existing pavement and trench patch.

I. Tack Coats

1. On areas where the top course is being placed over a milled surface, apply tack coat on the milled surface. The tack coat shall be RS-1 emulsion and shall be applied at a rate of 0.07 gallons per square yard.

2. Apply tack coat on the binder prior to placing the top course. The tack coat shall be RS-1 emulsion and shall be applied at a rate of 0.05 gallons per square yard on binder courses and streets to be overlayed.

3. The edges of the existing pavement where the joints are to be formed shall be thoroughly coated with tack coat to ensure adhesion between the two pavements.

4. The contact surfaces of curbs, castings, and other structures shall be painted with a tack coat prior to placement of paving.

J. Top course mixes shall provide for 4% air voids in the finished product. The initial in-place voids shall not exceed 7.5%. Final in-place voids shall not be below 2.5%. Additional asphalt content shall not be added for the sole purpose of reducing the in-place voids. If the in-place voids are too high or the paving is expected to occur during cold weather, more compactive effort will be required to adjust the void content rather than increasing the asphalt content.

K. Breakdown rolling shall not occur before the HMA has cooled to a temperature of 320 degrees Fahrenheit, and shall be completed before the HMA mat has cooled to a temperature of 275 degrees Fahrenheit. Intermediate rolling shall be completed prior to the HMA mat attaining a temperature of 200 degrees Fahrenheit. Finish rolling shall be completed prior to the HMA mat attaining a temperature of 150 degrees Fahrenheit. Roller and paver speeds shall be agreed upon with the Engineer prior to placing HMA to ensure mix temperature requirements will be met.

L. Thermal segregation of the HMA shall be limited to a maximum of 20 degrees Fahrenheit.

M. Cascading HMA material on the top of the finished mat with rakes or shovels will not be permitted. Coarse Aggregate dislodged as a result of unavoidable hand work shall be removed from the surface prior to rolling.

N. Place and compact HMA materials by steel-wheeled rollers of sufficient weight to compact the HMA to 92.5% of the calculated **T**heoretical **M**aximum **D**ensity (TMD) in accordance with ASTM D2041.

O. Along curbs, structures and all other places not accessible with a roller, the paving mixture shall be thoroughly compacted with tampers. Such tampers shall not weigh less than 25 pounds and shall have a tamping face no more than 50 square inches in size. The surface of the mixture after compaction shall be smooth and true to the established line and grade.

P. No vehicular traffic shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled to below 140 degrees Fahrenheit or sufficiently to prevent distortion or loss of fines. HMA delivery trucks (loaded or empty) shall not be permitted on the newly completed pavement until the asphalt has cooled to below 90 degrees Fahrenheit. If the climatic or other conditions warrant, the period of time before opening to traffic may be extended at the discretion of the Engineer.

Q. Following all paving, the area along the edge of all pavement shall be backed up with gravel, or loam and seed as required, so that it is flush with the adjacent paving. Whenever possible, the final surface of the backup material shall slope away from the surface edge for drainage runoff.

R. Following all paving, clean all catch basins and remove and dispose of all debris.

3.2 PAVING – HMA PAVING, PERMANENT, AND WEARING COURSE FOR ROADS

A. After a period of 90 days, or such other period as determined by the Engineer, has elapsed, proceed with the permanent road construction as shown on the Drawings.

B. Prior to placing full-width permanent HMA, notify Engineer of the intended work area at least 24 hours prior to start of work, so that Engineer can adequately inform residents regarding impacts to road access, driveways, detours, and work hours.

3.3 PAVING – BINDER COURSE

A. Place binder course as soon as possible after the gravel base has been prepared, shaped and compacted for all streets.

B. Binder course shall be placed on reclaimed or fully reconstructed roads as shown on the Drawings and as specified herein in preparation for the full-width top course.

C. Structure Adjustments

1. All manhole frames, catch basin frames and utility boxes are to be lowered prior to placement of the binder course. After placing the binder course, they shall be raised to the grade of the binder course until such time as the top course is placed, unless the period of time between the placement of the binder course and the placement of the top course is less than 2 weeks, in which case the frames may be raised to the grade of the top course. All excavated materials removed for raising of the frames and utility boxes are to be replaced with concrete. This ring of concrete shall be filled flush with the surrounding binder course.

2. Adjustments to existing municipally owned utility structures and appurtenances such as drainage manholes, catch basins and gate valve boxes, both within the area of excavation and within the existing paved surface, will be carried out by the Contractor prior to installation of the top course. The raising of other structures (privately owned utilities) as required to properly complete the final paving work should be completed by the structure owners. It is the responsibility of the Contractor to coordinate all such work and to assure that all structures are properly raised in a timely manner.

D. Maintain binder course in a condition suitable for traffic throughout the construction period. Defects shall be repaired within 3 days of notification.

E. Prepare the binder course for placement of the top course. The base shall be graded prior to the placement of the binder course. The binder course shall be regraded, placing additional HMA where settling has occurred, repairing the existing surface and replacing broken or damaged sections at no additional cost to the Owner. The binder course surface shall be in all respects acceptable to the Engineer before the final pavement is placed. The surface shall then be broom cleaned.

3.4 FULL-WIDTH TOP COURSE

A. Roads shall be cold planed, reclaimed, or fully reconstructed as shown on the Drawings and as specified herein in preparation for the full-width binder and/or top course.

B. Prior to the start of spreading the permanent HMA top course the road surface shall be prepared. This shall include, but not be limited to sweeping, repairing, removing of debris, adjustment of all structures for the finished, compacted overlay thickness, and tack coating the surface of the road to be overlaid.

C. Surface preparation shall also include filling and shimming all trench repair and pavement areas that have not been milled, reclaimed or reconstructed which require preparation prior to the placement of the overlay. Overlays shall not be placed over pavement areas with open seams, substantial cracks, pot-holes, depressions or other defects until proper filling and shimming has been completed.

D. Top course for an overlay shall be laterally "toed-in" to the existing pavement with a 2 foot minimum keyway cut with milling machines.

E. The final surface shall be properly graded and cambered to provide a smooth surface of proper cross-section and blended into all adjacent existing pavements. Any permanent pavement repair that in the opinion of the Engineer does not meet this requirement, or that will form puddles 1/16-inch deep or greater shall be repaired or replaced at the Contractor's expense.

F. The finished top course shall blend smoothly with all rim elevations of catch basins, manhole covers, gate box covers, and any other utilities, and shall in no way interfere with or alter the existing surface drainage.

3.5 PERMANENT HMA TRENCH REPAIR IN ROADS WITH FULL-WIDTH OVERLAY

A. Provide the permanent trench repair in accordance with paragraph 3.1 of this Section.

3.6 HMA DRIVEWAY APRON REPLACEMENT

A. Driveway aprons pavements shall be removed and replaced between the edge of the road and the sidewalk or to the property line (unless otherwise marked out by the Engineer), full width, under the following conditions:

1. If there is a trench patch in or through the driveway.
2. If there is no trench or incidental damage to the driveway but the road restoration adversely affects the pitch or drainage of a driveway.
3. The condition of the existing pavement would jeopardize other repair methods.
4. Other reasons as approved by the Engineer

B. For driveway aprons approved for replacement, remove the existing pavement back to the edge of the sidewalk, property line, or other point approved by the Engineer. If there is no sidewalk, sawcut existing pavements where the new pavement will abut.

C. The exposed subbase shall be regraded and prepared. Processed gravel shall be added or removed as necessary to properly grade the subbase to accept the specified thickness of new pavement.

D. After the subbase has been approved, install an initial HMA top course followed by an HMA dense mix surface course with thicknesses as specified in the Drawings.

E. Driveway replacements with trenches through them may only occur after the settlement period has passed.

END OF SECTION

SECTION 02920

LAWNS AND GRASSES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Restoration of all vegetated areas disturbed during construction including:
   a. Grass surfaces
   b. Easements
2. Restoration of vegetated areas abutting wetland resource areas
3. Loam, starter fertilizer, lime, lawn seed, and hydric seed

B. Contractor shall comply with the requirements of the Notice of Intent and Town of Longmeadow Conservation Commission Order of Conditions, attached to Section 00800.

1.2 SUBMITTALS

A. Lawn seed mixture including percent by weight of each seed type, and manufacturer/Supplier name.

B. Suitable laboratory analysis of the topsoil to determine the quantity of fertilizer and lime to be applied.

C. Lime and starter fertilizer application rates based on laboratory soil tests.

D. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment.

1.3 QUALITY ASSURANCE

A. Place seed only between the periods from April 15th to June 1st, and from August 15th to October 1st, unless otherwise approved by the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Loam

1. Loam from offsite, as required for Work, shall be taken from a well-drained, arable site, and shall be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Loam shall also be free of quack-grass rhizomes, Agropyron Repens, and the nut-like tubers of nutgrass, Cyperus Esculentus, and all other primary noxious weeds. Loam shall not be delivered or used for planting while in a frozen or muddy condition. Topsoil as delivered to the Site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free Samples dried at 100 degrees Celsius.

2. Onsite loam may be available from stripping of onsite topsoil. Onsite topsoil shall be tested as specified below and shall be amended as necessary to meet Specification requirements for loam.

3. Soil Analysis: The Contractor shall submit representative Samples of loam, which he intends to bring onto the Site, and Samples of loam from onsite sources, to a Soil and Plant Testing Laboratory acceptable to the Engineer. All reports shall be sent to the Engineer for approval. Samples of loam to be brought to the Site must be approved prior to delivery of soil. Deficiencies in the loam shall be corrected by the Contractor, as directed by the Engineer after review of the testing agency report by a soils consultant. Testing reports shall include the following tests and recommendations.

   a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.

   b. The silt clay content shall be determined by a Hydrometer Test.

   c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test.

   d. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and acidity (pH).

   e. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular lawn and planting objectives noted.

   f. All tests shall be performed in accordance with the current standards of the Association of Official Agriculture Chemists.

4. Loam for General Lawn and Site Restoration Areas: Loam shall conform to the following grain size distribution for material passing the #10 sieve:

	Percent Passing	
U.S. Sieve Size Number	**Minimum**	**Maximum**
10	100	----
18	84	100
35	63	72
140	26	40
270	22	34
0.002 mm	2	5

[1]The ratio of the particle size for 80% passing (D_{80}) to the particle size for 30% passing (D_{30}) shall be 6 or less ($D_{80}/D_{30} < 6$).

[2]Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.

[3]Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

[4]The organic content shall be between 4.0 and 6.0 percent.

B. Typical Sand Amendment

1. Sand to be mixed with topsoil shall meet the following requirements. The material shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

	Percent Passing	
U.S. Sieve Size Number	**Minimum**	**Maximum**
10	100	----
18	60	80
35	35	55
60	8	20
140	0	8
270	0	3
0.002 mm	0	0.3

[1]Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight of the total sample.
[2]The ratio of the particle size for 70% passing (D_{70}) to the particle size for 20% passing (D_{30}) shall be 3.0 or less ($D_{70}/D_{20} < 3.0$).
[3]Tests shall be combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

C. Starter Fertilizer

1. Starter fertilizer shall bear the manufacturer's name and guaranteed statement of analysis, and shall be applied in accordance with the manufacturer's directions.

2. Starter fertilizer shall be Scott's Starter Fertilizer, or equal, with timed nitrogen release to prevent burning.

D. Lime

1. Lime shall be an agricultural type ground limestone.

2. Lime shall be pelletized type for prolonged time release to soil.

3. Lime shall be applied at the rates recommended in the soil analysis.

E. Seed

1. Seed shall be of the previous year's crop.

2. Required properties:

a. Purity > 90%

b. Germination > 80%

c. Crop < 0.5%

d. Weed < 0.3%

e. Noxious Weed – 0%

f. Inert < 8%

3. Grass seed shall conform to the following mixture in proportion by weight and weed content and shall pass the minimum percentages of purity and germination as indicated for same.

Natural Area Seed Mix	% Weight
Kentucky 31 Fescue	40%
Palmer Perennial Ryegrass	30%
Birds Foot Trefoil (Empire Variety)	15%
Red Clover	5%
White Clover	5%
Redtop (Streaker Variety)	5%

4. All seed shall comply with State and Federal seed Laws and Regulations.

F. Hydric Seed

1. Hydric seed will be composed of the following species in equal percentages by volume:

a. Deer-tongue grass (Pancium clandestinum); FAC+.

b. Soft rush (Juncus effuses); FACW+.

c. Annual rye (Lolium multiflorum); FACU.

d. Grass-leaved goldenrod (Euthamia graminifolia); FAC.

PART 3 EXECUTION

3.1 RESTORATION

A. In locations where the Work passes through existing grass, weed brush or tree-surfaced areas that are not covered by a specific lawn repair item, surface restoration shall be as follows:

1. After completion of backfilling, the existing loam and organic ground cover materials that were salvaged during excavation shall be returned to the top of the trench.

2. After natural settlement and compaction has taken place, the trench surface shall be harrowed, dragged and raked as necessary to produce a smooth and level surface.

3. The area is then to be sowed with “orchard grass” or “rye grass” or other such materials to hold the soil and produce a growth similar to that existing prior to construction.

3.2 PREPARATION

A. After rough grading of the subgrade has been completed and approved, the subgrade surface shall be scarified to a depth of four (4) inches. Then furnish and install a layer of loam providing a rolled four (4) inch thickness. Any depressions which may occur during rolling shall be filled with additional loam, regraded and rerolled until the surface is true to the finished lines and grades. All loam necessary to complete the Work under this section shall be supplied by the Contractor.

B. The ground surface shall be fine graded and raked to prepare the surface of the loam for lime, fertilizer and seed.

C. The loam shall be prepared to receive seed by removing stones and grading to eliminate water pockets and irregularities prior to placing seed. Finish grading shall result in straight uniform grades and smooth, even surfaces without irregularities to low points.

D. All stones over one-half (½) inch in diameter remaining on the surface after raking shall be removed.

E. Shape the areas to the lines and grades required. The Contractor's attention is directed to the scheduling of Loaming and Seeding of graded areas to permit sufficient time for the stabilization of these areas.

F. All areas disturbed by construction within the property lines and not covered by structures, pavement, or bark mulch shall be loamed and seeded.

G. Limestone shall be thoroughly incorporated into the loam layer at a minimum rate of 3 ton per acre or more as recommended by the loam analysis in order to provide a pH value of 5.5 to 6.5.

H. Fertilizer shall be spread on the top layer of loam at the minimum rate of 500 pounds per acre or more as recommended by the loam analysis and worked into the surface

3.3 LOAM AND SEED AREAS

A. For temporary protection of disturbed areas, seed shall be applied at the following rates:

Winter Rye (fall seeding)	2.5 pounds per 1,000 square feet
Oats (spring seeding)	2.5 pounds per 1,000 square feet
Mulch	1.5 tons per acre

B. The seed mixtures shall be applied at a minimum rate of 200 pounds per acre, or 4.5 pounds per 1,000 square feet.

C. Seed shall be sown at the rates indicated above by rotary or drop spreader. Sowing shall be done on a calm, dry day. Immediately before seeding, the soil

shall be lightly raked. One half the seed shall be sown in one direction and the other half at right angles to the original direction. It shall be lightly raked into the soil to a depth not over 1/4 inch and rolled with a hand roller weighing not over 100 pounds per linear foot of width.

1. Straw mulch shall be applied immediately after seeding at a rate of 1.5 to 2 tons per acre. Mulch that blows or washes away shall be replaced immediately and anchored using appropriate techniques.

2. The surface shall be watered and kept moist with a fine spray as required, without eroding the soil, until the grass is well established. Any areas, which are not satisfactorily covered with grass, shall be reseeded, and all noxious weeds shall be removed.

D. Unless otherwise approved, seeding shall be done between the periods from April 15th to June 1st, and August 15th to October 1st, when soil conditions and weather are suitable for such Work.

3.4 MAINTENANCE

A. Maintenance shall include watering, weeding, removal of stones and other foreign objects over one half (½) inch in diameter, cutting the grass until final acceptance. Mow at least weekly, removing no more than 30-40 percent of the leaf tissue using well sharpened blades. Mow grass between one (1) and two (2) inches high in the spring and fall. Mowing heights shall be an additional one-half to an inch in the summer to reduce temperature stress. Leave the clippings in place to help recycle essential plant nutrients needed for growth. All bare or dead spots which become apparent shall be properly prepared, re-loamed, limed, aerated, fertilized, and reseeded as many times as necessary to secure a good growth. The entire area shall be maintained, watered and cut until final acceptance of the lawn installation.

B. The dressed and seeded areas shall be sprinkled with water as necessary from time to time. Signs and barricades should be placed to protect the seeded areas.

C. To be acceptable, seeded areas shall consist of a uniform stand without bare or dead spots of at least 90 percent established permanent grass species, with uniform count of at least 200 plants per square foot.

D. The Engineer shall determine whether maintenance shall continue in any part.

E. After all necessary corrective Work and clean-up has been completed, and maintenance instructions have been received by the Owner, the Engineer will certify in writing the acceptance of the lawns.

F. Substantial Completion will not be achieved until the seeded areas have demonstrated a satisfactory stand of growth as determined by the Engineer. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.

END OF SECTION