INDUSTRIAL DRIVE ATHLETIC FIELDS AND
DAWSON RECREATION IMPROVEMENTS
HOLDEN, MA

ADDENDUM NO. 2

to

CONSTRUCTION DOCUMENTS

February 23, 2024

Notice to Bidders

The attention of all bidders submitting proposals for "Industrial Drive Athletic Fields and Dawson Recreation Improvements" is called to the following Addenda to the specifications and plans. The items set forth herein, whether of omission, addition or substitution are to be included in, and form part of the specifications and plans of the above-named project for bids to be received as advertised.

PLEASE BE SURE TO ACKNOWLEDGE RECEIPT
OF THIS ADDENDUM ON THE BID FORM

The following clarifications, modifications, deletions, and additions are hereby incorporated into and become part of the Contract Documents. Contractors shall acknowledge receipt of this addendum with their bid submission.

GENERAL CLARIFICATIONS

1. **Specification Section 00 11 13 – ADVERTISEMENT FOR BID:**

   FOR CLARIFICATION AND CONFIRMATION, Sealed bids for the for construction of Industrial Drive Athletic Fields and Dawson Improvements Project located at 200 Salisbury St. and a new athletic complex located at 18 Industrial Dr. in Holden, MA. for the Town of Holden, Massachusetts, will be received at the Town Hall, 1196 Main Street 01520 on **Wednesday, March 13, 2024, at 2:00 PM**, at which time and place said bids will be publicly opened and read aloud.

All Questions regarding the construction of the ***Industrial Drive Athletic Field and Dawson Recreation Improvements,*** for the ***Town of Holden****,* shall be received by mail or electronically no later than ***3:00 PM*** prevailing time, on ***Thursday, March 7th, 2024.*** All responses shall be provided by ***2:00 PM*** prevailing time, on ***Monday, March 11th, 2024.***

2. **DELETE** all references to the "Pre-Engineered Support Building" in the plans and specifications.

WRITTEN CHANGES AND/OR CLARIFICATIONS TO SPECIFICATIONS

3. Specification Section 00 01 10 – TABLE OF CONTENTS:

   DELETE: 13 34 23 – PRE-ENGINEERED SUPPORT BUILDING

4. Specification 11 68 33 – ATHLETIC FIELD EQUIPMENT, Part 2.05, B, a.:

   DELETE: Daktronics Scoreboard Model# MS-2008. Single-sided multisport scoreboard displays period time to 99:59, HOME and GUEST scores to 99, PERIOD to nine. During the last minute of the period, the clock displays time to 1/10 of a second.

   ADD: Daktronics Scoreboard Model# MS-2002. Single-sided multisport scoreboard displays period time to 99:59, HOME and GUEST scores to 99, PERIOD to nine. During the last minute of the period, the clock displays time to 1/10 of a second.

5. Specification 13 34 23 - PRE-ENGINEERED SUPPORT BUILDING:

   DELETE: 13 34 23 – PRE-ENGINEERED SUPPORT BUILDING, entirely.

6. Specification Section 31 00 00 – EARTHWORK:

   DELETE: Specification Section 31 00 00 – EARTHWORK

   ADD: Specification Section 31 00 00 – EARTHWORK, per attachment.

7. Specification Section 32 33 00– SITE FURNISHINGS AND ACCESSORIES, Part 2.02,

   ADD:

   C. Café Table- 4 seats : Model# 445-33I – as offered by DuMor. table locations are shown on the plans. 4-seat Table shall be the following, or an approved equal.
      1. Table shall be, 42" diameter
      2. Dimension of the table slats shall be: Edge and interior slats-2"x3"x 16".
      3. Slats shall be Ipe hardwood, with natural finish.
      4. The frame of the bench shall be of cast steel. All steel members shall have be hot-dipped galvanized.

5. Finish of the steel members shall be powder coated. Color: Textured Silver.
6. Table shall be free-standing and surface mounted.

D. Café Table- 3 seats (accessible): Model# 445-34I – as offered by DuMor. table locations are shown on the plans. 4-seat Table shall be the following, or an approved equal.
   1. Table shall be, 42" diameter
   2. Dimension of the table slats shall be: Edge and interior slats-2"x3"x 16".
   3. Slats shall be Ipe hardwood, with natural finish.
   4. The frame of the bench shall be of cast steel. All steel members shall have be hot-dipped galvanized.
   5. Finish of the steel members shall be powder coated. Color: Textured Silver.
   6. Table shall be free-standing and surface mounted.

WRITTEN CHANGES AND/OR CLARIFICATIONS TO THE PLANS

8. Cover Sheet, Alternates List:

   DELETE: Add Alternate No.7, entirely.

9. Cover Sheet, Sheet Index:

   DELETE: L800-L801 - PRE-ENGINEERED SUPPORT BUILDING DETAILS

10. Various Sheets:

    DELETE: All references, callouts, and dimensions associated with the pre-engineered support building.

11. Sheet L800-L801 – PRE-ENGINEERED SUPPORT BUILDING DETAILS:

    DELETE: Sheet L800 and L801 – PRE-ENGINEERED SUPPORT BUILDING DETAILS, entirely

QUESTIONS AND CLARIFICATIONS

Question 1: *Would the Owner/Engineer please consider extending the bid date by two weeks to allow contractors more time to prepare bids?*

Response: **See above for extended bid date.**

Question 2: *Would the Owner/Engineer please provide bidding contractors with CAD files to facilitate cut/fill calculations to prepare more accurate bids?*

Response: **CAD files will not be provided.**

Question 3: *Is it possible to extend the bid deadline?*

Response: **See above for extended bid date.**

Question 4: *What is the quantity of water fountains?*

Response: **There shall be 1 drinking fountain.**

Question 5: *Please provide a specification section for the café tables.*

Response: **See above for the café table specifications.**

Question 6: *They are calling out an MS-2008 scoreboard, but that is not a model that exists. Based on the 4'6" x 16' size, it seems like they are describing an MS-2002 scoreboard. It has Time, Home/Guest Score and Period. It can have Team name message centers as they are requesting. One difference is the Home/Guest captions are 12" tall vs the called out 15" tall. If they want the TNMC's, they that really wouldn't matter. Please advise.*

Response: **See above for the scoreboard specification update.**

Question 7: *There was some confusion at the Pre-Bid Walkthrough as to what items the Town will be Supplying. Could we get a list of Items Supplied by the Town and When delivery is Expected?*

Response: **The town is furnishing the synthetic turf carpet, the associated infill, and the playground equipment only. Refer to specification 11 68 13 PLAYGROUND EQUIPMENT for the list of play equipment provided by the town. Delivery of owner furnished items shall be coordinated with the awarded Contractor.**

Question 8: *Will the Pre-Bid Walk through Attendance sheet be provided to all bidders?*

Response: **See the attached Pre-Bid Attendance Sheet.**

ATTACHMENTS:

Plan Holders List
Pre-Bid Attendance Sheet
Specification Section 31 00 00 - EARTHWORK

END OF ADDENDUM NO. 2

Holden - Industrial Drive Athletic Fields and Dawson Recreation Improvements

Industrial Drive Athletic Fields and Dawson Recreation Improvements

Plan Holders

Date	Company	Contact
2/14/24 2:05 pm	**Accent Printing, Inc** 99 Chelmsford Road No. Billerica, MA 01862	**Brian Fisher** Tel: 978-362-8038 Fax: 978-362-8038
2/16/24 4:17 am	**Act Global Americas Inc.** 4201 West Parmer Lane, Suite B175 Austin, TX 78727	**Melody Bensani** Tel: 5127335300
2/15/24 8:21 am	**Argus Construction Corp** 5 Shawsheen Ave Unit 2 Bedford, MA 01730	**Peter Salem** **President** Tel: 781-275-7417 Fax: 781-275-1514
2/14/24 2:30 pm	**Caracas Construction Corp.** 592 Holyoke Street Ludlow, MA 01056	**Matt Goncalves** Tel: (413) 547-6200
2/15/24 11:11 am	**Central Mass Signal** 41 Lawrence St Northborough, MA 01532	**Michael Church** Tel: 508-393-0511
2/16/24 3:00 pm	**ConstructConnect** 30 Technology Parkway South Ste. 100 Norcross, GA 30092	**Sandra Leibfarth** Tel: 8003642059 Fax: 8665708187
2/14/24 3:40 pm	**David G. Roach & Sons, Inc.** 99 Barre Depot Rd PO Box 359 So. Barre, MA 01074	**Chuck Skerry** **Project Manager** Tel: 978-257-8560 Fax: 978-257-8564
2/14/24 3:52 pm	**David W White and Son** 635 River Rd Bow, NH 03304	**Phil Lasker** Tel: 6032268873
2/17/24 1:23 am	**Dodge Data & Analytics** 2860 S State Hwy 161 Ste 160 #501 Grand Prairie, TX 75052	**Jayalakshmi Loganathan** Tel: 413-376-7032 Fax: 609-336-2767

Date	Company	Contact
2/14/24 3:10 pm	**E.T.& L. Corp** 873 Great Road, PO Box 295 Stow, MA 01775	**Jennie Lee Colosi** Tel: 978-897-4353 Fax: 978-897-0779
2/18/24 11:39 am	**Essex Horticulture, LLC** 308 Maple Street Danvers, MA 01923	**Zachary Navarro** **Principal** Tel: 978-548-8258
2/19/24 1:57 pm	**Green Acres Landscape & Construction Co Inc** 21 Malbone Street Lakeville, MA 02347	**Chris Cunha** **Estimator/Project Manager** Tel: 508-823-6699 Fax: 508-823-7502
2/19/24 11:09 am	**Heimlich Landscaping & Construction Corp.** 65 Rear Burlington Street Woburn, MA 01801	**Erin Wilburn** **Project Assistant** Tel: 781-938-8988 Fax: 781-935-6272
2/14/24 4:37 pm	**J & J Contractors Inc** 101 Billerica Ave , Suite 205 North Billerica, MA 01810	**Komal Pawar** **Office Administrator** Tel: 978-452-9898 Fax: 978-452-3796
2/14/24 2:41 pm	**M J Cataldo, Inc** P O Box 1343 563 King Street Littleton, MA 01460	**Barbara St.Onge** Tel: 9785019364
2/15/24 8:03 am	**Manafort Brothers** 24 Martin St Cumberland, RI 02864	**Peter Calcagni** Tel: 401-333-2550 Fax: 401-333-2551
2/15/24 7:47 am	**Mountain View Landscapes** 67 Old James St Chicopee, MA 01020	**Amanda Santaniello** **Estimator** Tel: 413-377-6164 Fax: 413-535-0279
2/16/24 11:50 am	**Musco Lighting** 2107 Stewart Rd Muscatine, IA 52761	**Mike Berry** **Sales Representative** Tel: 800-756-1205 Fax: 800-374-6402
2/15/24 7:20 am	**Northern Construction Service, LLC** 1520 Park Street Palmer, MA 01069	**Dulce Montana** Tel: 4132891230

Date	Company	Contact
2/15/24 12:41 pm	**P.J. Keating Company** 998 Reservoir Rd Lunenburg, MA 01462	**Kaitlyn Patterson** Tel: 1-978-582-5262 Fax: 1-978-582-7027
2/14/24 7:41 pm	**Projectdog** 18 Graf Road Unit 8 Newburyport, MA 01950	**Project Leads** Tel: 978-499-9014 Fax: 978-499-9016
2/16/24 4:26 am	**PWXPress** 1900 Coffeeport Rd Jacksonville, FL 32208	**Mary Miller** Tel: 4086768941
2/16/24 2:34 pm	**Quirk Construction Corp.** 1 Martel Way Georgetown, MA 01833	**Mark Masella** **Project Estimator** Tel: 978-352-4666 Fax: 978-352-9666
2/15/24 1:37 pm	**RAD Sports** 171 VFW Drive Rockland, MA 02370	**John Chaffin** **Sales** Tel: 15084000955 Fax: 7818781161
2/15/24 8:54 am	**RAD Sports** 171 VFW Drive Rockland, MA 02370	**Amanda Loggia** **Project Manager** Tel: 7818714400 Fax: 7818781161
2/20/24 10:14 am	**Romtec, Inc.** 18240 Roseburg, OR 97470	**Cody Dooley** Tel: 541-496-3541
2/14/24 3:11 pm	**Sprinturf** 113 Park River Dr. Westfield, MA 01085	**Ron Hawn** **Regional Sales Manager** Tel: 6178693220 Fax: 413-480-0937
2/15/24 11:14 am	**SumCo Eco Contracting, LLC** 16 Front Street Suite 209 Salem, MA 01970	**Tim Feliciano** **Estimating Coordinator** Tel: 978-744-1515 Fax: 815-572-5022
2/20/24 12:05 pm	**UELContractors, Inc** 65 Parker Street Clinton, MA 01510	**steve henault** **project manager** Tel: 9783452740

Date	Company	Contact
2/15/24 2:30 pm	**Versa-Lok of New England** 5 Northern Blvd Amherst, NH 03031	**Ted Blaisdell** **Sales** Tel: 6038833042
2/14/24 2:57 pm	**Wayne J. Griffin Electric, Inc.** 116 Hopping Brook Road Holliston, MA 01746	**Lisa Morton** **Administrative Assistant** Tel: 508-306-5278 Fax: 508-429-9251
2/14/24 2:05 pm	**Weston & Sampson** 55 Walkers Brook Drive Reading, MA 01867	**Carolyn Mahoney** Tel: 978-532-1900 Fax: 978-977-0100

TOWN OF HOLDEN

INDUSTRIAL DRIVE ATHLETIC FIELD

AND

DAWSON RECREATION IMPROVEMENTS

Pre-Bid Site Walk

February 21, 2024

Sign-in

Name	Company	email / phone
CHUCK SKERRY	DAVID G. ROACH & SONS	CHUCK.SKERRY@DGRSONS.COM
Ron Hawn	Sprinturf	RHawn@sprinturf.com 617.869.3224
Nick Salem	Argus	nick@argusconstructioncorp.com 781-275-7417 978-337-6173
STEVE CORRIGAN	MT VIEW	STEVE@MOUNTAINVIEWINC.COM
Kevin Hunt	MJ CATALDO INC.	khunter@mjcataldo.com 978-501-9364
Andrew Iovanni	Northern Const.	aiovanni@northernconstruction.com 413-568 4381

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading.

1.02 RELATED WORK:

A. Section 00 31 32, SUBSURFACE DATA

B. Section 00 31 43, PERMITS

C. Section 01 11 00, CONTROL OF WORK AND MATERIALS

D. Section 31 11 00, CLEARING AND GRUBBING

E. Section 31 23 19, DEWATERING

G. Section 31 50 00, SUPPORT OF EXCAVATION

H. Section 32 12 00, PAVING

I. Section 32 18 13, SYNTHETIC GRASS INFILL SYSTEM

J. Section 32 32 53, STONE RETAINING WALLS

K. Section 32 91 00, LOAMING AND PLANTING PREPARATION

1.03 REFERENCES:

ASTM International (ASTM)

ASTM C131 Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3))

ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soils and Rock by Mass ASTM D2487 Standard

Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D6913 Standard Test Method Particle Size Analysis of Soils

ASTM D6938 Test Methods for Density of Soil and Soil-aggregate in Place by Nuclear Methods (Shallow Depth).

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges.

Code of Massachusetts Regulations (CMR) 310.40.0032 Contaminated Media and Contaminated Debris

Code of Massachusetts Regulations (CMR) 520 CMR 14.00 Excavation & Trench Safety Regulation

1.04 DEFINITIONS:

A. Rock Excavation:

1. **Rock excavation in trenches and footing excavations includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42-inch wide bucket on medium-size track-mounted hydraulic excavator equivalent to Caterpillar Model 215, rated at not less than 90HP flywheel power and 30,000 lb. drawbar pull. Trenches and footing excavations in excess of 10-feet in width are classified as open excavation.**

2. **Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted heavy-duty hydraulic excavating equipment without drilling or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or No. 977K, or equivalent track-mounted loader, rated at not less than 170 HP flywheel power and developing 40,000-lb. breakout force (measured in accordance with SAE J732C).**

3. **Determination of rock excavation classification will be made by the Engineer. Typical of materials classified as rock are boulders 3.0 cubic yards or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by the Engineer. Visual observation of the completed excavation may be made by the Engineer to modify the excavation classifications. Removal of rock excavation prior to classification by the Engineer**

shall be considered as earth excavation unless accepted by the Engineer in writing. Such excavation will be paid on the basis of contract unit rates for this classification.

4. Rock payment lines (if applicable) are limited to the following:

a. Two feet outside of concrete work for which forms are required.

b. In footing excavations, one foot below bottom-of-footing elevation.

c. One foot below bottom-of-slab elevation.

d. One foot outside of the vertical walls of utility structures.

e. In pipe trenches, depth limits shall be 6 inches below the bottom of the pipe:

Depth from Ground Surface to Invert of Pipe (feet)	Pay Width	
	pipe ID 0 to 24"	Pipe ID greater than 24"
0 to 12	5'-0"	Pipe I.D. +3'-0"
12 to 20	7'-0"	Pipe I.D. +7'-0"
Over 20	9'-0"	Pipe I.D. +7'-0"

f. Rock sloping across the width of trench shall have the top of rock established at the rock elevation over the centerline of the pipe.

g. For all other site improvements not listed above, including but not limited to landscape plantings, and roadways, the payment line for rock removal shall be the subgrade for installation of the earthen components of the particular site improvement.

B. The word "earth," wherever used as the name of an excavated material, or material to be excavated shall mean all kinds of material other than rock as above defined.

(Addendum #2, 2/23/2024)

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

A. Material Test Reports: From a qualified independent testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 and particle size distribution according to ASTM D 6913 of each on-site and borrow soil and/or fill material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 1557 for each onsite and borrow soil and/or fill material proposed for fill and backfill.

1.06 PROTECTION OF EXISTING PROPERTY:

A. The work shall be executed in such manner as to prevent any damage to facilities at the site and adjacent property and existing improvements, such as but not limited to streets, curbs, paving, service utility lines, structures, monuments, benchmarks, observation

wells, and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout and other hazards created by earthwork operations.

B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at its own expense, make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations. The Contractor shall replace, at its own cost, existing benchmarks, observation wells, monuments, and other reference points, which are disturbed or destroyed.

C. Buried drainage structures and pipes, observation wells and piezometers, including those which project less than eighteen inches (18") above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment and shall be maintained at all times until completion of project.

1.07 DRAINAGE:

A. The Contractor shall provide, at its own expense, adequate drainage facilities to complete all work items in an acceptable manner. Drainage shall be done in a manner so that runoff will not adversely affect construction procedures or cause excessive disturbance of underlying natural ground or abutting properties.

1.08 FROST PROTECTION AND SNOW REMOVAL:

A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.

B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

1.09 GEOTECHNICAL FIELD AND LABORATORY TESTING:

A. The Contractor shall retain the services of a geotechnical testing laboratory to conduct the laboratory analyses and field testing of soil materials required by this specification. Coordinate locations and types of field tests to be performed with the Engineer and cooperate in every way with the Engineer and testing laboratory during field testing and with collection of soil samples for laboratory testing.

PART 2 - PRODUCTS

2.01 BACKFILL MATERIALS:

A. GRAVEL BORROW:

Gravel Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.03.0, Type b.

B. CRUSHED STONE:

Crushed stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.4 (3/4-inch crushed stone) or M2.01.1 (1 ½-inch crushed stone) or unless otherwise required.

C. SAND BORROW:

Sand Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.04.0.

D. PEASTONE:

Peastone shall be smooth, hard, naturally occurring, rounded stone meeting the following gradation requirements:

Passing 5/8 inch square sieve opening	-	100%
Passing No. 8 sieve opening	-	0%

E. DENSE GRADED CRUSHED STONE:

Dense Graded Crushed Stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.7.

F. RIPRAP:

1. Stone for pipe ends shall be angular and shall be in accordance with MassDOT Specification Section M2.02.3, Stone for Pipe Ends.

2. Stone for slope protection shall be angular and shall be in accordance with MassDOT Specification Section M2.02.4, Modified Rockfill.

3. Stone for drainage swale ends shall conform to MassDOT Specification Section M2.02.3 and shall be not weigh less than 50 pounds or more than 125 pounds and least 75% of the volume shall consist of stones not less than 75 pounds each. The stones shall be so graded that when placed with larger stones, the entire mass will be compact.

G. IMPERVIOUS SOIL BORROW:

Impervious soil borrow shall be in accordance with MassDOT Specification Section M1.08.0, Impervious soil borrow.

H. BACKFILL MATERIALS:

1. Class B Backfill:

Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

Sieve Size	Percent Finer by Weight
3"	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

I. ORDINARY FILL:

Ordinary Fill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

J. BASE STONE for SYNTHETIC TURF

Refer to Section 32 18 13 - SYNTHETIC GRASS INFILL SYSTEM for material requirements on base stone and finishing stone.

2.02 FABRIC MATERIALS:

A. GEOTEXTILE FABRIC:

1. Geotextile Fabric shall consist of a nonwoven fabric made from polypropylene or polyethylene filaments or yarns.

2. Geotextile Fabric shall be inert to organic chemicals commonly encountered in the soil.

3. The Geotextile Fabric shall be Tencate Mirafi 140N as manufactured by Tencate Geosynthetics, Pendergrass, GA; Foss 65 by Foss Manufacturing Co., Hampton, NH; US 120NW, as manufactured by US Fabrics, Cincinnati, OH, or approved equal.

4. The Geotextile Fabric shall be installed at locations shown on the drawings or designated by the Owner's Representative. Each width of Geotextile Fabric shall be overlapped in accordance with manufacturer's recommendations, but not less than 2 feet, to prevent intrusion of soil fines.

PART 3 - EXECUTION

3.01 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION:

A. Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures.

B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with a minimum 12-inch layer of compacted crushed stone wrapped all around in non-woven Geotextile Fabric . Costs of removal and replacement shall be borne by the Contractor.

C. The Contractor shall place a minimum of 12-inch layer of Crushed Stone wrapped in Geotextile Fabric over the natural underlying soil to stabilize areas which may become disturbed as a result of rain, surface water runoff or groundwater seepage pressures, all at no additional cost to the Owner. The Contractor also has the option of drying materials in-place and compacting to specified densities.

3.02 EXCAVATION:

A. GENERAL:

1. The Contractor shall perform all work of any nature and description required to accomplish the work as shown on the Drawings and as specified herein.

2. Excavations, unless otherwise required by the Engineer, shall be carried only to the depths and limits shown on the Drawings. If unauthorized excavation is carried out below required subgrade and/or beyond minimum lateral limits shown on Drawings, it shall be backfilled with Gravel Borrow and compacted at the Contractor's expense as specified below, except as otherwise indicated. Excavations shall be kept in dry and good conditions at all times, and all voids shall be filled to the satisfaction of the Engineer.

3. In all excavation areas, the Contractor shall strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, the Contractor shall first cut pavement as specified in paragraph 3.02 B.1 of this specification, strip pavement and pavement subbase separately from underlying soils. All excavated materials shall be stockpiled separately from each other within the limits of work.

4. The Contractor shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the Contractor's chosen method of dewatering, and which will allow visual observation of the bottom and backfill in the dry.

5. The Contractor shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as required by the Engineer. Unsuitable material includes undocumented fill, topsoil, loam, peat, other organic materials, snow, ice, trash, and soils that cannot be proof compacted as described herein. Unless specified elsewhere or otherwise required by the Engineer, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted Crushed Stone wrapped all around in non-woven Geotextile Fabric .

B. TRENCHES:

1. Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.

2. The Contractor shall satisfy all dewatering requirements specified in Section 31 23 19 DEWATERING, before performing trench excavations.

3. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.

4. Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.

5. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.

6. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.

7. If, in the opinion of the Engineer, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures, the Contractor shall remove such disturbed subgrade to a minimum of 12 inches and replace with Crushed Stone wrapped in Geotextile Fabric . The cost of removal and replacement shall be borne by the Contractor.

8. The Contractor shall obtain a trench permit from the municipality where the trench is located prior to making any excavations of trenches (any subsurface excavation greater than three (3) feet in depth and fifteen (15) feet or less between soil walls as measured from the bottom).

9. All trenches required to be permitted must be attended, covered, barricaded, or backfilled. Covers must be road plates at least ¾-inch thick or equivalent, barricades must be fences at least 6-feet high with no openings greater than 4-inches between vertical supports and all horizontal supports required to be located on the trench-side of the fencing.

C. BUILDING AND FOUNDATION EXCAVATION:

1. Excavations shall not be wider than required to set, brace, and remove forms for concrete, or perform other necessary work.

2. After the excavation has been made, and before forms are set for footings, mats, slabs, or other structures, and before reinforcing is placed, all loose or disturbed material shall be removed from the subgrade. The bearing surface shall then be compacted to meet the requirements of this specification.

3. If, in the opinion of the Engineer, the existing material at subgrade elevation is unsuitable for structural support, the Contractor shall excavate and dispose of the unsuitable material to the required width and depth as required by the Engineer. If, in the opinion of the Engineer, Geotextile Fabric is required; the Contractor shall place Geotextile Fabric, approved by the Engineer, as per manufacturer's recommendations. Crushed Stone shall then be placed in lifts and compacted to required densities. Backfill shall be placed to the bottom of the proposed excavation.

D. EXCAVATION NEAR EXISTING STRUCTURES:

1. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.

2. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.

3. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.03 BACKFILL PLACEMENT AND COMPACTION:

A. GENERAL:

1. Prior to backfilling, the Contractor shall compact the exposed subgrade to a firm and unyielding condition with at least 5 passes by a 12-ton smooth drum vibratory roller over the subgrade or other acceptable compaction equipment subject to the approval of the Engineer.

2. After approval of subgrade by the Engineer, the Contractor shall backfill areas to required contours and elevations with specified materials.

3. The Contractor shall place and compact materials to the specified density in continuous horizontal layers, not to exceed nine (9) inches in uncompacted lifts. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C. The minimum degree of compaction for fill placed shall be as follows:

Location	Percent of Maximum Density
Below pipe centerline	95
Above pipe centerline	92
Below pavement (upper 3 ft.)	95
Embankments	95
Below pipe in embankments	95
Adjacent to structures	92
Below structures	95
Below Geosynthetic Soil Stabilization	95

4. Crushed Stone shall be placed in horizontal layers not exceeding 12 inches of uncompacted lifts and each lift compacted to a firm and unyielding condition with at least four (4) passes of a 12-ton smooth drum vibratory roller or other acceptable compaction equipment subject to the approval of the Engineer.

5. The Engineer reserves the right to test backfill for conformance to the specifications and the Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated

by the Engineer, engaged and paid for by the Owner. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.

6. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.

7. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.

8. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.

9. Maintain backfill material with a uniform moisture content, with no visible wet or dry streaking, between plus 2 percent and minus 2 percent of optimum moisture content. The final filled soil mass shall be as uniform as possible in lift thickness, moisture content, and effort required to compact soil mass. Backfill which is too wet for use shall be stockpiled, allowed to dry sufficiently, and reused by the Contractor at no additional cost to the Owner.

B. TRENCHES:

1. Bedding as detailed and specified shall be furnished and installed beneath the pipeline prior to placement of the pipeline. A minimum bedding thickness shall be maintained between the pipe and undisturbed material, as shown on the Drawings.

2. As soon as practicable after the pipes have been laid, backfilling shall be started.

3. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of pipe. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

4. If the materials above the trench bottom are unsuitable for backfill, the Contractor shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.

5. Should the Engineer order Crushed Stone for utility support or for other purposes, the Contractor shall furnish and install the Crushed Stone as directed.

C. BACKFILLING UNDER BUILDINGS AND FOUNDATIONS:

1. Material to be used under structures shall be Dense Graded Crushed Stone or Gravel Borrow or as shown on the Drawings or as required by the Engineer. Where Gravel Borrow fill is required to support proposed footings, walls, slabs, and other structures, the material shall be placed in a manner accepted by the Engineer. Compaction of each lift shall meet the density requirements of this specification.

D. BACKFILLING ADJACENT TO STRUCTURES:

1. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.

2. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.

3.04 DISPOSAL OF SURPLUS MATERIALS:

A. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.

B. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations, and in accordance with arrangements made by it. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.

C. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.

D. The Contractor shall comply with Massachusetts regulations (310 CMR 40.0032) that govern the removal and disposal of surplus excavated materials. Materials, including

contaminated soils, having concentrations of oil or hazardous materials less than an otherwise Reportable Concentration and that are not a hazardous waste, may not be disposed of at locations where concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and /or hazardous materials present in the soil being disposed or reused.

END OF SECTION