

To: All Prospective Bidders
Town of Lincoln

From: Pare Corporation (on behalf of the Town of Lincoln)
8 Blackstone Valley Place
Lincoln, Rhode Island 02865

Subject: ADDENDUM NO. 2

Issued: December 30, 2020

NOTICE TO PROSPECTIVE BIDDERS

Addendum No. 2: Prospective bidders and all concerned are hereby notified of the following changes/modifications to the specifications for the MANVILLE MEMORIAL PARK ATHLETIC FIELD IMPROVEMENTS PROJECT located at 175 High Street in Manville, Rhode Island. These changes shall be incorporated into the Contract Plans and Specifications and shall become an integral part of the Contract Documents.

Clarification:

1. The gravel fill material owned by the Town of Lincoln stockpiled on Hood Drive behind Lincoln High School that was previously specified as being suitable for use as Sand Gravel Fill or Granular Fill is no longer available for the project. All imported fill material shall meet the requirements in specification 31 00 00 Earthwork.

Questions/Responses:

None.

Contract Specification Documents:

1. Bid Form section 3. Unit Prices, Item 4. "Hauling gravel material owned by the Town" has been removed.
2. 31 00 00 Earthwork
 - a. Part 1.4.B.3. has been removed (references material owned by the Town).
 - b. Part 1.4.D. Imported fill material submittal requirements added.
 - c. Part 1.5.N. has been removed (references material owned by the Town).
 - d. Part 1.8.A.1 revised to add statement about fill material not containing oil and/or hazardous materials *that would violate Rhode Island Department of Environmental Management regulations.*
 - e. Pare 1.8.A.2. updated submission to the Engineer timeframe requirements and sample size for imported materials.
 - f. Part 2.1.B.6. has been removed (references material owned by the Town).
 - g. Pare 2.1.D. added product requirements for imported materials.

Contract Plans:

None.

**Project: MANVILLE MEMORIAL PARK
ATHLETIC FIELD IMPROVEMENTS**

BID FORM

To: Town of Lincoln
100 Old River Road
Lincoln, RI 02865

Project: Manville Memorial Park Athletic Field Improvements
175 High Street
Manville, RI

Bidder:

Legal name of entity

Address

Contact name

Contact email

Contact telephone

Contact fax

1. BASE BID PRICE

The Bidder submits this bid proposal to perform all of the work (including labor and materials) as described in the solicitation for this Base Bid Price, (including the costs for all Allowances, Bonds, and Addenda):

\$

(Base Bid Price *in figures* printed electronically, typed, or handwritten legibly in ink)

(Base Bid Price *in words* electronically, typed, or handwritten legibly in ink)

**Project: MANVILLE MEMORIAL PARK
ATHLETIC FIELD IMPROVEMENTS**

• **ALLOWANCES**

The Base Bid Price ***includes*** the costs for the following Allowances:

No. 1: Quantities and Payment of Unanticipated Unsuitable Soils:

- a. The Contractor shall carry in the Lump Sum Bid for 50 cubic yards for removal of unanticipated unsuitable materials and replacement with compacted in place, as directed herein. The Lump Sum Bid shall cover all costs related to such excavation, removal off site, and replacement with compacted fill of approved material, overhead, and profit. No amount other than the Unit Price provided by the Contractor will be paid by the Owner for excavation herein defined.
 - i. The Unit Price for unanticipated unsuitable soil materials removal as specified herein shall not exceed \$40.00 per cubic yard.

No. 2: Quantities and Payment of Rock Excavation:

- a. The Contractor shall include in his Lump Sum bid 150 cubic yards of Bulk Excavation rock and its removal from site. No amount other than the Unit Price provided by the Contractor will be paid by the Owner for Bulk Rock Excavation herein defined.
 - i. The Unit Price for Bulk Excavation rock removal as specified herein shall not exceed \$100.00 per cubic yard.
- b. The Contractor shall include in his Lump Sum bid 150 cubic yards of trench rock and its removal from site. No amount other than the Unit Price provided by the Contractor will be paid by the Owner for Trench Rock Excavation herein defined.
 - i. The Unit Price for Trench Excavation rock removal as specified herein shall not exceed \$180.00 per cubic yard.

• **BONDS**

The Base Bid Price ***includes*** the costs for all Bid and Payment and Performance Bonds required by the solicitation.

• **ADDENDA**

The Bidder has examined the entire solicitation (including the following Addenda), and the Base Bid Price ***includes*** the costs of any modifications required by the Addenda.

All Addenda must be acknowledged.

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

**Project: MANVILLE MEMORIAL PARK
ATHLETIC FIELD IMPROVEMENTS**

2. ALTERNATES

The Bidder offers to: (i) perform the work described in these Alternates as selected by the Town of Lincoln in the order of priority specified below, based on the availability of funds and the best interest of the Town of Lincoln; and (ii) increase or reduce the Base Bid Price by the amount set forth below for each Alternate selected.

Check "Add" or "Subtract."

____ Add ____ Subtract Alternate No. 1 (Add): Sod Athletic Field (Base Bid – Seed Athletic Field).

\$ _____
(amount *in figures* printed electronically, typed, or handwritten legibly in ink)

(amount *in words* printed electronically, typed, or handwritten legibly in ink)

3. UNIT PRICES

The Bidder submits these predetermined Unit Prices as the Basis for any change orders approved in advance by the Town of Lincoln. These Unit Prices include **all** costs, including labor, materials, services, regulatory compliance, overhead, and profit.

1. Bulk Rock: Contractor shall provide a unit price for removal and disposal of bulk rock as defined in specification section 31 00 00 EARTHWORKS.

\$

(Unit Price in CUBIC YARDS *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price in CUBIC YARDS *in words* electronically, typed, or handwritten legibly in ink)

2. Trench Rock: Contractor shall provide a unit price for removal and disposal of trench rock as defined in specification section 31 00 00 EARTHWORKS.

\$

(Unit Price in CUBIC YARDS *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price in CUBIC YARDS *in words* electronically, typed, or handwritten legibly in ink)

**Project: MANVILLE MEMORIAL PARK
ATHLETIC FIELD IMPROVEMENTS**

3. Unanticipated Unsuitable Soils: Contractor shall provide a unit price for removal and disposal of unanticipated unsuitable soils as defined in specification section 31 00 00 EARTHWORKS.

\$

(Unit Price in CUBIC YARDS *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price in CUBIC YARDS *in words* electronically, typed, or handwritten legibly in ink)

4. ~~Hauling gravel material owned by the Town: Contractor shall provide a unit price per cubic yard of hauling gravel material that is acceptable for use as Sand Gravel Fill or Granular Fill as specified in 31 00 00 EARTHWORKS. This material is stockpiled on Hood Drive behind Lincoln High School.~~

\$

~~(Unit Price in CUBIC YARDS *in figures* printed electronically, typed, or handwritten legibly in ink)~~

~~(Unit Price in CUBIC YARDS *in words* electronically, typed, or handwritten legibly in ink)~~

5. Safety Netting: Contractor shall provide a unit price in linear feet for the cost of the 20-ft high safety netting. Cost for handling and installation of the 20-ft high safety netting shall be included in the Base Bid and not included in this unit price.

\$

(Unit Price in LINEAR FEET *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price in LINEAR FEET *in words* electronically, typed, or handwritten legibly in ink)

**Project: MANVILLE MEMORIAL PARK
ATHLETIC FIELD IMPROVEMENTS**

6. Soccer Goal Pak: Contractor shall provide unit price for each soccer goal pak.

\$

(Unit Price for EACH *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price for EACH *in words* electronically, typed, or handwritten legibly in ink)

7. Storage Units: Contractor shall provide unit price for each storage unit. Include cost of concrete pad for storage unit and installation.

\$

(Unit Price for EACH *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price for EACH *in words* electronically, typed, or handwritten legibly in ink)

8. Players Benches: Contractor shall provide unit price for each players bench.

\$

(Unit Price for EACH *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price for EACH *in words* electronically, typed, or handwritten legibly in ink)

9. Sand Gravel Fill: Contractor shall provide unit price per cubic yard for sand gravel fill material conforming to specification 31 00 00 EARTHWORKS.

\$

(Unit Price in CUBIC YARDS *in figures* printed electronically, typed, or handwritten legibly in ink)

(Unit Price in CUBIC YARDS *in words* electronically, typed, or handwritten legibly in ink)

Project: **MANVILLE MEMORIAL PARK ATHLETIC FIELD IMPROVEMENTS**

4. **CONTRACT TIME**

The Bidder offers to perform the work in accordance with the timeline specified below (refer to specifications 32 92 00 Seeding for Lawn Area and 32 92 30 Sodding for maintenance and warranty requirements):

Base Bid (Seed):

- Start of Construction: Within 7 days of issuance of Purchase Order.
Purchase Order anticipated on or before:
March 1, 2021
- Seeding Completed September 3, 2021
- Provisional Acceptance (Substantial Completion): October 15, 2021
- Final Acceptance (Final Completion): October 15, 2022

Alternate #1 (Sod):

- Start of Construction: Within 7 days of issuance of Purchase Order.
Purchase Order anticipated on or before:
March 1, 2021
- Sodding Completed September 3, 2021
- Provisional Acceptance (Substantial Completion): September 17, 2021
- Final Acceptance (Final Completion): December 26, 2021

5. **LIQUIDATED DAMAGES**

The successful bidder awarded a contract pursuant to this solicitation shall be liable for and pay the Town of Lincoln, as liquidated damages and not as a penalty, the following amount for **each** business day of delay beyond the dates below, as determined in the sole discretion of the Town of Lincoln:

- **Two Hundred Fifty Dollars (\$250) per day beyond Substantial Completion.**
- **Five Hundred Dollars (\$500) per day beyond Final Completion.**

**Project: MANVILLE MEMORIAL PARK
ATHLETIC FIELD IMPROVEMENTS**

BID FORM SIGNATURE(S)

This bid proposal is irrevocable for 120 days from the bid proposal submission deadline.

If the Bidder is determined to be the successful bidder pursuant to this solicitation, the Bidder will promptly: (i) comply with each of the requirements of the Tentative Letter of Award; and (ii) commence and diligently pursue the work upon issuance and receipt of the purchase order from the Town of Lincoln and authorization from the user agency.

The person signing below certifies that he or she has been duly authorized to execute and submit this bid proposal on behalf of the Bidder.

BIDDER

Date: _____

Name of Bidder

Signature in ink

Printed name and title of person signing on behalf of Bidder

Bidder's Contractor Registration Number

SECTION 31 00 00 – EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 REFERENCES

- A. All work specified in this Section shall conform to “Standard Specifications for Road and Bridge Construction” of the Rhode Island Department of Transportation, latest revision, herein referred to as “State Standards”.
- B. Existing Conditions Plan compiled from the following sources:
 - 1. Plan entitled “Manville Park” prepared by Marsh & Long Surveying, Inc. dated October 11, 2019.
 - 2. Plan entitled “Existing Conditions for the Town of Lincoln ‘Manville Park’” prepared by Marsh & Long Surveying, Inc. dated June 24, 2004.

1.3 SUMMARY

- A. This Section includes all excavation including, but not limited to, the following:
 - 1. Excavating and backfilling for structures and proposed improvements.
 - 2. Excavating and backfilling for utility trenches.
 - 3. Excavating and backfilling trenches for buried utilities, structures, catch basins, and manholes.
 - 4. Preparing subgrades for slabs-on-grade, walks, pavements, and lawns.
 - 5. Drainage course for slabs-on-grade.
 - 6. Subbase and base course for walks and pavements.
 - 7. Subbase and base course for asphalt paving.
 - 8. Subsurface drainage backfill for walls and trenches
 - 9. Geotextiles
- B. Related Sections include:
 - 1. Section 31 50 00 Excavation Support and Protection
 - 2. Section 31 23 19 Dewatering
 - 3. Section 32 92 00 Soil Preparation for Lawn Establishment
 - 4. Section 32 92 10 Soil Preparation for Athletic Fields

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Geotextiles
 - 2. Provide a 12-by-12-inch sample of geotextiles and the manufacturer’s recommended installation procedure.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance with the following requirements indicated:
 - 1. Gradation Test Results for each on-site and imported soil material proposed for fill and backfill.

- 2. Laboratory Compaction Curve according to ASTM D 698 ASTM D 1557 for each on-site and imported soil material proposed for fill and backfill.
- ~~3. The Town of Lincoln owns fill material suitable for use as Sand Gravel Fill and Granular Fill which is stockpiled on Hood Drive behind Lincoln High School. Gradation Test Results and Laboratory Compaction Curve submittals specified above shall be provided per 1,000 C.Y.~~

C. Copies of permits obtained for excavations that are required by state and local governing authorities and local utility companies shall be submitted to the owner's representative.

D. Imported Fill Materials

- 1. Provide information on the proposed types and sources of all fill and backfill materials. For each type of soil to be utilized as fill or backfill, the Contractor shall provide the following documentation:
 - a. The designation of the material shall match the nomenclature in the contract documents (i.e., "Sand Gravel Fill", "Granular Fill," etc.).
 - b. The material's intended use onsite.
 - c. Two (2) 50-lb bag samples of the proposed fill.
 - d. Location of borrow source site, including name of the owner of facility name with contact phone number, street address, city and state.
 - e. Present and past usage of the source site and material.
 - f. Volume of soil originating from each source area.
 - g. Name of the qualified firm and analytical laboratory that performed the material sampling and testing.
 - h. All existing report(s) associated with an assessment of the source site as it relates to the presence of oil or hazardous materials.
- 2. The Contractor shall provide a grain size analysis and laboratory compaction curve according to ASTM D1557 for each borrow material proposed for backfill. Such tests shall be no older than 5 days. Contractor shall provide additional grain size and compaction test for every 500 cubic yards (C.Y.) of the same material delivered to the site.
- 3. The backfill shall not contain any visual evidence of asbestos-containing materials (ACM). For backfill proposed from an urban, developed site, the Contractor shall provide soil analysis for the following parameters:
 - a. Total, Extractable and Volatile Petroleum Hydrocarbons, carbon ranges only, by RIDEM methodologies.
 - b. Volatile Organic Compounds (EPA Method 8260B with Method 5053)
 - c. PCBs and Herbicides/Pesticides (EPA Method 8080)
 - d. RCRA 8 metals (EPA Method 6000-7000 series)
 - e. TCLP for any RCRA 8 metal with a total concentration in excess of 20 x the RCRA Hazardous Waste TCLP Regulatory criteria
 - f. Semi-Volatile Organic Compounds (EPA Method 8270)
- 4. For each 1,000 C.Y. or separate borrow site, the Contractor shall collect one soil sample for the analysis stated above in Section 3. Data provided to the Engineer shall be less than 3 months old. For backfill operations extending beyond one year, annual analysis of the borrow pit shall be required.
- 5. The Contractor shall demonstrate that the incoming backfill meets all applicable requirements of the RIDEM Rhode Island Residential Direct Exposure Criteria under the School Siting Law and shall not contain detectable amounts of oil and/or hazardous materials that would violate Rhode Island Department of Environmental Management regulations. All required testing shall be completed prior to the material entering the site.

1.5 SITE INFORMATION

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.
- B. Plans, surveys, measurements and dimensions, under which the work is to be performed are believed to be correct to the best of the Engineer's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found herein.
- C. Data on indicated subsurface conditions are not intended as representations or warrants of continuity of such conditions between soil explorations. It is expressly understood that the Owner and Engineer will not be responsible for interpretations or conclusions drawn there from by the Contractor.
- D. The Contractor may request to perform additional test borings and other explorations at no cost to the Owner.
- E. Test pits have been made by qualified Contractors prior to this Contract. This information shall be made available to bidders as specified under other Sections. The Contractor is responsible to employ qualified personnel capable of interpreting test pit logs. The results of these subsurface explorations and recommendations for work were prepared by the Engineer, and are included in the project manual for information only. Procedures for dewatering, areas to receive special fill and other methods and procedures specified herein shall be supplemented by this information.
- F. The test pit logs, previous excavations, and field observations indicate that rock is present on the site. The costs of additional rock excavation resulting from changes in the work shall be paid for as outlined in the measurement and payment section of this specification.
- G. The test pit logs state that high groundwater is present on the site. The Contractor is made aware of this condition and will not be eligible to receive additional compensation for dewatering exceeding the Contractor's initial bid.
- H. The soil materials present on site contain quantities of silt beyond the limit deemed acceptable for re-use in some areas by this specification. The Contractor is made aware of this condition and will not be eligible to receive additional compensation for imported material exceeding the Contractor's initial bid.
- I. It is the responsibility of the Contractor under this Contract to do the necessary excavation, filling, grading, and rough grading to bring the existing grades to subgrade and parallel to finished grades as specified herein and as shown on the Drawings for this Work. The Contractor shall visit the site prior to submitting a bid to become familiar with the extent of the work to be done under this Contract. The Contractor shall be responsible for determining the quantities of earth materials that must be imported or hauled off the site necessary to complete the work under this Section. All imported earth materials required to construct the project shall be included in the Contractor's base bid.
- K. The Contractor is allowed to re-use excavated On-Site Common Borrow as fill in accordance with this specification. All On-Site Common Borrow used as backfill shall be compacted to the required percentage of maximum dry density included in Table 2 below.

1. The Contractor is made aware that On-Site Common Borrow contains large amounts of silt. Additional efforts required to reuse On-Site Common Borrow are the responsibility of the Contractor and shall result in no additional expense to the Owner or a request for additional time for delays caused by its usage.
 2. The Contractor agrees to use this material at his own risk and is responsible for any additional work required to install this material in accordance with the specifications.
 3. If project delays will result from the additional time required to re-work On-Site Common Borrow, placed as fill in accordance with the specifications, the Contractor shall remove material that does not meet the compaction requirements and provide imported fill meeting the specifications. This imported material shall be provided at no additional expense to the Owner.
 4. Any project delays resulting from additional time required to work this material are the responsibility of the Contractor.
- L. The Contractor shall use suitable on-site soils and fill, and soil from off-site sources, as needed. Please note that not all on-site materials will be suitable for reuse, nor will all required material gradations be present on the site. Imported materials are anticipated for this project and shall be provided by the Contractor at no additional cost to the Owner.
- M. Contractor shall protect and adjust moisture condition of all on-site and imported materials for proper installation, compaction, and use. This includes covering, drying, and adding moisture as required to maintain suitable workability of the soil materials. Please note onsite and imported materials will not necessarily be encountered, or delivered in a suitable condition as environmental factors prevalent at the time of construction will impact soil materials.
- ~~N. The Town of Lincoln owns fill material suitable for use as Sand Gravel Fill and Granular Fill. This material is stockpiled on Hood Drive behind Lincoln High School. See Section 1.4.B.3 for material test reporting requirements. Contractor is responsible for hauling material to the site.~~

1.6 UNIT PRICES

- A. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the limits specified in PART 3 – EXECUTION.
- B. Unit prices for rock excavation include all labor, equipment, and materials required for removal of rock and hauling of rock off-site. Unit prices for rock excavation also include all labor, equipment, and materials required for replacement of rock excavation with approved materials where the rock excavation extends beyond the specified excavation limits. Any excavation beyond the specified excavation limits must be approved by the Engineer prior to removal. Specified excavation limits for rock are specified in Section 3.4.

1.7 DEFINITIONS

- A. Backfill: Soil material used for fill and excavation.
 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Course placed between the subbase course and asphalt paving.
- C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow: Satisfactory soil for use as fill or backfill.

- E. Boulder: A soil particle with a minimum dimension of 12 inches.
- F. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated on the Drawings.
 - 1. Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
 - 2. Bulk Excavation: Excavation more than 6 feet in width and more than 10 feet in length for the installation of utilities, foundations, and footings.
 - 3. Trench Excavation: Excavation 6 feet in width or less for the installation of utilities, foundations, and footings
 - 4. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
- H. Fill: Soil materials used to raise existing grades.
- I. Imported Material: Material obtained by the Contractor from sources off the site.
- J. Influence Area: The area within planes sloped downward and outward at an angle of 60 degrees from the horizontal from (a) 1 foot outside the outermost edge at the base of foundations or slabs; or (b) 1 foot outside the outermost edge at the surface of roadways or shoulder; or (c) 0.5 foot outside the exterior edge at the spring line of pipes and culverts.
- K. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density for relative compaction.
- L. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D1557. Corrections for oversize material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Engineer.
- M. Relative Density: As defined by ASTM D4253 or D4254.
- N. Rock material in beds, ledges, unstratified masses, conglomerate deposits that cannot be removed, in the opinion of the Engineer, without systematic drilling, ram hammering, blasting, or ripping. Weathered Rock that can be removed by an excavator without hammering or other mechanical means shall not meet the definition of rock.
Rock also includes boulders of rock material that exceed 2 cu. yd. for bulk excavation or 1 cu. yd. diameter for footing, trench, and pit excavation.
 - 1. Bulk Rock Excavation: Rock encountered within bulk excavation as defined above.
 - 2. Trench Rock Excavation: Rock encountered within trench excavation as defined above.
- O. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- P. Subbase Course: Course placed between the subgrade and base course for asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or asphalt walk.

- Q. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- R. Topsoil: Natural or cultivated top layer of the soil profile or manufactured topsoil; containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and toxic and other nonsoil materials.
- S. Unsuitable Soils: Existing soils that, in the opinion of the Engineer and Owner's Representative, are unsuitable to remain in their existing location that are deposited outside the excavation limits. This does not include topsoil, subsoil, and silty-sand materials.
1. Anticipated unsuitable soils: Unsuitable soils identified in the test pit logs provided as part of the project manual.
 2. Unanticipated unsuitable soils: Unsuitable soils not identified in either the test pits provided as part of the project manual.
- T. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- U. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

1.8 IMPORTED MATERIAL ACCEPTANCE

- A. All imported earth materials specified in this section are subject to the following requirements:
1. Materials imported to the site by the Contractor for on-site use shall not contain oil and/or hazardous materials that would violate Rhode Island Department of Environmental Management regulations.
 2. All tests necessary for the Contractor to locate acceptable sources of imported material shall be made by the Contractor. Certification that the material conforms to the Specification requirements along with copies of the test results from a qualified commercial testing laboratory shall be submitted to the Engineer for approval at least 14 calendar days before the material is required for use. All material samples shall be a minimum of two (2) 50 pounds and furnished by the Contractor at the Contractor's sole expense. Samples shall be representative and be clearly marked to show the source of the material and the intended use on the project. Sampling of the material source shall be done by the Contractor in accordance with ASTM D75. Tentative acceptance of the material shall be based on an inspection of the source by the Engineer and/or the certified test results submitted by the Contractor to the Engineer at the Engineer's discretion. No imported materials shall be delivered to the site until the proposed source and the Engineer has tentatively accepted materials tests in writing. Final acceptance will be based on Quality Control and Quality Assurance tests made on samples of material taken from the completed and compacted course.
 3. Gradation tests by the Contractor shall be made on samples taken at the place of production prior to shipment. Samples of the finished product for gradation testing shall be taken as specified under Section 3.16, or more often as directed by the Engineer if variation in gradation is occurring, or if the material appears to depart from the Specifications. Test results shall be forwarded to the Engineer within 48 hours of testing.
 4. If tests conducted by the Contractor or the Engineer, indicate that the material does not meet Specification requirements; material placement will be terminated until corrective

measures are taken. Material that does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense. Retesting of material that does not meet specification requirements shall be performed at the Contractor's sole expense.

1.9 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548 shall be hired to provide required testing of earthwork materials at the Contractor's Expense.
 - 1. Refer to Part 3 for testing frequency.
- B. All temporary shoring and bracing shall be designed, detailed, and stamped by a Professional Engineer registered in the State of Rhode Island. Refer to Section 31 50 00- Excavation Support and Protection
- C. Pre-excavation Conference: Conduct conference at Project site prior to the start of construction. Date and time to be specified by the Owner and Engineer.

1.10 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner and then only after arranging to provide temporary utility services according to requirements indicated.
 - 1. Notify Owner and Engineer not less than two weeks in advance of proposed utility interruptions in writing. Renotify 72 hours in advance of proposed utility interruptions.
 - a. Notifications should be made to the Owner's Representative.
 - b. Do not proceed with utility interruptions without Owner's written permission.
 - c. All power shutdowns shall be coordinated with the Owner.
 - 2. Contact "Dig Safe" at 1-888-Dig Safe to verify locations of existing underground utilities in areas of proposed excavation prior to commencing any excavation effort.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed on the Drawings. Coordinate with utility companies to shut off services if lines are active.

1.11 EXCAVATION SAFETY

- A. The Contractor shall be solely responsible for making all excavations in a safe manner. Contractor shall comply with all Local and State OSHA requirements.
- B. Provide appropriate measures to attain a stable base, retain excavation side slopes and prevent earth slides to ensure that persons working in or near the excavation are protected.

1.12 LAYOUTS AND GRADES

- A. All line and grade work not presently established at the site shall be laid out by a survey team under the supervision of a Registered Land Surveyor or Professional Engineer employed by the Contractor in accordance with Drawings and Specifications. The Contractor shall supply all additional layout and grade control as necessary to properly implement and construct the work. The Contractor shall establish permanent benchmarks and replace as directed any which are destroyed or disturbed.

- B. The words “finished grades” as used herein shall mean final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slopes between points for which finished grades are indicated or between such points and existing established grades.

1.13 TOLERANCES

- A. All material limits shall be constructed within a vertical tolerance of 0.1 foot and a horizontal tolerance of 1 foot except where dimensions or grades are shown or specified as minimum. All grading shall be performed to maintain slopes and drainage as shown. No reverse slopes will be permitted.

1.14 DRAINAGE

- A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.
- B. The Contractor shall excavate interceptor swales and ditches where necessary prior to the start of major earthmoving operations to insure minimal erosion and to keep areas as free from surface water as possible.
- C. Should surface, rain, or ground water be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment, and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties for such water. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.
- D. Presence of ground water in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, lay piping, or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation.

PART 2 – PRODUCTS

2.1 SOIL MATERIALS

- A. General: The Contractor may reuse excavated on-site material for fill and backfilling where the material excavated is satisfactory and conforms with the below specified gradation requirements. The Contractor is to provide imported soil materials with satisfactory properties conforming with the below specified gradation requirements when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soils being free of rock or gravel larger than 3 inches in any dimension, debris, broken pavement, waste, frozen materials, vegetation, and other deleterious matter and conform to the criteria listed below:

1. Gradations of satisfactory soils are as shown in the Table below:

TABLE 1: SOIL GRADATIONS					
Sieve Size	Sand Gravel Fill	Granular Fill	1-1/2 inch Crushed Stone	3/4 inch Crushed Stone	Coarse Sand
3-inch*	100	60-100	-	-	-
1-1/2-inch*	80-100	-	85-100	100	-
3/4-inch	50-85	-	35-70	85-100	-
1/2-inch	-	50-85	-	-	-
3/8-inch	-	45-80	10-30	20-55	100
No. 4	30-55	40-75	0-5	0-10	95-100
No. 8	-	-	-	-	80-100
No. 16	-	-	-	-	50-85
No. 40	-	0-45	-	-	25-60
No. 50	8-25	-	-	-	10-30
No. 100	-	-	-	-	2-10
No. 200	0-8	0-10	<1	<1	<2

* The maximum recommended stone size is three inches where placed as base course below slabs and pavement; elsewhere, maximum stone size shall be 2/3 of the loose lift thickness.

2. Common Borrow shall be imported or excavated onsite material free of roots, sod, rubbish, debris, frozen materials, broken pavement, or other deleterious or organic matter, and conform to the following requirements.
 - a. Imported Common Borrow shall conform to the specified gradation of Granular Fill in Table 1.
 - b. Onsite Common Borrow shall conform to the specified gradation of Granular Fill in Table 1, but may contain no more than 15-percent by weight passing the No. 200 sieve. Onsite Common Borrow shall not be placed as foundation wall backfill, as pavement base or subbase courses, as retaining wall backfill, or locations where free-draining backfill are required.
 - c. Stones from excavated onsite material retained on a 3-inch sieve, less than 6-inches in diameter, and not exceeding two-thirds of the thickness of the horizontal layers placed after compaction can be placed for construction. Materials meeting this criteria shall not be included in the analysis for gradation. Materials exceeding this size shall not be placed in backfill below paved areas.
 3. Drainage Stone or Crushed Stone or 1 1/2" Crushed Stone shall be imported material conforming to the gradation for 1 1/2" Crushed Stone in Table 1 and having a maximum percentage loss of 12 percent as determined by the sodium sulfate test, AASHTO T104, and comply to the gradation provided in the table above.
 4. Sand Gravel Bedding and Granular Fill Bedding shall conform to the Sand Gravel Fill and Granular Fill gradations, respectively, specified above except that 100% by weight must pass the 1 1/2" sieve.
 5. Gravel Borrow shall conform to the Sand Gravel Fill Gradation in the Table above.
 - ~~6. The Town of Lincoln owns fill material suitable for use as Sand Gravel Fill and Granular Fill. This material is stockpiled on Hood Drive behind Lincoln High School. See Section 1.4.B.3 for material test reporting requirements. Contractor is responsible for hauling material to the site.~~
- C. Unsatisfactory Soils are defined as soils not conforming to the satisfactory soils criteria unless otherwise approved by the Engineer.

D. All materials to be imported to the site shall not contain unacceptable amounts of oil and/or hazardous materials as defined by the Rhode Island Department of Environmental Management. Recycled brick, concrete, or asphalt material will not be acceptable for any type of backfill.

2.2 GEOTEXTILES

- A. Filter Fabric: Non-woven geotextile shall be nonwoven and needle punched pervious sheets of polyester, polyethylene, nylon, or polypropylene filaments formed into a uniform pattern conforming to the MIRAFI 140N or approved equivalent. The geotextile shall have minimum properties as stated in the following table, when measured in accordance with the referenced standards.

Test	Method	Nonwoven ⁽¹⁾
Grab Tensile Strength (lbs)	ASTM D-4632	120
Puncture Strength (lbs)	Modified ASTM D-3787 Using 5/16-inch flat tipped rod	65 min
Mullen Burst (lbs/in ²)	ASTM D-3786	225 min
Elongation at Required Strength (%)	ASTM D-4632	50 min
Equivalent Opening (US Standard Sieve)	ASTM D-4751	70-100
Permittivity (sec-1)	ASTM D-4491 with 60 mm Falling Head	1.7 min
Water Flow Rate (gal/min/ft ²) at 50 mm Constant Head	(2)	80 –120

- (1) All numerical values represent minimum/maximum average roll values (i.e., the average of minimum test results on any roll in a lot should meet or exceed the minimum specified values).
- (2) Water flow rate in gal/min/ft² shall be determined by multiplying permittivity in sec⁻¹ as determined by ASTM D-4491 by a conversion factor of 74.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Furnish, install, and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of earth and rock excavations, and to keep and prevent any movement which may damage adjacent structures, pavements, and utilities, damage or delay the work, or endanger life and health. Furnish, install, and maintain shoring, sheeting, bracing, and sloping as required by OSHA and other applicable government regulations and agencies.
- B. All temporary shoring and bracing shall be designed, detailed, and stamped by a Professional Engineer registered in the State of Rhode Island.
- C. Provide excavation support and protection in accordance with Section 31 50 00 – Excavation Support and Protection.
- D. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent building area and walkways.

- E. The use of onsite, excavated material may require stockpiling to allow the material to dry prior to placement. Provide erosion-control measures as specified in the drawings and as required by the Owner's Representative to prevent erosion of piles during wet weather periods.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Refer to Section 31 23 19 Dewatering.
- B. The test pit logs completed for this project indicate that groundwater may be present within the limits of excavation. The Contractor is made aware of this condition and shall include dewatering within his Bid.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system, specified in Section 31 23 19 - Dewatering, to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required at any additional expense to the Owner.

3.3 WORK IN FREEZING WEATHER

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.
- B. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.
- C. The Contractor shall not place a layer of compacted fill on snow, ice, or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Engineer.
- D. Do not excavate to full indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade or piping can be installed and backfilled the same day. Protect the excavation from frost if placing of concrete or piping is delayed.
- E. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as required to carry out the work.

3.4 ROCK EXCAVATION

- A. General
 - 1. Rock excavation includes the removal of rock to the lines and grades shown on the plans and as specified within this Section and the disposal of the Rock off site by legal methods.
 - 2. The Contractor shall obtain all necessary permit and licenses and pay all fees at no additional cost to the Owner.
 - 3. All rock excavation shall be included within the original Contract Sum based upon the quantities provided in Part 4. Payment for rock excavation shall be adjusted in accordance with Part 4.

4. Unit prices for rock excavation include all labor, equipment, and materials required for removal of rock and hauling of rock off-site. Unit prices for rock excavation also include all labor, equipment, and materials required for replacement of rock excavation with approved materials where the rock excavation extends beyond the specified excavation limits. Any excavation beyond the specified excavation limits must be approved by the Engineer prior to removal. Specified excavation limits for rock are specified in Section 3.4.
 5. Rock capable of removal through standard excavation procedures shall be removed from the excavation, measured by the Contractor, and verified by the Owner's Representative.
 6. The dimensions and quantity of the uncovered rock in place and the rock removed from the trench shall be measured by a Licensed Land Surveyor registered in the State of Rhode Island at the Contractor's expense. All survey information shall be supplied to the Owner's Representative for verification of the quantity. Survey information shall include the existing rock surface topography, the removed rock surface topography and the rock removal limits as specified herein.
 7. If a change in the work occurs, which includes the excavation of additional rock outside the original contract limits, the Contractor shall uncover all rock to be removed. Upon uncovering rock in excavations that cannot be removed by standard excavation measures, the Contractor shall expose all faces of rock in the area that requires excavation and notify the Owner. The dimensions and quantity of the rock in place and the rock removed from the trench shall be measured by a Licensed Land Surveyor registered in the State of Rhode Island at the Contractor's expense. All survey information shall be supplied to the Owner's Representative for verification of the quantity.
 8. Rock shall be removed by mechanical means and methods. Blasting is not allowed.
 9. A pre-excavation survey is required for all new and existing structures, utility poles, and nearby utilities, which may be affected by rock excavation within 500 feet of the excavation area. The results of this survey shall be summarized in a report prepared by a Professional Engineer registered in the State of Rhode Island. Photo documentation of all existing features examined shall be included in this report. Provide copies of the report to the Owner and the Owner's Representative.
- C. Rock Removal Limits
1. The Contractor shall remove rock to elevations, which will allow the installation of all foundations, footings, utilities, structures, trees and plantings, shown on the drawings.
 2. The Contractor shall remove rock to a minimum of 30 inches below finished grade in paved areas and a minimum of 24 inches below finished grade in landscaped areas.
 3. Around proposed utilities, the Contractor shall remove rock to the lines and subgrade elevations indicated on drawings and as dictated within this specification. The Contractor shall remove sufficient rock to permit the installation of permanent construction without exceeding 6 inches beneath pipe in trench, and the greater of 24 inches wider than pipe or 36 inches wide.
- D. Rock Excavation for the Installation of Structures
1. Boulders and bedrock encountered during the site preparation should be removed from the area of the proposed structure. Any boulder or bedrock located within the area should be removed to a depth of at least 12 inches below the structure. Voids that result from boulder removal should be backfilled with compacted Granular Fill.
- E. Rock Excavation for the Removal of Utilities and Structures
1. Remove rock directly above and to the sides of piped utilities and structures proposed for removal without exceeding the following dimensions:
 - a. 12 inches outside of concrete structures, walls, and footings.
 - b. 12 inches from either edge of piped utility and 6 inches below piped utility
 - c. 6 inches outside of edge of concrete cast against grade.
 - d. 6 inches beneath bottom of concrete pads or slabs on grade.

2. Upon uncovering rock within a trench that cannot be removed by standard excavation measures, the Contractor shall expose all faces of rock within the trench and notify the Owner. The dimensions of the rock in place shall be measured by survey instrument by a RI Licensed Land Surveyor at the Contractor's expense and verified by the Owner's Representative.
3. Rock capable of removal through standard excavation procedures shall be removed from the trench, measured by the Contractor, and verified by the Owner's Representative.

3.5 EXCAVATION, GENERAL

- A. Excavate to subgrade elevations. Material to be excavated will be classified as earth or rock. Do not excavate rock until it has been classified and quantified by the Contractor's land surveyor, and verified by the Owner's Representative
 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
- B. All topsoil and unsuitable or excess materials shall be stripped from areas of new construction or regrading. Materials suitable for reuse shall be stored in locations approved by the Town of Lincoln that will not interfere with construction operations.
- C. All excess topsoil is the property of the Town of Lincoln. Contractor shall haul excess topsoil material to the stockpile areas on Hood Drive behind Lincoln High School, or as designated by the Owner's Representative, at no additional cost to the Owner.
- D. All unsuitable materials shall be legally disposed of off-site by the Contractor.

3.6 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
- B. All unsuitable and fill materials shall be removed from the proposed building area to a limit defined by a 1-horizontal to 1-vertical slope extending downward and outward from two feet outside the edges of the building footing to firm undisturbed glacial till or bedrock. Boulders encountered within these areas shall be removed to a depth of at least 12 inches below the bottom of footings. Voids that result from boulder excavations shall be backfilled with Granular Fill and compacted.
- C. Over-excavation by the Contractor, excavation below the proposed bottom of excavation, shall be backfilled in 6 inch lifts with compacted Sand Gravel Fill. In wet conditions, overexcavation shall be backfilled in 6-inch lifts with 3/4-inch Crushed Stone and a layer of filter fabric approved by the Engineer and compacted to 95% until the proposed subgrade elevation is reached and the subgrade stabilized.
- D. Excavation for Catch Basins and Manholes: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.7 SUBGRADE INSPECTION

- A. Notify Owner's Representative when excavations have reached required subgrade.

- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Continue this process until the area has been proof-rolled 4-6 times. Limit vehicle speed to 3 mph.
 - 2. Proof-roll with a vibratory roller with a static weight of no less than 10,000 lbs and a dynamic weight of 20,000 lbs.
 - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.
- E. Refer to SECTION 32 92 10 SOIL PREPARATION FOR ATHLETIC FIELDS for Field Quality Control survey requirements.

3.8 EXCAVATION OF UNSUITABLE MATERIALS

- A. The Contractor shall notify the Owner's Representative and Engineer when excavations uncover potential unsuitable materials.
- B. Payment for all excavation and disposal of Unanticipated Unsuitable Soils within the limit of excavation shall be included as part of the original Contract Sum.
- C. Excavation and disposal of Unanticipated Unsuitable Soils outside the limit of excavation shall be paid for in accordance with the Unit Prices included in Part 4 of this specification.
 - 1. Unit prices for unanticipated unsuitable soils excavation include all labor, equipment, and materials required for removal of unsuitable soils, hauling of unsuitable soils off-site, and disposal. Unit prices for unanticipated unsuitable soil also include all labor, equipment, and materials required for replacement of unsuitable soil excavation with approved materials. Any unanticipated unsuitable soil excavation must be approved by the Engineer and Owner's Representative prior to removal.
 - 2. The dimensions and quantity of the Unanticipated Unsuitable Soils excavated shall be measured by a Professional Land Surveyor registered in the State of Rhode Island at the Contractor's expense. The Surveyor shall measure the elevations of the unsuitable materials prior to excavation and the surface topography following excavation. All survey information shall be supplied to the Owner's Representative for verification of the quantity. Survey information shall include the topography of the uncovered suitable soil surface prior to excavation and the topography of the final soil surface following excavation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under structures by extending bottom elevation of structure to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Engineer.
- B. Concrete required to fill unauthorized excavation shall be furnished and installed at the expense of the Contractor.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations in locations approved by the Town of Lincoln. Do not store within drip line of remaining trees.

3.11 BACKFILL GENERAL

- A. The contractor shall notify the Engineer a minimum of 2 days prior to backfilling utility trench to schedule inspection.
- B. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Receiving approval from the respective Utility Company, and the Owner 's Representative following inspection.
- C. Place backfill on subgrades free of mud, frost, snow, or ice.
- D. The Contractor is allowed to re-use excavated On-Site Common Borrow as fill in accordance with this specification. All On-Site Common Borrow used as backfill shall be compacted to the required percentage of maximum dry density included in the Table below.
 - 1. The Contractor is made aware that On-Site Common Borrow contains a large amount of silt. Additional efforts required to reuse On-Site Common Borrow are the responsibility of the Contractor and shall result in no additional expense to the Owner.
 - 2. The Contractor agrees to use this material at his own risk and is responsible for any additional work required to install this material in accordance with the specifications.
 - 3. If project delays will result from the additional time required to re-work On-Site Common Borrow, placed as fill in accordance with the specifications, the Contractor shall remove material that does not meet the compaction requirements and provide imported fill meeting the specifications. This imported material shall be provided at no additional expense to the Owner.
 - 4. Any project delays resulting from additional time required to work this material are the responsibility of the Contractor.

3.12 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact initial backfill conforming to the specified material requirements to the height specified on the Drawings over the utility pipe or conduit.
- C. Backfill voids with satisfactory soil while installing and removing shoring and bracing.
- D. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- E. Bedding material shall be placed and compacted in maximum 6" lifts.

3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.
 - 3. The Contractor shall furnish water for compaction. Water for compaction from sources other than potable sources shall be as approved by the Engineer.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Compaction shall be completed with a vibratory roller having a static weight of 10,000 lbs and a dynamic weight of 20,000 lbs.
- C. The Contractor shall use caution when compacting near existing utilities including electric and communications duct banks. Any damage to existing utilities or structures resulting from compaction operations shall be repaired at the expense of the Contractor.
- D. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- E. The Contractor is allowed to re-use excavated On-Site Common Borrow as fill in accordance with this specification. All On-Site Common Borrow used as backfill shall be compacted to the required percentage of maximum dry density included in Table 2.
- F. The Contractor is made aware that on-site Common Borrow is silty. The Contractor agrees to use this material at his own risk and is responsible for any additional work required to install this material in accordance with the specifications. In the event that project delays result from the additional time required to re-work On-Site Common Borrow placed as fill in accordance with the specifications, the Contractor shall remove material that does not meet the compaction requirements and provide imported fill meeting the specifications. This imported material shall be provided at no additional expense to the Owner. Any project delays resulting from additional time required to work this material are the responsibility of the Contractor and shall be made up elsewhere on the project.
- G. Compact soil materials to not less than the following percentages of maximum dry density:

TABLE 2: MINIMUM COMPACTION REQUIREMENTS	
Location	Percent of Maximum Dry Density ¹
Backfill below structures ²	95
Backfill within pavement base and sub base layers	95
Backfill below pavement sub base layers	92
Around and above utilities in paved areas	92
Backfill behind retaining walls	95 ³
Backfill within landscaped areas	85

¹ Maximum dry density as determined by the Modified Proctor test (ASTM D 1557)

² Building area is described as an area extending downward and outward from the outside edge of the footing at a 1H:1V slope.

³ During compaction of fill placed behind retaining walls, care shall be taken so as to maintain uniform elevation along both sides within the embedded areas, and to not overstress the wall by applying too much compactive energy at the top of the wall.

3.15 SUBBASE AND BASE COURSE

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. Place subbase and base course on subgrade in 6-inch lifts and compact as specified.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: The Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test per lift for every 2000 sq. ft. or less of paved area, but in no case fewer than 3 tests.
 - 2. Below Athletic Fields: At subgrade and at each compacted fill and backfill layer, at least 1 test per lift for every 2000 sq. ft. or less of athletic field area, but in no case fewer than 3 tests.
 - 3. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length per lift, but no fewer than 2 tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specify tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Topsoil is the property of the Town of Lincoln. Contractor shall haul excess topsoil material to the stockpile areas on Hood Drive behind Lincoln High School, or as designated by the Owner's Representative, at no additional cost to the Owner.
- B. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by the Owner's Representative.
 - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

3.19 GEOTEXTILES

- A. Install Geotextiles in accordance with Manufacturer's recommendations.

PART 4 - MEASUREMENT AND PAYMENT

4.1 GENERAL

- A. Payment for earthwork as outlined in this Section or shown on the Drawings, including, but not limited to, all design, submittals, materials, labor, equipment, and all other incidentals associated with this work shall be included in the Contractor's Base Bid.
- B. Unit prices for rock excavation include all labor, equipment, and materials required for removal of rock and hauling of rock off-site. Unit prices for rock excavation also include all labor, equipment, and materials required for replacement of rock excavation with approved materials where the rock excavation extends beyond the specified excavation limits. Any excavation beyond the specified excavation limits must be approved by the Engineer prior to removal. Specified excavation limits for rock are specified in Section 3.4.
- C. Unit prices for unanticipated unsuitable soils excavation include all labor, equipment, and materials required for removal of unsuitable soils, hauling of unsuitable soils off-site, and disposal. Unit prices for unanticipated unsuitable soil also include all labor, equipment, and materials required for replacement of unsuitable soil excavation with approved materials. Any unanticipated unsuitable soil excavation must be approved by the Engineer and Owner's Representative prior to removal.
 - 1. Quantities and Payment of Unanticipated Unsuitable Soil Conditions:
 - a. If unanticipated unsuitable materials are encountered beyond the limits of excavation as specified on the Drawings and Specifications, the Contractor shall notify the Owner's Representative in writing. The Contractor shall carry excavation deeper and replace the excavated material with appropriate specified material or concrete as directed by the Owner's Representative.
 - b. Removal of topsoil, subsoil, and rock layer as specified in this specification will not be considered as unanticipated unsuitable soil conditions. Similarly, removal of these materials within paved areas as specified herein will not be considered unanticipated unsuitable soil conditions.
 - d. Only changes in the work authorized in advance by the Owner's Representative in writing shall constitute an adjustment in Contract Price.
 - e. Material that is too wet or too dry for compaction of the particular material in place as determined by the Owner's Representative and/or Soil Testing Company and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall be removed and replaced with approved material as directed

- by the Owner's Representative at no additional cost to the Owner. Wet material is not considered Unanticipated Unsuitable Soil.
- f. The Contractor shall follow a construction procedure, which permits visual identification of firm natural ground.
 - g. The Contractor shall carry in the Base Bid 50 cubic yards for removal of unanticipated unsuitable materials and replacement with suitable compacted fill material in place, as directed herein. The Base Bid shall cover all costs related to such excavation, removal off site, and replacement with compacted fill of approved material, overhead, and profit. No amount other than the Unit Price provided by the Contractor will be paid by the Owner for excavation herein defined.
 - 1) The Unit Price for unanticipated unsuitable soil materials removal as specified herein shall not exceed \$40.00 per cubic yard.
2. Quantities and Payment of Rock Excavation:
- a. The Contractor shall include in his base bid 150 cubic yards of Bulk Excavation rock and its removal from the site. No amount other than the Unit Price provided by the Contractor will be paid by the Owner for Bulk Rock Excavation herein defined.
 - 1) The Unit Price for Bulk Excavation rock removal as specified herein shall not exceed \$100.00 per cubic yard.
 - b. The Contractor shall include in his base bid 150 cubic yards of trench rock and its removal from the site. No amount other than the Unit Price provided by the Contractor will be paid by the Owner for Trench Rock Excavation herein defined.
 - 1) The Unit Price for Trench Excavation rock removal as specified herein shall not exceed \$180.00 per cubic yard.
- D. All quantities of unanticipated unsuitable soils and rock excavated are to be measured in place by a Professional Land Surveyor registered in Rhode Island as described above and verified by the Owner's Representative prior to removal. The Professional Land Surveyor shall be employed by the Contractor at no additional cost to the Owner.
- E. The Contractor shall submit signed slips showing quantities of Unanticipated Unsuitable Soils and Rock removed from excavations at the end of each workday, with a total quantity mutually agreed upon. Slips shall be signed by the Owner's on-site representatives at the end of each day signifying that the quantities are accurate. The Owner has the right to inspect individual loads, slips and quantities as they arrive at or leave from the site and as they are weighed out at the stone quarry. These quantities are for reference only and will not be used to calculate payment with the unit prices above.

END OF SECTION