ADDENDUM NUMBER 2:

CITY OF PORTSMOUTH, NEW HAMPSHIRE
BID #11-22 PORTSMOUTH MULTI-PURPOSE RECREATION FIELDS LIGHTING PROJECT

CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

Issued: December 28, 2021
For Bids Due: January 5, 2022

This addendum modifies, amends, and supplements parts of the Contract Documents, Technical Specifications, and Construction Drawings for **Bid #11-22 Portsmouth Multi-Purpose Recreation Field Lighting Project,** and is hereby made an integral part thereof by reference and shall be as binding as though inserted in its entirety in the locations specified herein. The Contractor shall notify their subcontractors and suppliers of any changes or modifications contained in this addendum.

Bidders shall acknowledge receipt of this **Addendum No. 2** on the Bid Form.

Bids are due on January 5, 2022, at 2:30 p.m. (Note: the superseded bid date was December 22, 2021, at 2:00 p.m.)

The Contract Documents, Technical Specifications, and Construction Drawings for the subject project shall be supplemented and/or amended as follows:

1. TECHNICAL SPECIFICATIONS
    1. Section 02229 – Backfill and Compaction
        a. This specification section shall be incorporated into the technical specifications, division 2.

Attachments to Addendum No. 2:

Specification Section 02229 – Backfill and Compaction

Please acknowledge this Addendum within tour proposal; failure to do so may disqualify the Bidder.

END OF ADDENDUM NO. 2

SECTION 02229
BACKFILL AND COMPACTION

PART 1 -- GENERAL

1.1 DESCRIPTION

A. Work Included:
   1. Work includes backfilling trenches and/or excavation around structures with suitable material removed in the course of excavating and other suitable materials.
   2. Testing soils.

B. Work Specified Elsewhere. This Section is not a stand-alone Section. Other requirements which relate to this Section are noted elsewhere in these documents. The Contractor and all Subcontractors are required to review this entire document along with the Drawings in an effort to identify all requirements.

1.2 REFERENCE STANDARDS

A. Sieve Analysis of Fine and Coarse Aggregates: ASTM C136
B. Sampling Aggregates: ASTM D75
C. Moisture Density Relations of Soils (Modified Proctor): ASTM D1557
D. Density of Soil In-Place by Nuclear Methods: ASTM D2922
E. State of New Hampshire Department of Transportation (NHDOT) Standard Specifications for Road and Bridge Construction (latest edition)

1.3 QUALITY ASSURANCE

A. The Contractor shall obtain and pay for all services of a geotechnical testing firm to perform the necessary soil and compaction tests. The independent soils laboratory shall be approved by the Engineer prior to testing.
B. The Contractor shall make necessary arrangements to allow compaction testing to be performed at a time, place and elevation determined by the Engineer.
C. Pre-placement testing.
   1. The Contractor shall take one sample of each material proposed to be used on the project. The samples shall be taken in the presence of the Engineer and in accordance with ASTM D75.
   2. Subgrade Material: Proctor density tests shall be performed on the existing subgrade in accordance with the following schedule and in accordance with ASTM D1557:
      a. At the bottom of excavations where structures or slabs will be placed.
      b. One after every 5,000 cubic yards has been relocated on the site.
      c. Whenever the material has changed in the opinion of the Engineer.
   3. Select and Borrow Materials: Sieve and modified proctor density tests shall be performed on all select and borrow material in accordance with the following schedule and in accordance with ASTM C136 and ASTM D1557:

a. Before any materials are brought to the site.
b. One after every 5,000 cubic yards has been brought to the site.
c. Whenever the source changes.

4. The result shall be submitted to the Engineer for approval prior to placement.
5. The Contractor shall obtain representative samples for ongoing trench backfill operations.
   a. Samples may be obtained in-situ at time of testing provided they are, in the Engineers opinion, representative of ongoing operations.
   b. Samples may be obtained from stockpiles provide the stockpiled material is thoroughly mixed to represent ongoing operations.
   c. Samples shall also be obtained for select materials such as reclaimed asphalt or gravels previously excavated from the trench.

D. Post-placement testing:
1. The trench and/or excavation shall be prepared using the normal backfill technique employed by the Contractor. No special or additional preparation will be allowed.
2. Determine in-place density in accordance with ASTM D2922 or by other methods as approved by the Engineer.
3. Compaction tests shall be made in accordance with the following table:

	Material	**Testing Frequency**	**Percent Compaction**
Under Slabs or Structures:			
	Native material or borrow material	One for every 500 s.f. of surface area of the slab for every 2 lifts of material placed.	95% 12” lifts
	Structural fill or crushed gravel	One for every 500 s.f. of surface area of the slab for every lift of material placed	95% 6” lifts
Around Structures:			
	Borrow material or other material noted on the drawings	One for every 500 l.f. of wall for every 2 lifts of material placed.	95% 12” lifts
In Trenches:			
	Native material or borrow material	From the blanket material to the underside of the gravel or loam. See Note #1 Below	95% 12” lifts
	Gravels or loam	See requirements for Under paved Areas and Grassed Areas for requirements below	See below

Under Paved Areas:			
	Native material or borrow material	One for every 10,000 s.f. of surface area for every 2 lifts of material placed.	95% 12" lifts
	Gravel	One for every 10,000 s.f. of surface area for every lift of material placed.	95% 6" lifts
	Crushed Gravel	One for every 10,000 s.f. of surface area for every lift of material placed.	95% 6" lifts
Under Grassed or Landscaped Areas			
	Native material or borrow material	One for every 20,000 s.f. of surface area for every 2 lifts of material placed.	90% 12" lifts

Notes:

1. *The Contractor shall propose a method for backfill on the first day of work. This proposed method will be tested and modified as required to meet the compaction requirements noted in the above table. The first day of testing shall include testing of a minimum of 4 lifts. This compaction method shall be used until the soil characteristics have changed in the opinion of the Engineer. At that point new compaction tests shall be performed to determine if the requirements are still being met. If they are, the method shall continue, if they are not, the method shall be modified until the requirements are met. Even if the soil characteristics have not changed, confirmatory compaction tests shall be taken every 3 weeks. Confirmatory testing shall include testing of a minimum of 2 lifts. The Engineer shall determine the location of all tests.*

4. Should compaction tests fail to meet the specified densities, the Contractor shall modify backfill methods as necessary to obtain passing results. The modified method shall be used from that point on.

1.4 SUBMITTALS

A. The Contractor shall submit at the preconstruction meeting his proposed compaction technique which shall include compaction around field structures (i.e manholes, catch basins, etc.) and valve boxes.

B. The Contractor shall submit sieve and proctor curves to the Engineer for approval 7 days before any material is brought to the site.

C. The Contractor shall submit compaction test result sheets to the Engineer no later than 7 days after the test were performed.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. Excavated Material Suitable for Reuse:

1. Material shall be friable natural material comprised of gravels, sand, silts, or clayey gravel and sands.
2. Material shall be free from peat, muck, other organic matter, frozen material, ice, and/or snow.
3. Material shall be free from stones, ledge/rock fragments, and asphalt over 8" in the largest dimension.
4. The material shall not have a moisture content over 2% of its optimum moisture content.

B. Common Borrow (Embankment in place):

1. Consist of earth suitable for embankment construction; free from frozen material, perishable rubbish, peat and other unsuitable material.
2. The moisture content shall be sufficient to provide the required compaction and stable embankment. In no case shall the moisture content exceed 4 percent above optimum.
3. The optimum moisture content shall be determined in accordance with AASHTO T 180, Method C or D.
4. 100% shall pass the 3" sieve and 70-100% shall pass the No. 4 sieve.
5. ***Common Borrow placed deeper than 4-feet below finished grade may contain stones up to 18" in diameter (average) but must be well mixed with smaller particle soil to minimize voids.***
6. ***Crushed and recycled concrete and asphalt shall not be used as Common Borrow.***

C. Select and Borrow Materials:

1. Crushed Stone (Drain/Sewer Pipe Bedding Material):
   a. Crushed stone shall be well graded in size from 1/4 inch to 3/4 inch and conform to ASTM C33 stone size No. 67.
   b. Clean, hard, and durable particles or fragments.
   c. Sieve Analysis:

Sieve Designation	% Passing by Weight Square Opening
1"	100
3/4"	90 - 100
3/8"	20 - 55
No. 4	0 - 10
No. 8	0 - 5
No. 200	1% Max.

2. Sand (Sand Blanket or Water Pipe Bedding):
   a. Clean, hard and durable particles or fragments.
   b. Sieve Analysis:

Sieve Designation	% Passing by Weight Square Opening
3/8"	100
No. 4	95 - 100
No. 16	50 - 85
No. 50	10 - 30
No. 100	2 - 10

3. Roadway Base Course Gravel & Sand Materials:
   a. Materials shall conform to Division 300 – Base Courses, Section 304 of NHDOT's Standard Specifications, latest edition, as amended herein.
4. ***Surface Gravel (304.8) hall meet following screen analysis requirements by weight:***

Sieve Designation	Percent Passing
¾"	100
No. 4	40 - 75
No. 8	25 – 67
No. 40	13 - 35
No. 200	8 - 15

PART 3 -- EXECUTION

3.1 PERFORMANCE

Methods of installation shall be in accordance with Division 300 – Base Courses, Section 304 of NHDOT's Standard Specifications, latest edition, as amended herein.

A. General:
   1. Provide and place all necessary backfill material.
   2. Do not allow large masses of backfill to be dropped into the excavation, as from a grab bucket, in such a manner that may endanger pipes and structures.
   3. Place material in a manner that will prevent stones and lumps from becoming nested.
   4. Completely fill all voids between stones with fine material.
   5. Do not place backfill on or against new concrete until it has attained sufficient strength to support loads without distortion, cracking, and other damage.
   6. Deposit backfill material evenly on all sides of structures to avoid unequal soil pressures.

7. Place backfill material evenly in the trench in an effort to maximize compaction.
8. Do not backfill with, or on, frozen materials.
9. Remove, or otherwise treat as necessary, previously placed material that has frozen prior to placing backfill.
10. Do not mechanically or hand compact material that is, in the opinion of the Engineer, too wet. Fill material that is too wet to be properly placed back in the trench it its current state shall be dried (disced, harrowed, etc.) to within 2% of optimum moisture content. This material shall not be classified as unsuitable material and ineligible for payment as such.
11. Material made unsuitable by the Contractor's construction methods shall be replace with Gravel Borrow at no additional cost to the Owner.
12. Fill that is too dry shall be uniformly watered. The water shall be placed over a loose lift to allow for the water to migrate through the entire lift before compaction.
13. Do not continue backfilling until the previously placed and/or new materials have dried sufficiently to permit proper compaction.
14. When original excavated material is, in the opinion of the Engineer, unsuitable, use only approved gravel borrow for backfilling.
15. Backfill excavation/trench as early as possible to allow for the maximum time for natural settlement.
16. Slope grade away from structures at a minimum slope of 1.5%.
17. The Contractor shall remove excess fill material from the site.

B. Sheeting:
1. Leave sheeting in place when damage is likely to result from its withdrawal. This shall only be allowed with written approval of the Engineer.
2. Completely fill with suitable material and thoroughly compact all voids left by the removal of sheeting.
3. Sheet shall be left in-place and incrementally moved up to allow for a safe work environment in which to properly compact the excavation/trench.
4. See Section 02369 – Sheeting.

C. Backfilling Around Trench Obstacles
1. Material must be properly compacted around trench obstacles (i.e. manholes, catch basin, valve boxes, etc.). Uncompacted fill will not be allowed to be placed around these obstacles.
2. The Contractor shall provide adequate excavation supports to allow for a safe work environment in which to properly compact the excavation/trench.
3. The Contractor shall use methods that compensate for the space limitations in the immediate area around these obstacles.

D. Backfilling in Paved Areas:
1. Backfill trenches in streets and other paved areas by maintaining a moisture content within 2% of optimum.
2. In an effort to allow the road to heave uniformly, backfill material that was removed from the top portion of the trench shall be replaced back into the top of

the trench. Similarly, the material removed from the middle of the trench shall be replaced back into the middle of the trench. Existing material removed from the bottom of the trench (i.e. where the pipe box is located) shall be stockpiled for later use.

3. Backfill in such a manner as to permit the rolling and compaction of the filled trench with the adjoining material to provide the required bearing value for paving immediately after backfilling is completed.
4. Where required, place excavated material, that is acceptable to the Engineer for surfacing or pavement subbase, at the top of the backfill to the depths as needed to adequately support pavement.

3.2

A. Backfilling Trenches in Nonpaved Areas:
   1. Grade the ground to a reasonable uniformity.
   2. Leave the mounding over the trenches in a uniform and neat condition, satisfactory to the Engineer.

B. Bedding & Backfilling of Pipelines:
   1. Install pipe bedding and cushion and primary backfill in accordance with the requirements noted herein, in the specific pipe Specification Section, and on the Drawings.
   2. Deposit and thoroughly compact the remainder of the backfill as noted herein.

C. Placing and Compacting Backfill:
   1. Water Jetting: Shall not be allowed without the approval of the Engineer.
      a.
   2. Puddling: Shall not be allowed without the approval of the Engineer.
   3. Tamping:
      a. Deposit and spread the backfill material in uniform parallel layers not exceeding the lift thicknesses noted herein.
      b. Tamp each layer as required to obtain a thoroughly compacted mass.
      c. If necessary, furnish and use an adequate number of power-driven tampers, each weighing at least 150 lbs.
   4. Rolling:
      a. Compact material by rolling only when the width and depth of the excavation are sufficient to accommodate the rollers, dozers, mechanical tampers, or other similar powered equipment, as may prove to be acceptable, and when it can be performed without causing damage to pipes and structures installed in the excavation.
      b. Deposit and spread the backfill material in uniform parallel layers not exceeding the lift thicknesses noted herein.
      c. Roll each layer as required to obtain a thoroughly compacted mass.
   5. Other placing and compacting methods may be employed only when approved by the Engineer.

D. Improper Backfill

1. When, in the opinion of the Engineer, excavation and trenches have been improperly backfilled, and when settlement occurs, reopen the excavation to the depth required, as directed by the Engineer.
2. Refill and compact the excavation or trench with suitable material and restore the surface to the required grade and condition.
3. Excavation, backfilling, compacting work and testing performed to correct improper backfilling shall be performed at no additional cost to the Owner.

END OF SECTION