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DIVISION 150 – CONTRACT REQUIREMENTS
SECTION 153 – PROGRESS SCHEDULE

153.03 PROCEDURE

This subsection is supplemented as follows:

The Contractor shall provide the Engineer and Owner with written weekly project updates which will include, but not limited to, work completed the previous week, work scheduled to be completed for the upcoming week and any issues encountered.

153.04 MEASUREMENT AND PAYMENT

This subsection is supplemented as follows:

Progress Schedule will not be measured for payment. All work required in accordance with this section will not be measured and the cost shall be included in the various items in the proposal.
SECTION 154 – MOBILIZATION

154.04 MEASUREMENT AND PAYMENT

This entire subsection is deleted and replaced with the following:

Mobilization will not be measured. No separate payment will be made for Mobilization regardless of the number of times the Contractor shuts down and returns to the Project. Include the cost in the various bid items.
SECTION 157 – CONSTRUCTION LAYOUT AND MONUMENTS

157.03 PROCEDURE

This subsection is deleted and replaced with the following:

The Contractor shall establish the construction layout based on a minimum of two (2) field control points. These controls are to be provided to the Engineer for review and approval. This is NOT the field controls established prior to construction, to be provided by the Owner.

Whenever the Contractor detects an error in the Contractor set field controls during construction, the Contractor shall immediately notify the Owner and the Owner's Engineer of such error with sufficient documentation. The Contractor shall be held responsible for all corrective measures and associated costs for failure to notify the Owner of such error.

Separate payment will not be made for construction layout. Contractor is responsible for setting construction stakes, establishing lines and continuous profile grade in roadwork. All costs shall be included in the price bid for the various items in the Contract.

These stakes and marks shall constitute the field control by and in accordance with which the Contractor shall establish other necessary controls and perform the work.

All marking devices used by the Contractor for project management during construction shall be temporary in nature and removed prior to final acceptance. Any permanent devices used shall be removed at the Contractor’s expense prior to final acceptance. If such devices are not removed, the cost to remove them shall be deducted from final payment.

157.04 MEASUREMENT AND PAYMENT

This entire subsection is deleted and replaced with the following:

Measurement and payment for Construction and Layout will not be made; the cost(s) will instead be included in the various bid items.
SECTION 159 – TRAFFIC CONTROL

159.01 DESCRIPTION

This subsection is supplemented as follows:

The traffic control plan is based on the requirements provided in the current Manual on Uniform Traffic Control Devices (MUTCD). The contractor shall work in accordance with the provisions of the traffic control or detour plan and shall only deviate from the plan if approved by the engineer. When a traffic control plan is not included in the construction plans or specifications then the requirements of the MUTCD shall apply and the contractor shall assume all responsibilities for the execution and maintenance of all appropriate traffic control measures. Regardless, the contractor shall prepare traffic control plan submittals of construction work zones for approval of Owner, Engineer, local police or other having jurisdiction of the roadway as may be appropriate.

Any road closures shall permit access to emergency vehicles.

159.04 MEASUREMENT AND PAYMENT

This entire subsection is deleted and replaced with the following:

There will be no separate payment for traffic control. Include all costs in the various items in the proposal.
SECTION 161 – FINAL CLEANUP

161.02 MATERIALS

This subsection is supplemented as follows:

The Contractor will provide the materials, labor and equipment to conduct a final cleanup of the project site, including existing and newly constructed items and the surrounding area affected by the construction.

161.04 MEASUREMENT AND PAYMENT

This entire subsection is deleted and replaced with the following:

Measurement and payment for Final Cleanup will not be made; the cost(s) will instead be included in the various bid items.

END OF SECTION
DIVISION 200 – EARTHWORK
SECTION 201 – CLEARING SITE

201.01 DESCRIPTION

This subsection is supplemented as follows:

Clearing Site shall also include the removal, relocating, resetting or protection in place of any fencing, gates, concrete pads, signs, asphalt walkway, concrete sidewalk, concrete curb, inlets, valves, boxes, hydrants, subsurface drainage, piping, catch basins, footings, foundations, walls, trees or other items which are in conflict with construction whether or not they are designated to be removed or reset in the plans. This work shall also include the resetting of any and all utility castings and boxes within the work zone whether they are designated on the plan or not, including but not limited to inlets, manholes and water valve boxes. The Contractor is encouraged to walk the site to make his/her own determination of the items which are in conflict with construction and which must be removed and/or reset. No additional payment will be given for items removed or reset by the Contractor during the course of construction which have not been identified in the plans and were not brought to the attention of the Engineer prior to removal.

This work shall also include the disposal of any and all waste materials generated during the demolition/removal of existing surfaces necessary for construction of the improvements noted on the construction plans.

Clearing Site shall also include the bracing of utility poles in accordance with the utility Owner(s) requirements and all coordination with the utility Owner(s).

Clearing Site shall also include the saw cutting and removal of existing pavement in areas affecting proper installation of proposed features.

Clearing Site shall also include the restoration in kind of all disturbed finished grade surfaces, including but not limited to asphalt, concrete sidewalks and curbs, and lawn areas.

The Owner reserves the right to retain items that exist on the site that will be removed by the Contractor as part of Clearing Site. These items may be utilized elsewhere by the Owner. The Contractor will remove such items and store on the site for removal or storage by the Owner. The Contractor shall be notified at the commencement of construction of all items that the Owner will retain and the Contractor shall not remove from the site.

201.03 CONSTRUCTION

201.03.09 Disposal of Removed Materials and Debris

This subsection is supplemented as follows:

All items scheduled for removal that are of value shall be stored by the Contractor for inspection by the Owner. The Contractor shall provide a list of items kept for inspection and submit to the Owner and Engineer for review. Should any material be selected to be salvaged by the Owner, the Contractor shall provide a safe storage location onsite.

Removed items and debris under Clearing Site not selected for salvaging by the Owner shall be recycled/disposed of by the Contractor at sites outside the The University. Disposal shall be in conformance with all Federal, State and Local Laws.

Recyclable components of those materials removed under Clearing Site shall be recycled and written documentation of the tonnage of material recycled shall be provided to the Owner. Documentation shall be in the form of accurate weight slips or other form acceptable by the Owner as will satisfy the State’s requirements for municipal eligibility for state tonnage grants. Recycling components shall be any NJDEP Class “B” recyclable material, including but not limited to concrete, brick, block, and tree stumps/trunks or any other components identified by the Owner as having an NJDEP approved recycling facility capable of accepting said material. The Owner shall make available, on request, a listing of NJDEP approved Recycling Facilities for Class “B” Recycling Materials, including the company names, NJDEP Identification Numbers, phone numbers, locations and material types accepted.
201.04 MEASUREMENT AND PAYMENT

This entire subsection is deleted and replaced with the following:

Clearing Site items will not be measured, and payment will be made on a lump sum basis. Measurement and Payment for Clearing Site shall be paid for under the appropriate base bid item, Clearing Site.

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SECTION 202 – EXCAVATION

202.01 DESCRIPTION

This subsection is supplemented as follows:

The work shall consist of stripping existing ground cover and excavation for the installation of facility improvements including the concrete walkways and pads, concrete stairs, footings, and concrete curbs. Excavated site soil that is deemed suitable can be used as backfill onsite.

Any unsuitable material for backfill shall be disposed of off-site by the Contractor at no additional cost to the Owner.

Excavated materials shall either be immediately removed from the site or protected in accordance with appropriate soil erosion and sediment control measures.

202.02 MATERIALS

This subsection is supplemented as follows:

Import certified clean and compactable fill meeting the soil characteristics below with supporting source and analytical data verifying to its cleanliness to boring area up to subgrade. The Contractor shall provide all load tickets of imported fill and shall provide certification of imported fill is classified as Residential Clean Fill material.

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than two inches (2") inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
   1. Unsatisfactory soils also include satisfactory soils not maintained within two percent (2%) of optimum moisture content at time of compaction.

D. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.

E. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

Filter fabric to be Mirafi 140N, or approved equal, woven fabric consisting of monofilaments of polypropylene, weighing 4 oz. per square yard with water flow rate of 35 gallons per minute per square foot of fabric and equivalent opening size of (U.S. standard sieve) 20-45. Fabric shall be non-biodegradable and resistant to soil chemicals and acid and alkalis within a pH range of 3 to 12.

202.03 CONSTRUCTION

202.03.03 Excavating Unclassified Material

This subsection is supplemented as follows:

202.03.03.01 Excavated Material

The Contractor shall remove all material excavated and not scheduled for reuse immediately. Stockpiles onsite should be limited to topsoil and suitable fill. Contractor shall remove topsoil and excavated material off site in accordance with state/federal regulations if the material exceeds what is required for site restoration and cut/fill balance or at the discretion of the Owner.
The project may require fill material import to meet proposed sub grades. The Contractor shall make their own estimate of the required fill volume during bidding based on the material that is to be removed. Importing and placing certified clean fill as documented with analytical results and meeting the gradation criteria specified in the 202.03 shall not be measured for payment. The cost for this material shall be included in the various applicable bid items in the contract.

**Compaction Acceptance Testing**

The compaction requirement in this subsection are waived. The base material shall be placed and compacted in field according to subsection 203.03.02.D (95% Compaction). Compaction testing results shall be provided by the Contractor to the Engineer prior to acceptance of the subgrade including in-situ nuclear density testing. Minimum testing requirements as follows by an independent third-party consultant:

- Minimum of ten (10) tests within the site subgrade
- Three (3) tests around each subsurface structure within the site.

Contractor to contract with and provide third-party, certified testing consultant as approved by the Engineer with the proper equipment to determine the compaction results for review by the Engineer. Acceptance of the testing results of subgrade by the Engineer is required prior to placement of drainage & base layers of fabric, stone and piping and all else listed above.

**202.04 MEASUREMENT AND PAYMENT**

*This entire subsection is deleted and replaced with the following:*

Measurement and Payment for Excavation and Compaction Acceptance Testing shall be paid for under the appropriately awarded base bid items. All soil shall not be measured and cost for disposal shall be included in the Grading and Earthwork bid item.

**Grading and Earthwork** will not be measured, and payment will be made, instead all work associated with grading and earthwork including all labor, material and equipment needed to perform the required **Grading and Earthwork** necessary to install proposed site improvements shall be included in those specific bid items.

**END OF SECTION**
DIVISION 300 – SUBBASE AND BASE COURSES
SECTION 302 – AGGREGATE BASE COURSE

302.01 DESCRIPTION

This subsection is supplemented as follows:

This work shall also consist of the construction and grading of the paved areas as shown on the plans and repair of subgrade as necessary to meet compaction requirements for the paved areas noted as compacted subgrade in plans and details. Work to include excavation of soils which are soft and must be removed as determined by the engineer up to two feet (2’) below the required subgrade. Import of clean fill to be compacted in eight-inch (8”) maximum lifts and installation of crushed stone and geogrid as shown in project details. Compaction testing to demonstrate compliance with these specifications shall be provided by contractor at their expense.

302.02 MATERIALS

This subsection is supplemented as follows:

Geogrid to be used in subgrade repair shall be TriAx TX7 geogrid as manufactured by Tensar International Corporation or approved equal. Fill material for subgrade repair should be free of any environmental contamination and unsuitable material, such as organic matter or other deleterious matter, frozen clods, construction debris and boulders and contain no more than fifteen percent (15%) by weight of material containing non-plastic fines passing No. 200 sieve.

302.03 CONSTRUCTION

This subsection is supplemented as follows:

Base courses for paved areas shall utilize dense graded aggregate (Section 900 of the 2007 NJDOT Specifications) as detailed on the plans.

For repair of subgrade, the fill shall be placed in even horizontal lifts not exceeding eight inches (8”) loose thickness before compaction.

302.03.01 Aggregate Base Course

E. Compaction Acceptance Testing

This subheading is supplemented as follows:

The compaction requirement in this subsection are waived. The base course shall be placed and compacted in field according to subsection 203.03.02.D (95% Compaction). Compaction testing results shall be provided by the Contractor to the Engineer prior to acceptance of the subgrade for pavement, and field areas, including in-situ nuclear density testing. Minimum testing requirements as follows by an independent third-party consultant:

Contractor is responsible for demonstrating proper subgrade compaction prior to placement of Dense Graded Aggregate through nuclear density testing to achieve necessary compaction limits (95% proctor density). Cost of third-party verification by adequate number of testing points shall be the responsibility of the Contractor.

302.04 MEASUREMENT AND PAYMENT

This subsection is supplemented as follows:

Measurement and payment for Aggregate Base Course items shall not be made. The costs shall instead be included in the various applicable bid items in the Contract. Aggregate Base Course items shall include the excavation, removal, geotextile, aggregate, grading and all else necessary for installation as detailed on the Plans.

END OF SECTION
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DIVISION 400 – PAVEMENTS
SECTION 401 – HOT MIX ASPHALT (HMA) COURSES

401.01 DESCRIPTION

The following is added:

Asphalt material utilized for work under this subsection shall be in accordance with the contract plans and these contract documents. This work shall consist of all equipment, material and construction and surface preparation for the installation of the HMA for the proposed Hot Mix Asphalt Repair, as shown on the plans.

401.03 CONSTRUCTION

Hot Mix Asphalt Repair shall consist of the installation of new Hot Mix Asphalt Walkway, 5 1/2” Thick consisting of Hot Mix Asphalt 9.5M64 Surface Course, 1 1/2” Thick over Hot Mix Asphalt 12.5M64 Base Course, 4” Thick over six inches (6”) of dense graded aggregate base course per the details on the construction plans where existing asphalt must be removed for proposed improvements.

H. Air Void Requirements

This entire subpart is deleted and replaced with the following:

The in-place air voids of each mixture in a completed lot shall be a minimum of two percent (2%) and a maximum of eight percent (8%). Conformance will be determined on the basis of the average of five (5) air voids measurements for each lot of approximately 10,000 square yards of pavement surface area. Air voids will be determined from six-inch (6”) diameter drilled cores tested according to AASHTO T166 and T209. The pay quantity for each nonconforming lot will be reduced according to the following table.

### REDUCTION PER LOT DUE TO NONCONFORMANCE TO AIR VOIDS REQUIREMENTS

<table>
<thead>
<tr>
<th>LOT AVERAGE AIR VOIDS (FIVE SAMPLES)</th>
<th>REDUCTION PER LOT (PERCENT OF EACH LOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 TO 1.4</td>
<td>20</td>
</tr>
<tr>
<td>1.5 TO 1.9</td>
<td>10</td>
</tr>
<tr>
<td>2.0 TO 8.0</td>
<td>0</td>
</tr>
<tr>
<td>8.1 TO 9.0</td>
<td>5</td>
</tr>
<tr>
<td>9.1 TO 10.0</td>
<td>10</td>
</tr>
<tr>
<td>OVER 10.0</td>
<td>20</td>
</tr>
</tbody>
</table>

I. Thickness Requirements

This entire subpart is deleted and replaced with the following:

Upon completion of HMA paving, the engineer will obtain cores from the finished pavement at random locations.

The thickness requirements contained herein shall apply only when each component hot mix asphalt mixture in the pavement structure is specified to be a uniform thickness, when such uniform thickness hot mix asphalt mixtures are specified, the combined total thickness of the mixture or mixtures shall be measured to determine compliance with the governing acceptance limit shown in Table 404-4. In addition, the surface course shall be measured to determine compliance with a minimum thickness requirement using an acceptance limit of 1.25 inches. Results of this check on surface course minimum thickness will be used solely to determine whether a remove and replace or an overlay condition exists, not for payment reduction.
TABLE 404-4 THICKNESS ACCEPTANCE LIMITS

<table>
<thead>
<tr>
<th>SPECIFIED OR TOTAL PLAN THICKNESS (INCHES)</th>
<th>ACCEPTANCE LIMIT (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.25</td>
</tr>
<tr>
<td>2.0</td>
<td>1.75</td>
</tr>
<tr>
<td>2.25</td>
<td>2.00</td>
</tr>
<tr>
<td>3.0</td>
<td>2.75</td>
</tr>
<tr>
<td>4.0</td>
<td>3.75</td>
</tr>
<tr>
<td>4.5</td>
<td>4.25</td>
</tr>
<tr>
<td>5.0</td>
<td>4.75</td>
</tr>
<tr>
<td>5.5</td>
<td>5.25</td>
</tr>
<tr>
<td>6.0</td>
<td>5.75</td>
</tr>
<tr>
<td>OVER 6.0</td>
<td>SPECIFIED THICKNESS LESS 0.25</td>
</tr>
</tbody>
</table>

Conformance to thickness requirements will be determined in lots consisting of approximately 10,000 square yards or less. Areas consisting of different combinations of hot mix asphalt mixtures or thickness will not be included in the same lot.

A thickness lot shall have not more than 25 percent of the lot area, as determined from Table 404-5, less than the governing acceptance limit for total thickness shown in Table 404-4.

The acceptance of a thickness lot will be determined from thickness measurements of five drilled cores obtained by the engineer for each lot. Each core will be removed from a random location within each lot and shall be a minimum of four inches (4") in diameter. The total core thickness and the thickness of each component hot mix asphalt mixture contained therein will be determined in accordance with Section 990, NJDOT B-4.

When variations in total thickness cause more than 25 percent of the areas of a lot to be less than the governing acceptance limit shown in Table 404-4, the lot is unacceptable and shall be removed and replaced or overlaid. However, should the percent of lot deviating from the thickness acceptance limit not exceed 45 percent, upon written request, the lot may be left in place without being overlaid provided that the lot payment will be reduced in accordance with Table 404-5.

The percent of lot area less than the applicable acceptance limit shall be determined from the calculated value for the term QL.

The term QL is here defined as:

\[
QL = \frac{\text{AVERAGE LOT THICKNESS} - \text{THICKNESS ACCEPTANCE LIMIT}}{\text{RANGE}}
\]

Where average lot thickness is the average of the total thickness measurements obtained from the five (5) lot cores and range is the absolute difference between the smallest and largest total thickness measurements obtained from the five (5) lot cores.

TABLE 404-5 REDUCTION PER LOT DUE TO NONCONFORMANCE TO THICKNESS REQUIREMENTS

<table>
<thead>
<tr>
<th>QL EQUAL TO OR GREATER THAN</th>
<th>LESS THAN</th>
<th>PERCENT OF LOT AREA OUTSIDE THICKNESS ACCEPTANCE LIMIT</th>
<th>REDUCTION PER LOT, PERCENT (SEE NOTE 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>0.06</td>
<td>GREATER THAN 45</td>
<td>(SEE NOTE 2)</td>
</tr>
<tr>
<td>0.06</td>
<td>0.11</td>
<td>41-45</td>
<td>50</td>
</tr>
<tr>
<td>0.11</td>
<td>0.23</td>
<td>36-40</td>
<td>20</td>
</tr>
<tr>
<td>0.17</td>
<td>0.30</td>
<td>31-35</td>
<td>10</td>
</tr>
<tr>
<td>0.23</td>
<td>--</td>
<td>26-30</td>
<td>5</td>
</tr>
<tr>
<td>0.30</td>
<td>--</td>
<td>0-25</td>
<td>NONE</td>
</tr>
</tbody>
</table>

Note 1 – Percent reductions are not applicable when the term QL is calculated to determine if the surface course complies with the minimum thicknesses.

Note 2 – Remove and replace or overlay.
The term QL shall also be calculated for the HMA surface course of each lot independently using the core thickness values for that course and a minimum thickness acceptance limit of 1.25 inches. When the QL value, so calculated, is less than 0.23 indicating that more than 30 percent of the surface course is outside the minimum thickness acceptance limit of 1.25 inches, the surface course in that lot shall be removed and replaced or overlaid, and any reduction for that lot based on total thickness requirements shall not be applied.

401.04 MEASUREMENT AND PAYMENT

This Subsection is supplemented with the following:

Measurement and payment for removal and disposal of existing asphalt walkway will not be made; the cost will instead be included in the bid item for Clearing Site.

Measurement and payment for sawcutting will not be made; the cost will instead be included in the bid item below. The bid item **HMA Pavement Repair** shall be measured on a square yard basis and include all work, materials, preparation, and activities necessary for installation of this item including, but not necessarily limited to, excavation, subgrade preparation, asphalt courses, dense graded aggregate, and surface restoration.

<table>
<thead>
<tr>
<th>Bid Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA Pavement Repair</td>
<td>SY</td>
</tr>
</tbody>
</table>

END OF SECTION
DIVISION 500 – BRIDGES AND STRUCTURES
SECTION 504 – STRUCTURAL CONCRETE

504.01 DESCRIPTION

The following is added to this section:

This section covers the concrete work for the construction of cast-in-place footings for concrete stairs as shown and detailed on the plans and as described below.

1. Stair footings: Cast-in-place reinforced concrete foundations of the dimension, layout, and material as described on the plans.

The Contractor shall furnish all materials, labor, equipment and machinery for the construction of the aforementioned items in accordance with contract plans and specifications, NJDOT Standard Specifications and as directed by the Engineer.

504.02 MATERIALS

The following is added to the subsection:

The concrete materials used for this project shall be as specified on the plans and herein in the specifications and shall conform to the Division 900 of the standard specification. Any material not covered in Division 900 of the specification shall be governed by the NJDOT Standard Specifications for Road and Bridge Construction, 2007 or latest version.

Footings shall be NJDOT class "B" and shall attain a minimum of 4000 psi at 28 days or as specified on the plans. Slump shall not exceed four inches (4”). The same brand and type of concrete shall be used throughout the project. Wall and stair footings, reinforcing steel, etc. shall be in accordance with the plans and manufacturers’ requirements. The foundations shall also be upsized or modified if required to accommodate local building code official requirements upon attaining local permits.

All concrete not exposed to the surface shall be Class B, 4,000 PSI or as specified on the plans and shall be air entrained. When air temperatures are below 40° F or when air temperatures are expected to fall below 40' F within a 24-hour period, the Engineer may specify Type III cement to be used in the Mix or require an approved cold weather concrete placement plan. No additional payment will be made for this substitution.

504.03 CONSTRUCTION

Construction shall be in strict accordance to these specifications, the plans and, where applicable, the manufacturers’ recommendations. The contractor is responsible to make any discrepancy clear to the owner/Engineer immediately.

504.04 MEASUREMENT AND PAYMENT

This subsection is deleted and replaced with the following:

Measurement and payment for installation of cast-in-place concrete footings associated with all shall not be made. The cost shall instead be included in the various applicable base bid items in the contract.
The following section is added to the standard specifications:

**SECTION 515 – REINFORCED CONCRETE STAIRS**

515.01 DESCRIPTION

This work shall consist of all labor, materials and equipment necessary for the furnishing and installation of the **Concrete Stairs** with Railings at both side of the Russ Hall South entrance and the removal and replacement of **Precast Stair Units** at University Hall to be removed and replaced. This shall include, but not be limited to, all necessary excavation, installation of materials, base courses, fabric, placement of forms & wire mesh reinforcement and steel reinforcing bar, pouring of concrete, finishing and final curing to the dimensions as shown on the plans and as specified herein and related items as shown on the plans and as specified herein, including sawcutting, removal, and repairs to adjoining surfaces and pavements damaged during construction.

515.02 MATERIALS

515.02.01 Materials

General: The concrete materials used for this project shall be as specified on the plans and herein in the specifications and shall conform to the Division 900 of the standard specification. Any material not covered in Division 900 of the specification shall be governed by the NJDOT Standard Specifications for Road and Bridge Construction, 2007 or latest version.

Grout material shall be non-shrink cementitious grout with a minimum strength of 4,000 psi at 28 days.

All anchoring devices shall be corrosion resistant and as specified by the appropriate component manufacturer. The Contractor shall coordinate with the individual manufacturers/suppliers to identify anchoring materials needed to install the components. If reinforcing anchors are to be drilled and epoxied into poured footings, the anchors shall be installed to the depths recommended by the component manufacturers and the epoxy shall be rated appropriate for the structural loading.

Concrete shall be Class B, 4000 PSI as specified in Subsection 914 and shall be air entrained. When air temperatures are below 40° F or when air temperatures are expected to fall below 40° F within a 24-hour period, then the Engineer may specify Type III cement to be used in the Mix. No additional payment will be made for this substitution.

**Stairs and Railings**

**Concrete:** NJDOT class "B" and shall attain a minimum of 4000 psi at 28 days. Slump shall not exceed four inches (4").

**Reinforcement:** Refer to plan details for the various reinforcement requirements. Contractor shall submit shop drawing depicting reinforcing steel schedule.

**Expansion joint filler:** Bituminous pre-molded cellular joint filler. To be caulked with Type IV sealer in accordance with Section 914.02.

**Railing:** All ramps and stairs to be provided with ADA handrails as depicted on the plans meeting ADA, IBC, and applicable local codes. Railings shall be as detailed on the construction plans. Railings shall be galvanized steel with factory applied black powdercoat finish. Contractor shall submit shop drawings and manufacturer’s information for the railing.

**Form Release Agent:** Contractor shall treat all form liners and form work with a VOC compliant, petroleum based chemical release agent such as Sika Form Release 8000, by Sika Corporation, or approved equal. Contractor shall comply with manufacturer’s written instruction and recommendations for use.
Curing Compound/Sealer: Contractor shall apply clear concrete curing compound and abrasion resistant sealer for exterior concrete surfaces such as Cureseal-W by Scofield Company, or approved equal. Contractor shall comply with manufacturer’s written instruction and recommendations for use.

515.03 CONSTRUCTION

515.03.01 Dense-Graded Aggregate Base Course

Dense-graded aggregate base course shall be according to Section 302.

515.03.02 Concrete Stairs

Unless specified otherwise, stair treads shall be 12” in depth and constructed with a 1% slope across the stair tread to ensure positive drainage. Unless specified otherwise, all stair risers shall be 6” in height with riser slope as shown on the details. Top stair tread shall be set flush with adjacent concrete pavement as shown on the plans and details. All stairs to receive full abrasive nosing as shown on the plans and details.

Construct 1/2-inch wide expansion joints at top and bottom of stairs, filled with preformed joint filler.

Construction of exposed concrete components of concrete stairs shall be performed in accordance with the requirements of Section 606.03.02.

515.03.03 Railings

Concrete Stairs shall be furnished complete with steel railings meeting all applicable ADA, IBC, and local building codes, per the plans and these specifications. Railings shall be set with non-shrink grout in cored holes in the ramp or stairs to the depth depicted on the plans.

515.04 MEASUREMENT AND PAYMENT

Concrete Stairs and Precast Stair Units items shall be paid on a lump sum basis. The lump sum price bid shall include all costs to construct the concrete stairs, walls, footings new handrails and resetting existing railings, including all labor, formliners, sealants, admixtures, reinforcement, as well as costs of any appurtenant work, including pavement sawcutting, removal and repair necessary for construction of the bid items listed herein.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Stairs</td>
<td>LS</td>
</tr>
<tr>
<td>Precast Stair Units</td>
<td>LS</td>
</tr>
</tbody>
</table>
SECTION 516 – CONCRETE REPAIR

516.01 DESCRIPTION

This work shall consist of all labor, materials and equipment necessary for the rehabilitation and restoration of various concrete items at the locations indicated on the plans. This shall include, but not be limited to, all necessary excavation, saw-cutting, base courses, fabric, placement of forms & wire mesh reinforcement and steel reinforcing bar, pouring of concrete, finishing and final curing to the dimensions as shown on the plans and as specified herein and related items as shown on the plans and as specified herein, including sawcutting, removal, and repairs to adjoining surfaces and pavements damaged during construction.

516.02 MATERIALS

516.02.01 Materials

Structural Repair Concrete: The concrete materials used for the various concrete repair items shall be a polymer modified structural repair material for vertical and horizontal structural concrete repairs. Product shall be polymer modified structural repair No. 1241-25, as manufactured by Quikrete, or approved equal.

Expansion joint filler: Bituminous pre-molded cellular joint filler. To be caulked with Type IV sealer in accordance with Section 914.02.

516.03 CONSTRUCTION

516.03.01 Concrete Repair

A. Preparation. Sawcut repair areas to a depth of one inch (1”) around the perimeter of each repair area before removing the deteriorated concrete. Remove loose and disintegrated concrete from the areas to expose a sound concrete surface. Remove at least ¼ inch of sound concrete. Clean and roughen the area by sandblasting. Ensure that the remaining concrete is not damaged. Use only pneumatic or hand tools to remove the disintegrated material and to prepare and shape the areas to be repaired. Do not use hammers that exceed 30 pounds. Remove concrete adjacent to exposed reinforcement steel by hand chipping. Do not damage or debond the reinforcement steel.

If corroded reinforcement steel is uncovered, clean the steel by sandblasting, waterblasting or wire brushing. If concrete is debonded from the reinforcement steel or the steel is exposed, remove the concrete adjacent to the reinforcement steel to provide a 1/2 inch clearance.

B. Placement. Place and consolidate patch materials as specified for concrete in 405.03.02.D.1.b and 405.03.02.D.1.c. Finish concrete to match appearance of adjacent existing concrete.

516.04 MEASUREMENT AND PAYMENT

Concrete Repair item shall be measured and paid on a square foot face basis. The unit price bid shall include all costs to repair the concrete items called out for repair on the plans, including all labor, sealants, admixtures, reinforcement, as well as costs of any appurtenant work, including pavement sawcutting, removal and repair necessary for construction of the bid items listed herein.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Repair</td>
<td>SFF</td>
</tr>
</tbody>
</table>

END OF SECTION
DIVISION 600 – MISCELLANEOUS CONSTRUCTION
SECTION 606 – SIDEWALKS, DRIVEWAYS AND ISLANDS

606.01 DESCRIPTION

This subsection is supplemented as follows:

This work shall consist of all labor, materials and equipment necessary for the furnishing and installation of Concrete Sidewalk, 4" Thick, Reinforced Concrete Sidewalk, 6" Thick, Reset/Replace Concrete Pavers, and Steel Edging as shown on the plans and details, including but not limited to stairs and walkways. This shall include but not be limited to all necessary excavation, installation of materials, base courses, fabric, placement of forms & wire mesh reinforcement, pouring of concrete, finishing and final curing to the dimensions as shown on the plans and as specified herein and related items as shown on the plans and as specified herein, including saw-cutting, removal, and repairs to adjoining surfaces and pavements damaged during construction.

606.02 MATERIALS

606.02.01 Materials

This subsection is supplemented as follows:

Concrete shall be Class B, 4000 PSI as specified in Subsection 914 and shall be air entrained. When air temperatures are below 40°F or when air temperatures are expected to fall below 40°F within a 24-hour period, then the Engineer may specify Type III cement to be used in the Mix. No additional payment will be made for this substitution.

Concrete

NJDOT class "B" and shall attain a minimum of 4000 psi at 28 days. Slump shall not exceed four inches (4”). The same brand and type of concrete shall be used throughout the project. All concrete system components shall be manufactured by L.M. Scofield Company, Los Angeles, CA, 90040 (800) 800-9900, (323) 723-5285 or approved equal. Area representative: John Tutunjian (201) 342-1380.

Reinforcement

Refer to plan details for the reinforcement requirements.

Expansion Joint Filler

Bituminous pre-molded cellular joint filler.

Sealing and Finishing

Cureseal-W Concrete Curing Compound and Sealer by L.M. Scofield Co., or approved equal, shall be applied to the cured concrete at a rate specified by the manufacturer.

Expansion Joints shall receive Sikaflex-2c, self leveling, polyurethane-based, elastomeric sealant by Sika Corporation, or approved equal. Color shall be chosen from standard Sikaflex colors and matched as close as possible to the color of the adjacent colored concrete. Sealant shall be applied per manufacturer’s written instructions and recommendation. Refer to color chart included in the appendix of the specifications.

Pattern

All concrete walkways shall be scored in accordance with the construction details.
Decorative Pavers

Pavers to match manufacturer and model of existing pavers to be replaced. Based on record drawings from the University the Promenade pavers shall be Hanover Prest Brick Pavers as manufactured by Hanover Architectural Proudcts, or approved equivalent as indicated on the plans. Colors and finishes shall be as noted on the plans and details, and as approved by the Landscape Architect and Owner prior to installation.

Color and finish of Decorative Pavers to be three color random blend: #B92079 Tudor Finish, #B92079 Natural Finish, and #B92827 Tudor Finish. Color shall be confirmed during submittal process by client and Landscape Architect.

Information on manufacturer and model of existing pavers at University Hall Entrance were not available, Contractor must match existing pavers.

Pavers shall receive surface level color-enhancing protectant.

Pavers size shall be of the size and shape of existing pavers to be replaced.

Concrete Pavers shall conform to the following requirements set forth in ASTM C-936:

Measured length or width of test specimens shall not differ by more than +/- 0.063 in, while measured thickness shall not differ by more than +/- 0.125 in.

Average compressive strength of 8,000 psi (55 MPa) with no individual unit under 7,200 psi (50 MPa) when tested in accordance with ASTM C-140.

Average absorption of five percent (5%) with no unit greater than seven percent (7%) when tested in accordance with ASTM C-140.

Where freeze-thaw testing is required, the average mass loss of all specimens tested shall not be greater than

(a) 225 g/m2 when subject to 28 freeze thaw cycles, or
(b) 500 g/m2 when subject to 49 freeze thaw cycles.

Testing shall be conducted using a three percent (3%) saline solution in according to ASTM C-1645.

Efflorescence shall not be a cause for rejection.

Pigment in Concrete Pavers shall conform to ASTM C-979.

Concrete pavers shall be gauged.

Bedding Course for Pavers

Clean, non-plastic sand, free from deleterious or foreign matter, natural or manufactured from crushed rock.

Do not use limestone screenings or stone dust.

For Decorative Pavers when placed over a concrete slab, use a bituminous/paver mastic bed.

Verify gradation conforms to ASTM C-33 requirements for concrete sand as tested in accordance to ASTM C-136.

Joint Filling Sand

Clean, non-plastic, free from deleterious or foreign matter, natural or manufactured from crushed rock.

Verify gradation conforms to ASTM C-144 requirements for mortar sand as tested in accordance to ASTM C-136.
Base Course

Clean, non-plastic, free from deleterious or foreign matter, natural or manufactured from crushed rock.

Verify gradation conforms to ASTM D-2940

Layout and patterns shall match layout and pattern of adjacent existing pavers to remain.

All pavers shall meet the manufacturer specifications.

Steel Edging

Steel edging shall be constructed of high-strength steel with the following dimensions: 5-inches in height and 1/4”-inch in thickness. Steel edging section shall be fabricated with anchor stake loops stamped in face of sections minimum 32” on center. Edging shall be secured with 15-inch by 3/16”-inch thick tapered steel stakes. All edging and stakes to receive factory-applied enamel paint finish, color to be black and shall be confirmed by owner during shop drawing submittal phase. Steel edging shall be Border King model as manufactured by Border Concepts, Inc, 800-845-3343, or approved equal.

606.03 CONSTRUCTION

606.03.01 HMA Sidewalks, Driveways and Islands

This subsection is supplemented as follows:

Dense-graded aggregate base course shall be as according to Section 302.

606.03.02 Concrete Sidewalks, Driveways and Islands

This subsection is supplemented as follows:

Unless specified otherwise, sidewalks shall be constructed with a slope of ¼ inch vertically for every one foot (1’) horizontally, and sloped toward landscape areas and drains where applicable.

Sidewalks shall be constructed of class “B” air entrained concrete, four-inches (4”) thick or six-inches (6”) thick as specified on the plans over ¾” clean stone aggregate base course.

Prior to removing any interfering tree roots, the Contractor shall receive permission for the root removal from the Engineer. The Contractor shall allow sufficient time for the Engineer to examine the exposed roots prior to root removal. If the required root removal is deemed to be excessive by the Engineer, the tree and stump shall be removed by change order.

Dense-graded aggregate base course shall be according to Section 302.

Sidewalks to receive a light broom finish perpendicular to the main direction of travel.

The layout and location of all control joints and expansion joints must be approved by the Engineer and Landscape Architect prior to installation. The Contractor to submit a plan with the layout of all control joints and expansion joints for review prior to the installation of concrete.

Installation of pavers and steel edging shall be as per manufacturer’s recommendations and written instructions and as specified on the plans and details.
E. Expansion Joints

This subpart is supplemented as follows:

Expansion Joints in Concrete: Transverse expansion joints shall be placed as shown on the plans and details. The joints shall be ½ inch wide. Joints shall be filled with bituminous pre-molded cellular joint filler cut ½ inch below top of grade.

Construct ½ inch wide expansion joints, placed at intervals of approximately twelve feet (12’), filled with preformed joint filler. Contractor to submit plan for approval prior to installation

Where sidewalk widths exceed five feet (5’), longitudinal scribed joints shall be provided as approved by the Engineer. Such joints shall be a minimum one-inch (1”) deep. See detail for typical joint pattern.

Transverse scribed joints shall be placed at intervals equal to the sidewalk width. These shall be a minimum of one-inch (1”) deep. See detail for typical joint pattern. Contractor to prepare submittal for review prior to construction.

606.04 MEASUREMENT AND PAYMENT

This subsection is supplemented as follows:

Concrete Sidewalk, 4” Thick and Reinforced Concrete Sidewalk, 6” Thick, shall be measured and paid on a square yard basis. Reset/Replace Concrete Pavers shall be measured and paid on a square foot basis. Steel Edging shall be measured and paid on a lineal foot basis. These items shall include all costs to construct concrete sidewalks, pads, aprons, including all labor, sealants, admixtures, reinforcement, resetting and replacing existing concrete pavers in kind, installing steel edging where indicated on the plans, as well as costs of any appurtenant work, including pavement sawcutting, and repair necessary for construction of the bid items listed herein.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Sidewalk, 4” Thick</td>
<td>SY</td>
</tr>
<tr>
<td>Reinforced Concrete Sidewalk, 6” Thick</td>
<td>SY</td>
</tr>
<tr>
<td>Reset/Replace Concrete Pavers</td>
<td>SF</td>
</tr>
<tr>
<td>Steel Edging</td>
<td>LF</td>
</tr>
</tbody>
</table>
SECTION 607 – CURB

607.01 DESCRIPTION

The first sentence is changed to:

This work shall consist of the installation of 6”x18” Concrete Vertical Curb, as identified on the plans. These curbs are to be constructed as detailed on the plans and to the grades specifically identified on the grading plan.

607.03 CONSTRUCTION

607.03.02 Concrete Vertical Curb and Concrete Sloping Curb

The title of this subsection is changed to the following:

607.03.02 6”x18” Concrete Vertical Curb

This subsection is supplemented as follows:

6”x18” Concrete Vertical Curb shall be constructed in accordance with the contract plans and these specifications.

Curb construction shall include the various designs as depicted on the plans. All exposed surfaces shall be smooth and all exposed corners filleted.

All exposed Concrete Curbs shall be N.J.D.O.T. class “B” air entrained, 4,000 psi.

The Contractor is directed to the plans for specific requirements of curb expansion joints.

The Contractor shall meet the top of existing curb to remain flush at joint.

607.04 MEASUREMENT AND PAYMENT

This subsection is supplemented as follows:

Measurement and payment for 6”X18” Concrete Vertical Curb, including the excavation, bedding, joint material, reinforcement, and all else necessary for the installation will be made by the linear foot of curb installed.

Payment shall be made under:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>6”x18” Concrete Vertical Curb</td>
<td>LF</td>
</tr>
</tbody>
</table>
SECTION 610 – TRAFFIC STRIPES, TRAFFIC MARKINGS AND RUMBLE STRIPS

610.01 DESCRIPTION

This subsection is supplemented as follows:

Traffic markings removed or partially damaged during construction activities including lines, crosswalks and stop bars shall be remarked in their entirety with thermoplastic marking paint following improvement installation and asphalt restoration. This work consists of furnishing and applying line striping, including, but not limited to, white thermoplastic to HMA surfaces as shown in construction plans.

610.02 MATERIALS

This subsection is supplemented as follows:

Equipment for applying traffic markings, of the various materials, shall be so designed, equipped, maintained and operated that the traffic markings are applied according to the specifications and the manufacturer’s recommendations.

610.04 MEASUREMENT AND PAYMENT

This subsection is supplemented as follows:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Markings, Thermoplastic</td>
<td>LS</td>
</tr>
</tbody>
</table>

All striping and markings shall be completed at one time and contractor shall coordinate with the Owner during construction.
The following section is added to the standard specifications:

SECTION 614 – HANDRAIL RESTORATION

614.01 DESCRIPTION

Handrail Restoration scope of work shall include all labor, materials and equipment necessary for the restoration of existing handrails, including removal of existing damaged paint, debris, markings, etc and repainting to match adjacent existing handrails as shown on the plans.

614.02 MATERIALS

All primers, paints and coatings shall be applied as per the manufacturer’s recommendations and written instructions. Contractor shall submit product data for all materials listed below:

**Primer**

Primer shall be a high performance, low VOC, single component, exterior ferrous metal acrylic bonding primers for use on galvanized steel. Primer shall be ULTRASHIELD Galvanized Metal Primer as manufactured by Dunn-Edwards Paints, 888-337-2468, or approved equal.

**Finish Coat**

Finish Coat shall be a high performance, exterior, silicone alkyd gloss enamel made for primed metal that will be exposed to severe weather conditions. Finish coat shall be ENDURGLOSS as manufactured by Dunn-Edwards Paints, 888-337-2468, or approved equal. Color shall be black.

614.03 CONSTRUCTION

Contractor shall clean use wire brushes or other appropriate paint removal tools to remove all loose and peeling paint from existing handrails. After loose and peeling paint has been removed to a satisfactory level for proper adhesion of new primer and finish coats, handrails surfaces shall be cleaned using an appropriate cleaner-degreaser followed by a Brush-Off Blast(SSPC-SP16) or chemical etching solution. If an etching solution is used, it must be thoroughly rinsed prior to applying any coating.

Contractor shall then apply primer at manufacturer’s recommended rates for proper coverage. Primer shall be allowed to dry for period of time indicated by manufacturer. Once Primer is fully dried contractor shall apply finish coat of exterior enamel paint at the manufacturer’s recommended rates for proper coverage. Contractor shall apply as many finish coats as needed to result in a smooth, uniform coating along the entirety of handrails.

614.04 MEASUREMENT AND PAYMENT

The following subsection is changed to:

Handrail Restoration shall be measured and paid on a lineal foot basis. This includes all labor, equipment and material cost(s) for cleaning and removal of old paint, handrail surface preparation for new coatings and application of new primer and finish coatings in accordance with the plan details and manufacturer's recommendations.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handrail Restoration</td>
<td>LF</td>
</tr>
</tbody>
</table>

END OF SECTION
DIVISION 700 – ELECTRICAL  
SECTION 705 – SITE LIGHTING

705.01 DESCRIPTION

The Contractor shall furnish and install light poles and luminaire fixtures on existing concrete foundations in accordance with all requirements of the NEC, and in addition, as shown on the plans and drawings, and as hereinafter specified.

705.01.01 Quality Assurance

The lighting System shall be Underwriters' Laboratories (UL) listed, and each fixture, shall bear the UL label. Fixtures to be installed in areas subject to the weather shall be UL listed as "Enclosed and gasketed suitable for wet locations." The execution of work of this Section shall satisfy the applicable requirements of the latest NEC, regulations of jurisdictional authorities and the National Occupational Safety and Health Act.

705.01.02 Warranty

The decorative lighting system materials and workmanship shall be warranted to be free from manufactured defects for three (3) years from time of shipment for all components except LED engines and drivers which shall have a five (5) year warranty from time of shipment from the manufacturers facility to the site. Excluded from this three (3) year warranty are lamp, fuses, and any labor charges.

705.01.03 Submittals

A. Product Data

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
2. Details of attaching luminaires and accessories.
3. Details of installation and construction.
4. Luminaire materials.
5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories. For indicated luminaires, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
6. Photoelectric relays.
7. Ballasts, including energy-efficiency data.
8. Lamps, including life, output, and energy-efficiency data.
10. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
11. Anchor bolts for poles.
12. Manufactured pole foundations.

B. Shop Drawings:

1. Light Pole Foundation design; signed and sealed by a NJ Professional Engineer
2. Anchor-bolt templates keyed to specific poles and certified by manufacturer.

C. Maintenance and installation instructions.
705.02 MATERIALS

Light Fixtures:

Luminaire: Luminaire fixture shall match existing acorn style light fixtures on campus and shall be S8409B Luminaire, type V optics, as manufactured by Lumilock or approved equal, verify make and model with the owner.

Pole: Pole for light fixtures shall match existing light poles on campus and shall be round 5-inches tapering to 3-inches with decorative cast aluminum base w/access cover and shall be SP8409 as manufactured by Lumilock, or approved equal, color black, verify make and model with the owner.

Substitute Products

A. Luminaires, poles lighting assemblies, and electrical components not in compliance with specification criteria must be submitted to the Owner seven (7) days prior to bid opening. Substitute equipment must be equal to or exceed the requirements specified herein.

B. Lighting manufacturers submitting products other than those in compliance with specifications shall submit photometric data showing equal or better footcandles levels, uniformity levels, and electrical consumption, while using the same design criteria and formulations.

C. Information shall be included on the following: ballast and ballast housing, all materials and electrical components of the luminaire, prewiring, and luminaire construction. Omission of information or failure to provide proper and concise data shall be ground for rejection of bid.

D. Photometric reports must be submitted. Failure to provide this information may be cause for rejection of substitute.

E. Lighting system manufacturer shall provide statement of warranty for all substitute equipment provided.

F. Lighting system manufacturer shall submit a written itemized statement of exceptions and discrepancies to specification.

705.03 CONSTRUCTION

A. Product Delivery, Handling and Storage

1. Products shall be delivered securely wrapped and packaged. Packages shall be clearly marked to identify manufacturer, product or component number, and job fixture type. Products shall be handled in a manner, which will prevent breakage of packages and damage to contents, and shall be stored in a clean, dry, and secure storage area pending installation. Damaged items shall be replaced with new at no additional cost to the Owner. Spare lamps shall be delivered to the Owner in their original packaging and stored on site as directed.

B. Installation

1. Lamps shall be installed not earlier than 48 hours immediately before the date of final inspection and shall be warranted for six (6) months. All fixtures shall be operational prior to acceptance.

2. Surfaces and structures to, and on, which products will be affixed, placed, and installed shall be inspected before the work of this Section begins, and shall be capable of supporting the products. Surfaces, which will be concealed by products, shall be finished before products are installed.

3. Assemble where required, wire and install lighting fixtures and accessories at locations and mounting heights indicated on the Contract Drawings.

4. At the request of the Owner or Contractor, the manufacturer shall provide a representative during the installation of the lighting system to instruct the Contractor and to ensure that poles and luminaire assemblies are properly oriented according to manufacturer requirements.

5. Ground light fixtures according to requirements of NEC Article 410.E 3.
6. Follow the cleaning procedures as recommended by the fixture manufacturer with respect to new fixture cleaning for construction work practice. Use only those products for cleaning as outlined in the fixture manufacturer’s literature.

C. Testing, Measurement & Certification

1. All luminaires shall be operating and properly aimed.
2. At the request of the Owner or Contractor, the manufacturer shall provide a representative during the test of the lighting system.
3. Testing shall be done when the air and sky are clear and extraneous light is at a minimum.
4. The photometer shall be of good quality and accuracy, recently calibrated or its accuracy otherwise verified.
5. The measurement record shall include the following in formations:
   - Name of the installation.
   - Date and time of the measurements.
   - Description of the lighting system, including luminaire and lamp type and quantities, mounting heights.
   - Age of lighting system and number of operating hours since the last lamp change.
   - Type, make and serial number of the photometer.

   A variation between computer-predicted performance and the site-measured results is to be expected. However, the actual results shall be within ten percent (10%) of the predicted results.

705.04 MEASUREMENT AND PAYMENT

The following is added to this subsection:

Light Pole and Fixture will be measured and payment will be made on a unit basis. Measurement and Payment will include furnishing and installation of new decorative site lighting fixtures and poles on existing light pole foundations and all items necessary for installation for full operation of new lights.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Pole and Fixture</td>
<td>UNIT</td>
</tr>
</tbody>
</table>

END OF SECTION
DIVISION 800 – LANDSCAPING
SECTION 804 – TOPSOILING

804.01 DESCRIPTION

This subsection is supplemented as follows:

This work shall consist of all labor, materials, and equipment necessary for the furnishing and placement of topsoil to 2-inches in depth in areas indicated on the plans. This includes but is not limited to the preparation of areas to receive topsoil, screening of topsoil (if needed), and the delivery & placement of topsoil.

The Contractor shall submit samples of the topsoil to the Engineer/Landscape Architect for approval.

1. Topsoil shall be amended as required to meet the specifications. Following the incorporation of amendments and additives, the Contractor shall provide a minimum of one (1) six-inch (6”) depth by three-inch (3”) diameter core sample for every 1000 cubic yards of soil material. The samples shall be taken for testing, analysis, and approval. The cost of all testing shall be the responsibility of the Contractor. No final grading or seeding operations shall occur until acceptance of the soil samples has been obtained. Contractor shall deliver samples to testing laboratories and shall have the testing report sent directly to the Owner’s Designated Representative (the Engineer or Landscape Architect).

2. Mechanical gradation (sieve analysis with no particles over ½”) and chemical (pH soluble salts) shall be performed by public extension agency or a certified private testing laboratory in accordance with the current standards of the Association of Official Agricultural Chemists. A hydrometer shall be used to determine percent of clay and silt.

3. Percent of organics shall be determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 110ºC, plus or minus five degrees Celsius (±5ºC).


5. Tests, as specified, for gradation, organics, soil chemistry and pH shall be performed by a qualified testing laboratory acceptable to the Owner’s Designated Representative.

6. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for fertilizing and liming applications to support successful turf growth.

7. All tests shall be performed in accordance with the current standards of the Association of Official Agricultural Chemists.

804.02 MATERIALS

This subsection is supplemented as follows:

Topsoil:

The cleaning of existing topsoil shall be on the site with the use of Bleckevator power rake or equal down to a maximum stone size of one-half inch (½”) and any stockpiled topsoil shall be shredded and screened for removal of stone and other debris in excess of one-half inch (½”) at the storage site with a Royer Shredder – Screener or approved equal.

Sand:

The Contractor shall provide a high quality silica sand (hereafter designated as sand) for the modification procedure. The sand shall consist of 90% (by weight) of particles in the range of 2.0 mm to .25 mm with a minimum of 60% in 1.0 mm to .5 mm range.

In addition, the sand shall be free of extraneous materials. Soil acidity shall be in the range of pH 5.0 to 7.0 and free from any contaminants detrimental to plant growth.
Sand which does not conform to the specifications will be rejected by the Engineer or its designated representative and removed by the Contractor at his/her expense and replaced with sand that meets the specifications.

**Root Zone Mix (Topsoil):**

The Topsoil blended by the Contractor shall contain no stones, lumps, roots or similar objects larger than one-half inch (½") in any dimension, and free of any contaminants detrimental to Turfgrass establishment and growth. The Topsoil shall have a pH value of between 6.5 and 7.0. If initial PH is less than 6.5, it shall be increased by applying ground limestone at a rate necessary to attain a pH value of 6.5.

Soil blending process shall be monitored by the Engineer/Landscape Architect or designated representative for conformance to specifications. Topsoil shall also be free of Quackgrass rhizomes, Agropyron Repens, and the nut-like tubers of Nutgrass, Cyperus Esculentus, and all other primary noxious weeds.

Any Topsoil which does not meet specifications shall be removed by the Contractor and replaced with specified soil at his/her expense.

Both existing Topsoil to be amended and any Imported Topsoil shall conform to the following particle size distribution, as determined by pipette method in compliance with ASTM F-1632:

<table>
<thead>
<tr>
<th>Particle Size Distribution</th>
<th>Gravel** (&lt;2.0mm)</th>
<th>Sand (0.05 to 2mm)</th>
<th>Silt (0.002 to 0.05 mm)</th>
<th>Clay (&lt;0.002 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel**</td>
<td>(&lt;2.0mm)</td>
<td>70% to 80%</td>
<td>10% to 15%</td>
<td>10% to 15%</td>
</tr>
<tr>
<td>Sand</td>
<td>(0.05 to 2mm)</td>
<td></td>
<td>10% to 15%</td>
<td></td>
</tr>
<tr>
<td>Silt</td>
<td>(0.002 to 0.05 mm)</td>
<td></td>
<td>10% to 15%</td>
<td></td>
</tr>
<tr>
<td>Clay</td>
<td>(&lt;0.002 mm)</td>
<td></td>
<td>10% to 15%</td>
<td></td>
</tr>
</tbody>
</table>

**note** Maximum size shall be ½ inch (13 mm) largest dimension.

If organic amendments are needed to obtain the specified organic matter content of the topsoil, the organic matter source may be a peat or compost material. The peat shall be Canadian sphagnum peat having an ash content not exceeding fifteen percent (15%), as determined by ASTM D-2974. Composts may be used, provided that the material has been composted in an in-vessel system and has ash content not exceeding 40% and is screened to ¼ inch.

**804.03 CONSTRUCTION**

*This subsection is supplemented as follows:*

Topsoil shall not be placed until it has been screened and the area to be topsoiled has been approved. All stones one inch (1") or larger in any dimension, and other debris such as wires, cables, tree roots, pieces of concrete, clods, and lumps shall be removed.

**For lawn areas:** Provide imported topsoil to meet material specifications. Prior to placing spreading topsoil, contractor shall scarify existing soil surface to a depth of 2-inches. After spreading topsoil, rake up large stiff clods, hard lumps, roots, litter, other foreign matter and stones larger than one inch (1") in greatest dimension. Remove from the premises or dispose where directed, in a satisfactory manner. Apply topsoil to lawn areas to provide a four-inch (4") depth of topsoil.

No greater than one inch (1") of depth shall be lost to natural settlement, picking of rocks and final preparation of seed beds. If any area is found to have lost greater than one inch (1"'), additional topsoil shall be spread to raise depths to the original minimum depth.

Fine grade and rake topsoiled areas to a smooth, uniform surface. Compact with an approved roller weighing approximately 500 pounds. Regrade and reroll until satisfactory grades as shown are obtained with the required depths of topsoil. Do not finish grade during unsuitable weather. If soil tests indicate organic matter content below the required levels, humus shall be applied to the surface of the spread topsoil and worked into the mix during raking operations. Apply quantity of organic amendments, either humus or mushroom compost, as necessary to meet the organic matter content specified. Submit soil test results demonstrating compliance with the requirements.
Topsoil spreading shall be performed in such a manner that seeding can proceed with a minimum of additional soil preparation and tillage. Irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or crowns. Topsoil shall not be placed while the ground is frozen or muddy, or in a condition that may otherwise be detrimental to proper grading. After the topsoil has been spread and the final grade is established, the area shall be cleared of all grade stakes, surface trash and debris.

The Contractor shall, wherever possible, conduct topsoiling immediately upon completion of approved subgrade preparation. The Contractor shall commence seeding, or other finished surfacing operations immediately upon completion of approved topsoil installation.

In no case shall completed topsoiled field surfaces or lawn areas outside of field, which have been topsoiled, stand for more than two (2) days prior to commencement of seeding.

Excess topsoil which is not used on the job site shall be stockpiled and stabilized by the Contractor onsite as directed by the Engineer.

**804.04 MEASUREMENT AND PAYMENT**

*This entire subsection is deleted and replaced with the following:*

Measurement and payment for Topsoiling will not be made; all costs will instead be included in the **Topsoil, Fertilizer, Seed and Mulch** base bid item. Measurement and payment for all labor, materials, and equipment necessary for the furnishing and installation of Topsoiling including any necessary excavation, subgrade preparation, soil amendments, fertilizers, placement, rolling, dragging, dressing, and all materials and all else necessary therefore and incidental thereto will not be made; the costs will instead be included in the appropriate bid item.
SECTION 806 – FERTILIZING AND SEEDING

The heading of this section has been changed to:

SECTION 806 – FERTILIZING, SEEDING AND MULCHING

806.01 DESCRIPTION

This entire subsection is deleted and replaced with the following:

This work shall consist of furnishing and placing pulverized limestone, fertilizer, seed mixtures and straw mulch. This includes but is not limited to the installation of topsoil, preparation of the seed bed, incorporation of fertilizer, placement of seed and watering as shown on the plans and as specified herein. The Contractor shall be responsible for the repair/replacement of natural turf disturbance, leaving greater than a ¼ inch depression.

Lawn seed shall be applied to all areas except paved and planted bed areas. Seedbed preparation shall be determined by soil test conducted prior to seeding at Contractor’s expense.

806.02 MATERIALS

This entire subsection is deleted and replaced with the following:

Lawn seeding mixture shall be as follows:

<table>
<thead>
<tr>
<th>Grass Type</th>
<th>% MIX</th>
<th>MIN. % PURITY</th>
<th>MIN. GERMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merion Kentucky Bluegrass</td>
<td>50%</td>
<td>90%</td>
<td>75%</td>
</tr>
<tr>
<td>James Town Fine Fescue</td>
<td>30%</td>
<td>98%</td>
<td>85%</td>
</tr>
<tr>
<td>Manhattan Perennial Ryegrass</td>
<td>20%</td>
<td>98%</td>
<td>90%</td>
</tr>
</tbody>
</table>

806.03 CONSTRUCTION

806.03.01 Turf Seeding

E. Turf Establishment

The second sentence of the first paragraph of this subpart is deleted and replaced with the following:

Any damage to seeded areas caused by pedestrian or vehicular traffic or other causes shall be repaired at no cost to the Owner.

This subsection is supplemented as follows:

Planting Season

Seeding operations shall be carried out between April 1 to May 31 and August 16 to October 15. In no event shall seeding take place later than October 15 and no seeding shall be done on frozen ground or when the temperature is 32°F or lower. No changes or extensions of the above seeding periods will be made unless approved in writing by the Engineer/Landscape Architect.

Seedbed Preparation

Provide fine grading, addition of soil amendments and raking as specified under Section 804 Topsoiling. All lawn areas shall have a minimum of four inches (4”) of topsoil and must be adjusted as per soil test results prior to seeding.
Dry Application Method of Lime, Fertilizer and Seed

Lime, seed, fertilizer and mulch shall be applied in dry form for all fields and margin areas. Lime shall be applied at the rate of 4,000 pounds per acre (or as necessary to adjust soil pH to 6.0-6.5) and shall be applied separately and prior to fertilizing and seeding on prepared seedbeds.

The lime shall be spread evenly and worked into the upper five inches to six inches (5”-6”) of the soil after which the seedbed shall have the proper, smooth grade. Commercial fertilizer of analysis 10-20-10 as previously specified herein, shall be applied at the rate of between 600 and 800 pounds per acre. Apply the specified seed mix evenly at a rate of 300 pounds per acre immediately after fertilizing.

Seeding Method for areas with less than three to one (3:1) Slope:

Seed may be broadcast using cyclone type spreaders, drop spreaders or hydro-seeders. Seeding rate shall be 4 lbs./1000 SF. Seed shall be applied in two (2) perpendicular courses. After the seed has been properly applied, the seedbed shall be immediately mulched. Mulch seedbed as specified, to establish a uniform complete coverage and to ensure optimal moisture retention. Maintain optimal watering schedules throughout the seeding process.

Mulch Seeded Areas

Spread straw mulch with a properly equipped mulcher blower, run by an experienced operator. Mulch shall be evenly spread to a uniform one to one and one-half inch (1”-1½”) depth loose measurement and tacked in place.

Provide watering of all lawn areas as required to promote growth.

Establishment Period

Until the project is substantially completed, and accepted by the Engineer, the Contractor shall be required to maintain all field turf between two and four inches (2”-4”) in height. (Depending upon prevailing weather conditions at the time of turf establishment, the Contractor may maintain longer shoot heights, providing that mowing operations remove no more than 1/3 the length of the shoot). The Contractor is required to repair or replace, or both, all seeding and mulching that is defective or becomes damaged. For the purpose of establishing compliance with the incentive clause described herein, for turf establishment, the Contractor shall maintain the seedbed, and seeding operation, including watering, fertilizing, re-seeding and mulching, until a uniform, vigorous stand of turfgrass, having a minimum seedling count of six (6) plants per square inch, uniformly distributed, is established to the satisfaction of the Engineer. Localized areas which must be re-seeded will be justification for withholding payment for this item, until entire area has been satisfactorily established.

Guarantee

Seeded area shall obtain 100% coverage by the end of one (1) year, or two (2) full, growing seasons; or the Contractor shall reseed the areas. Replacement seeding shall be done not later than the proper planting season following the end of the guarantee period. All replacement seeded areas are subject to the same guarantee from the time they are seeded.

Maintenance

The Contractor’s responsibility for maintenance shall be continuous until acceptance of the work. The Contractor shall submit a lawn maintenance schedule to the Engineer for review and approval no later than two (2) weeks after the award of the contract. Maintenance shall include, but not be limited to watering, reseeding, and reworking as follows:

- checking the seeded areas before watering to avoid excessive moisture.
- refilling of rain-washed gullies and rutted areas.
- reworking and reseeding of any areas which fail to show a uniform stand of grass.
- weeding, cultivating, control of insects, fungus, and other diseases by means of spraying with an all-purpose insecticide and fungicide.
Grass shall be mowed as many times as necessary during the maintenance period in order to maintain a maximum height of four inches (4”) as measured from the top of the ground. No more than 1/3 of the grass height shall be removed during any one (1) mowing.

**Watering**

The Contractor shall maintain all new lawn areas including watering until date of substantial completion.

**Refertilization**

At the completion of the second mowing, fertilize the grass with complete specified fertilizer at the rate of ten (10) pounds per 1,000 square feet.

**Reseeding**

Reseeding of any areas which fail to show a uniform stand of grass, shall be accomplished without additional cost to the Owner using originally specified materials and methods. Reseeding shall be repeated until all lawn areas are covered with a satisfactory stand of grass. A satisfactory stand of grass, as described above, shall be required.

**Clean-up**

The Contractor shall dispose of excess materials and debris, including but not limited to branches, paper, leaves, and rubbish resulting from this work.

All areas shall be kept neat and clean and upon completion of work, the site shall be left in an orderly condition satisfactory to the Engineer.

**Approval and Acceptance**

An inspection of turf shall be made by the Engineer 30 calendar days after completion of seeding and mulching on all fields. Calendar day count shall commence only after the total completion of all fields. Random test locations representative of the overall turf density shall be selected by the Owner’s Landscape Architect based upon one (1) test location per 15,000 square feet. Blade counts should be recorded for each test location. Criteria shall be met when all locations equal or exceed the minimal uniform plant count specified herein.

**806.04 MEASUREMENT AND PAYMENT**

This entire subsection is deleted and replaced with the following:

Measurement and payment for Topsoil, Fertilizer, Seed and Mulch will be measured on a square yard basis and payment will be made on a square yard basis. Payment shall be made under the Topsoil, Fertilizer, Seed and Mulch bid item. This includes but is not limited to any necessary excavation, subgrade preparation, fertilizers, placement of mix, rolling, dragging, dressing, watering, maintenance and mowing, all materials and seed and mulch application as shown on the plans and all else necessary therefore and incidental thereto.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topsoil, Fertilizer, Seed and Mulch</td>
<td>SY</td>
</tr>
</tbody>
</table>

**END OF SECTION**
902.02 HOT MIX ASPHALT (HMA)

902.02.02 Composition of Mixtures

*This subsection is supplemented as follows:*

Composition of the mixture for the bottom layer of bituminous concrete surface course shall be coarse aggregate, fine aggregate, mineral filler and asphalt cement. The use of reclaimed asphalt pavement will not be acceptable unless otherwise approved by the Engineer.

902.02.03 Mix Design

*This subsection is supplemented as follows:*

Unless otherwise approved by the Engineer, only one source of supply for bituminous concrete surface course may be used on the project.
SECTION 903 – CONCRETE

903.02 CONCRETE ADMIXTURES

This subsection is supplemented as follows:

If a type F admixture is used, its chloride content shall not exceed 0.8 percent by weight of the admixture.

The use of Type F, water reducing, high range admixtures shall be in accordance with the admixture manufacturer's recommendation for the given mix design and anticipated field conditions, including the admixture dosage rate(s) and the location (plant or placement site) where it is to be introduced into the mixture. The admixture manufacturer's technical representative shall be on the project site for the first full day's production of mix containing a Type F admixture in order to recommend methods and operations based on prevailing climate and job conditions.

903.03 CONCRETE

903.03.01 Composition

This subsection is supplemented as follows:

Portland cement concrete may include fly ash, except that fly ash shall not be used for bridge structures, retaining walls, culverts or white concrete.

A water-reducing admixture (Type A) may be used. A water reducing and retarding admixture (Type D) or a water reducing admixture (Type A) and a retarding admixture (Type B) may be used when the ambient temperature reaches 75 degrees F. A water reducing, high range admixture (Type F) may be used in accordance with Tables 914-1 or 914-2 and Tables 914-3 of Subsection 914.05.

A water-reducing, high range admixture conforming to ASTM C494 type F, may be used for precast structural concrete items subject to the following restrictions:

1. The chloride content of the admixture shall not exceed 0.8% by weight of admixture.
2. The maximum acceptable slump shall be six inches (6") and the percentage of entrained air shall be 6 +/- 1 1/2%.

903.03.02 Mix Design and Verification

This subsection is supplemented as follows:

Manufacturer’s certification for polyethylene sheeting shall be submitted to the Engineer prior to installation.

If the concrete producer has satisfactorily met applicable design, control and acceptance testing requirements at the batch plant and has provided automatic recordation of the various batched weights which comply with specified design criteria, slump and air content, the concrete will be presumed to be in compliance with department standards at the time of delivery. This presumption shall not waive or alter any other requirements or otherwise affect the Engineer's ability to impose pay adjustments.

903.03.05 Control and Acceptance Testing Requirements

This subsection is supplemented as follows:

A. Sampling And Testing Methods

Note – Wherever the reference to six inch (6") (diameter) X twelve inch (12") (height) compression test cylinder appears in these specifications, the use of four inch (4") (diameter) X eight inch (8") (height) test cylinders will be permitted for mix designs containing coarse aggregate sizes not exceeding a nominal maximum size of one inch (1").
C. Acceptance Testing Procedures For Slump And Air Entrainment

If the average of the two (2) test results for either slump or air-entrainment falls below the lower specification limit, a single addition of mix water (or the approved Type F admixture for those mixes containing a water reducing, high range admixture) and/or air-entraining agent will be permitted provided that this additional step can be accomplished without exceeding the time or revolution limits specified in Subsection 405.08. When an air-entraining agent is added, it shall be diluted with water prior to addition to the drum.

Following any permitted additions, the drum shall be rotated at the recommended mixing speed for a minimum of 10 and a maximum of 20 revolutions, the original test results are to be disregarded, and a single test for both slump and air-entrainment performed. Further additions of mix water or admixtures will not be permitted. If the measured values for slump and air content are not within the ranges specified in Subsection 914.05 (Tables 914-1 or 914-2) the load of concrete will be rejected and removed from the project.

D. General Acceptance Testing Requirements For Strength

If curing facilities are not provided as required, the Engineer will instruct the Contractor to provide such facilities. If, within ten (10) days of the Engineer's request, the facilities are not provided, the Contractor shall not place any concrete.

903.03.06 Tables

The following note is added at the end of Table 903-03-06-3:

Note 2 – The maximum water/cement ratio for all classes of concrete, when a Type F, water reducing, high range admixture is used in accordance with tables 903.03.06-1 and 903.03.06-2, shall be 0.40 lb/lb (4.5 gals/bag).

The following addition is made to table 903.03.06-4:

Retest limit (psi) for Class A concrete pay-adjustment is changed to 4000.

The following note is added at the end of table 903.03.06-4:

Note 6 - retest limit for non-pay adjustment roadway and structural items requiring the use of class B, white concrete, shall be 3000 psi.
SECTION 919 – MISCELLANEOUS

919.08 WATER

This subsection is supplemented as follows:

Water used in mixing or curing shall be clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product. Water will be tested in accordance with and shall meet the requirements of AASHTO T 26. Water known to be of potable quality may be used without test. Where the source of water is relatively shallow, the intake shall be so enclosed as to exclude silt, mud, grass or other foreign materials.

The following subsection is added:

919.16 CERTIFICATION OF COMPLIANCE

Manufacturer’s certifications are required for Portland cement and shall be submitted for review by the Engineer.

END OF SECTION