

SECTION 32 1400 – UNIT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.
- B. Comply with most current edition of the Northwestern University Design Standards.

1.2 SUMMARY

- A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.
- B. This Section includes:
  - 1. Brick pavers.
  - 2. Prepared subgrade.
  - 3. Subbase.
  - 4. Sand leveling course.
  - 5. Fabric layer.
- C. Related Sections:
  - 1. Division 31 Section "Earth Moving."
  - 2. Division 32 Section for "Concrete Paving."
  - 3. Northwestern University's current Concrete Paver Program.

1.3 SUSTAINABILITY/REGIONAL MATERIALS

- A. Precast concrete pavers and curbs shall be manufactured within 500 miles of Project site from aggregates and cement extracted and manufactured within 500 miles of Project site.
- B. Granite and natural stone curbs shall be manufactured within 500 miles of Project site from materials extracted and manufactured within 500 miles of Project site.
- C. Aggregate and soil extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

1.4 SUBMITTALS

- A. Furnish Samples, manufacturer's product data, test reports, and materials certifications for brick.

1.5 QUALITY ASSURANCE

- A. Approved Installation Contractors:
  - 1. List of previously approved contractors

1.6 WARRANTY

- A. Contractor agrees that by acceptance of this work and in consideration thereof, and for each of the Subcontractors, binds them to the guarantees and warranties called for. Work to be free from defective workmanship for 2 years after the date of final acceptance.
- B. Warranty shall include filling of paver joints 1 year after installation at no additional cost.
- C. If within warranty period, it is found that the warranted work needs to be repaired or changed because of the use of defective materials, equipment, or inferior workmanship, or work not in accordance with the terms of the Agreement, the Contractor, upon notification, shall promptly and without additional expense to the Owner:
  - 1. Place such warranted work in a satisfactory condition.
  - 2. Repair or replace damage to the Project, or contents thereof, which is a result of such unsatisfactory warranted work.
  - 3. Repair or replace work, materials, and equipment that are disturbed in fulfilling the warranty, including disturbed work, materials, and equipment that may have been warranted under another Contract.
- D. Should the Contractor fail to proceed promptly in accordance with the warranty, the Owner may have such work performed at the expense of the Contractor and sureties.
- E. Contractor shall execute and deliver to the Owner, before final payment, a written warranty subject to the stipulations and provisions above.

PART 2 - PRODUCTS

2.1 BRICK PAVERS

- A. General: Provide solid brick paver units, class SX, in colors where indicated on Drawings. Colors will be subject to NU Project Manager approval. Units are to be made from clay, shale, fireclay, or mixtures thereof, and shall be fired to incipient fusion. The units are intended for use as a paving material to support pedestrian and light vehicular traffic. Units shall conform to ASTM C902.
  - 1. Pavers Adjacent to Concrete Curbs: 2-1/4-inch x 4-inch x 8-inch with spacer bars; color shall be KW Old Smokie supplied by Glen-Gery Brickwork or Belden Brick.
  - 2. Pavers in Walk Panels: 2-1/4-inch x 4-inch x 8 inch with spacer bars, color and pattern to be determined. Supplied by Glen-Gery Brickwork or Belden Brick.
- B. Physical Requirements and Tests:
  - 1. Compressive Strength: Not less than 8,000 psi for an average of 5 brick, with no individual unit having a strength of less than 7,000 psi.

2. Cold Water Absorption: Shall not exceed 8% for an average of 5 brick, with no individual unit having an absorption of greater than 11%.
3. Saturation Coefficient (Maximum): Shall not exceed 0.78 for an average of 5 brick, with no individual unit having a coefficient of greater than 0.80. Saturation coefficient is the ratio of absorption by 24 hour submersion in room temperature water to that after 5 hours of submersion in boiling water.
4. Warpage: Shall not exceed 1/16-inch for each 6 inches of brick length when measured in accordance with ASTM C67 Section 12.
5. Efflorescence: When units are tested in accordance with Section 10 of Methods C67, the rating for efflorescence shall not be more than "slightly effloresced."
6. Abrasion Requirements: The Abrasion Index for brick paver units shall not exceed 0.11. The Volume Abrasion Loss (CM<sup>3</sup>/CM<sup>2</sup>) shall not exceed 1.7.
7. Chippage: Maximum permissible extent of chippage from edges shall be 1/4-inch; from corners shall be 3/8-inch. The aggregate length of chips on a single unit shall not exceed 10% of the perimeter of the exposed face of the brick.
8. Dimensional Tolerances: Brick pavers shall conform to ASTM grade PX. Brick to be selected will be approximately 2-1/4-inch x 4-inch x 8-inch.

## 2.2 SUBBASE

- A. Base Course: 6-inch thick concrete paving as specified in Division 32 Section "Concrete Paving."
- B. Leveling Course: Clean, coarse, concrete sand (not mason sand), with the following gradation limits:
  1. Sieve Size: 3/4-inch; Percent Passing: 100.
  2. Sieve Size: 4-inch; Percent Passing: 90 to 100.
  3. Sieve Size: 8-inch; Percent Passing: 80 to 95.
  4. Sieve Size: 16-inch; Percent Passing: 55 to 85.
  5. Sieve Size: 50-inch; Percent Passing: 10 to 35.
  6. Sieve Size: 200-inch; Percent Passing: 0 to 5.

## 2.3 SEPARATOR FABRIC

- A. AMOCO Landscape Fabric; or approved equal.

## 2.4 JOINT SAND

- A. RG Polymeric Locking Joint Sand, supplied by Brickscape, Northville, Michigan, 248-348-2500. Color: Tan/ochre. Joint sand shall be placed only when completely dry.

## 2.5 EDGE RESTRAINTS

- A. Stainless Steel or Aluminum.

## 2.6 CURBS

- A. Precast concrete or Granite

PART 3 - EXECUTION

3.1 PLACEMENT

- A. Leveling Course: Spread evenly over concrete base to be paved and screed to a level that will produce the required finished elevation when the brick pavers have been placed and vibrated.
- B. Separator Fabric: Secure over concrete base drainage openings, as well as over leveling course. Locate to minimize seams, where seams are necessary, and overlap fabric 6-inch minimum.
- C. Brick Pavers:
  - 1. Lay in the pattern indicated on Drawings; joints between units shall not exceed 1/8-inch. Brick shall be cut to a straight, even surface without cracks or chips. To minimize need for small brick segments, review brick layout with landscape architect. Brick row alignments shall be uniform and straight.
  - 2. Vibrate to final level by 2 or 3 passes of a vibrating plate compactor. After the first vibration, joint sand shall be swept into joints. To avoid scratching, do not pass vibrating plate over brick with sand on the surface. Execute additional passes of the plate vibrator. Sweep fill the joints again if necessary to completely fill joints. Surplus material shall then be swept from the surfaces and the entire site left clean. The finished surface shall be true to grade and shall not vary by more than 1/4-inch when tested with a 10-foot board at any location on the surface.
- D. Install joint sand the full depth of the joints and as indicated in the manufacturer's specifications.
  - 1. Water the pavers in a manner that will activate the polymeric binder without washing the sand away.

**END OF SECTION 32 1400**