

SECTION 32 13 16

**CONCRETE PAVERS**

*(Sentences and/or paragraphs that are double underlined indicate revisions that were made from the 2008 specification.)*

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This item shall consist of the placement of a sand laying course on an approved subgrade or base and the installation of interlocking concrete pavers in the quality, shape, thickness and color specified.

**1.2 MEASUREMENT AND PAYMENT**

- A. Accepted work performed as prescribed by this item will be measured by the square foot of surface area.
- B. The work performed by this item will be paid for at the unit price bid for “Concrete Pavers” which price shall be full compensation for preparing the subgrade, placement of base course, placement of lateral restraint curb, installation of concrete pavers on a sand laying course and for furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work.

**1.3 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in the manufacturing of solid concrete interlocking pavers for a minimum of four (4) years.
- B. Installer: Company specializing in the installation of solid concrete interlocking pavers with three (3) years documented experience (and accredited by the manufacturer in relation to the paver type and project requirements).

**PART 2 – PRODUCTS**

**2.1 MATERIALS**

- A. Pavers shall be solid concrete interlocking paving units complying with ASTM Designation C936.
  - 1. The stone’s thickness shall be 80 millimeters in all areas or as shown on the plans.
  - 2. Contractor shall submit color samples for City selection prior to any construction activity relative to this item. Color shall be “River Red” or as shown on the plans.
  - 3. Cementitious Material: Portland cement shall conform to ASTM Specification C-150.
  - 4. Aggregates shall conform to ASTM Specification C-33 for Normal Weight Concrete Aggregate (no expanded shale or lightweight aggregates) except that grading requirements shall not necessarily apply.

5. Other Constituents: Coloring pigments, air-intrating agents, integral water repellants, finely ground silica, etc., shall conform to ASTM standards where applicable, or shall be previously established as suitable for use in concrete.
  6. Compressive Strength – At the time of delivery to the work site, the average compressive strength shall not be less than 8,000 psi with no individual unit strength less than 7,200 psi, with testing procedures in accordance with ASTM Standard C-140.
  7. Absorption – The average absorption shall not be greater than 5% with no individual unit absorption greater than 7%.
  8. Proven Field Performance – Satisfying field performance is indicated when units smaller in composition, and made with the same manufacturing equipment as those to be supplied to the purchaser, do not exhibit objectionable deterioration after at least one (1) year.
  9. All units shall be sound and free of defects that would interfere with the proper placing of unit or impair the strength or performance of the construction. Minor cracks incidental to the usual methods of handling in shipment and delivery, shall not be deemed ground for rejection.
  10. The purchaser or his authorized representative shall be accorded proper facilities to inspect and sample the units at the place of manufacture from lots ready for delivery.
  11. Sample and test units in accordance with ASTM Method C-140.
    - a.) Manufacturer shall provide a minimum of three (3) years testing backup data showing manufactured products that meet and exceed ASTM 936-82 when tested in compliance with ASTM C-140.
    - b.) Sampling shall be random with a minimum of nine (9) specimens per 20,000 sq.ft. per product shape and size, with repeated samples taken every additional 20,000 sq.ft. or fraction thereof.
    - c.) Test units in accordance with ASTM for compressive strength, absorption and dimensional tolerance. A minimum of three (3) specimens per test required for average value.
  12. Rejection – In case the shipment fails to conform to the specified requirements, manufacturer may sort it, and new test units shall be selected at random by the purchaser from the retained lot and tested at the expense of the manufacturer. In case the second set of test units fails to conform to the specified requirements, the entire lot shall be rejected.
  13. Expense of Tests – The expense of inspection and testing shall be borne by the Contractor unless otherwise agreed.
- B. **SAND LAYING COURSE:** the sand laying course shall be well-graded, clean, washed, sharp sand with 100% passing a 3/8" sieve size and a maximum 2% passing a No. 200 sieve size. Use concrete sand or similar. **DO NOT USE MASON SAND OR LIMESTONE SCREENING.** The sand shall contain no more than 10% of acid soluble material. The sand laying course is the responsibility of the paving stone installer.
- C. **EDGE RESTRAINT:** All edges of the installed pavers shall be restrained. The type of edge restraint shall be approved at locations and to details noted on plans.

- D. **BASE COURSE:** The material shall consist of reinforced concrete placed on a stabilized subgrade as detailed in the plans.
- E. **JOINT FILLING SAND:** The joint filling sand shall be graded, clean, washed sand with 100% passing the No. 16 sieve size and a maximum of 5-10% passing the No. 200 sieve size. The sand shall contain no more than 10% of acid soluble material.

### **PART 3 – EXECUTION**

#### **3.1 GENERAL**

A suitable base shall be prepared as specified and detailed in the construction drawings. The base course shall be shaped to grade and the cross section with an allowable tolerance of 0-1/4" (relative to specified dimensions below finish design elevation with a 10-foot straight edge).

- A. The Contractor shall inspect and approve the finished base course prior to placement of the sand laying course.
- B. The un-compacted sand laying course shall be spread evenly over the area to be paved and then screeded to a level that will produce 1" (26mm) thickness when the paving stones have been placed and vibrated. Provide the proper level of sand such that the final elevation of paving stones will be nominally 1/4" to 3/8" higher than adjacent curb, gutters, other paving, to allow for free drainage from chambers or block edges any minor settling that may occur within the base.
- C. Once screeded and leveled to the desired elevation, the sand laying course shall not be disturbed in any way.
- D. Placement
  1. The pavers shall be placed in the approved pattern as noted or shown on the drawings. (Herringbone pattern is recommended for vehicular traffic.)
  2. The pavers shall be placed in such a manner that the desired pattern is maintained and the joints between the pavers are nominally 1/8" with no individual gap exceeding 3/16".
  3. Use string lines to hold all patterns true. Lines shall not deviate more than  $\pm 1/2$  of an inch in 100 linear feet.
  4. The gaps at the edge of the paver surface shall be filled with standard pavers or with pavers cut to fit. No pavers shall be installed which are less than 1/2 of the original unit's surface area.
  5. The cutting of pavers, using a double headed breaker or a masonry saw shall leave a maximum 1/4" underbite.
  6. The finished elevation of pavers shall not deviate more than 1/4" within a 10' straight edge.
  7. When cutting precision designed areas, as directed by the engineer, a masonry saw shall be used.
  8. Pavers to be alternately selected from at least three (3) pallets, working from top to bottom of each pallet stack.

9. Pavers shall be vibrated into the sand laying course using a vibrator capable of 3,000 to 5,000 pounds compaction force with the surface clean and the joints open.
10. After vibration, washed sand shall be spread over the paver stone surface, allowed to dry, and vibrated into the joints with additional vibrator passes and brushing so as to completely fill the joints.
11. Surplus material shall be swept from the surface. (Or left on the surface during construction to insure complete filling of the joints during initial use. This sand may also provide surface protection from construction debris.)
12. Upon completion of work covered in this section, the contractor shall clean up all work by removing all debris, surplus material, and equipment from the site.
13. The re-sanding as necessary of paver joints shall be provided by Contractor for a period of 90 days after completion of work.

**END OF SECTION**