

SECTION 02780

CONCRETE UNIT PAVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Interlocking Concrete Pavement Institute (ICPI) Tech Spec Technical Bulletins.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. CONCRETE Pavers set in aggregate setting bed.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for compacted subgrade and base course under unit pavers.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. CONCRETE Pavers.
 - 2. C33 Sand: Sieve Analysis Report.
- B. Samples for Verification: Full-size units of each type of unit paver indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
 - 1. Provide Product Samples.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Paver Installation Subcontractor:
 - 1. A copy of Subcontractor's current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
 - 2. Job references from projects of a similar size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax and email address.

1.4 EXTRA MATERIALS

- A. Provide 20 of each paver.

1.5 QUALITY ASSURANCE

- A. Paving Subcontractor Qualifications:
 - 1. Utilize an installer having successfully completed Concrete paver installation similar in design, material and extent indicated on this project.
 - 2. Utilize an installer holding a current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
- B. Regulatory Requirements and Approvals: (Specify applicable licensing, bonding or other requirements of regulatory agencies).

- C. Mock-Ups:
 1. Install a 7 ft x 7 ft (2 x 2 m) paver area.
 2. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
 3. This area will be used as the standard by which the work will be judged.
 4. Subject to acceptance by owner, mock-up may be retained as part of finished work.
 5. If mock-up is not retained, remove and properly dispose of mock-up.
- D. Source Limitations: Obtain each type of unit paver, joint material, and setting material from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

1.6 DELIVERY, STORAGE, AND HANDLING.

- A. General: Comply with Division 1 Product Requirement Section.
- B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.
 1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
 2. Deliver Concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 3. Unload pavers at job site in such a manner that no damage occurs to the product.
- D. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials. (Store Concrete paver cleaners and sealers per manufacturer's instructions.)
 1. Cover bedding sand and joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 1. Do not install sand or pavers during heavy rain or snowfall.
 2. Do not install sand and pavers over frozen base materials.
 3. Do not install frozen sand or saturated sand.
 4. Do not install CONCRETE Pavers on frozen or saturated sand.

1.8 MAINTENANCE

- A. Extra Materials: Provide (Specify area) (Specify percentage) additional material for use by owner for maintenance and repair.
- B. Pavers shall be from the same production run as installed materials

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by manufacturer listed on the plans.

2.2 UNIT PAVERS

1. As specified on the drawings.

2.3 BEDDING AND JOINT SAND

- A. Provide bedding and joint sand as follows:

1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
2. Do not use limestone screenings, stone dust, or sand for the bedding sand material that does not conform to the grading requirements of ASTM C 33
3. Do not use mason sand or sand conforming to ASTM C 144 for the bedding sand.
4. Bedding Sand Material Requirements: Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 1.

Table 1
Grading Requirements for Bedding Sand
ASTM C 33

Sieve Size	Percent Passing
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075 mm)	0 to 1

5. Joint Sand Material Requirements
 - a. Polymerized Techni-Seal RG Jointing Sand for Pavement Joints. As manufactured by Techni-Seal, as available through Basalite, contact Jeff Chapman, 208-888-4050. Color as selected by Architect or Landscape Architect from the manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Verify base is dry, certified by General Contractor as meeting material, installation and grade specifications
- B. Verify that base (and geotextile) is ready to support sand, (edge restraints) and, pavers and imposed loads
- C. Edge Restraint Preparation:
 1. Install edge restraints per the drawings (and manufacturer's recommendations) (at the indicated elevations)
 2. Mount directly to finished base. Do not install on bedding sand.
 3. The minimum distance from the outside edge of the base to the spikes shall be equal to the thickness of the base.

3.3 INSTALLATION, GENERAL

- A. Do not use unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible.
- B. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
- C. Joint Pattern: As indicated.

- D. Tolerances: Do not exceed 1/32-inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 10 feet from level, or indicated slope, for finished surface of paving.

3.4 INSTALLATION

- A. Spread bedding sand evenly over the base course and screed to a nominal 1 in. (25 mm) thickness, not exceeding 1-1/2 in. (40 mm) thickness. Spread bedding sand evenly over the base course and screed rails, using the rails and/or edge restraints to produce a nominal 1 in. (25 mm) thickness, allowing for specified variation in the base surface.
 - 1. Do not disturb screeded sand
 - 2. Screeded area shall not substantially exceed that which is covered by pavers in one day.
 - 3. Do not use bedding sand to fill depressions in the base surface.
- B. Lay pavers in pattern(s) shown on drawings. Place units hand tight without using hammers. Make horizontal adjustments to placement of laid pavers with rubber hammers and pry bars as required.
- C. Provide joints between pavers between [1/16 in. and 3/16 in (2 and 5 mm)] wide. No more than 5% of the joints shall exceed [1/4 in. (6mm)] wide to achieve straight bond lines.
- D. Joint (bond) lines shall not deviate more than $\pm \frac{1}{2}$ in (± 15 mm) over 50 ft. (15 m) from string lines.
- E. Fill gaps at the edges of the paved area with cut pavers or edge units.
- F. Cut pavers to be placed along the edge with a (double blade paver splitter or) masonry saw.
- G. (Adjust bond pattern at pavement edges such that cutting of edge pavers is minimized. All cut pavers exposed to vehicular tires shall be no smaller than one-third of a whole paver.) (Cut pavers at edges as indicated on the drawings.)
- H. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and joint sand.
- I. Use a low-amplitude plate compactor capable of at least minimum of 4,000 lbf (18 kN) at a frequency of 75 to 100 Hz to vibrate the pavers into the sand. Remove any cracked or damaged pavers and replace with new units.
- J. Install Polymeric Sand per manufacturer's specifications.
- K. All work within 6 ft (2m) of the laying face must shall be left fully compacted with sand-filled joints at the end of each day or compacted upon acceptance of the work. Cover the laying face or any incomplete areas with plastic sheets overnight if not closed with cut and compacted pavers with joint sand to prevent exposed bedding sand from becoming saturated from rainfall.
- L. Remove excess sand from surface when installation is complete.
- M. Surface shall be broom clean after removal of excess joint sand.

3.5 FIELD QUALITY CONTROL

- A. The final surface tolerance from grade elevations shall not deviate more than $\pm 3/8$ in. (± 10 mm) under a 10 ft (3m) straightedge.
- B. Check final surface elevations for conformance to drawings
- C. The surface elevation of pavers shall be 1/8 in. to 1/4 in (3 to 6 mm) above adjacent drainage inlets, Concrete collars or channels
- D. Lippage: No greater than 1/8 in (3 mm) difference in height between adjacent pavers

3.6 CLEANING, SEALING, JOINT SAND STABILIZATION

- E. Clean, seal, apply joint sand stabilization materials between CONCRETE Pavers in accordance with the manufacturer's written recommendations.

3.7 PROTECTION

- A. After work in this section is complete, the General Contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.

END OF SECTION 02780