



**SPECIAL PROVISIONS
FOR
PCC PAVERS AND DETECTABLE WARNING PAVERS**

**Johnson County
STP-U-1557(638)--70-52**

**Effective Date
December 17, 2013**

**THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING
MODIFICATIONS. THESE ARE SPECIAL PROVISIONS AND SHALL PREVAIL OVER THOSE
PUBLISHED IN THE STANDARD SPECIFICATIONS.**

PART 1 GENERAL

1.01 SUMMARY

A. SECTION INCLUDES

1. This part of the Specifications includes all labor, materials, equipment, and supervision required to furnish and install concrete pavers.
2. This section includes the specifications for concrete pavers, bituminous setting bed, modified asphalt adhesive, paver joint filler, concrete subbase preparation, concrete subbase priming, installation of bituminous setting bed, paver and joint filler installation.

1.02 MEASUREMENT AND PAYMENT

- A. Basis of Measurement: The Engineer will measure the SQUARE FEET surface area of the installed concrete pavers.
- B. Basis of Payment: Payment for concrete pavers includes all labor, materials, equipment, and supervision required to furnish and install concrete pavers.
- C. Unit Price for concrete pavers will include sub-slab preparation and primer, material and installation of pavers, bituminous setting bed, modified asphalt adhesive, and joint filler.

1.03 DEFINITIONS

- A. Mechanical Installation: The use of specialized machines to lift clusters of pavers from the bundles and place them on the prepared bedding course. These specialized machines are designed specifically for this application.
- B. Method Statement: The paver installer's and manufacturer's plan for construction and quality control of the pavers.
- C. Spacer Bars: Small protrusions on each side of pavers which are used to keep them uniformly spaced while minimizing chipping and spalling. Mechanically installed pavers must have spacer bars.

1.04 SUBMITTALS

- A. Paver manufacturer's material test data certifying pavers comply with contract documents.
- B. Paver samples representing actual size, shape, and color range.
- C. PCC paver sample – 12 inch x 12 inch for detectable warning pavers and 4 inch x 8 inch for 6 cm and 8 cm pavers (showing the full range of colors for blended colors)
- D. Joint filler sand gradation reports
- E. Supplier's formulation for Neoprene-modified asphalt adhesive
- F. Submit Method Statement and Quality Control Plan

1.05 SITE DISTURBANCES

- A. Take precautions to insure equipment and vehicles do not disturb or damage existing site grading, walks, drives, utilities, plants, etc.

- B. Repair and/or return to original condition any damage caused by Contractor's negligence at no cost to Contracting Authority.
- C. Provide temporary barricades and warning lights as required for protection of project work and public safety.

1.06 DELIVERY, STORAGE & HANDLING

- A. 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 fork lift or clamp lift.
 - 3. Unload pavers at job site in such a manner that no damage occurs to the product.
- B. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials.
 - 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.

1.07 QUALITY ASSURANCE

- A. Quality Control Plan
 - 1. The installer and manufacturer shall establish, provide and maintain a quality control plan. The quality control plan shall provide reasonable assurance that the materials and completed construction submitted for acceptance will conform to the contract requirements. Although guidelines are established and certain requirements are specified, they are a minimum and the installer and manufacturer shall assume full responsibility for meeting all requirements.
 - 2. The installer and manufacturer shall agree upon a method for measuring the clusters at the factory and in the field. That method shall be submitted in writing to the Contracting Authority for approval.
 - 3. The Quality Control Plan shall contain at a minimum, but not limited to, the following elements:
 - a. The manufacturer's quality control procedures.
 - b. The manufacturer's production records showing at a minimum the date of manufacture, a mix design designation, mold number, mold cycles, and sequential pallet numbers. Copies of such records shall be made available to the Contracting Authority upon request.
 - c. A description of the anticipated growth (due to mold wear) in the cluster size and a plan for managing the growth so as to not interfere with placement by paving machine(s), if mechanically installed.
 - d. The installer's quality control procedures, including but not limited to, dimensional control methods, paving machine(s) head adjustment, typical daily work schedule to insure that all pavers placed on the bedding course on any given day are adjusted as required and vibrated, and installation of void filler completed at the end of that work day. (Exception: The installation of the void filler may not be installed for the first and second day due to start-up procedures.)
- B. Sampling and Testing
 - 1. The manufacturer shall employ an independent testing company, qualified to undertake tests in accordance with the applicable standards specified herein. Test results shall be provided to the installer and the Contracting Authority, upon request.
 - 2. Pavers shall be tested for density and dimensional variation, compressive strength (ASTM C 140), density and absorption (ASTM C 140) and abrasion resistance (ASTM C 418).

- a. The initial testing frequency shall be one set of tests for each 100,000 full-sized pavers delivered to the site or at any time a change in the manufacturing process, mix design, cement, aggregate or other material occurs.
- b. The following number of full-sized pavers shall be randomly sampled for each test: five for dimensional variation; three for density and absorption; three for compressive strength; and three for abrasion resistance.
- c. If all pavers tested pass all requirements for a sequence of 400,000 pavers then the testing frequency may be relaxed to one set of tests for each 500,000 full-sized pavers. If any pavers fail any of the required tests then the testing frequency shall revert to the initial testing frequency.
- d. When any of the individual test results fail to meet the specified requirements, the cube of pavers represented by that test sample shall be rejected. The manufacturer shall provide additional testing of paver samples taken from both before and after the rejected test sample to determine the sequence of the paver production run that should be rejected. In addition, the testing frequency shall revert to the initial testing frequency specified in Item B.1 for the balance of the project.
- e. Additional testing, as described above, shall be carried out at no additional expense to the Contracting Authority. The sequence of pavers found to be defective shall, if they have been delivered to the site, be removed from the site promptly at no expense to the Contracting Authority or installer.
- f. Pavers shall be sound and free from defects that would interfere with the proper placing of the pavers or impair the strength or performance of the construction.

C. Method Statement

1. The installer and manufacturer shall each prepare a Method Statement describing the overall plan to complete the work. This plan shall include at a minimum:
 - a. The quality control plan.
 - b. A description of the anticipated mold life, rate and effect of mold wear on pavers produced, individual mold runs, and a mold rotation plan.
 - c. Clear diagrams of the site showing the proposed starting point of the installation and the proposed direction of installation.
 - d. A method of measuring the clusters at the factory and in the field.
 - e. A description of the anticipated growth in cluster size due to mold wear and a plan for dealing with that growth or other dimensional variances.
 - f. A description of the personnel and equipment to be employed for each portion of the work including manufacture, installation and quality control.
 - g. The manufacturer's proposed daily production rate and mold life for this project and supply data demonstrating experience on similar past projects. Installer shall state the proposed daily installation rate.

D. Qualifications

1. Every manufacturer and installer shall demonstrate that they have supplied and/or installed pavers for projects of a similar nature, with regard to installation and production capacity of at least 300,000 square feet. Qualifications shall be submitted at the time of bid, without exception.
 - a. Paver Manufacturer's Qualifications:
 - 1) The manufacturer shall demonstrate a minimum of five years successful experience in the manufacture of interlocking concrete block pavers.
 - 2) The manufacturer shall have sufficient production capacity and established quality control procedures to produce, transport, and deliver the required number of pavers with the quality specified, without causing a delay to the work.
 - 3) The manufacturer shall have suitably experienced personnel and a management capability sufficient to produce the number of quality pavers as depicted on the contract plans and as specified herein.
 - b. Paver Installer's Qualifications

- 1) Installer shall provide installation history, including references in writing with contact information, demonstrating to the satisfaction of the owner their ability to perform the paver installation and related work indicated in the contract documents.
- 2) The installer shall have suitably experienced personnel and a management capability sufficient to execute the work shown on the plans and specified herein.
- 3) The installer's foreman shall demonstrate, including references, a minimum of five years experience in the installation of unit paver systems similar in size and nature to this project.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not install during heavy rain or snowfall.
- B. Do not install over frozen aggregate base materials.
- C. Do not install frozen sand or saturated sand.
- D. Do not install concrete pavers on frozen or saturated sand.

PART 2 PRODUCTS

2.01 PCC PAVERS, 6 CM

- A. Acceptable Manufacturers:
 1. Borgert Products
Contact: Matt Strand
8646 Ridgewood Road
St. Joseph, MO 66374
Phone: 320.363.4671
Toll Free: 800.622.4952
Fax: 320.363.8516

Style: Uni-Stone
Color: Type A: Charcoal
Type B: To be selected by Owner's Representative
 2. Approved Equal
- B. Pavers in compliance with the following:
 1. Comply with ADA regulations.
 2. Compressive Strength: Minimum 8,000 PSI
 3. Flexural Strength: Minimum 600 PSI
 4. Water Absorption: 5 percent to 6 percent
 5. Freeze Thaw: Less than 1 percent loss of dry weight
 6. Size: +/-4 inch x +/-8 inch (nominal) x thickness varies depending on manufacturer.
- C. Paving Patterns: As shown on the plans.

2.02 PCC PAVERS, 8 CM

- A. Acceptable Manufacturers:
 1. Borgert Products
Contact: Matt Strand
8646 Ridgewood Road

St. Joseph, MO 66374
Phone: 320.363.4671
Toll Free: 800.622.4952
Fax: 320.363.8516

Style: Uni-Stone
Color: Type A: Charcoal
Type B: To be selected by Owner's Representative

2. Approved Equal
- B. Pavers in compliance with the following:
1. Comply with ADA regulations.
 2. Compressive Strength: Minimum 8,000 PSI
 3. Flexural Strength: Minimum 600 PSI
 4. Water Absorption: 5 percent to 6 percent
 5. Freeze Thaw: Less than 1 percent loss of dry weight
 6. Size: +/-4 inch x +/-8 inch (nominal) x thickness varies depending on manufacturer.
- C. Paving Patterns: As shown on the plans.

2.03 DETECTABLE WARNING PAVERS, 7 CM

- A. Acceptable Manufacturers:
1. Hanover Architectural Products
Contact: Rick Masemer
717-637-0500

Description: Hanover Prest Paver Detectable Warning
12 inch x 12 inch
Color: To be selected by Owner's Representative
 2. Unilock
Contact: Brad Punke
630-892-9191, ext. 253
847-489-0382 (mobile)
Description: Unilock Detectable Warning ADA Pavers
12 inch x 12 inch
Color: To be selected by Owner's Representative
 3. Wassau Tile
Contact: Paul Hantz
800-388-8728
Description: Terra Paving ADA Compliant Warning Pavers
12 inch x 12 inch
Color: To be selected by Owner's Representative
 4. Approved Equal
- B. Detectable Warning Pavers in compliance with the following:
1. Comply with ADA regulations.
 2. Compressive Strength: Minimum 8,000 PSI
 3. Flexural Strength: Minimum 600 PSI
 4. Water Absorption: 5 percent to 6 percent
 5. Freeze Thaw: Less than 1 percent loss of dry weight
 6. Size: +/-12 inch x +/-12 inch (nominal) x thickness varies depending on manufacturer.

- C. Paving Patterns: As shown on the plans.

2.04 ASPHALT PRIMER

- A. Section 2303 of the Standard Specifications; Hot Mix Asphalt Mixtures.

2.05 ASPHALTIC SETTING BED FOR PAVERS

- A. Mixture: The approximate proportion of materials shall be 7 percent asphalt binder and 93 percent fine aggregate. Each ton shall be apportioned by weight in the approximate ratio of 145 pounds asphalt binder to 1855 pounds sand. The dried fine aggregate shall be combined with asphalt binder and the mix shall be heated to approximately 300°F at an asphalt plant. The Contractor shall determine the exact proportions to produce the appropriate mixture for construction of the asphalt setting bed to meet construction requirements.
- B. Asphalt Binder: Asphalt binder (7 percent) to be used in the asphalt setting bed shall conform to AASHTO MP-1, with a performance grade of PG58-28 or 64-22.
- C. Fine Aggregate: Fine aggregate (93 percent) for asphalt setting bed shall be clean, hard sand with durable particles and free from adherent coating, lumps of clay, alkali salts and organic matter. To be uniformly graded from coarse to fine with all passing the No. 4 sieve and meeting requirements when tested in accordance with the standard method of test for sieve or screen analysis of fine and coarse aggregate, AASHTO T27.

2.06 NEOPRENE ASPHALT ADHESIVE FOR PAVERS

Neoprene asphalt adhesive shall conform to the following:

A. Mastic (Asphalt adhesive):

- Solids (base): 75 + 1 percent
- Pounds/Gallon: 8 – 8.5 pounds
- Solvent: Varsol (over 100°F flash)

B. Base (2% Neoprene, 10% Fiber, 88% Asphalt):

- Melting Point: ASTM D-36, 200°F Minimum
- Penetration: 77% F 100 gram load, 5 second, 23-27
ASTM D-137-79 @ 25°C, 5 cms/per minute, 125 cm minimum

2.07 JOINT FILLER SAND

- A. Sand shall be concrete sand or finer.
- B. General fineness requirement: 95 percent - 100 percent passing the No. 8 sieve.
- C. Submit sand gradation analysis for approval. Grading Requirements for Joint Filler Sand.

Sieve Size	ASTM C 144 Natural Sand	ASTM C 144 Manufactured Sand
	<i>Percent Passing</i>	<i>Percent Passing</i>
No. 4 (4.75 mm)	100	100
No. 8 (2.36 mm)	95 to 100	95 to 100
No. 16 (1.18 mm)	70 to 100	70 to 100
No. 30 (0.600 mm)	40 to 75	40 to 100
No. 50 (0.300 mm)	10 to 35	20 to 40
No. 100 (0.150 mm)	2 to 15	10 to 25
No. 200 (0.075 mm)	0	0 to 10

PART 3 EXECUTION

3.01 PREPARATION OF CONCRETE SUBBASE

- A. Inspect PCC sub-slab to insure surface is clean and built in conformance with details.
- B. Verify elevation difference between PCC sub-slab and adjacent finished roadway pavement to confirm PCC Pavers can be installed flush with bordering pavement.
- C. Prior to construction of concrete base (included in separate bid item and specification), confirm all dimensions of the actual pavers with the design pattern to confirm configuration, patterns, and dimensions of all material. Contractor shall notify the Engineer if there are any conflicts between the material and the design. Inspect the PCC sub-slab to ensure surface is clean and built in conformance with the plans.

3.02 PRIME CONCRETE SLAB

- A. Clean PCC sub-slab
- B. Prime PCC sub-slab surface with asphalt primer.

3.03 PLACING BITUMINOUS SETTING BED

- A. Prior to bituminous setting bed installation, install protective covering over adjacent PCC sidewalk pavement to avoid pavement staining and other surface damage.
- B. Install the setting bed over the PCC sub-slab surface, place 3/4 inch deep control bars directly over the base.
 - 1. If grade must be adjusted, set wood chocks under depth control bars to proper grade.
 - 2. Set two bars parallel to each other, approximately 11 feet apart to serve as guides for striking board (12 feet long x 2 inch x 6 inch board).

3. The depth control bars must be set carefully to bring pavers, when laid, to proper grade.
- C. Place some bituminous bed between parallel depth control bars. Pull this bed with the striking board over bars several times.
 1. After each passage, low porous spots must be showered with fresh bituminous material to produce a smooth, firm, and even setting bed.
 2. As soon as this initial panel is completed, advance the first bard to the next position, in readiness for striking the next panel.
 3. Carefully fill up any depressions that remain after removing the depth control bars and wood chocks.
 - D. The setting bed shall be rolled/tamped to a nominal depth of 3/4 inch while still hot; the thickness shall be adjusted so that when the concrete pavers are placed, the top surface of the pavers will be at the required finished grade.
 - E. After the setting bed has cooled, a coating of two percent neoprene-modified asphalt adhesive shall be applied by mopping or squeegeeing or troweling over the top surface of the bituminous setting bed so as to provide a bond under the pavers; if the adhesive is troweled, the trowel shall be serrated with serrations not to exceed 1/16 of an inch.
 - F. Limitations: Comply with Article 2303 of the Standard Specifications.

3.04 INSTALLATION OF PCC PAVERS

- A. After the modified asphalt adhesive is applied, carefully place the pavers in straight courses with "hand" tight joints and uniform top surface.
- B. Pavers shall be installed in approximately the order in which they were manufactured. No cluster shall be installed next to a cluster that was manufactured more than 2,500 cycles before or after.
- C. Good alignment must be kept and the pattern shall be that shown on the plans.
- D. No partial paver shall be installed that has an area less than one-half the original full-size paver.

3.05 JOINT TREATMENT

- A. Joints shall be from 0 inches to maximum of 1/4 inch for concrete pavers.
- B. Sweep the dry joint filler sand into concrete paver joints.
- C. Simultaneously spread, sweep and compact dry joint sand into joints continuously until full. This will require at least four to six passes with a plate compactor. Do not compact within 6 feet of unrestrained edges of paving units.
- D. All work within 6 feet of the laying face 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.
- E. Remove excess sand from surface when installation is complete.
- F. Allow excess joint sand to remain on surface to protect pavers from damage from other trades. Remove excess sand when directed by the Engineer.

- G. Surface shall be broom clean after removal of excess joint sand.
- H. Final joints will be from 0 inches to maximum of 1/4 inch for concrete pavers.

3.06 CLEAN-UP

- A. Sweep excess sand from paved surfaces and remove from site.
- B. Remove all excess materials and debris from site.