

Specification Section 526

ORIGINATION

Date: 6-28-24

Name: David Cerlanek

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COMMENTARY

The minimum thickness listed in the current specification is not currently used in production for brick pavers. This gives an unfair advantage to concrete pavers. Requiring asphalt base will reduce the need for future maintenance. Also, designers are requesting Modified Special Provisions (MSP) to add certain common language elements, like reinstallation of existing pavers. These additions will mitigate the need for these MSP requests.

INDUSTRY COMMENTS AND RESPONSES

(Please note all comments and responses are verbatim as received. The Specifications Office does not alter typos or grammar.)

BLACK = Comment **BLUE** = Specifications Response **GREEN** = Change Made to Specification

Name: David Smith

Date: 8-27-24

COMMENT: Proposed edits with rationale to 526 Architectural Pavers will emailed to David Cerlanek.

RESPONSE: (Specifications Office)

Suggested edits were sent via Robert Bowers 9-12-24. See attached document.

Smith Comment
attached Proposed

RESPONSE FROM ORIGINATOR:

Meeting held on 9/24/2024 with commentors. Primary focus on the proposed required use of asphalt or concrete base with no flexibility given for the use of other aggregate base materials as the final base course. Intent of proposed modification is to improve the quality and service life of the paver system and reduce maintenance costs. Suggest further discussion on paver system cross section design once projects using the proposed specification are evaluated. Other topics of the meeting included recommending particle size tolerances for bedding and joint sand and restricting the use of joint grouts for vehicular applications.

ACTION TAKEN:

- 1. Various recommended editorial changes**
- 2. Added minimum thickness of concrete base**
- 3. No more than 1% bedding sand passing the No. 200 sieve**
- 4. No more than 5% joint sand passing the No. 200 sieve**
- 5. Rewrote 526-3.2 paragraph 1 for better clarification**

Name: J Williams

Date: 9-4-24

COMMENT: Proposed 526-2.4 states: "526-2.4 Base Materials: For Architectural Pavers – Roadway, the minimum base as established per the Contract Documents shall include, in part, 1-1/2 inches of Superpave Asphalt Base meeting the requirements in Section 234..." Proposed 526-4.1 states: "... Base materials will be paid in accordance with Section 234 or Section 350, as required.". If I read correctly, this means that the Base materials for Pavers will be paid for under pay item 285- 7- Optional Base (per Spec 234-10). However, asphaltic base has a minimum thickness of 4" (as stated in Flexible Pavement Design Manual). Which Optional Base pay item is expected to be used to pay for the asphaltic base associated with this work?

RESPONSE: (Originator's response to comment)

Specification 285-7 paragraph 5 points to Spec 234-8 for thickness. Under 234-8.1.1, allowable layer thicknesses for asphalt base mixtures includes 1-1/2 inches. Please consider the Specifications as the governing document for pay items.

ACTION TAKEN:

None.

Name: Paul Cureton

Date: 9-12-24

COMMENT: For low-traffic areas, an asphalt base may not always be necessary so it should be a design option but not a requirement. I would also recommend requiring a compacted aggregate base per FDOT 204 for vehicular applications and specifically prohibit cheap and potentially poor-performing limerock bases. This will increase construction costs but increases performance.

RESPONSE: (Originator's response to comment)

Limerock is still heavily used as part of Specification 204 and is not recommended as an option for the final base course on roadway applications. The proposed language intentionally leaves the remainder of base design to the Engineer for all other applications.

ACTION TAKEN:

None.

**ARCHITECTURAL PAVERS
(REV 7-24-24)**

SECTION 526 is deleted and the following substituted:

526-1 Description.

Furnish and install base materials, concrete curbs, and bedding materials, and joint materials, architectural pavers and joint materials in accordance with this Section and as indicated in the Contract Documents.

Commented [DS1]: Describe the pavement assembly in the order in which it is built.

526-2 Materials.

526-2.1 General: Architectural pavers shall meet the following requirements:

Table 526-1 Architectural Paver Requirements			
Proposed Use	ASTM C902 (Brick Paver)	ASTM C1272 (Brick Paver)	ASTM C936 (Concrete Paver)
Local Side Streets (≤ 35 mph Design Speed)	Do Not Use	X	X
Commercial Driveways	Do Not Use	X	X
Sidewalks and Medians	X	Do Not Use X	X
Residential Driveways	X	Do Not Use X	X

Ensure that the pavers are consistent in color, size, and appearance. Architectural paver type, pattern, shape and ~~color~~ color(s) will be in accordance with plan details, when specified. Existing pavers to be installed as new pavement or reinstalled must be whole, uncut, or unbroken unbroken except cut pavers placed along edges and to fill gaps. Use due care when removing and storing existing pavers identified for reinstallation. Pavers with hairline cracks or edge spalls greater than 1/4 inch shall be discarded and replaced with a type matching the new or existing paver.

526-2.2 Architectural Pavers - Roadway: For installations on roadways and commercial driveways, alleys, and parking lots, provide concrete architectural pavers having a minimum thickness of 3-1/8 inches or brick architectural pavers having a minimum thickness of 2-5/8 inches. Reinstalling existing pavers as roadway pavers requires Engineer written approval.

Commented [DS2]: Approval of what? The reinstallation, or the actual finished re-installation (re-installed)work?

526-2.3 Architectural Pavers - Sidewalk: For installations on sidewalks, medians and residential driveways, provide concrete architectural pavers having a minimum thickness of 2-3/8 inches or brick architectural pavers having a minimum thickness of 2-1/4 inches. Reinstalling existing pavers as roadway pavers requires Engineer written approval.

526-2.4 Base Materials: For Architectural Pavers – Roadway, the minimum base as established per the Contract Documents and as established by the Engineer shall conform to Sections 204 Rock Base, or in part, a minimum 1-1/2 inches of Superpave Asphalt Base meeting the requirements in Section 234 placed over Section 204 Rock Base or 4 inches of Cement Concrete Pavement meeting the requirements of Section 350, placed as the final lift of base material. Do not use limerock base materials. For Section 234 or Section 350 base, provide 2-inch diameter weep holes to the soil subgrade at the lowest base elevations to drain the bedding sand. Fill with washed pea gravel and cover with geotextile to prevent ingress of bedding sand. For Architectural Pavers – Sidewalk, base materials shall conform to Section 204 or 230 including base surface Priming and Maintaining per Section 200-8.

Commented [DS3]: Base materials and selection should be per ASCE 58-16 for concrete pavers or Brick Institute of America guidance documents as established in the design phase by the project engineer. Need to specify a minimum concrete base thickness as well as weep holes to drain the bedding sand over asphalt or concrete bases.

Commented [DS4]: Limerock is a reason why paver pavements deform. Limerock becomes weak when saturated increasing the risk of deformation under vehicular traffic.

526-2.5 Bedding and Joint Sands: Provide clean, non-plastic bedding and joint sand, free from deleterious or foreign matter, natural or manufactured from crushed rock. Do not use recycled concrete, limestone screenings, or stone dust.

Ensure the bedding sand meets the grading requirements of ASTM C33 Standard Specification for Concrete Aggregate with no more than 1% passing the No. 200 sieve.

Ensure the joint sand meets the grading requirements of ASTM C144 Standard Specification for Aggregate for Masonry Mortar with no more than 5% passing the No. 200 sieve.

Bedding sand may be used for joint sand. Do not use joint sand for bedding sand.

526-2.5.6 Bedding and Joint Grouts: A suitable non-shrinking grout or mortar conforming to Section 934 in a thickness specified by the manufacturer and approved for use by the architectural paver manufacturer, may be substituted for either the bedding sand or joint sand or both when specified in the Plans and approved by the Engineer. Bedding and joint grouts shall only be used for non-vehicular applications.

526-2.7 Concrete Curbs: Concrete curbs to restrain the pavers, bedding and base layers shall conform to Section 520.

526-3 Construction Methods.

526-3.1 General:

526-3.1.1 Submittals: For Architectural Pavers – Roadway, furnish full size samples to the Engineer for approval prior to beginning placement. For Architectural Pavers – Sidewalk, submit to the Engineer a certification that the architectural pavers meet the requirements of this Section. In addition, for all architectural pavers except existing pavers approved for reinstallation, submit a certified sieve analysis for gradation comparing results of the bedding sand and joint sand with the requirements of ASTM C33 or ASTM C144 as applicable.

526-3.1.2 Mock-ups: Prior to beginning placement, install a 6 foot by 6 foot paver area following these specifications. This area will be used to determine surcharge of the bedding material layer, joint sizes, lines, laying patterns and colors of the job. This area will be adjacent to an edge treatment, incorporated into the work, and will be the standard from which the work will be judged.

526-3.1.3 Environmental Conditions: Cover stockpiled materials with waterproof covering to prevent exposure to rainfall. Do not install bedding materials or architectural pavers during heavy rains or over wet substrata.

526-3.2 Installation: Install the architectural pavers in the following manner:

1. When reinstallation of existing pavers is shown in the Contract Documents, remove existing sidewalk and/or roadway pavers with caution to avoid damage to the pavers. Replace any pavers damaged during removal or storage with a new paver at no cost to the Department. Remove and dispose of existing leveling bedding sand below freshly removed pavers. Remove and replace base material to the Engineer's approval. Place and screed new bedding sand material evenly on the base, and lightly compacted, in all areas that leveling where existing bedding sand was removed, not to exceed 6 inches in depth. Follow existing layout pattern when reinstalling existing pavers.

2. Spread the bedding sand material evenly over the base course and screed to plan thickness, not to exceed a thickness of 1-1/2 inches. Do not disturb the screeded bedding material. Ensure placement of sufficient bedding sand material to stay ahead of the laid architectural pavers. Do not use the bedding sand material to fill depressions in the base course.

3. Lay architectural pavers in the pattern(s) shown in the Contract Documents and maintain straight pattern lines.

4. Maintain consistent joint widths Joints between the architectural pavers. On average, joints shall be between 1/16 to 3/16 inch wide.

Commented [DS5]: These materials often have excessive fines and breakdown easily over time and traffic.

Commented [DS6]: C33 can have as much as 3% passing the No. 200 sieve. A 1% limit enables drainage of the bedding sand.

Commented [DS7]: C144 allows up to 10% passing the No. 200 sieve. When saturated, joint sand with a high amount of fines can be lubricated and experience a loss of paver-to-paver interlock.

Commented [DS8]: 6 inches of bedding sand is NOT recommended as it presents a high risk of saturation and instability whether saturated or not. Sand alone is not an adequate base for sidewalk pavers as it often settles unevenly causing tripping hazards. Sidewalk pavers require a minimum 4 inch thick graded aggregate base per Section 204, limerock per Section 230, or a renewed existing limerock base per Section 210, all of these bases placed under 1½ inches of screeded bedding sand.

45. Fill gaps at the edges of the paved area with saw cut or edge architectural pavers. For vehicular applications, no cut paver subject to tires shall be less than one-third of a whole paver.

56. When utilizing bedding and joint sand:

a. Use a low amplitude vibrator ~~capable of~~ with a minimum of 5,000 foot-pounds ~~with centrifugal force operating at 70- to 100 Hz frequencies~~ to vibrate and compact architectural pavers into bedding sand. Make a minimum of two passes over the entire area with the second pass perpendicular to the first pass.

b. Vibrate the architectural pavers, sweeping dry joint sand into the joints and vibrating, until the joints are full. Do not vibrate within 3 feet of the unrestrained edges of the architectural pavers. Make a minimum of two passes over the entire area with the second pass perpendicular to the first pass.

c. At the end of each day, all work within 3 feet of laying face must be left fully compacted, with sand-filled joints. If rain is forecasted overnight, secure a waterproof cover over exposed, screeded bedding sand that has not received pavers such that it does not become saturated.

d. Sweep off the excess sand.

67. Leave a final surface elevation of architectural pavers of 1/8 to 1/4 inch above adjacent drainage inlets, concrete collars or channels.

78. Do not permit the final surface elevations of the pavers to deviate more than 3/8 inch under a ~~10-foot-long~~ 10-foot-long straightedge, or more than 1/8 inch between adjacent pavers.

526-4 Method of Measurement.

526-4.1 General: The quantity to be paid for will be the plan quantity, in square yards, for architectural pavers, bedding, base, and edge restraints completed and accepted. No deduction will be made for the areas occupied by ornamental trees left within and any other areas occupied by manholes, inlets, drainage structures or by public utility appurtenances within the normal areas of the architectural pavers. Base materials will be paid in accordance with Section 234 or Section 350, as required.

526-4.2 Removal and Reinstallation of Existing Pavers: Payment for removal and reinstallation of existing architectural pavers will be the plan quantity area, in square yards, for existing pavers removed and reinstalled, completed and accepted.

Payment for replacing existing damaged pavers as identified in the Contract Documents will be made as new pavers.

No payment will be made for material used to replace pavers damaged during removal or storage.

526-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all materials, equipment, edge restraint curbing, and labor; including any preparation of the base or subgrade not included in the work to be paid for under another Contract item; and all incidentals necessary to complete the work. labor, and incidentals necessary to complete the work.

Payment shall be made under:

Item No. 526- 1- - - ~~Pavers, Architectural Pavers~~ per square yard.

Roadway – per square yard.

Sidewalk – per square yard.

Remove Existing and Reinstall - per square yard.