



**SPECIAL PROVISIONS
FOR
UNIT PAVING**

**Polk County
EDP-PA26(001)--7Y-77**

**Effective Date
March 29, 2022**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

151131.01 DESCRIPTION.

A. General

The work of this section consists of installation of Unit Paving, Dimensional ~~Flagstone Limestone~~ on granular subbase with aggregate joint filler, and Unit Paving, Concrete Pavers on asphaltic setting bed atop concrete subslab with joint sand.

B. References: ASTM International, latest edition

- C 67, Sampling and Testing Brick and Structural Clay Tile
- C 97, Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
- C 170, Standard Test Method for Compressive Strength of Dimension Stone
- C 241, Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic
- C 568, Specification for Limestone Dimension Stone
- C 880, Standard Test Method for Flexural Strength of Dimension Stone
- C 936, Solid Concrete Interlocking Paving Units
- D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil
- D 1353, Abrasion Resistance of Stone by Taber Abraser

C. Submittals

1. General: submittals shall be prepared and submitted in accordance with Article 1105.03 of Standard Specifications.
2. **Dimensional ~~Flagstone Limestone~~**
 - a. Five full-size samples of dimensional ~~flagstone limestone~~.
 - b. Test results from an independent testing laboratory for compliance of dimensional ~~flagstone limestone~~ with ASTM C241, C568, and D1353.
 - c. Testing must be completed on product delivered to project site. Test results must reference project and delivery or palate information to be able to tie on site product to

testing data. Installation prior to receipt of testing data will be at the Contractor's own risk. No extra compensation will be paid for removal of product that fails to meet specifications. Historic test results may be submitted for initial approval prior to ordering the product.

3. Concrete Pavers:

- a. Five full-size units of each type of unit paver indicated.
- b. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C936.
- c. Testing must be completed on product delivered to project site. Test results must reference project and delivery or palate information to be able to tie on site product to testing data. Installation prior to receipt of testing data will be at the Contractor's own risk. No extra compensation will be paid for removal of product that fails to meet specifications. Historic test results may be submitted for initial approval prior to ordering the product.

D. Quality Assurance

1. 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.
2. Mockups: the contractor shall be required to construct up to three 10 feet by 10 feet sample panels, for each paver type showing full range of paver sizes and colors selected. Build mockups to comply with the following requirements, using materials indicated for final unit of work, including same base construction, special features for expansion joints, and contiguous work as indicated.
 - a. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Engineer.
 - b. Notify Engineer 1 week in advance of the dates and times when mockups will be constructed.
 - c. Demonstrate the proposed range of aesthetic effects and workmanship.
 - d. Obtain Engineer's acceptance of mockups before start of final unit of Work.
 - e. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - f. If accepted, mockup can be maintained as part of completed Work.
 - g. If mock-up is not part of permanent work, or is not accepted, demolish and remove from the project site when directed by the Engineer.
3. Pre-Installation Conference: Conduct conference at Project site. Before submitting unit pavers, require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:
 - a. Contractor's superintendent.
 - b. Unit pavers subcontractor.
 - c. Unit pavers suppliers.
 - d. Engineer.
4. Delivery, Storage, and Handling
 - a. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.
 - b. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
 - c. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.
 - d. Store liquids in tightly closed containers protected from freezing.
 - e. Store asphalt cement and other bituminous materials in tightly closed containers.

- f. Storage of product on the wet side of the levee is prohibited. Remove any extra materials at the end of the working day.
5. Project Conditions
- a. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.
 - b. Weather Limitations for Bituminous Setting Bed: Install bituminous setting bed only when ambient temperature is above 40°F and when base is dry. Apply asphalt adhesive only when ambient temperature is above 50°F and when temperature has not been below 35°F for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.

151131.02 MATERIAL.

A. Dimensional ~~Flagstone~~ Limestone

Rectangular paving slabs made from limestone complying with ASTM C568.

1. Classification: ~~Dolomitic limestone, Classification~~ III High-Density per ASTM C568.
2. Stone Abrasion Resistance: Minimum hardness (H_a) value of 12 based on testing according to ASTM C1353.
3. Absorption Rate: 0.66%, tested in accordance with ASTM C97.
4. Density: ~~173.0~~ 160.0 pounds per cubic foot, tested in accordance with ASTM C97.
5. Modulus of Rupture: 2072 pounds per square inch, tested in accordance with ASTM C97.
6. Compressive Strength: 26,260 pounds per square inch, tested in accordance with ASTM C170.
7. Flexural Strength: 1374 pounds per square inch, tested in accordance with ASTM C 880.
8. Color: ~~Grey Buff~~
9. Finish: Split face top and bottom with sawn sides.
10. Thickness: Not less than 6 inch nominal depth unless otherwise indicated.
11. Face Size: 2 feet wide by varying lengths ranging from ~~1 foot 6 inches~~ 3 feet minimum to 4 5 feet maximum.
12. Quarry. Subject to compliance with requirements, provide stone from one of the following:
 - a. Buechel Stone Corp.
 - b. Cold Spring; Kasota Valley Limestone.
 - c. Kasota Stone.
 - d. Vetter Stone Company.
 - e. Or approved equal.

B. Concrete Pavers

1. Concrete pavers shall be solid interlocking paving units complying with ASTM C 936 and resistant to freezing and thawing when tested according to ASTM C 67, made with normal-weight aggregates.

2. Basis-of-Design Product:

The design is based on Wausau Tile, Inc. subject to compliance with requirements, provided the named product or a comparable product by one of the following:

- a. Wausau Tile, Inc., Wausau, Wisconsin. Contact: Jeff Grambling (800) 388-8728
- b. Hanover pavers will not be allowed due to previous failures within the City of Des Moines.
- c. Or approved equal.

3. Products: Subject to compliance with requirements, provided of the following:

Pavers shall be 2 3/8 inches thick. The face size and shape will be 12 inches by 18 inches nominal and 12 inches by 24 inches nominal. Pattern shall be as shown on plans. The color blend shall be 10% Matrix V19-128, 30% Matrix V19-157 and 60% Matrix V19-158. The size mix shall be 50% 12 inches by 18 inches size and 50% 12 inches by 24 inches.

- Wausau Tile, Inc. V19-128
- Wausau Tile, Inc. V19-157
- Wausau Tile, Inc. V19-158

C. Granular Subbase Setting-Bed Materials

1. Granular subbase material meeting Section 4121 of the Standard Specifications.
2. Engineering fabric per Section 4196 of the Standard Specifications.

D. Bituminous Setting-Bed Materials

1. Primer for Base: Per Section 2303 of the Standard Specifications; Grade: MC-70
2. Bituminous Setting Bed: Per Section 2303 of the Standard Specifications; 3/8 inches Type A Binder and Surface Course Mixtures.
3. Neoprene-Modified Asphalt Adhesive: Paving manufacturer's standard adhesive consisting of oxidized asphalt combined with 2% neoprene and 10% long-fibered mineral fibers containing no asbestos.

E. Bituminous Setting Bed Mix:

Mix bituminous setting-bed materials at an asphalt plant in approximate proportion, by weight, of 7% asphalt cement to 93% fine aggregate, unless otherwise indicated. Heat mixture to 300°F.

F. Joint Filler Materials

1. Limestone Chip for Joints: Stabilized crushed limestone 3/8 inch chip meeting gradation number 1 per Aggregate Gradation Table of the Standard Specifications.
2. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100% passing No. 16 sieve and no more than 10% passing No. 200 sieve. Provide sand of color needed to produce required joint filler color.

G. Paver Sealer

Intensifying sealer shall be as manufactured by Wausau Tile, Inc. Contact: Jeff Grambling (800) 388-8728

151131.03 CONSTRUCTION.

A. Examination

1. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Placing Granular Subbase Setting Bed

1. Compact soil subgrade uniformly to at least 95% of ASTM D698 laboratory density.
2. Proof-roll prepared subgrade to identify soft pockets and areas of excessive yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.
3. Place engineering fabric over prepared subgrade, overlapping ends and edges at least 12 inches.
4. Place granular subbase, compact by tamping with place vibrator, and screed to 6 inch depth.

C. Placing Bituminous Setting Bed.

1. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance. Clean concrete substrates to remove dirt, dust, debris, and loose particles.
2. Prime concrete slab surface with asphalt primer applied in accordance with Section 2303 of the Standard Specifications (Rate = 0.02 to 0.025 gallons per square yard).
3. Prior to bituminous setting bed installation, install protective cover over adjacent PCC pavement surfaces to avoid pavement staining and other surface damage.
4. Install the setting bed over the base surface, place 1 inch spacer bars directly over the base.
 - a. If grade must be adjusted, set wood chucks under depth control bars to proper grade.
 - b. Set two bars parallel to each other to serve as guides for striking board.
 - c. The depth control bars must be carefully set to bring pavers, when laid, to proper grade.
5. Place some bituminous bed between parallel depth control bars. Pull this bed with the striking board over bars several times.
 - a. After each passage, low porous spots must be showered with fresh bituminous material to produce a smooth, firm, and even setting bed.
 - b. As soon as this initial panel is completed, advance the first bar to the next position, in readiness for striking the next panel.
 - c. Carefully fill up any depressions that remain after removing the depth control bars and wood chocks.
6. The setting bed shall be rolled with a 600 pound walk-behind, power roller 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.
7. 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.
8. Limitations: placement of the setting bed and application of the modified asphalt adhesive will comply with Article 2303.03, C, 4 of the Standard Specifications.

D. Dimensional Limestone Installation

1. Place dimensional limestone on granular subbase setting bed. Use additional granular

subbase material so that dimensional limestone is uniformly supported and achieves grade lines.

2. Cut limestone with motor driven masonry saw equipment to provide a clean, sharp, unchipped edges.
3. Set dimensional limestone units to provide the pattern indicated with joints of 1 inch minimum to 2 inches maximum.
4. Tolerances: Do not exceed 1/4 inch unit-to-unit offset from flush (lippage) nor 1/4 inch in 24 inches and 1/2 inch in 10 feet from level, or indicated slope, for finished surface of paving.
5. Joint treatment: Fill joints by sweeping limestone chips over surface until the joints are filled. Remove excess chips after joints are filled.

E. Concrete Paver Installation

1. Do not use unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures. 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. A block splitter may be used.
2. Tolerances: Do not exceed 1/16 inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.
3. Joint treatment: Place pavers with hand-tight joints. Fill joints by sweeping sand over surface until the joints are filled. Remove excess sand after joints are filled.

F. Paver Sealer

Apply pavement sealer at manufacturer's specified rates and methods.

G. Repairing and Cleaning

Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

151131.04 METHOD OF MEASUREMENT.

Measurement for Unit Paving, Dimensional **Flagstone Limestone** and Unit Paving, Concrete Pavers shall be made on a per square foot basis measured by the Engineer.

151131.05 BASIS OF PAYMENT.

A. Unit Paving, Dimensional **Flagstone Limestone**

Payment for Unit Paving, Dimensional **Flagstone Limestone** shall be per square foot. Included with item is all labor, equipment, and materials necessary for furnishing and installation of the dimensional **flagstone limestone**. Mock-ups and joint filler shall be incidental to this bid item. Granular Subbase under dimensional **flagstone limestone**, shall be paid as part of the Granular Subbase bid item.

B. Unit Paving, Concrete Pavers

Payment for Unit Paving, Concrete Pavers shall be per square foot. Included with item is all labor, equipment, and materials necessary for furnishing and installation of the concrete pavers. Mock-ups, Bituminous primer, setting bed, adhesive, and joint filler shall be incidental to the Unit Paving, Concrete Pavers Bid item. Concrete subslab under the bituminous setting bed, shall be

paid as part of the Subslab, Reinforced P.C. Concrete, 6 In. bid item.