

SP-236002
(New)



**SPECIAL PROVISIONS
FOR
UNIT PAVERS**

**Johnson County
STP-U-1557(648)--70-52**

**Effective Date
October 17, 2023**

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

236002.01 DESCRIPTION

1.01 SECTION INCLUDES

- A. Unit pavers on bituminous setting bed (over concrete subslab).

1.02 REFERENCES: ASTM INTERNATIONAL, LATEST EDITION

- A. C 33, Standard Specification for Concrete Aggregates
- B. C 33, Standard Specification for Concrete Aggregates
- C. C 67, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8, Freezing and Thawing
- D. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- E. C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
- F. C 144 Standard Specifications for Aggregate for Masonry Mortar
- G. D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction
- H. C 936, Standard Specification for Solid Concrete Interlocking Paving Units
- I. C 979, Standard Specification for Pigments for Integrally Colored Concrete
- J. D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop
- K. D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop
- L. C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units
- M. D 1883, Test Method for California Bearing Ratio of Laboratory-Compacted Soils
- N. D 2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports
- O. D 4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

1.03 SUBMITTALS

- A. Submit samples for selection by the Engineer of color and texture, in the form of manufacturer's actual units or sections of units showing the specified color, texture and layout pattern for each type of unit paver included. Include similar samples of materials for joint sand and accessories involving color selection.
- B. Submit manufacturer's data on each paver type. Indicate color, thickness, finish, laying pattern and joint sand.
- C. Paving Installation Contractor Qualifications: Job references from a minimum of three projects similar in size and complexity. Project experience must reflect the same setting bed details required by this project. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.
- D. Sealant as recommended by the unit paver manufacturer.
- E. Cleaner as recommended by the unit paver manufacturer.

- F. Submit plan illustrating installation of pavers.
- G. See "Mock-Ups" under Quality Assurance.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed unit paver installations similar in material, design and extend to that included in this project, with a record of successful in-service performance.
- B. Utilize a Manufacturer having at least 10 years of experience manufacturing unit pavers on projects of similar nature or project size.
- C. Source limitations:
 1. Obtain unit pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.
 2. Obtain joint sand from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.
 3. Obtain setting bed material from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.
- D. Paver Installation Contractor Qualifications: Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project. The proof of required experience must be project with the same setting bed detail.
- E. Mockups:
 1. Install a 5 foot by 5 foot mockups with each type of paver on bituminous setting bed prior to mastic application. The pavers shall remain removable until approved.
 2. Once the layout patterns are approved they can be adhered. Joint sizes, lines, laying pattern(s) and levelness shall be per specification and this area will serve as the standard by which the workmanship will be judged.
 3. Subject to acceptance by the Engineer, mock-up may be retained as part of finished work.
 4. If mock-up is not retained, remove, and dispose legally.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect unit pavers and joint sand during storage and construction against soilage or contamination from earth and other materials.
- B. Deliver unit pavers in manufacturer's original, unopened, and undamaged container packaging with identification labels intact.
 1. Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.
 2. Deliver unit pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 3. Unload unit pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.
- C. Store and protect materials free from mud, dirt, and other foreign materials.

- D. Prevent joint sand from exposure to rainfall or removal by wind with secure, waterproof covering.
- E. Store joint sand on elevated platforms, under a cover and/or in a dry location.

1.06 PROJECT / SITE CONDITIONS

A. Environmental Requirements:

- 1. Install setting bed or unit pavers only when there is no heavy rain or snowfall.

1.07 CONCRETE PAVER OVERAGE AND ATTIC STOCK

- A. Provide a minimum of 5% additional material for overage to be used during construction.
- B. Contractor to provide 50 square feet of each product and size used to the Contracting Authority for maintenance and repair. Furnish pavers from the same production run as installed materials.
- C. Manufacturer to supply maintenance and reinstallation manuals for concrete paver units.

236002.02 MATERIALS

2.01 UNIT PAVERS

A. Basis-of-Design Product: The unit paver shapes are based on:

- 1. Unilock commercial grade concrete unit pavers in the Paver Types listed below, Chicago, IL, 302 East Sullivan Road, Aurora, IL, Contact: Brad Punke, (603) 892-9191.
- 2. Or approved equal. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.
 - a. To obtain acceptance of unspecified products, submit written requests at least 10 days before the Bid Date.

B. Product requirements:

- 1. Unit Paver Type 1: HOLLAND PAVER, 8 CM
 - a. Color: Harvest Gold
 - b. Finish: Standard
 - c. Edge: Chamfered
 - d. Laying Pattern: Varies – refer to detail drawings
 - e. Size: Manufacture size indicated with a max tolerance of plus or minus 1/16 in all directions.
 - 1) 7.875 inch by 3.875 inch by 3.125 inch
- 2. Concrete Paver Type 2: HOLLAND PAVER, 8 CM
 - a. Color: Charcoal
 - b. Finish: Standard
 - c. Edge: Chamfered
 - d. Laying Pattern Varies – refer to detail drawings
 - e. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 in all directions
 - 1) 7.875 inch by 3.875 inch by 3.125 inch

C. Provide pavers meeting minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Efflorescence is not a cause for rejection.

- 1. Average compressive strength 8000 psi with no individual unit under 7200 psi.

- 2. Average absorption of 5%, no unit greater than 7% when tested according to ASTM C140.
- 3. Resistance to 50 freeze-thaw cycles, when tested according to ASTM C1645, with no breakage greater than 1% loss in dry weight of any individual unit. Conduct this test method not more than 12 months prior to delivery of units.
- D. Accept only pigments in unit pavers conforming to ASTM C 979.
 - 1. Note: ACI Report No. 212.3R provides guidance on the use of pigments.
- E. Maximum allowable breakage of product is 5%.

2.02 BITUMINOUS SETTING BED

- A. Bituminous setting bed:
 - 1. Asphalt primer: ASTM D2028 cut-back asphalt, Type RC, rapid cure.
 - 2. Asphalt cement: Shall conform to ASTM D946 with a penetration at 77°F, 5 Sec of minimum 85 mm and maximum of 100 mm.
 - 3. Fine aggregate: ASTM C136, clean hard sand free of adherent coatings, clay alkali salts, and organic matter. Uniformly graded with coarse to fine and 100% passing No. 4 sieve.
 - 4. Tack coat: 2% neoprene (grade WMI), oxidized asphalt, 10% long fibered mineral fiber.
 - 5. Mix: Combine dried fine aggregate with hot asphalt cement. Heat the mix to approximately 300°F at an asphalt plant. The approximate proportion of materials shall be 7% asphalt cement and 93% fine aggregates. Apportion each ton by weight in the approximate ratio of 145 pounds asphalt to 1855 pounds sand.
- B. Rigid base: Concrete, provided as shown on the contract documents.
- C. Other materials: Other materials, not specifically described, but required for a complete and proper installation of unit pavers, shall be as selected by the Contractor subject to review of the Engineer.

2.03 JOINT SAND

- A. Provide polymeric joint sand as follows:
 - 1. Shall be polymeric jointing compound sand in one color for each paver type. Colors shall be standard and selected by the Engineer during the submittal process.
 - 2. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural, or manufactured from crushed rock.
 - 3. Do not use limestone screenings, stone dust, or sand for the joint sand material that does not conform to the grading requirements of ASTM C 144.
 - 4. Utilize sands that are as hard as practically available where unit pavers are subject to vehicular traffic.
- B. Aggregate material shall comply with ASTM C 144 and gradation below:

Natural Sand	Manufactured Sand	
Sieve Size	Percent Passing	Percent Passing
No. 4	100	100

No. 8	95 to 100	95 to 100
No. 16	70 to 100	70 to 100
No. 30	40 to 75	40 to 100
No. 50	10 to 35	20 to 40
No. 100	2 to 15	10 to 25
No. 200	0 to 1	0 to 5

236002.03 CONSTRUCTION

3.01 EXAMINATION

Examine surfaces to receive unit pavers, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit pavers. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Verify the concrete underlayment is clean and dry, certified by the Contractor as meeting material, installation, and grade specifications.
- B. Stockpile joint sand such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.
- C. Contractor is responsible to verify that concrete subbase has been installed to the correct elevation and will accept the appropriate thickness of bituminous setting bed.
- D. Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all joint sand materials contaminated with sediment with clean materials.
- E. Vacuum clean concrete substrates to remove dirt, dust, debris, and loose particles.
- F. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

3.03 INSTALLATION

- A. Unit pavers on bituminous setting bed over concrete base:
 - 1. Install all unit paving in strict accordance with the recommendations of the manufacturer, and the patterns shown on the contract documents, bonding all units firmly in place for long life under hard use. All joints shall be uniform.
 - 2. Clean existing concrete base. Remove dirt and debris.
 - 3. Apply asphalt prime coat. Allow to dry and cure as required.
 - 4. Install control bars directly on base. Adjust control bars to proper elevations. Provide control bars parallel to each other to serve as striking board guides.
 - 5. Place bituminous setting bed between depth control bars. Place setting bed materials and pull with striking board until a smooth, firm, and level setting bed is established. Advance first bar to next position when initial paved is completed. Fill depressions, porous areas, and voids with bituminous material as work progresses.
 - 6. Roll setting bed while hot with power roller to provide specified compacted depth.

7. Adjust elevation to provide top surface of installed unit pavers at the required finish grade.
8. Apply tack coat by mop, squeegee, or trowel over the top surface of the bituminous setting bed to provide a paver bond. When troweled, use a serrated trowel with serrations not exceeding 1/16 inch.
9. When tack coat is dry to touch, place unit pavers by hand in straight courses with hand tight joints and uniform top surface. Maintain alignment in pattern shown on the contract documents.

B. Joint sand

1. Provide, spread, and sweep dry joint sand into joints immediately after vibrating pavers until full. Vibrate pavers and add joint sand material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.
2. Leave all work to within 3 feet of the laying face fully compacted with sand-filled joints at the completion of each day.
3. Remove excess joint sand broom clean from surface when installation is complete.

3.04 FIELD QUALITY CONTROL

- A.** Verify final elevations for conformance to the drawings after sweeping the surface clean.
1. Prevent final concrete paver finished grade elevations from deviating more than $\pm 3/8$ inch under a 10 foot straightedge or indicated slope, for finished surface of paving.
- B.** Lippage: No greater than 1/32 inch difference in height between unit pavers and adjacent paved surfaces.
- C.** Protect newly laid unit pavers with plywood panels. Advance panels as work progresses. Maintain plywood protection in areas subject to continued movement of materials and equipment. Provide additional leveling if required. Roll with a power roller. Roll prior to filling joints.

3.05 REPAIR, POINTING, CLEANING AND PROTECTION

- A.** Remove and replace unit pavers that are loose, chipped, broken, stained or otherwise damaged, or if they do not match adjoining units as intended. Provide new units to match adjoining units, and install in same manner as original units, with same joint treatment to eliminate evidence of replacement.
- B.** Pointing: During tooling of joints, enlarge voids or holes and completely fill with mortar or grout. Point up joints at sealant lines to provide a neat, uniform appearance, properly prepared for application of sealant.
- C.** Cleaning: Remove excess sand and dirt from exposed paver surfaces; wash and scrub clean.
1. Use commercial cleaner as recommended by unit paver manufacturer to clean surface.
- D.** Provide final protection and maintain conditions in a manner acceptable to Installer that ensures that unit paver work is without damage or deterioration at the time of Substantial Completion.

- E. Sweep excess sand and grit from surfaces and remove from site. Remove all excess materials and debris from site.
- F. Protect completed work from damage due to subsequent construction activity on the site.

3.06 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.

3.07 CLEAN-UP

Sweep excess sand from paved surfaces and remove from site, remove all excess materials and debris from site.

236002.04 METHOD OF MEASUREMENT

All unit pavers shall be measured based upon a square foot basis.

236002.05 BASIS OF PAYMENT

Full compensation for complete installation of unit pavers including all labor, materials, and equipment to furnish and install, including the asphalt setting bed and joint sand.