SECTION 32 14 00
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.

1.2 SUMMARY

A. This Section includes the following:
   1. Concrete pavers
   2. Stone pavers

B. Related Sections include the following:
   1. "Earthwork" for excavation and compacted subgrade.
   2. "Cast-in-place Concrete" for concrete base under unit pavers.

1.3 SUBMITTALS

A. Product Data: For materials other than water and aggregates.

B. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C 136.

C. Samples for Verification:
   1. Each type of unit paver indicated showing the full range of colors expected on the Project
   2. Joint materials involving color selection, (if applicable)

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed unit paver installations similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. 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.

1.5 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.

1.6 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 Mortar and Grout:

1. Cold-Weather Requirements: Protect unit paver work against freezing when ambient temperature is 40 deg F (4 deg C) and falling. Heat materials to provide mortar and grout temperatures between 40 and 120 deg F (4 and 49 deg C). Provide the following protection for completed portions of work for 24 hours after installation when the mean resistant membrane; below 25 deg F (minus 4 deg C), cover with insulating blankets; below 20 deg F (minus 7 deg C), provide enclosure and temporary heat to maintain temperature above 32 deg F (0 deg C).
2. Hot-Weather Requirements: Protect unit paver work when temperature and humidity conditions produce excessive evaporation of setting beds and grout. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and higher.
    a. When ambient temperature exceeds 100 deg F (38 deg C), or when wind velocity exceeds 8 mph (13 km/h) and ambient temperature exceeds 90 deg F (32 deg C), set pavers within 1 minute of spreading setting-bed mortar.

PART 2 – PRODUCTS:

2.1 CONCRETE PAVERS

A. London Walk: Pavers as manufactured by Hanover of Hanover , Pennsylvania.
    1. Size: 12” x 18”.
    2. Thickness: 2-1/4 inches
    3. Finish: Tudor
    4. Color: Limestone gray

B. Paver bands: Pavers as manufactured by Hanover of Hanover , Pennsylvania.
    1. Size: 6” x 6” traditional Prest brick with square edges
    2. Thickness: 2 ¼”
    3. Finish: Tudor
    4. Color: Terracotta

2.3 STONE PAVERS

A. Granite pavers with finish faces and edges as indicated on the drawings complying with ASTM C 615. Comply with standards in the “Specifications for Architectural Granite” by the National Building Granite Quarries Association.
    1. Hard, durable, first quality granite as approved by the Architect, free from seams, cracks, iron rust, or other imperfections, and having an even thermal finish.
    2. Varieties and Sources: Subject to compliance with requirements, provide the following:
        a. Granite Mile Markers: Charcoal gray granite with thermal finish as supplied by Cold Spring Granite; Cold Spring, Minnesota, size and depth as shown on drawings

2.4 ACCESSORIES

A. Compressible Foam Filler: Preformed strips complying with ASTM D 1056, Grade 2A1, suitable for receiving sealant.

2.5 AGGREGATE SETTING-BED MATERIALS

A. Sand for Leveling Course (Setting Bed): Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33 for fine aggregate.

B. Sand for Joints: Non-toxic, all-natural ecological organic polymeric sand and binder that is a colorless and odorless and binds together to produce a firm paver joint and/or surface. Stabilizer must not change color of sand or be harmful to plants, animals or humans.

1. Provide SandLOCK Premix as manufactured by Pave Tech, Inc., Prior Lake, Minnesota, www.pavetech.com or approved equal.

2.6 MORTAR SETTING-BED MATERIALS

A. Portland Cement: ASTM C 150, Type I or II.

B. Sand: ASTM C 144.

C. Hydrated Lime: ASTM C 207, Type S

D. Latex Additive: Manufacturer's standard styrene-butadiene-rubber water emulsion, serving as replacement for part or all of gauging water, of type specifically recommended by latex- additive manufacturer for use with field-mixed portland cement mortar bed, and not containing a retarder.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering latex additives that may be incorporated into the Work include, but are not limited to, the following:

2. Manufacturer: Subject to compliance with requirements, provide latex additive by one of the following:

a. Boiardi Products Corporation.
b. Bonsal, W. R. Company.
c. Bostik Findley Inc.
d. C-Cure.
e. Custom Building Products.
f. DAP Inc.
g. Jamo Inc.
h. Laticrete International, Inc.
i. MAPEI Corp.
j. SGM.
k. Summitville Tiles, Inc.
l. TEC Incorporated; H. B. Fuller Company.

E. Water: Potable.

2.7 GROUT MATERIALS

A. Polymer-Modified Grout: ANSI A118.7, sanded grout; in color indicated.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering polymer-modified grouts that may be incorporated into the Work include, but are not limited to, the list in the paragraph above.

2. Product Type: Two-component mix, containing styrene-butadiene rubber in liquid-latex form and prepackaged dry-grout mix complying with ANSI A118.6 and recommended by latex-additive manufacturer.

B. Grout Colors: To match granite pavers.

2.8 MORTAR AND GROUT MIXES

A. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing times, and other procedures needed to produce setting-bed and joint materials of uniform quali-

ty and with optimum performance characteristics. Discard mortars and grout if they have reached their initial set before being used.

B. Mortar-Bed Bond Coat: Mix neat cement or cement and sand with latex additive to a creamy consistency.

C. Latex-Modified, Portland Cement Setting-Bed Mortar: Proportion and mix portland cement, sand, and latex additive for setting bed to comply with written instructions of latex-additive manufacturer and as necessary to produce stiff mixture with a moist surface when bed is ready to receive pavers.

D. Latex-Modified, Portland Cement Slurry Bond Coat: Proportion and mix portland cement, sand, and latex additive for slurry bond coat to comply with written instructions of latex- additive manufacturer.

E. Packaged, Polymer-Modified Grout Mix: Proportion and mix grout ingredients according to grout manufacturer's written instructions.

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.

1. Proceed with installation only after unsatisfactory conditions have been corrected.
2. Where pavers are to be installed over waterproofing, examine waterproofing installation, with waterproofing Installer present, for protection from paving operations. Examine areas where waterproofing system is turned up or flashed against vertical surfaces and horizontal waterproofing. Proceed with installation only after protection is in place.

3.2 PREPARATION

A. In areas where latex mortar bed (if used) is in direct contact with concrete substrate, remove substances from concrete that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

B. Clean concrete substrates to remove dirt, dust, debris, and loose particles.

C. Proof-roll prepared subgrade according to requirements in Section "Earthwork" to identify soft pockets and areas of excess yielding. Proceed with unit paver installation only after deficient subgrades have been corrected and are ready to receive base course for unit pavers.

3.3 INSTALLATION, GENERAL

A. Do not use unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

C. 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.

D. Exercise care in handling coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. Remove coating from bonding surfaces before setting brick.

E. Joint Pattern: As indicated on the Drawings.

F. Tolerances: Do not exceed 1/16-inch (1.6-mm) unit-to-unit offset from flush (lippage) nor 1/8 inch in 10 feet (3 mm in 3 m) from level, or indicated slope, for finished surface of paving.

G. Expansion and Control Joints: Provide for sealant-filled joints at locations and of widths indicated. Provide foam filler as backing for sealant-filled joints, unless otherwise indicated. Install joint filler before setting pavers. Sealant materials and installation are specified in Division 7 Section "Joint Sealants or Division 2 Section “Pavement Joint Sealants”.

3.4 AGGREGATE SETTING-BED APPLICATIONS

A. Place leveling course on concrete slab and screed to a thickness of 1 to 1-1/2 inches (25 to 38 mm), taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.

B. Set pavers with a minimum joint width of 1/16 inch (1.5 mm) and a maximum of 1/8 inch (3 mm), being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

1. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

C. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf (16- to 22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

1. After edge pavers are installed and there is a completed surface or before surface is exposed to rain.
2. Before ending each day's work, fully compact installed concrete pavers to within 36 inches (900 mm) of the laying face. Cover pavers that have not been compacted, and leveling course on which pavers have not been placed, with nonstaining plastic sheets to protect them from rain. Do not allow traffic on installed pavers until joints have been filled.

D. Fill the joints with sand stabilizer mix:

1. Spread SandLOCK Premix material over paved surface evenly. Completely cover paver surface with a thin layer using a push broom to sweep the mixture into the joints with a slight pounding motion.
2. Once the area of pavement has been swept, run a plate compactor over the pavers in with minimum of two passes. Brush more sand mixture into the joints as needed, and repeat this procedure until joints are full and sand can no longer be vibrated into them.
3. Activation of bonding:
    a. Carefully sweep entire pavement clean to remove joint sand stabilizer mixture from the paver surfaces. Excess sand materials including chamfered areas must be swept off paved surface and removed. Power brooms or blowers are recommended for large areas. Excess material remaining on the surface after the mixture as been activated is difficult to remove.
    b. Gently saturate the paver area to activate the joint sand stabilizer. Exercise care to avoid washing sand from the joints.
    c. Do not permit traffic on newly activated paver area until area is dry including joints.

3.5 MORTAR SETTING-BED APPLICATIONS

A. Saturate concrete base with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.

B. Apply mortar-bed bond coat over surface of concrete base about 15 minutes before placing setting bed. Limit area of bond coat to avoid its drying out before placing setting bed. Do not exceed 1/16-inch (1.6-mm) thickness for bond coat.

C. Apply mortar bed over bond coat immediately after applying bond coat. Spread and screed setting bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.

D. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Cut back, bevel edge, remove, and discard setting-bed material that has reached initial set before placing pavers.

E. Wet brick pavers before laying if the initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

F. Place pavers before initial set of cement occurs. Immediately before placing pavers on setting bed, apply uniform 1/16-inch- (1.5-mm-) thick, slurry bond coat to bed or to back of each paver with a flat trowel.

G. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.

H. Spaced Joint Widths: Provide 3/8-inch nominal joint width with variations not exceeding plus or minus 2/8-inch to meet curved banding pattern per paving plans.

I. Grout joints as soon as possible after initial set of setting bed.

1. Force grout into joints, taking care not to smear grout on adjoining surfaces.
2. Clean pavers as grouting progresses by dry brushing or rubbing with dry burlap to remove smears before tooling joints.
3. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
4. If tooling squeezes grout from joints, remove excess grout and smears by dry brushing or rubbing with dry burlap and tool joints again to produce a uniform appearance.

J. Cure grout by maintaining in a damp condition for seven days, unless otherwise recommended by grout or liquid-latex manufacturer.

3.6 REPAIRING, POINTING, AND CLEANING

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that 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.

B. Pointing: During tooling of joints, enlarge voids or holes and completely fill with grout. Point up joints at sealant joints to provide a neat, uniform appearance, properly prepared for sealant application.

C. Cleaning: Remove excess grout from exposed paver surfaces; wash and scrub clean.

END OF SECTION