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SECTION 321400 - UNIT PAVING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

Revise subparagraphs below to suit Project.

1. Brick pavers set in [**aggregate**] [**bituminous**] [**and**] [**mortar**] setting beds.
2. Concrete pavers set in [**aggregate**] [**bituminous**] [**and**] [**mortar**] setting beds.
3. Asphalt-block pavers set in bituminous setting beds.
4. Stone pavers set in [**aggregate**] [**and**] [**mortar**] setting beds.
5. [**Plastic**] [**Steel**] [**Aluminum**] edge restraints.
6. Cast-in-place concrete edge restraints.
7. Precast concrete curbs.
8. Stone curbs.

- B. Related Sections:

Retain Sections in subparagraphs below that contain requirements Contractor might expect to find in this Section but are specified in other Sections.

If retaining first subparagraph below, insert other materials included in the waterproofing Section retained that the reader might expect to find in this Section.

1. [Section 071326 "Self-Adhering Sheet Waterproofing"] [Section 071353 "Elastomeric Sheet Waterproofing"] [Section 071354 "Thermoplastic Sheet Waterproofing"] [Section 071413 "Hot Fluid-Applied Rubberized Asphalt Waterproofing"] [Section 071416 "Cold Fluid-Applied Waterproofing"] for waterproofing and protection board under plaza deck pavers.
2. [Section 075113 "Built-up Asphalt Roofing"] [Section 075116 "Built-up Coal Tar Roofing"] [Section 075213 "Atactic-Polypropylene (APP) Modified Bituminous Membrane Roofing"] [Section 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing"] [Section 075316 "Chlorosulfonate-Polyethylene (CSPE) Roofing"] [Section 075323 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing"] [Section 075416 "Ethylene Interpolymer (KEE) Roofing"] [Section 075419 "Polyvinyl-Chloride (PVC) Roofing"] [Section 075423 "Thermoplastic Polyolefin (TPO) Roofing"] [Modified Bituminous Protected Membrane Roofing"] [Section 075556 "Fluid-Applied Protected Membrane Roofing"] for roof pavers.
3. Section 096313 "Brick Flooring" for brick flooring for interior applications.
4. Section 096340 "Stone Flooring" for dimension stone paving.
5. Section 321216 "Asphalt Paving" for asphalt base under unit pavers.
6. Section 321313 "Concrete Paving" **[for concrete base under unit pavers] [and] [for cast-in-place concrete curbs and gutters serving as edge restraints for unit pavers].**
7. Section 321443 "Porous Unit Paving" for unit paving using grid pavers or pavers with openings between them.

1.3 PRECONSTRUCTION TESTING

Retain paragraph below if latex additives are specified and if testing is considered necessary.

- A. Preconstruction Adhesion and Compatibility Testing: Submit to latex-additive manufacturer, for testing as indicated below, samples of paving materials that will contact or affect mortar and grout that contain latex additives.
 1. Use manufacturer's standard test methods to determine whether mortar and grout materials will obtain optimum adhesion with, and will be nonstaining to, installed pavers and other materials constituting paver installation.

1.4 ACTION SUBMITTALS

Retain one of first two paragraphs below. If retaining second paragraph, revise list to coordinate with products retained in Part 2.

- A. Product Data: For materials other than water and aggregates.
- B. Product Data: For the following:
 1. Pavers.
 2. Bituminous setting materials.
 3. Mortar and grout materials.
 4. Edge restraints.
 5. Precast concrete curbs.

6. Stone curbs.

C. LEED Submittals:

Retain subparagraph below if regional materials are required for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5; coordinate with requirements selected in Part 2 for materials.

1. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.

Retain first paragraph below if requirement for preconstruction adhesion and compatibility testing is retained or if latex additive is used.

- D. Adhesion and Compatibility Test Reports: From latex-additive manufacturer for mortar and grout containing latex additives.
- E. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C 136.
- F. Samples for Initial Selection: For the following:
 1. Each type of unit paver indicated.
 2. Joint materials involving color selection.
 3. Exposed edge restraints involving color selection.
 4. Precast concrete curbs.
 5. Granite for stone curbs.

Delete paragraph above if colors and other characteristics are preselected and specified or scheduled. Retain paragraph below with or without above.

G. Samples for Verification:

1. Full-size units of each type of unit paver indicated.[**Assemble no fewer than five Samples of each type of unit on suitable backing and grout joints.**]
2. Joint materials.
3. Exposed edge restraints.
4. Precast concrete curbs.
5. Stone curbs.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

Delete first paragraph below if not required. If retaining, indicate location, size, and other details of mockups on Drawings or by inserts. Revise wording if only one mockup is required.

- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Retain subparagraph below if mockups are installed as part of building rather than separately and the intention is to make an exception to the default requirement in Section 014000 "Quality Requirements" for demolishing and removing mockups when directed unless otherwise indicated.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

Retain paragraph below if Work of this Section is extensive or complex enough to justify a preinstallation conference.

- C. Preinstallation Conference: Conduct conference at [**Project site**] <Insert location>.

1.6 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.

Retain first paragraph below if liquid-latex compounds are used.

- D. Store liquids in tightly closed containers protected from freezing.

Retain paragraph below if bituminous setting bed is used.

- E. Store asphalt cement and other bituminous materials in tightly closed containers.

1.7 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.

Retain first paragraph below if bituminous setting bed is used.

- B. Weather Limitations for Bituminous Setting Bed:

1. Install bituminous setting bed only when ambient temperature is above 40 deg F (4 deg C) and when base is dry.
2. Apply asphalt adhesive only when ambient temperature is above 50 deg F (10 deg C) and when temperature has not been below 35 deg F (2 deg C) for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.

Retain paragraph below if mortar or grout is used.

C. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

Retain subparagraph below for pavers set in mortar. Hot weather has more effect on paver installations than on masonry because horizontal surfaces absorb more solar energy than vertical surfaces. Insert specific limits to suit local conditions.

2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. 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 BRICK PAVERS

Retain first paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5; before retaining, verify availability of materials that comply.

- A. Regional Materials: Provide brick pavers that have been manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

If brick pavers are used, retain one of first two paragraphs below. Standards cover a range of brick used as paving material for pedestrian and vehicular traffic. See Evaluations.

If retaining first paragraph below, retain one weather class, traffic type, and application. Class SX is for exposure to freezing weather, and Class MX is for exterior uses that do not expose brick to freezing. Class NX is excluded because it is for interior locations. Type I is for locations exposed to extensive abrasion, such as sidewalks and driveways in public spaces; Type II is for locations exposed to intermediate abrasion, such as heavily traveled residential walkways and driveways; Type III is for locations exposed to low abrasion, such as floors and patios exposed in single-family homes. Application PS is normal tolerance; Application PX is exceptionally close dimensional tolerance; Application PA is nonuniform sized for characteristic architectural effects. If retaining Application PA, specify tolerances.

- B. Brick Pavers: Light-traffic paving brick; ASTM C 902, [Class SX] [Class MX], [Type I] [Type II] [Type III], [Application PS] [Application PX] [Application PA]. Provide brick without frogs or cores in surfaces exposed to view in the completed Work.
1. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. <Insert, in separate subparagraphs, manufacturer's name>.
 2. Thickness: [1-1/4 inches (32 mm)] [1-1/2 inches (38 mm)] [1-5/8 inches (41 mm)] [2-1/4 inches (57 mm)] [2-5/8 inches (67 mm)] [As indicated] <Insert dimension>.
 3. Face Size: [3-3/4 by 7-1/2 inches (95 by 190 mm)] [3-5/8 by 7-5/8 inches (92 by 194 mm)] [3-5/8 by 11-5/8 inches (92 by 295 mm)] [7-5/8 by 7-5/8 inches (194 by 194 mm)] [4 by 8 inches (102 by 203 mm)] [4 by 12 inches (102 by 305 mm)] [8 by 8 inches (203 by 203 mm)] [As indicated] <Insert dimensions>.

Subparagraph below may be deleted if manufacturer's product designation is used and specifies color.

4. Color: [Dark red] [Medium red] [Full-range red] [Dark brown] [Medium brown] [Full-range brown] [Tan] [Buff] [Cream] [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color>.

If retaining first paragraph below, retain one type and application. Type F is for units set in a sand setting bed with sand between the pavers. Type R is for units set in a mortar setting bed or a bituminous setting bed supported by an adequate base. Application PS is for general use; Application PX is for pavers with close dimensional tolerances; Application PA is nonuniform sized for characteristic architectural effects. If retaining Application PA, specify tolerances. Application PX must be retained if specifying Type F.

- C. Brick Pavers: Heavy vehicular paving brick; ASTM C 1272, [Type F, Application PX] [Type R, Application PS] [Type R, Application PX] [Type R, Application PA]. Provide brick without frogs or cores in surfaces exposed to view in the completed Work.
1. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. <Insert, in separate subparagraphs, manufacturer's name>.

In first subparagraph below, 2-1/4 inches (57 mm) is minimum thickness for Type R; 2-5/8 inches (67 mm) is minimum for Type F.

2. Thickness: [2-1/4 inches (57 mm)] [2-5/8 inches (67 mm)] [As indicated] <Insert dimension>.
3. Face Size: [3-3/4 by 7-1/2 inches (95 by 190 mm)] [3-5/8 by 7-5/8 inches (92 by 194 mm)] [3-5/8 by 11-5/8 inches (92 by 295 mm)] [7-5/8 by 7-5/8 inches (194 by 194 mm)] [4 by 8 inches (102 by 203 mm)] [4 by 12 inches (102 by 305 mm)] [8 by 8 inches (203 by 203 mm)] [As indicated] <Insert dimensions>.

Subparagraph below may be deleted if manufacturer's product designation is used and specifies color.

4. Color: [Dark red] [Medium red] [Full-range red] [Dark brown] [Medium brown] [Full-range brown] [Tan] [Buff] [Cream] [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color>.

D. Efflorescence: Brick shall be rated "not effloresced" when tested according to ASTM C 67.

Consider retaining paragraph below if latex-modified mortar or grout is used. Temporary protective coating prevents staining.

- E. Temporary Protective Coating: Precoat exposed surfaces of brick pavers with a continuous film of a temporary protective coating that is compatible with brick, mortar, and grout products and can be removed without damaging grout or brick. Do not coat unexposed brick surfaces; handle brick to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.

2.2 CONCRETE PAVERS

Retain first paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5; before retaining, verify availability of materials that comply.

- A. Regional Materials: Provide concrete pavers that have been manufactured within 500 miles (800 km) of Project site from aggregates [**and cement**] that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

First paragraph below applies to most standard units. ASTM reference limits length-to-thickness ratio to no more than 4 (to provide interlocking effect) and face area to no more than 101 sq. in. (0.065 sq. m) and requires compressive strength of 8000 psi (55 MPa). Revise if units made from lightweight aggregate are required.

- B. Concrete Pavers: Solid interlocking paving units complying with ASTM C 936 [**and resistant to freezing and thawing when tested according to ASTM C 67**], made from normal-weight aggregates.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. Manufacturers: Subject to compliance with requirements, [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:
- a. <Insert, in separate subparagraphs, manufacturer's name>.

Standard-duty interlocking concrete pavers are usually 2-3/8 inches (60 mm) thick; heavy-duty units are usually 3-1/8 inches (80 mm) thick.

2. Thickness: [**2-3/8 inches (60 mm)**] [**3-1/8 inches (80 mm)**] <Insert dimension>.

Retain and revise one of first three subparagraphs below to specify face size and shape. Maximum length per ASTM C 936 is 9-1/2 inches (241 mm) for 2-3/8-inch- (60-mm-) thick units and 12-1/2 inches (318 mm) for 3-1/8-inch- (80-mm-) thick units.

3. Face Size and Shape: [3-7/8 inches (98 mm)] [4-7/16 inches (113 mm)] [8-7/8 inches (225 mm)] [9 inches (229 mm)] square.
4. Face Size and Shape: [3-7/8-by-7-7/8-inch (98-by-200-mm)] [4-by-8-inch (102-by-203-mm)] [4-7/16-by-8-7/8-inch (113-by-225-mm)] rectangle.
5. Face Size and Shape: [5-1/2-inch (140-mm) octagon with attached 3-1/2-inch (89-mm) square] [4-1/2-by-9-inch (114-by-229-mm) rectangle with saw-tooth edges] [4-3/4-inch (121-mm) rectangular and trapezoidal units arranged in semicircular courses to produce fan-shaped pattern] [As indicated] <Insert dimensions and shape>.
6. Color: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color>.

First paragraph below applies primarily to custom and large-size units.

- C. Concrete Pavers: Solid paving units, made from normal-weight concrete with a compressive strength not less than [5000 psi (34 MPa)] [6000 psi (41 MPa)] <Insert value>, water absorption not more than 5 percent according to ASTM C 140, and no breakage and not more than 1 percent mass loss when tested for freeze-thaw resistance according to ASTM C 67.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. <Insert, in separate subparagraphs, manufacturer's name>.
2. Thickness: [1-5/8 inches (41 mm)] [1-3/4 inches (45 mm)] [2 inches (51 mm)] [2-3/8 inches (60 mm)] <Insert dimension>.

Retain and revise one of first three subparagraphs below to specify face size and shape.

3. Face Size and Shape: [8-7/8 inches (225 mm)] [9 inches (229 mm)] [12 inches (305 mm)] [18 inches (457 mm)] [24 inches (610 mm)] square.
4. Face Size and Shape: [9-by-18-inch (229-by-457-mm)] [12-by-24-inch (305-by-610-mm)] rectangle.
5. Face Size and Shape: [As indicated] <Insert dimensions and shape>.
6. Color: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color>.

Units in paragraph below are primarily suitable for residential walks and patios.

- D. Concrete Pavers: Solid paving units complying with ASTM C 1491, made from lightweight concrete.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. <Insert, in separate subparagraphs, manufacturer's name>.
2. Thickness: **[1-5/8 inches (41 mm)] [1-3/4 inches (45 mm)] [2 inches (51 mm)]** <Insert dimension>.
3. Face Size and Shape: **[9 inches (229 mm) square] [12 inches (305 mm) square] [18 inches (457 mm) square]** **[As indicated]** <Insert dimensions and shape>.
4. Color: **[As indicated by manufacturer's designations]** **[Match Architect's sample]** **[As selected by Architect from manufacturer's full range]** <Insert color>.

2.3 ASPHALT-BLOCK PAVERS

- A. Asphalt-Block Pavers: Solid units made from asphalt cement complying with ASTM D 312, Type III; inorganic stone dust or cement filler; and coarse aggregate, consisting of clean, hard, unweathered stone crushed into angular particles varying in size up to 3/8 inch (9.5 mm).

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. \$L~Manufacturers~\$1~5230~L\$: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. \$M~Hanover Architectural Products, Inc~\$m~123456790894~M\$.
 - b. <Insert manufacturer's name>.
2. Thickness: **[1-1/4 inches (32 mm)] [2 inches (51 mm)] [3 inches (76 mm)]** <Insert dimension>.
3. Face Size: **[4 by 6 inches (102 by 152 mm)] [6 by 6 inches (152 by 152 mm)] [8 by 8 inches (203 by 203 mm)] [5 by 12 inches (127 by 305 mm)] [6 by 12 inches (152 by 305 mm)] [8-inch- (203-mm-) wide hexagon]** <Insert dimensions>.
4. Dimensional Tolerances: Plus or minus 1/16 inch (1.6 mm).
5. Finish: **[Natural, smooth]** **[Ground]** **[Ground and sandblasted]**.
6. Color: **[As indicated by manufacturer's designations]** **[Match Architect's sample]** **[As selected by Architect from manufacturer's full range]** <Insert color>.

2.4 STONE PAVERS

- A. Granite Pavers: Rectangular paving slabs made from granite complying with ASTM C 615.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, **[provide the following]** **[provide one of the following]** **[stone varieties that may be incorporated into the Work include, but are not limited to, the following]:**

- a. <Insert names of varieties and producers, distributors, or importers>.

First subparagraph below is an example only. Revise color or grain or specify a retained variety.

2. Color and Grain: [**Light gray**] [**Dark gray**] [**Buff**] [**White**] [**Black**] [**Pink**] <Insert color> with [**medium**] [**fine**] grain.
3. Finish: [**Honed**] [**Thermal**] [**As indicated**] [**Match Architect's sample**] <Insert finish>.

Retain first subparagraph below for added quality control if required.

4. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

Verify availability of thickness retained in first subparagraph below with stone suppliers.

5. Thickness: Not less than [**3/4 inch (20 mm)**] [**30 mm**] [**1-1/4 inches (32 mm)**] [**1-5/8 inches (40 mm)**] unless otherwise indicated.
6. Face Size: [**9 inches (229 mm) square**] [**12 inches (305 mm) square**] [**18 inches (457 mm) square**] [**9 by 18 inches (229 by 457 mm)**] [**As indicated**] <Insert dimensions>.

- B. Limestone Pavers: Rectangular paving slabs made from limestone complying with ASTM C 568.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, [**provide the following**] [**provide one of the following**] [**stone varieties that may be incorporated into the Work include, but are not limited to, the following**]:
 - a. Indiana oolitic limestone quarried in Lawrence, Monroe, or Owen Counties, Indiana.
 - b. <Insert names of varieties and producers, distributors, or importers>.

Usually retain one of two options in first subparagraph below. If varieties and sources are named, specifying a classification may be unnecessary but would provide additional quality control and a salient characteristic to use in determining if another variety or source is equivalent. First option generally applies to oolitic and some dolomitic limestone; second, to dolomitic limestone.

2. Classification: [**II Medium-Density**] [**III High-Density**].

Consider retaining first subparagraph below. ASTM C 568 requires value of 10 for floors. Before retaining, verify that stone complies.

3. Stone Abrasion Resistance: Minimum value of [**10**] <Insert value>, based on testing according to ASTM C 241 or ASTM C 1353.

If retaining Indiana limestone above, retain first subparagraph below and retain one grade and color. Delete if Indiana limestone is not used. Gray is more plentiful than buff. Verify availability with producers.

4. Indiana Oolitic Limestone Grade and Color: [**Select, buff**] [**Select, gray**] [**Standard, buff**] [**Standard, gray**] [**Rustic, buff**] [**Rustic, gray**] [**Variegated**], according to grade and color classification established by ILI.

Before specifying, verify availability and suitability of chat-sawed and shot-sawed finishes.

5. Finish: [**Smooth**] [**Chat sawed**] [**Shot sawed**] [**As indicated**] <Insert finish>.

Retain first subparagraph below for added quality control if required.

6. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

Verify availability of thickness retained in first subparagraph below with stone suppliers.

7. Thickness: Not less than [**1 inch (25 mm)**] [**1-1/4 inches (32 mm)**] [**1-5/8 inches (40 mm)**] [**2 inches (50 mm)**] unless otherwise indicated.
8. Face Size: [**9 inches (229 mm) square**] [**12 inches (305 mm) square**] [**18 inches (457 mm) square**] [**9 by 18 inches (229 by 457 mm)**] [**As indicated**] <Insert dimensions>.

- C. Marble Pavers: Rectangular paving slabs made from marble complying with ASTM C 503.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, [**provide the following**] [**provide one of the following**] [**stone varieties that may be incorporated into the Work include, but are not limited to, the following**]:
- a. <Insert names of varieties and producers, distributors, or importers>.

Consider retaining first subparagraph below. ASTM C 503 requires value of 10 for floors. Before retaining, verify that stone complies.

2. Stone Abrasion Resistance: Minimum value of [**10**] <Insert value>, based on testing according to ASTM C 241 or ASTM C 1353.

First subparagraph below is an example of a generic description that can be retained and revised for a nonproprietary specification. For a more explicit specification, delete subparagraph and list varieties and sources in "Products" Subparagraph above. Subparagraph below describes a crystalline calcite marble; revise to describe other varieties of marble if required.

3. Description: Uniform, fine- to medium-grained, [**white**] <Insert color> stone with only slight veining.
4. Finish: [**Honed**] [**As indicated**] [**Match Architect's sample**] <Insert finish>.

Retain first subparagraph below for added quality control if required.

5. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

Verify availability of thickness retained in first subparagraph below with stone suppliers.

6. Thickness: Not less than [**3/4 inch (20 mm)**] [**30 mm**] [**1-1/4 inches (32 mm)**] unless otherwise indicated.

7. Face Size: **[9 inches (229 mm) square]** **[12 inches (305 mm) square]** **[18 inches (457 mm) square]** **[9 by 18 inches (229 by 457 mm)]** **[As indicated]** **<Insert dimensions>**.
- D. Quartz-Based Stone Pavers: **[Rectangular paving slabs]** **[Random polygonal flagstones]** made from quartz-based stone complying with ASTM C 616, Classification **[I Sandstone]** **[II Quartzitic Sandstone]** **[III Quartzite]**.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, **[provide the following]** **[provide one of the following]** **[stone varieties that may be incorporated into the Work include, but are not limited to, the following]:**
- a. **<Insert names of varieties and producers, distributors, or importers>**.

Consider retaining first subparagraph below. ASTM C 616 requires value of 10 for floors. Before retaining, verify that stone complies.

2. Stone Abrasion Resistance: Minimum value of **[10]** **<Insert value>**, based on testing according to ASTM C 241 or ASTM C 1353.
3. Finish: **[Sand rubbed]** **[Natural cleft]** **[Thermal]** **[As indicated]** **[Match Architect's sample]** **<Insert finish>**.

Retain first subparagraph below for added quality control if required.

4. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

Verify availability of thickness retained in first subparagraph below with stone suppliers.

5. Thickness: Not less than **[1 inch (25 mm)]** **[1-1/4 inches (32 mm)]** **[1-1/2 inches (38 mm)]** **[1-5/8 inches (40 mm)]** **[2 inches (50 mm)]** unless otherwise indicated.
6. Face Size: **[9 inches (229 mm) square]** **[12 inches (305 mm) square]** **[18 inches (457 mm) square]** **[9 by 18 inches (229 by 457 mm)]** **[As indicated]** **[Random]** **<Insert dimensions>**.
- E. Slate Pavers: **[Rectangular paving slabs]** **[Random polygonal flagstones]** made from slate complying with ASTM C 629, Classification I Exterior, with a fine, even grain **[and unfading color,]** from clear, sound stock.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, **[provide the following]** **[provide one of the following]** **[stone varieties that may be incorporated into the Work include, but are not limited to, the following]:**
- a. **<Insert names of varieties and producers, distributors, or importers>**.

First subparagraph below is an example of a generic description that can be retained and revised for a nonproprietary specification. For a more explicit specification, delete subparagraph and list varieties and sources in "Products" Subparagraph above.

2. Color: **[Black] [Blue-black] [Gray] [Blue-gray] [Green] [Purple] [Mottled purple and green] [Red]**.

Consider retaining first subparagraph below. ASTM C 629 requires value of 8 for floors. Before retaining, verify that stone complies.

3. Stone Abrasion Resistance: Minimum value of **[8] <Insert value>**, based on testing according to ASTM C 241 or ASTM C 1353.
4. Finish: **[Honed] [Sand rubbed] [Natural cleft] [As indicated] [Match Architect's sample] <Insert finish>**.

Retain first subparagraph below for added quality control if required.

5. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

Verify availability of thickness retained in first subparagraph below with stone suppliers.

6. Thickness: Not less than **[1/2 inch (13 mm)] [3/4 inch (20 mm)] [1 inch (25 mm)]** unless otherwise indicated.
7. Face Size: **[9 inches (229 mm) square] [12 inches (305 mm) square] [18 inches (457 mm) square] [9 by 18 inches (229 by 457 mm)] [As indicated] [Random] <Insert dimensions>**.

- F. Travertine Pavers: Rectangular paving slabs made from travertine complying with ASTM C 1527, Classification I Exterior.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, **[provide the following] [provide one of the following] [stone varieties that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **<Insert names of varieties and producers, distributors, or importers>**.

Consider retaining first subparagraph below. ASTM C 1527 requires value of 10 for floors. Before retaining, verify that stone complies.

2. Stone Abrasion Resistance: Minimum value of **[10] <Insert value>**, based on testing according to ASTM C 241 or ASTM C 1353.

Fleuri cut, also called "cross cut," travertine should not be used for pavers because it will contain voids just beneath the surface, which will eventually fracture.

3. Cut: Vein cut.

Filling pores will prevent them from accumulating dirt.

4. Filling: Fill pores on faces of stone with cementitious filler of color [**selected by Architect**] [**matching Architect's sample**].
5. Finish: [**Honed**] [**As indicated**] [**Match Architect's sample**] <Insert finish>.

Retain first subparagraph below for added quality control if required.

6. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

Verify availability of thickness selected in first subparagraph below with stone suppliers.

7. Thickness: Not less than [**3/4 inch (20 mm)**] [**30 mm**] [**1-1/4 inches (32 mm)**] unless otherwise indicated.
8. Face Size: [**9 inches (229 mm) square**] [**12 inches (305 mm) square**] [**18 inches (457 mm) square**] [**9 by 18 inches (229 by 457 mm)**] [**As indicated**] <Insert dimensions>.

The "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines" limits vertical changes in surfaces of an accessible route to 1/4 inch (6.4 mm) or less. If retaining paragraph below for use on an accessible route, verify that pavers comply with requirements. Some pavers are made by splitting thermal-finished slabs into blocks, which gives them a more even surface than those made with split faces.

- G. Rough-Stone Pavers: Rectangular[**tumbled**] paving stones, with split[**or thermal-finished**] faces and edges, made from granite complying with ASTM C 615.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. If naming varieties or manufacturers, retain one of first two subparagraphs and lists below. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, [**provide the following**] [**provide one of the following**] [**stone varieties that may be incorporated into the Work include, but are not limited to, the following**]:
 - a. <Insert names of varieties and producers, distributors, or importers>.
2. \$L~Manufacturers~\$I~5232~L\$: Subject to compliance with requirements, [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:
 - a. \$M~Buechel Stone Corp~\$m~123456790895~M\$.
 - b. \$M~Cold Spring Granite Inc~\$m~123456790896~M\$.
 - c. \$M~Fletcher Granite Company, Inc~\$m~123456790897~M\$.
 - d. \$M~Granicor, Inc~\$m~123456790898~M\$.
 - e. \$M~Milestone Imports, Inc~\$m~123456790899~M\$.
 - f. \$M~New England Stone, LLC~\$m~123456790900~M\$.
 - g. \$M~North Carolina Granite Corporation~\$m~123456790901~M\$.
 - h. <Insert manufacturer's name>.

First subparagraph below is an example only. Revise color or grain or specify a retained variety.

3. Color and Grain: [**Light gray**] [**Dark gray**] [**Buff**] [**White**] [**Black**] [**Pink**] <Insert color> with [**medium**] [**fine**] grain.

Retain one of first four options in first subparagraph below for pavers made by splitting thermal-finished slabs into blocks. Usually retain fifth option for pavers with rough-split faces.

4. Thickness: [**1-1/4 inches (32 mm)**] [**2 inches (51 mm)**] [**3 inches (76 mm)**] [**4 inches (102 mm)**] [**4 inches (102 mm), plus or minus 1/2 inch (13 mm)**] <Insert dimension>.

Retain one of three options in subparagraph below or revise to suit Project. Sizes listed are offered by North Carolina Granite as Durax #1 and Belgium #1.

5. Face Size: [**4 by 4 inches (100 by 100 mm), plus or minus 1/2 inch (13 mm)**] [**3 to 5 inches (75 to 125 mm) by 8 to 12 inches (200 to 300 mm)**] [**As indicated**] <Insert dimensions>.

2.5 CURBS AND EDGE RESTRAINTS

Delete this article if no curbs or edge restraints or if specified in other Sections. Other sizes and configurations are available besides those indicated below. See manufacturers' catalogs.

Second option in first paragraph below describes PAVE TECH's "Industrial" edging.

- A. Plastic Edge Restraints: Manufacturer's standard triangular PVC extrusions [**1-3/4 inches (45 mm) high by 3-1/2 inches (89 mm) wide**] [**3-1/8 inches (79 mm) high by 9-1/2 inches (241 mm) wide**] designed to serve as edge restraints for unit pavers; rigid type for straight edges and flexible type for curved edges, with pipe connectors and 3/8-inch (9.5-mm) diameter by 12-inch- (300-mm-) long steel spikes.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. \$L~Manufacturers~\$1~5233~L\$: Subject to compliance with requirements, [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:
- a. \$M~Brickstop Corporation~\$m~123456790902~M\$.
 - b. \$M~Dimex Corporation~\$m~123456790903~M\$.
 - c. \$M~Oly-Ola Edgings, Inc~\$m~123456790904~M\$.
 - d. \$M~Pave Tech Inc~\$m~123456790905~M\$.
 - e. <Insert manufacturer's name>.

First option in first paragraph below is designated "Landscape Divider" by J. T. Ryerson & Son; second option is designated "Roadway Curbing."

- B. Steel Edge Restraints: Manufacturer's standard painted steel edging [**3/16 inch (4.8 mm) thick by 4 inches (100 mm) high**] [**1/4 inch (6.4 mm) thick by 5 inches (125 mm) high**] with loops pressed from or welded to face to receive stakes at 36 inches (900 mm) o.c., and steel stakes 15 inches (380 mm) long for each loop.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. \$L~Manufacturers~\$1~5234~L\$: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. \$M~Border Concepts, Inc~\$m~123456790906~M\$.
 - b. \$M~Collier Metal Specialties, Inc~\$m~123456790907~M\$.
 - c. \$M~J. D. Russell Company (The)~\$m~123456790908~M\$.
 - d. \$M~Sure-loc Edging Corporation~\$m~123456790909~M\$.
 - e. <Insert manufacturer's name>.
 2. Color: **[As indicated by manufacturer's designations]** **[Match Architect's sample]** **[As selected by Architect from manufacturer's full range]** <Insert color>.
- C. Aluminum Edge Restraints: Manufacturer's standard **[straight, 1/8-inch- (3.2-mm-) thick by 4-inch- (100-mm-) high]** **[straight, 3/16-inch- (4.8-mm-) thick by 4-inch- (100-mm-) high]** **[L-shaped, 1/8-inch- (3.2-mm-) thick by 1-3/8-inch- (35-mm-) high]** **[L-shaped, 3/16-inch- (4.8-mm-) thick by 2-1/4-inch- (57-mm-) high]** extruded-aluminum edging with loops pressed from face to receive stakes at 12 inches (300 mm) o.c., and aluminum stakes 12 inches (300 mm) long for each loop.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. \$L~Manufacturers~\$1~5236~L\$: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. \$M~Brickstop Corporation~\$m~123456790910~M\$.
 - b. \$M~Curv-Rite, Inc~\$m~123456790911~M\$.
 - c. \$M~Permaloc Corporation~\$m~123456790912~M\$.
 - d. \$M~Sure-loc Edging Corporation~\$m~123456790913~M\$.
 - e. <Insert manufacturer's name>.

Retain first paragraph below for troweled-concrete edge restraints and for edges made of pavers embedded in concrete.

- D. Job-Built Concrete Edge Restraints: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mixed concrete with minimum 28-day compressive strength of 3000 psi (20 MPa).
- E. Precast Concrete Curbs: Made from normal-weight concrete with a compressive strength not less than **[5000 psi (34 MPa)] [6000 psi (41 MPa)]** <Insert value> and water absorption not more than 5 percent, in shapes and sizes indicated.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Section 016000 "Product Requirements."

1. \$L~Manufacturers~\$1~5237~L\$: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:

- a. \$M~Hanover Architectural Products, Inc~\$m~123456790914~M\$.
 - b. <Insert manufacturer's name>.
2. Color and Texture: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color and texture>.
- F. Stone Curbs: Granite curbing, with face battered 1 inch per foot (1:12), produced in random lengths not less than 36 inches (900 mm) from granite complying with ASTM C 615.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. If naming varieties or manufacturers, retain one of first two subparagraphs and lists below. See Section 016000 "Product Requirements."

1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 - a. <Insert names of varieties and producers, distributors, or importers>.
2. \$L~Manufacturers~\$l~5239~L\$: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. \$M~Cold Spring Granite Inc~\$m~123456790915~M\$.
 - b. \$M~Fletcher Granite Company, Inc~\$m~123456790916~M\$.
 - c. \$M~Granikor, Inc~\$m~123456790918~M\$.
 - d. \$M~New England Stone, LLC~\$m~123456790919~M\$.
 - e. \$M~North Carolina Granite Corporation~\$m~123456790921~M\$.
 - f. \$M~Polycor Inc~\$m~123456790923~M\$.
 - g. \$M~Swenson Granite Co~\$m~123456790925~M\$.
 - h. <Insert manufacturer's name>.

First subparagraph below is an example only. Revise color or grain or specify retained variety.

3. Granite Color and Grain: [Light gray] [Dark gray] [Buff] [White] [Black] [Pink] <Insert color> with [fine] [medium] [coarse] grain.

Retain dimensions in first three subparagraphs below, insert others, or delete subparagraphs and show dimensions on Drawings.

4. Top Width: [4 inches (102 mm)] [5 inches (127 mm)] [6 inches (152 mm)] <Insert dimension>.
5. Face Height: [4 inches (102 mm)] [6 inches (152 mm)] [8 inches (203 mm)] <Insert dimension>.
6. Total Height: [12 inches (305 mm)] [16 inches (406 mm)] [18 inches (457 mm)] <Insert dimension>.

Retain finishes in two subparagraphs below; usually retain sawed tops and either split or sawed faces.

7. Top Finish: [Sawed] [Thermal] [Bush hammered].
8. Face Finish: [Split] [Sawed] [Thermal] [Bush hammered].

Insert other materials (pressure-treated wood, stone, etc.) used for edge restraints if not included in other Sections.

2.6 ACCESSORIES

- A. Cork Joint Filler: Preformed strips complying with ASTM D 1752, Type II.

Retain paragraph above or below for expansion joints in pavers with grouted joints and at perimeter when placed against waterproofing. Filler below is used with sealant; filler above may be used where sealant is not required.

- B. Compressible Foam Filler: Preformed strips complying with ASTM D 1056, Grade 2A1.

2.7 AGGREGATE SETTING-BED MATERIALS

Retain this article for aggregate setting-bed applications.

First two paragraphs below are examples of aggregate types and gradations that could be used where two layers are placed beneath leveling course. For heavy-duty applications, consult highway department requirements and revise to suit Project. See Evaluations.

First option in first paragraph below is for light-traffic uses; second is for heavy-duty applications. Delete paragraph if subbase is not required.

- A. Graded Aggregate for Subbase: Sound, crushed stone or gravel complying with [**ASTM D 448 for Size No. 57**] [**ASTM D 2940, subbase material**] [**requirements in Section 312000 "Earth Moving" for subbase material**].

First option in first paragraph below is for light-traffic uses; second is for heavy-duty applications.

- B. Graded Aggregate for Base: Sound, crushed stone or gravel complying with [**ASTM D 448 for Size No. 8**] [**ASTM D 2940, base material**] [**requirements in Section 312000 "Earth Moving" for base course**].

Revise first paragraph below to ASTM C 144 for leveling course less than 1 inch (25 mm) thick.

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

Usually retain paragraph above and delete first paragraph below. See Evaluations.

- D. Stone Screenings for Leveling Course: Sound stone screenings complying with ASTM D 448 for Size No. 10.

- E. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 (1.18-mm) sieve and no more than 10 percent passing No. 200 (0.075-mm) sieve.

Retain subparagraph below if a particular color is required.

1. Provide sand of color needed to produce required joint color.

Retain first paragraph below if separation geotextile is used between subgrade and aggregate setting bed. Revise to suit Project. Project's geotechnical report may include recommendations. See the Evaluations in Section 312000 "Earth Moving."

- F. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications; made from polyolefins or polyesters, with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

Survivability in first subparagraph below is the rating of a geotextile's ability to withstand installation stresses and is divided into three classes by AASHTO M 288. Class 2 is the default class recommended by AASHTO M 288 for separation geotextile applications.

1. Survivability: Class 2, AASHTO M 288.

Requirements in three subparagraphs below are default values in AASHTO M 288 for Class 2 separation geotextiles.

2. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
3. Permittivity: 0.02 per second, minimum; ASTM D 4491.
4. UV Stability: 50 percent after 500 hours' exposure, ASTM D 4355.

Retain first paragraph below if nonwoven geotextile is used between aggregate base and leveling course. Performance requirements in AASHTO M 288 have been widely adopted by geotextile manufacturers and are repeated below. Project's geotechnical report may include recommendations.

- G. Drainage Geotextile: Nonwoven needle-punched geotextile fabric, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

Retain first subparagraph below if AASHTO M 288 survivability classification is required. Survivability is the rating of a geotextile's ability to withstand installation stresses and is divided into three classes by AASHTO M 288. Class 2 is the default class recommended by AASHTO M 288 for subsurface drainage applications. Revise to Class 1 if higher strength is required or Class 3 if lower strength is permitted.

1. Survivability: Class 2, AASHTO M 288.
2. Apparent Opening Size: No. 40 (0.425-mm) sieve, maximum; ASTM D 4751.
3. Permittivity: 0.5 per second, minimum; ASTM D 4491.
4. UV Stability: 50 percent after 500 hours' exposure, ASTM D 4355.

- H. Herbicide: Commercial chemical for weed control, registered with the EPA. Provide in granular, liquid, or wettable powder form.

2.8 BITUMINOUS SETTING-BED MATERIALS

Retain this article for bituminous setting-bed applications.

First paragraph below is used to prime bases (concrete slab or binder course) under paving for vehicular traffic. Delete if not required.

- A. Primer for Base: ASTM D 2028, cutback asphalt, grade as recommended by unit paver manufacturer.
- B. Fine Aggregate for Setting Bed: ASTM D 1073, No. 2 or No. 3.
- C. Asphalt Cement: ASTM D 3381, Viscosity Grade AC-10 or Grade AC-20.
- D. Neoprene-Modified Asphalt Adhesive: Paving manufacturer's standard adhesive consisting of oxidized asphalt combined with 2 percent neoprene and 10 percent long-fibered mineral fibers containing no asbestos.
- E. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 (1.18-mm) sieve and no more than 10 percent passing No. 200 (0.075-mm) sieve.

Retain subparagraph below if a particular color is required.

- 1. Provide sand of color needed to produce required joint color.

2.9 MORTAR SETTING-BED MATERIALS

Retain this article if cement-bed or grout applications are required.

Retain first paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5; before retaining, verify availability of materials that comply.

- A. Regional Materials: Provide aggregate[, **cement, and lime**] for mortar that has been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Portland Cement: ASTM C 150, Type I or Type II.

Delete first paragraph below if latex-modified portland cement mortar mix is specified for setting bed.

- C. Hydrated Lime: ASTM C 207, Type S.

Revise first paragraph below for latex-modified portland cement mortar bed if latex-additive manufacturer requires coarser aggregate complying with ASTM C 33.

- D. Sand: ASTM C 144.

Retain first paragraph below for thickset applications if latex additive is required to improve flexibility and other properties of mortar setting bed or if latex additive is used for mortar-bed bond coat.

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

Product in first paragraph below can be used for bond coat.

F. Thinset Mortar: Latex-modified portland cement mortar complying with ANSI A118.4.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain one of first two subparagraphs and list of manufacturers below. See Section 016000 "Product Requirements."

1. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

Retain option in first subparagraph below if manufacturer's name and model number are indicated in schedules or plans on Drawings; delete option and insert manufacturer's name and model number if not included on Drawings.

2. \$L~Basis-of-Design Product~\$l~5240~L\$: Subject to compliance with requirements, provide **[product indicated on Drawings] <Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. \$M~Boiardi Products~\$m~123456790928~M\$; a QEP company.
 - b. \$M~Bostik, Inc~\$m~123456790930~M\$.
 - c. \$M~C-Cure~\$m~123456790931~M\$.
 - d. \$M~Custom Building Products~\$m~123456790932~M\$.
 - e. \$M~Jamo Inc~\$m~123456790933~M\$.
 - f. \$M~Laticrete International, Inc~\$m~123456790935~M\$.
 - g. \$M~MAPEI Corporation~\$m~123456790937~M\$.
 - h. \$M~Mer-Krete System, ParexLahabra, Inc~\$m~123456790939~M\$.
 - i. \$M~ProSpec~\$m~123456790941~M\$.
 - j. \$M~Southern Grouts & Mortars, Inc~\$m~123456790943~M\$.
 - k. \$M~Summitville Tiles, Inc~\$m~123456790945~M\$.
 - l. \$M~TEC, Specialty Construction Brands, Inc~\$m~123456790947~M\$.
 - m. **<Insert manufacturer's name>**.

Retain one of two subparagraphs below or delete both and allow Contractor to select type of mortar.

3. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
4. Provide prepackaged, dry-mortar mix combined with **[acrylic resin] [or] [styrene-butadiene-rubber]** liquid-latex additive at Project site.

G. Water: Potable.

Retain paragraph below if reinforced mortar bed is required. See Evaluations.

H. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches (50.8 by 50.8 mm) by 0.062 inch (1.57 mm) in diameter; comply with ASTM A 185/A 185M and ASTM A 82/A 82M except for minimum wire size.

2.10 GROUT MATERIALS

Retain this article if Project includes grouted joints.

Retain first paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5; before retaining, verify availability of materials that comply.

- A. Regional Materials: Provide aggregate[**and cement**] for grout that has been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

Grout in first paragraph below is a Project-site mix of portland cement and fine sand; delete if only factory-prepared products are allowed.

- B. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.

Retain subparagraph below if job-mixed pigmented grout is used. See Evaluations.

1. Colored Mortar Pigments for Grout: Natural and synthetic iron and chromium oxides, compounded for use in mortar and grout mixes. Use only pigments that have proved, through testing and experience, to be satisfactory for use in portland cement grout.

Retain one of first two paragraphs below if packaged grout is used instead of job-mixed grout.

- C. Standard Cement Grout: ANSI A118.6, sanded.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain one of two subparagraphs and list of manufacturers below. See Section 016000 "Product Requirements."

1. Manufacturers: Subject to compliance with requirements, [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:

Retain option in subparagraph below if manufacturer's name and model number are indicated in schedules or plans on Drawings; delete option and insert manufacturer's name and model number if not included on Drawings.

2. \$L~Basis-of-Design Product~\$l~5241~L\$: Subject to compliance with requirements, provide [**product indicated on Drawings**] <**Insert manufacturer's name; product name or designation**> or comparable product by one of the following:
- a. \$M~Boiardi Products~\$m~123456791091~M\$; a QEP company.
 - b. \$M~Bostik, Inc~\$m~123456791092~M\$.
 - c. \$M~C-Cure~\$m~123456791093~M\$.
 - d. \$M~Custom Building Products~\$m~123456791095~M\$.
 - e. \$M~Jamo Inc~\$m~123456791096~M\$.
 - f. \$M~Laticrete International, Inc~\$m~123456791098~M\$.
 - g. \$M~MAPEI Corporation~\$m~123456791099~M\$.
 - h. \$M~Mer-Krete System, ParexLahabra, Inc~\$m~123456791101~M\$.
 - i. \$M~ProSpec~\$m~123456791102~M\$.
 - j. \$M~Southern Grouts & Mortars, Inc~\$m~123456791103~M\$.

- k. \$M~Summitville Tiles, Inc~\$m~123456791106~M\$.
- l. \$M~TEC, Specialty Construction Brands, Inc~\$m~123456791108~M\$.
- m. <Insert manufacturer's name>.

D. Polymer-Modified Tile Grout: ANSI A118.7, sanded.

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain one of first two subparagraphs and list of manufacturers below. See Section 016000 "Product Requirements."

- 1. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

Retain option in first subparagraph below if manufacturer's name and model number are indicated in schedules or plans on Drawings; delete option and insert manufacturer's name and model number if not included on Drawings.

- 2. \$L~Basis-of-Design Product~\$l~5242~L\$: Subject to compliance with requirements, provide **[product indicated on Drawings] <Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. \$M~Boiardi Products~\$m~123456791112~M\$; a QEP company.
 - b. \$M~Bostik, Inc~\$m~123456791113~M\$.
 - c. \$M~C-Cure~\$m~123456791115~M\$.
 - d. \$M~Custom Building Products~\$m~123456791117~M\$.
 - e. \$M~Jamo Inc~\$m~123456791119~M\$.
 - f. \$M~Laticrete International, Inc~\$m~123456791121~M\$.
 - g. \$M~MAPEI Corporation~\$m~123456791124~M\$.
 - h. \$M~ProSpec~\$m~123456791126~M\$.
 - i. \$M~Southern Grouts & Mortars, Inc~\$m~123456791128~M\$.
 - j. \$M~Summitville Tiles, Inc~\$m~123456791129~M\$.
 - k. \$M~TEC, Specialty Construction Brands, Inc~\$m~123456791130~M\$.
 - l. <Insert manufacturer's name>.

Retain one of two subparagraphs below, or delete both and allow Contractor to select type of grout.

- 3. Polymer Type: Ethylene-vinyl acetate or acrylic additive in dry, redispersible form; prepackaged with other dry ingredients.
- 4. Polymer Type: **[Acrylic resin] [or] [styrene-butadiene rubber]** in liquid-latex form for addition to prepackaged dry-grout mix.

E. Grout Colors: **[As indicated by manufacturer's designations] [Match Architect's samples] [As selected by Architect from manufacturer's full range] <Insert color>**.

Retain paragraph below for job-mixed grout and prepackaged grout formulations that only require adding water.

F. Water: Potable.

2.11 BITUMINOUS SETTING-BED MIX

- A. Mix bituminous setting-bed materials at an asphalt plant in approximate proportion, by weight, of 7 percent asphalt cement to 93 percent fine aggregate unless otherwise indicated. Heat mixture to 300 deg F (149 deg C).

2.12 MORTAR AND GROUT MIXES

Revise article title if mortar is used but not grout. Coordinate with materials and products retained in articles specifying mortar setting-bed and joint materials and their installation.

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

Retain first paragraph below if mortar bed is installed directly over concrete. Latex additive can be used with either latex-modified or unmodified, portland cement-lime setting-bed mortar; water should be used only with unmodified, portland cement-lime setting-bed mortar.

- B. Mortar-Bed Bond Coat: Mix neat cement and [**latex additive**] [**water**] to a creamy consistency.

Retain one of first two paragraphs below. Use of latex-modified, portland cement mortar can make curing times undesirably long. See Evaluations.

- C. Portland Cement-Lime Setting-Bed Mortar: Type M complying with ASTM C 270, Proportion Specification.
- D. 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.

Retain one of first two paragraphs below with either latex-modified, portland cement setting-bed mortar or portland cement-lime setting-bed mortar.

- E. Latex-Modified, Portland Cement Bond Coat: Proportion and mix portland cement, aggregate, and liquid latex for bond coat to comply with written instructions of liquid-latex manufacturer.
- F. Thinset Mortar Bond Coat: Proportion and mix thinset mortar ingredients according to manufacturer's written instructions.
- G. Job-Mixed Portland Cement Grout: Proportion and mix job-mixed portland cement and aggregate grout to match setting-bed mortar except omit hydrated lime and use enough water to produce a pourable mixture.

Retain one of two subparagraphs below with paragraph above for job-mixed colored grout.

1. Pigmented Grout: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1 to 10, by weight.
 2. Colored-Aggregate Grout: Produce color required by combining colored aggregates with portland cement of selected color.
- H. Packaged Grout Mix: Proportion and mix grout ingredients according to grout manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

Coordinate conditions required by Work of this Section with requirements in Section where substrate is specified. Delete this article if aggregate setting-bed method is used.

- A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Where pavers are to be installed over waterproofing, examine waterproofing installation, with waterproofing Installer present, for protection from paving operations, including areas where waterproofing system is turned up or flashed against vertical surfaces.
- C. Proceed with installation only after unsatisfactory conditions have been corrected[**and waterproofing protection is in place**].

3.2 PREPARATION

Coordinate first paragraph below with the Section that specifies concrete substrate. Include a requirement in that Section that forbids use of curing and sealing compounds on surfaces to be covered by unit pavers set in mortar.

- A. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.

Retain paragraph above and first paragraph below for concrete slabs under unit pavers. Retain paragraph above if pavers are set in mortar.

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

Retain paragraph below for aggregate setting-bed applications where paving will be subjected to heavy traffic if subgrade compaction is specified in Section 312000 "Earth Moving." Delete if subgrade compaction is specified in this Section.

- C. Proof-roll prepared subgrade according to requirements in Section 312000 "Earth Moving" 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 [**subbase and base**] [**base**] course for unit pavers.

3.3 INSTALLATION, GENERAL

- A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining 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.
 - 1. For concrete pavers, a block splitter may be used.
- D. Handle protective-coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.

Retain one of six options in first paragraph below or revise to suit Project. Patterns are not applicable to all paver shapes.

- E. Joint Pattern: **[Running bond] [Herringbone] [Basket weave] [Grid] [As indicated] [Match and continue existing unit paver joint pattern]**.

Retain first paragraph below if pavers are used over waterproofing.

- F. Pavers over Waterproofing: Exercise care in placing pavers and setting materials over waterproofing so protection materials are not displaced and waterproofing is not punctured or otherwise damaged. Carefully replace protection materials that become displaced and arrange for repair of damaged waterproofing before covering with paving.

Joint filler in subparagraph below will protect waterproofing against pavers and will form an expansion joint.

- 1. Provide joint filler at waterproofing that is turned up on vertical surfaces[**unless otherwise indicated; where unfilled joints are indicated, provide temporary filler or protection until paver installation is complete**].

Retain one of two "Tolerances" paragraphs below. Retain first for smooth pavers where slopes to drains are critical; retain second when nominal control of paving surface is acceptable.

- G. Tolerances: Do not exceed 1/32-inch (0.8-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.

Retain option in "Tolerances" Paragraph below only for smooth, flat pavers.

- H. Tolerances: Do not exceed[**1/16-inch (1.6-mm) unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches (3 mm in 600 mm) and**] 1/4 inch in 10 feet (6 mm in 3 m) from level, or indicated slope, for finished surface of paving.

Retain one of two "Expansion and Control Joints" paragraphs below if joints are required.

- I. Expansion and Control Joints: Provide for sealant-filled joints at locations and of widths indicated. Provide compressible foam filler as backing for sealant-filled joints[**unless otherwise indicated; where unfilled joints are indicated, provide temporary filler until paver installation is complete**]. Install joint filler before setting pavers. Sealant materials and installation are specified in Section 079200 "Joint Sealants."
- J. Expansion and Control Joints: Provide cork joint filler at locations and of widths indicated. Install joint filler before setting pavers. Make top of joint filler flush with top of pavers.

Retain first paragraph below if applicable; revise to suit Project. Aggregate and bituminous setting-bed applications in areas without surrounding walls require edge restraints.

- K. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.

Retain first subparagraph below if plastic or metal edge restraints are retained in Part 2. If job-built edge restraints are required, indicate details on Drawings.

- 1. Install edge restraints to comply with manufacturer's written instructions. Install stakes at intervals required to hold edge restraints in place during and after unit paver installation.

Retain first subparagraph below for metal edge restraints.

- 2. For metal edge restraints with top edge exposed, drive stakes at least 1 inch (25 mm) below top edge.

Retain first subparagraph below for job-built concrete edge restraints; delete if specified in another Section.

- 3. Install job-built concrete edge restraints to comply with requirements in Section 033000 "Cast-in-Place Concrete."

Retain one of two subparagraphs below and detail on Drawings if pavers set in mortar or embedded in concrete are used as edge restraints for aggregate-set pavers.

- 4. Where pavers set in mortar bed are indicated as edge restraints for pavers set in aggregate setting bed, install pavers set in mortar and allow mortar to cure before placing aggregate setting bed and remainder of pavers. Cut off mortar bed at a steep angle so it will not interfere with aggregate setting bed.
- 5. Where pavers embedded in concrete are indicated as edge restraints for pavers set in aggregate setting bed, install pavers embedded in concrete and allow concrete to cure before placing aggregate setting bed and remainder of pavers. Hold top of concrete below aggregate setting bed.

Retain paragraph below if steps surfaced with pavers are required.

- L. Provide steps made of pavers as indicated. Install paver steps before installing adjacent pavers.

Retain subparagraph below and detail on Drawings if pavers set in mortar are used as steps with aggregate-set pavers.

1. Where pavers set in mortar bed are indicated for steps constructed adjacent to pavers set in aggregate setting bed, install steps and allow mortar to cure before placing aggregate setting bed and remainder of pavers. Cut off mortar bed at a steep angle so it will not interfere with aggregate setting bed.

3.4 AGGREGATE SETTING-BED APPLICATIONS

Retain first paragraph below if compaction is not covered in Section 312000 "Earth Moving." Coordinate with that Section to ensure that compaction for subgrade under concrete pavers is correctly specified. Compaction below is an example only; revise to suit Project.

- A. Compact soil subgrade uniformly to at least [95] <Insert number> percent of [ASTM D 698] [ASTM D 1557] laboratory density.

If retaining paragraph above, retain first paragraph below for aggregate setting-bed applications where paving will be subjected to heavy traffic. Delete below if deleting paragraph above.

- B. Proof-roll prepared subgrade to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

Revise overlap in first paragraph below to 24 or 36 inches (600 or 900 mm) for weak subgrade soils. Delete if geotextile is not required.

- C. Place separation geotextile over prepared subgrade, overlapping ends and edges at least 12 inches (300 mm).
- D. Place aggregate[**subbase and**] base, compact by tamping with plate vibrator, and screed to depth indicated.

Retain paragraph above or first paragraph below, or delete both if subbase and base are specified in another Section. Retain above for light-traffic uses; retain below for heavy-duty applications. Delete subbase if not required. Compaction below is an example only, although 100 percent compaction is usually easily achieved with highly granular materials used for base and subbase; revise to suit Project. ASTM D 1557 is generally used instead of ASTM D 698 for highly granular material when maximum compaction is required.

- E. Place aggregate[**subbase and**] base, compact to 100 percent of ASTM D 1557 maximum laboratory density, and screed to depth indicated.

Retain first paragraph below for open-graded base course material to prevent leveling course from washing into subbase or base course.

- F. Place drainage geotextile over compacted base course, overlapping ends and edges at least 12 inches (300 mm).
- G. Place leveling course 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 uniform until pavers are set and compacted.

- H. Treat leveling course with herbicide to inhibit growth of grass and weeds.
- I. 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)**] <Insert dimension> 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.

Revise first paragraph below for pavers installed over waterproofing if required.

- J. 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. Use vibrator with neoprene mat on face of plate or other means as needed to prevent cracking and chipping of pavers. Perform at least three passes across paving with vibrator.
 - 1. Compact pavers when there is sufficient surface to accommodate operation of vibrator, leaving at least 36 inches (900 mm) of uncompacted pavers adjacent to temporary edges.
 - 2. Before ending each day's work, compact installed concrete pavers except for 36-inch (900 mm) width of uncompacted pavers adjacent to temporary edges (laying faces).
 - 3. As work progresses to perimeter of installation, compact installed pavers that are adjacent to permanent edges unless they are within 36 inches (90 mm) of laying face.
 - 4. Before ending each day's work and when rain interrupts work, cover pavers that have not been compacted and cover leveling course on which pavers have not been placed with nonstaining plastic sheets to protect them from rain.
- K. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.
- L. Do not allow traffic on installed pavers until sand has been vibrated into joints.
- M. Repeat joint-filling process 30 days later.

3.5 BITUMINOUS SETTING-BED APPLICATIONS

Retain this article for asphalt block or brick set with bituminous setting bed.

First paragraph below may be deleted if paving is not subject to vehicular traffic.

- A. Apply primer to concrete slab or binder course immediately before placing setting bed.
- B. Prepare for setting-bed placement by locating 3/4-inch- (19-mm-) deep control bars approximately 11 feet (3.3 m) apart and parallel to one another, to serve as guides for striking board. Adjust bars to subgrades required for accurate setting of paving units to finished grades indicated.
- C. Place bituminous setting bed where indicated, in panels, by spreading bituminous material between control bars. Spread mix at a minimum temperature of 250 deg F (121 deg C). Strike

setting bed smooth, firm, even, and not less than 3/4 inch (19 mm) thick. Add fresh bituminous material to low, porous spots after each pass of striking board. After each panel is completed, advance first control bar to next position in readiness for striking adjacent panels. Carefully fill depressions that remain after removing depth-control bars.

1. Roll setting bed with power roller to a nominal depth of 3/4 inch (19 mm). Adjust thickness as necessary to allow accurate setting of unit pavers to finished grades indicated. Complete rolling before mix temperature cools to 185 deg F (85 deg C).

Retain subparagraph above and first paragraph below for asphalt-block paving subject to vehicular traffic and for brick paving regardless of traffic.

- D. Apply neoprene-modified asphalt adhesive to cold setting bed by squeegeeing or troweling to a uniform thickness of 1/16 inch (1.6 mm). Proceed with setting of paving units only after adhesive is tacky and surface is dry to touch.
- E. Place pavers carefully by hand in straight courses, maintaining accurate alignment and uniform top surface. Protect newly laid pavers with plywood panels on which workers can stand. Advance protective panels as work progresses, but maintain protection in areas subject to continued movement of materials and equipment to avoid creating depressions or disrupting alignment of pavers. If additional leveling of paving is required, and before treating joints, roll paving with power roller after sufficient heat has built up in the surface from several days of hot weather.
- F. Joint Treatment: Place unit pavers with hand-tight joints. Fill joints by sweeping sand over paved surface until joints are filled. Remove excess sand after joints are filled.

3.6 MORTAR SETTING-BED APPLICATIONS

Retain this article for pavers set in either portland cement-lime or latex-modified, portland cement mortar.

- A. Saturate concrete subbase 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 subbase about 15 minutes before placing mortar 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; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.

Delete paragraph above or first two paragraphs below. Retain above if reinforcing wire is not used; retain below if reinforcing wire is used.

- D. Place reinforcing wire over concrete subbase, lapped at joints by at least one full mesh and supported so mesh becomes embedded in the middle of mortar bed. Hold edges back from vertical surfaces approximately 1/2 inch (13 mm).

- E. Place mortar bed with reinforcing wire fully embedded in middle of mortar bed. Spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.
- F. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Before placing pavers, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.

Retain first paragraph below if brick pavers are used.

- G. 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 according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.
- H. Place pavers before initial set of cement occurs. Immediately before placing pavers on mortar bed, apply uniform 1/16-inch- (1.5-mm-) thick bond coat to mortar bed or to back of each paver with a flat trowel.
- I. 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.

Joint widths in first paragraph below are examples only. Retain tolerance to suit manufacturing tolerances of pavers; rough-stone pavers and Application PA brick pavers require large tolerances.

- J. Spaced Joint Widths: Provide [**3/8-inch (10-mm)**] [**1/2-inch (13-mm)**] [**3/4-inch (19-mm)**] nominal joint width with variations not exceeding plus or minus [**1/16 inch (1.5 mm)**] [**1/8 inch (3 mm)**] [**3/16 inch (4.5 mm)**].

Retain three paragraphs below for grouted joints.

- K. Grouted Joints: Grout paver joints complying with ANSI A108.10.
- L. 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.
- M. Cure grout by maintaining in a damp condition for seven days unless otherwise recommended by grout or liquid-latex manufacturer.

3.7 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 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.

Retain two subparagraphs below if applicable for brick pavers.

- 1. Remove temporary protective coating as recommended by coating manufacturer and as acceptable to paver and grout manufacturers.
- 2. Do not allow protective coating to enter floor drains. Trap, collect, and remove coating material.

END OF SECTION 321400