

SECTION 097516 - STONE BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- 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 stone base.
- B. Related Requirements:
 - 1. Section 079200 "Joint Sealants" for sealing expansion joints in stone base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each [**variety of stone,**] stone accessory, and manufactured product.
- B. LEED Submittals (Projects authorized for LEED certification only):
 - 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.
 - 2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured [**and regionally extracted and manufactured**] materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
 - b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.
 - 3. Product Data for Credit IEQ 4.1: For [**adhesives**] [**and**] [**sealants**], documentation including printed statement of VOC content.
 - 4. Laboratory Test Reports for Credit IEQ 4.1: For [**adhesives**] [**and**] [**sealants**], documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

- C. Shop Drawings: Show fabrication and installation details for stone base, including dimensions and profiles of stone units.
 - 1. Show locations and details of joints.
 - 2. Show locations and details of anchors, including locations of supporting construction.
- D. Samples for Initial Selection: For joint materials involving color selection.
- E. Samples for Verification:
 - 1. For each stone type indicated, in sets of Samples not less than **12 inches (300 mm)** square. Include **[two] [three] [four] [five]** <Insert number> or more Samples in each set and show the full range of variations in appearance characteristics in completed Work.
 - 2. For each color of **[grout] [pointing mortar] [and] [sealant]** required.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For **[Installer] [fabricator]**.
- B. Material Test Reports:
 - 1. Stone Test Reports: For **[each]** stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, other than abrasion resistance, according to referenced ASTM standards. Base reports on testing done within previous **[three] [five]** <Insert number> years.
 - 2. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer indicating that sealants will not stain or damage stone. Include interpretation of test results and recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate stone similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of stone base.
- C. Installer Qualifications: A firm or individual experienced in installing stone base similar in material, design, and extent to that indicated for this Project, whose work has a record of successful in-service performance.
- D. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical wall area as shown on Drawings.
 - 2. Build mockup for stone base, not less than **72 inches (1800 mm)** long.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Sealant Adhesion and Compatibility Testing: Submit to joint-sealant manufacturers, for compatibility and adhesion testing according to sealant manufacturer's standard testing methods and Section 079200 "Joint Sealants," Samples of materials that will contact or affect joint sealants.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, and other causes.
- B. Mark stone units, on surface that will be concealed after installation, with designations used on Shop Drawings to identify individual stone units.
- C. Deliver sealants to Project site in original unopened containers labeled with manufacturer's name, product name and designation, color, expiration period, pot life, curing time, and mixing instructions for multicomponent materials.
- D. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.8 FIELD CONDITIONS

- A. Maintain air and material temperatures to comply with requirements of installation material manufacturers, but not less than 50 deg F (10 deg C) during installation and for seven days after completion.
- B. Field Measurements: Verify dimensions of construction to receive stone base by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 COORDINATION

- A. Time delivery and installation of stone base to avoid extended on-site storage and to coordinate with work adjacent to stone base.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Stone: Obtain[**each variety of**] stone, [**regardless of finish,**] from a single quarry[, **whether specified in this Section or in another Section of the Specifications,**] with resources to provide materials of consistent quality in appearance and physical properties.
 - 1. For stone types that include same list of varieties and sources, provide same variety from same source for each.

- B. Varieties and Sources: Subject to compliance with requirements, provide stone of varieties and from sources complying with Section 044200 "Exterior Stone Cladding."

2.2 GRANITE <Insert drawing designation>

- A. Material Standard: Comply with ASTM C 615.
- B. Regional Materials: Granite shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Granite shall be fabricated within 500 miles (800 km) of Project site.
- D. Description: Uniform, [fine] [medium]-grained, [white] [pink] [gray] [black] <Insert color> stone[without veining].
- E. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 - 1. <Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.
- F. Cut: [Vein] [Fleuri].
 - 1. Orientation of Veining: [Horizontal] [Vertical] [As indicated].
- G. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
- H. Finish: [Polished] [Honed] [Thermal] [As indicated] [Match Architect's sample] <Insert finish>.
- I. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.3 LIMESTONE <Insert drawing designation>

- A. Material Standard: Comply with ASTM C 568.
 - 1. Classification: [I Low] [II Medium] [III High] Density.
- B. Regional Materials: Limestone shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Limestone shall be fabricated within 500 miles (800 km) of Project site.
- D. Description: [Dolomitic] [Oolitic] [Shell] limestone.
- E. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:

1. **<Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.**
- F. Varieties and Sources: Indiana oolitic limestone quarried in Lawrence, Monroe, or Owen Counties, Indiana.
 1. 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.
- G. Cut: **[Vein] [Fleuri]**.
 1. Orientation of Veining: **[Horizontal] [Vertical] [As indicated]**.
- H. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
- I. Finish: **[Smooth] [Sand rubbed] [Machine tooled, four bats per 1 inch (25 mm)] [Machine tooled, six bats per 1 inch (25 mm)] [Machine tooled, eight bats per 1 inch (25 mm)] [As indicated] [Match Architect's sample] <Insert finish> [, matching standard ILI finish]**.
- J. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.4 MARBLE **<Insert drawing designation>**

- A. Material Standard: Comply with ASTM C 503, **[Classification I Calcite] [, Classification II Dolomite] [, Group A] [, Group B] [, Group C] [, Group D]**.
- B. Regional Materials: Marble shall be fabricated within **500 miles (800 km)** of Project site from stone that has been extracted within **500 miles (800 km)** of Project site.
- C. Regional Materials: Marble shall be fabricated within **500 miles (800 km)** of Project site.
- D. Description: Uniform, fine- to medium-grained, **[white] <Insert color>** stone with only slight veining.
- E. Varieties and Sources: Subject to compliance with requirements, **[provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]**:
 1. **<Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.**
- F. Cut: **[Vein] [Fleuri]**.
 1. Orientation of Veining: **[Horizontal] [Vertical] [As indicated]**.
- G. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
- H. Finish: **[Polished] [Honed] [As indicated] [Match Architect's sample] <Insert finish>**.

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

2.5 QUARTZ-BASED STONE <Insert drawing designation>

- A. Material Standard: Comply with ASTM C 616, [Classification I Sandstone] [Classification II Quartzitic Sandstone] [Classification III Quartzite] [, except for minimum free silica content].
- B. Regional Materials: Quartz-based stone shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Quartz-based stone shall be fabricated within 500 miles (800 km) of Project site.
- D. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 1. <Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.
- E. Finish: [Sand rubbed] [Natural cleft] [Thermal] [As indicated] [Match Architect's sample] <Insert finish>.
- F. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.6 SERPENTINE <Insert drawing designation>

- A. Material Standard: Comply with ASTM C 1526, [Classification I Exterior] [Classification II Interior].
- B. Regional Materials: Serpentine shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Serpentine shall be fabricated within 500 miles (800 km) of Project site.
- D. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 1. <Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.
- E. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
- F. Finish: [Polished] [Honed] [As indicated] [Match Architect's sample] <Insert finish>.

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

2.7 SLATE <Insert drawing designation>

- A. Material Standard: Comply with ASTM C 629, [Classification I Exterior] [Classification II Interior].
- B. Regional Materials: Slate shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Slate shall be fabricated within 500 miles (800 km) of Project site.
- D. Description: [Black] [Blue-black] [Gray] [Blue-gray] [Green] [Purple] [Mottled purple and green] [Red] slate with a fine, even grain[and unfading color,] from clear, sound stock.
- E. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 - 1. <Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.
- F. Finish: [Honed] [Sand rubbed] [Natural cleft] [As indicated] [Match Architect's sample] <Insert finish>.
- G. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.8 TRAVERTINE <Insert drawing designation>

- A. Material Standard: Comply with ASTM C 1527, [Classification I Exterior] [Classification II Interior].
- B. Regional Materials: Travertine shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Travertine shall be fabricated within 500 miles (800 km) of Project site.
- D. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 - 1. <Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.
- E. Cut: [Vein] [Fleuri].
 - 1. Orientation of Veining: [Horizontal] [Vertical] [As indicated].

- F. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
- G. Filling: Fill pores on faces of stone with cementitious filler of color [selected by Architect] [matching Architect's sample].
- H. Finish: [Polished] [Honed] [As indicated] [Match Architect's sample] <Insert finish>.
- I. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.9 OTHER STONE <Insert drawing designation>

- A. Material Standards:
 - 1. Maximum Absorption per ASTM C 97/C 97M: <Insert required value>.
 - 2. Minimum Compressive Strength per ASTM C 170/C 170M: <Insert required value>.
 - 3. Minimum Flexural Strength per ASTM C 880/C 880M: <Insert required value>.
- B. Regional Materials: Stone shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.
- C. Regional Materials: Stone shall be fabricated within 500 miles (800 km) of Project site.
- D. Varieties and Sources: Subject to compliance with requirements, [provide the following] [provide one of the following] [available stone varieties that may be incorporated into the Work include, but are not limited to, the following]:
 - 1. <Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers>.
- E. Finish: [Polished] [Honed] [Sand rubbed] [Natural cleft] [As indicated] [Match Architect's sample] <Insert finish>.
- F. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.10 SETTING MATERIALS

- A. Molding Plaster: ASTM C 59/C 59M.
- B. Portland Cement: ASTM C 150, Type I or Type II.
 - 1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Aggregate: ASTM C 144.
- E. Water: Potable.

- F. Adhesives, General: Use only adhesives formulated for stone and ceramic tile and recommended by their manufacturer for the application indicated.
- G. Organic Adhesive: ANSI A136.1, Type I[.][, with a VOC content of 65 g/L or less.][, that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]
1. **Manufacturers:** Subject to compliance with requirements, [provide products by the following] [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. Boiardi Products; a QEP company.
 - b. Bostik, Inc.
 - c. C-Cure.
 - d. Custom Building Products.
 - e. DAP Inc.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Mer-Krete Systems; ParexLahabra, Inc.
 - j. Prospec; Bonsal American; a division of Oldcastle Architectural Products Group.
 - k. Southern Grouts & Mortars, Inc.
 - l. TEC, Specialty Construction Brands, Inc.; an H. B. Fuller company.
 - m. **<Insert manufacturer's name>.**
- H. Water-Cleanable Epoxy Adhesive: ANSI A118.3[.][, with a VOC content of 65 g/L or less.][, that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]
1. **Manufacturers:** Subject to compliance with requirements, [provide products by the following] [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. Boiardi Products; a QEP company.
 - b. Bonstone Materials Corporation.
 - c. Bostik, Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Mer-Krete Systems; ParexLahabra, Inc.
 - j. Prospec; Bonsal American; a division of Oldcastle Architectural Products Group.
 - k. Summitville Tiles, Inc.
 - l. TEC, Specialty Construction Brands, Inc.; an H. B. Fuller company.
 - m. **<Insert manufacturer's name>.**

- I. Stone Adhesive: Two-part, **[epoxy-resin] [or] [polyester-resin]** stone adhesive with an initial set time of not more than two hours at **70 deg F (21 deg C)**., **and with a VOC content of 65 g/L or less.**., **that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."**
 1. Color: **[Clear] [Match stone]**.
 2. **Products:** Subject to compliance with requirements, **[provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. Epoxy Adhesive: [Akemi North America](#); Akepox.
 - b. Epoxy Adhesive: [Axson North America, Inc.](#), Wood & Stone Company; Akabond Epoxy.
 - c. Epoxy Adhesive: [Bonstone Materials Corporation](#); Touchstone Last Patch.
 - d. Epoxy Adhesive: [Bonstone Materials Corporation](#); Touchstone Ratio Pac Clear Gel Epoxy.
 - e. Epoxy Adhesive: **<Insert manufacturer's name; product name or designation>**.
 - f. Polyester Adhesive: [Akemi North America](#); Platinum Clear Polyester Adhesive.
 - g. Polyester Adhesive: [Axson North America, Inc.](#), Wood & Stone Company; Wood & Stone Polyester.
 - h. Polyester Adhesive: [Bonstone Materials Corporation](#); Gripstone L-200KG.
 - i. Polyester Adhesive: **<Insert manufacturer's name; product name or designation>**.

2.11 GROUT

- A. Grout Colors: **[Match stone] [As indicated by manufacturer's designations] [Match Architect's samples] [As selected by Architect from manufacturer's full range]**.
- B. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate to produce required color.
- C. Standard Cement Grout: ANSI A118.6, packaged.
 1. Grout Type: **[Sanded] [Unsanded]**.
- D. Polymer-Modified Tile Grout: ANSI A118.7, packaged.
 1. **Manufacturers:** Subject to compliance with requirements, **[provide products by the following] [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. [Bostik, Inc.](#)
 - b. [C-Cure.](#)
 - c. [Custom Building Products.](#)
 - d. [DAP Inc.](#)
 - e. [Jamo Inc.](#)

- f. [Laticrete International, Inc.](#)
 - g. [MAPEI Corporation.](#)
 - h. [Mer-Krete Systems; ParexLahabra, Inc.](#)
 - i. [Prospec; Bonsal American; a division of Oldcastle Architectural Products Group.](#)
 - j. [Southern Grouts & Mortars, Inc.](#)
 - k. [Summitville Tiles, Inc.](#)
 - l. [TEC, Specialty Construction Brands, Inc.; an H. B. Fuller company.](#)
 - m. **<Insert manufacturer's name>.**
2. Polymer Type: [**Acrylic resin**] [or] [**ethylene vinyl acetate**], in dry, redispersible form, packaged with other dry ingredients.
 3. Polymer Type: [**Acrylic resin**] [or] [**styrene-butadiene rubber**] in liquid-latex form for addition to packaged dry-grout mix.
 4. Grout Type: [**Sanded**] [**Unsanded**].
- E. Water-Cleanable Epoxy Grout: ANSI A118.3, packaged, chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.
1. **Manufacturers:** Subject to compliance with requirements, [**provide products by the following**] [**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. [Boiardi Products; a QEP company.](#)
 - b. [Bostik, Inc.](#)
 - c. [C-Cure.](#)
 - d. [Custom Building Products.](#)
 - e. [Jamo Inc.](#)
 - f. [Laticrete International, Inc.](#)
 - g. [MAPEI Corporation.](#)
 - h. [Mer-Krete Systems; ParexLahabra, Inc.](#)
 - i. [Prospec; Bonsal American; a division of Oldcastle Architectural Products Group.](#)
 - j. [Summitville Tiles, Inc.](#)
 - k. [TEC, Specialty Construction Brands, Inc.; an H. B. Fuller company.](#)
 - l. **<Insert manufacturer's name>.**

2.12 POINTING MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II. Provide natural color or white cement as required to produce mortar color indicated.
 1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Pigments shall have a record of satisfactory performance in mortar.

1. **Products:** Subject to compliance with requirements, **[provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **Davis Colors**; True Tone Mortar Colors.
 - b. **Lanxess Corporation**; Bayferrox Iron Oxide Pigments.
 - c. **Solomon Colors**; SGS Mortar Colors.
 - d. **<Insert manufacturer's name; product name or designation>**.

D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime.

E. Colored Portland Cement-Lime Mix: Packaged blend of portland cement, hydrated lime, and mortar pigments. Use a mix of formulation required to produce color indicated or, if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 10 percent of portland cement by weight.

1. **Products:** Subject to compliance with requirements, **[provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **Holcim (US) Inc.**; Rainbow Mortamix Custom Color Cement/Lime.
 - b. **Lafarge North America Inc.**; Eaglebond.
 - c. **Lehigh Cement Company**; Lehigh Custom Color Portland/Lime Cement.
 - d. **<Insert manufacturer's name; product name or designation>**.

F. Aggregate: ASTM C 144, except with 100 percent passing **No. 16 (1.18-mm)** sieve.

1. White Aggregates: Natural white sand or ground white stone.
2. Colored Aggregates: Natural-colored sand or ground marble, granite, or other durable stone; of color necessary to produce required mortar color.

G. Water: Potable.

2.13 SEALANTS

A. Joint Sealants: Manufacturer's standard sealants of characteristics indicated below that comply with applicable requirements in Section 079200 "Joint Sealants" and will not stain the stone they are applied to.

1. Mildew-Resistant Joint Sealant: **[Mildew resistant, single component, nonsag, neutral curing, silicone] [Single component, nonsag, mildew resistant, acid curing, silicone] <Insert joint sealant>**.
2. Joint Sealant: **[Latex] [Acrylic based] [Butyl rubber based] [Single component, nonsag, neutral curing, silicone; Class 25] <Insert joint sealant>**.
3. VOC Content: **[250] <Insert value>** g/L or less.
4. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
5. Colors: Provide colors of exposed sealants to match other joints in stone adjoining sealed joints unless otherwise indicated.

2.14 STONE ANCHORS AND ATTACHMENTS

- A. Wire Tiebacks: [**No. 9 AWG copper or copper-alloy**] [or] [**0.120-inch- (3.0-mm-) diameter, stainless-steel**] wire.

2.15 STONE ACCESSORIES

- A. Temporary Setting Shims: Rigid plastic shims, nonstaining to stone, sized to suit joint thickness.
- B. Cleaner: Stone cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
- C. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.
1. **Manufacturers:** Subject to compliance with requirements, [provide products by the following] [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. [Bostik, Inc.](#)
 - b. [Custom Building Products.](#)
 - c. [Hillyard, Inc.](#)
 - d. [HMK Stone Care; ACI International.](#)
 - e. [Miracle Sealants Company.](#)
 - f. [Stone Care International.](#)
 - g. [Summitville Tiles, Inc.](#)
 - h. **<Insert manufacturer's name>.**

2.16 STONE FABRICATION, GENERAL

- A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically unpleasing, as judged by Architect.
- B. Fabricate stone base in sizes and shapes required to comply with requirements indicated.
1. For granite, comply with recommendations in NBGQA's "Specifications for Architectural Granite."
2. For marble, comply with recommendations in MIA's "Dimension Stone - Design Manual VII."
3. For limestone, comply with recommendations in ILI's "Indiana Limestone Handbook."

- C. Cut stone to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by applicable stone association.
 - 1. Where items are installed with adhesive or where stone edges are visible in the finished work, make items uniform in thickness and of identical thickness for each type of item; gage back of stone if necessary.
 - 2. Clean sawed backs of stones to remove rust stains and iron particles.
 - 3. Dress joints straight and at right angle to face unless otherwise indicated.
- D. Fabricate molded work to produce stone shapes with a uniform profile throughout entire unit length and with precisely formed arris slightly eased to prevent snipping, and matched at joints between units.
 - 1. Produce moldings with machines having abrasive shaping wheels made to reverse contour of molding shape; do not sculpt moldings.
- E. Finish exposed faces and edges of stone to comply with requirements indicated for finish of each stone type required and to match approved Samples and mockups.
- F. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.
 - 1. Grade and mark stone for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stone units match range of colors and other appearance characteristics represented in approved Samples[**and mockups**].

2.17 STONE BASE

- A. Nominal Thickness: [**3/4 inch (20 mm)**] [**7/8 inch (22 mm)**] [**1-1/4 inches (32 mm)**] unless otherwise indicated.
- B. Top-Edge Detail: [**Straight, slightly eased at corner**] [**3/8-inch (10-mm) bevel**] [**3/4-inch (20-mm) radius**] [**3/8-inch (10-mm) radius**] [**As indicated**].
- C. Ends: [**Butt ends into casings**] [**Butt ends into opening frames**] [**Return ends to depth of adjacent finish with edge detail same as top edge**] unless otherwise indicated.
- D. Joints: [**1/16-inch- (1.5-mm-) wide grouted joints**] [**1/8-inch- (3-mm-) wide grouted joints**] [**1/8-inch- (3-mm-) wide, sealant-filled joints**] [**Bonded joints, 1/32 inch (0.8 mm) or less in width**].
 - 1. Locate joints at midpoints between adjacent paneling joints unless otherwise indicated.

2.18 MIXES

- A. Spotting Plaster: Stiff mix of molding plaster and water.
- B. Mortar, General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing

time, and other procedures needed to produce mortar of uniform quality and with optimum performance characteristics.

1. Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated. Do not use calcium chloride.
 2. Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer unless otherwise indicated. Discard mortar when it has reached initial set.
- C. Setting Mortar: Comply with ASTM C 270, Proportion Specification.
1. Type: [N] [O].
 2. Mix Proportions: 1 part portland cement and 2-1/2 to 4 parts lime with aggregate ratio of 2-1/4 to 3 times the volume of cement and lime.
- D. Pointing Mortar: Comply with ASTM C 270, Proportion Specification, for mortar types indicated. Provide pointing mortar mixed to match Architect's sample and complying with the following:
1. Pigmented Pointing Mortar: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1:10, by weight.
 2. Packaged Portland Cement-Lime Mix Mortar: Use portland cement-lime mix of selected color.
 3. Colored-Aggregate Pointing Mortar: Produce color required by combining colored aggregates with portland cement of selected color.
 4. Type: [N] [O].
 5. Mix Proportions: 1 part portland cement and 2-1/2 to 4 parts lime with aggregate ratio of 2-1/4 to 3 times the volume of cement and lime.
- E. Grout: Comply with mixing requirements of referenced ANSI standards and with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive stone base and conditions under which stone base will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone base.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of stone base.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SETTING STONE, GENERAL

- A. Before setting stone, clean surfaces that are dirty or stained by removing soil, stains, and foreign materials. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.
- B. Do necessary field cutting as stone is set. Use power saws with diamond blades to cut stone. Cut lines straight and true, with edges eased slightly to prevent snipping.
- C. Set stone to comply with requirements indicated. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure stone in place. Shim and adjust anchors, supports, and accessories to set stone accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
- D. Erect stone units level, plumb, and true with uniform joint widths. Use temporary shims to maintain joint width.
- E. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.
 - 1. Sealing of expansion and other joints is specified in Section 079200 "Joint Sealants."
 - 2. Keep expansion joints free of plaster, mortar, grout, and other rigid materials.

3.3 CONSTRUCTION TOLERANCES

- A. Variation from Level: For lintels, sills, chair rails, horizontal bands, horizontal grooves, and other conspicuous lines, do not exceed **1/8 inch in 10 feet (3 mm in 3 m)**, **1/4 inch in 20 feet (6 mm in 6 m)**, **3/8 inch (10 mm)** maximum.
- B. Variation in Joint Width: Do not vary from average joint width more than plus or minus **1/16 inch (1.5 mm)** or one-fourth of nominal joint width, whichever is less.
- C. Variation in Plane between Adjacent Stone Units (Lipping): Do not exceed **1/32-inch (0.8-mm)** difference between planes of adjacent units.

3.4 INSTALLATION OF STONE BASE

- A. Stone Base: At locations with stone paneling, set units by adhering to stone paneling with water-cleanable epoxy adhesive. Hold adhesive back from exposed edges of joints to allow for grouting.
- B. Stone Base: At locations with stone paneling, set units firmly against setting spots. Locate setting spots at anchors and spaced not more than **18 inches (450 mm)** apart unless otherwise indicated. Provide no fewer than two anchors per piece for stone base up to **48 inches (1200 mm)** in length, plus one additional anchor for each additional **24 inches (600 mm)** of length.
- C. Stone Base: At locations without stone paneling, adhere units to plywood backing with full spread of water-cleanable epoxy adhesive. Hold adhesive back from exposed edges of joints to allow for grouting.

- D. Stone Base: At locations without stone paneling, adhere units to gypsum board with full spread of [**organic**] [**water-cleanable epoxy**] adhesive. Hold adhesive back from exposed edges of joints to allow for grouting.
- E. Assemble indicated multiple-piece stone base by bonding joints with stone adhesive as units are set. Mask areas adjacent to joints to prevent adhesive smears. Clamp units in place to ensure that surfaces are properly aligned and joints are minimum width.
- F. [**Grout**] [**Point**] joints after setting stone.
- G. Fill[**indicated**] joints with sealant after setting [**and grouting**] [**and pointing**] stone.

3.5 GROUTING JOINTS

- A. Grout stone to comply with ANSI A108.10.
 - 1. Use sanded grout mixture for joints wider than **1/8 inch (3 mm)**.
 - 2. Use unsanded grout mixture for joints **1/8 inch (3 mm)** and narrower.
- B. Remove temporary shims before grouting.
- C. Tool joints uniformly and smoothly with plastic tool.

3.6 POINTING JOINTS WITH MORTAR

- A. Prepare stone-joint surfaces for pointing with mortar by removing temporary shims, dust, and mortar particles. Where setting spots occur at joints, rake out excess setting mortar or plaster to a depth of not less than **1/2 inch (13 mm)**.
- B. Point stone joints by placing pointing mortar in layers of not more than **3/8 inch (10 mm)**. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer. Apply mortar first to areas where depths are greater than surrounding areas until a uniform depth is formed.
- C. Tool joints when pointing mortar is thumbprint hard. Use a round jointer having a diameter **1/8 inch (3 mm)** larger than width of joint.

3.7 JOINT-SEALANT INSTALLATION

- A. Prepare joints and apply sealants of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants." Remove temporary shims before applying sealants.

3.8 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean stone base as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.

- B. Remove and replace stone base of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective stone base.
 - 3. Defective joints, including misaligned joints.
 - 4. Stone base and joints not matching approved Samples and mockups.
 - 5. Stone base not complying with other requirements indicated.
- C. Replace in a manner that results in stone base that matches approved Samples and mockups, complies with other requirements, and shows no evidence of replacement.
- D. Clean stone base no fewer than six days after completion of grouting and pointing, using clean water and soft rags or stiff-bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage stone.
- E. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions and recommendations.

3.9 PROTECTION

- A. Protect stone surfaces, edges, and corners from construction damage. Use securely fastened untreated wood, plywood, or heavy cardboard to prevent damage.
- B. Before inspection for Substantial Completion, remove protective coverings and clean surfaces.

END OF SECTION 097516