Copyright 2010 by The American Institute of Architects (AIA)

Exclusively published and distributed by Architectural Computer Services, Inc. (ARCOM) for the AIA

SECTION 097513 - STONE PANELING

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.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section includes anchored stone paneling for the following interior applications:

Wall paneling.

Column facing.

Units with carving or inscriptions.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 033000 "Cast-in-Place Concrete" for installing concrete inserts for anchoring stone paneling.

Section 042000 "Unit Masonry" for installing masonry inserts for anchoring stone paneling.

Section 079200 "Joint Sealants" for sealing expansion joints in stone paneling.

Section 093033 "Stone Tiling" for stone wall tile.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

If needed, insert list of conference participants not mentioned in Section 013100 "Project Management and Coordination."

* + - 1. ACTION SUBMITTALS
				1. Product Data: For each[**variety of stone,**] stone accessory, and manufactured product.
				2. LEED Submittals:

First "Product Certificates for Credit MR 5" Subparagraph below applies to LEED-NC, LEED-CS, and LEED for Schools.

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.

"Product Certificates for Credit MR 5" Subparagraph below applies to LEED-CI. Retain option for Credit MR 5, Option 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.

First subparagraph below applies to LEED-CI Credit MR 5, Option 1 and Option 2.

Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.

First subparagraph below applies to LEED-CI Credit MR 5, Option 2.

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.

"Product Data for Credit IEQ 4.1" Subparagraph below applies to LEED-NC, LEED-CI, and LEED-CS; coordinate with requirements for sealants.

Product Data for Credit IEQ 4.1: For sealants, documentation including printed statement of VOC content.

"Laboratory Test Reports for Credit IEQ 4.1" Subparagraph below applies to LEED for Schools.

Laboratory Test Reports for Credit IEQ 4.1: For 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."

* + - * 1. Shop Drawings: Show fabrication and installation details for stone paneling system, including dimensions and profiles of stone units.

Show locations and details of joints both within stone paneling system and between stone paneling system and other finish materials.

Show locations and details of anchors, including locations of supporting construction.

Show direction of veining, grain, or other directional pattern.

Include large-scale shaded drawings of [**decorative surfaces**] [**and**] [**inscriptions**].

* + - * 1. Samples for Initial Selection: For joint materials involving color selection.

Generally retain "Samples for Verification" Paragraph below, especially for more variable varieties where Samples may serve to define acceptable range of colors, patterns, etc.

* + - * 1. Samples for Verification:

Section 013300 "Submittal Procedures" requires that Samples for verification "show the full range of color and texture variations expected"; however, this requirement may be inadequate for stone varieties that exhibit variations in color and veining. First subparagraph below may provide better control.

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.

For each color of [**grout**] [**pointing mortar**] [**and**] [**sealant**] required.

If retaining subparagraph below, usually include more specific description of required Samples or indicate on Drawings the area of work to be represented by Samples.

For [**carving**] [**and**] [**inscriptions**].

Retain "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor.

* + - * 1. Delegated-Design Submittal: For stone paneling assembly.
			1. INFORMATIONAL SUBMITTALS

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + - * 1. Qualification Data: For [**Installer**] [**fabricator**] [**professional engineer**].

Retain "Material Test Reports" Paragraph below for material test reports that are Contractor's responsibility.

* + - * 1. Material Test Reports:

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.

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. CLOSEOUT SUBMITTALS
				1. Maintenance Data: For stone paneling to include in maintenance manuals. Include product data for stone-care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.
			2. QUALITY ASSURANCE

Retain "Fabricator Qualifications" Paragraph below if required by Project size, fabrication, or installation details.

* + - * 1. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate stone paneling similar to that required for this Project, and whose products have a record of successful in-service performance.

Usually retain one of two "Installer Qualifications" paragraphs below. Generally retain first for undivided responsibility if Contractor is required to assume responsibility for engineering. Delete both if not required by Project size, fabrication, or installation details.

* + - * 1. Installer Qualifications: Fabricator of stone paneling.
				2. Installer Qualifications: A firm or individual experienced in installing stone paneling similar in material, design, and extent to that indicated for this Project, whose work has a record of successful in-service performance.
				3. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

Retain first subparagraph below for large-scale mockup or include in Section 014000 "Quality Requirements." Indicate portion of wall represented by mockup on Drawings or draw mockup as separate element.

Build mockup of typical wall area as shown on Drawings.

Retain first subparagraph below for limited mockups.

Build mockups for the following kinds of stone paneling:

First five subparagraphs below are examples only. Revise to suit Project or indicate extent of each type on Drawings.

Typical stone wall paneling, not less than 72 inches (1800 mm) long by 96 inches (2400 mm) high.

Typical stone wainscot paneling, not less than 72 inches (1800 mm) long by full wainscot height.

Typical column facing, one complete column.

Grouting or pointing of joints.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Retain subparagraph below if the intention is to make an exception to the default requirement in Section 014000 "Quality Requirements" for demolishing and removing mockups.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. PRECONSTRUCTION TESTING

Retain "Preconstruction Sealant Adhesion and Compatibility Testing" Paragraph below if specifying sealants in this Section.

* + - * 1. 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. DELIVERY, STORAGE, AND HANDLING
				1. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, and other causes.

Lift stone with wide-belt slings; do not use wire rope or ropes that might cause staining. Move stone, if required, using dollies with cushioned wood supports.

Store stone on wood A-frames or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to stone. Ventilate under covers to prevent condensation.

* + - * 1. Mark stone units, on surface that will be concealed after installation, with designations used on Shop Drawings to identify individual stone units. Orient markings on vertical panels so that they are right side up when units are installed.
				2. 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.
				3. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
			1. FIELD CONDITIONS
				1. 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.
				2. Field Measurements: Verify dimensions of construction to receive stone paneling by field measurements before fabrication and indicate measurements on Shop Drawings.
			2. COORDINATION
				1. Coordinate installation of inserts that are to be embedded in concrete or masonry and similar items to be used by stone paneling Installer for anchoring and supporting stone paneling. Furnish setting drawings, templates, and directions for installing such items and deliver to Project site in time for installation.
				2. Time delivery and installation of stone paneling to avoid extended on-site storage and to coordinate with work adjacent to stone paneling.
1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures, see Section 016000 "Product Requirements."

* + - 1. MANUFACTURERS

Delete third option in "Source Limitations for Stone" Paragraph below if not using other stone Sections or if other Sections do not require same stone varieties.

* + - * 1. 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.

For stone types that include same list of varieties and sources, provide same variety from same source for each.

Examination of blocks is usually only done for large installations and involves traveling to quarry or to shop where blocks are sawed into slabs, which is frequently not the fabrication shop.

Make quarried blocks available for examination by Architect.

When blocks are not selected at the quarry, subparagraph below may allow some control over range of color and other visual characteristics. Supplier must have adequate stock of slabs to allow selection, or procedure below is not beneficial. Retaining below may add cost because supplier may increase prices to account for rejected slabs.

Make stone slabs available for examination by Architect.

Architect will select aesthetically acceptable slabs[**and will indicate aesthetically unacceptable portions of slabs**].

Segregate slabs selected for use on Project and mark backs indicating approval.

Subparagraph below may be advantageous for stone that is highly variable; otherwise, delete below.

Mark and photograph aesthetically unacceptable portions of slabs as directed by Architect.

Retain "Varieties and Sources" Paragraph below and delete stone-type articles below if specifying stone varieties and sources in Section 044200 "Exterior Stone Cladding." Specifying all stone types in one Section helps ensure uniformity of stone supplied under different Sections.

* + - * 1. Varieties and Sources: Subject to compliance with requirements, provide stone of varieties and from sources complying with Section 044200 "Exterior Stone Cladding."
			1. PERFORMANCE REQUIREMENTS

Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for design.

* + - * 1. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stone paneling system.
				2. General: Design stone anchors and anchoring systems according to ASTM C 1242.

Model building codes and ASCE/SEI 7 establish criteria for buildings subject to earthquake motions. Coordinate requirements with structural engineer. Verify requirements of authorities having jurisdiction.

* + - * 1. Seismic Performance: Stone paneling system shall withstand the effects of earthquake motions determined according to [**ASCE/SEI 7**] <**Insert requirement**>.

Component Importance Factor is 1.0 unless the structure is in Seismic Use Group III and failure of stone paneling system could impair continued operation of facility, in which case the Component Importance Factor is 1.5.

Component Importance Factor: [**1.5**] [**1.0**].

Delete "Varieties and Sources" Paragraph in "Manufacturers" Article and retain one or more of first eight articles below to describe stone types used if not specifying stone types in Section 044200 "Exterior Stone Cladding." If retaining articles describing stone types here and only one type from each category is required, retain the generic name and use on Drawings instead of a stone-type designation; otherwise, copy and re-edit article retained for each type required, inserting a different stone-type designation each time.

* + - 1. GRANITE <**Insert drawing designation**>

Some varieties of granite that are suitable for interior use do not comply with ASTM C 615; verify that granite selected will comply before retaining "Material Standard" Paragraph below.

* + - * 1. Material Standard: Comply with ASTM C 615.

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Granite shall be fabricated within 500 miles (800 km) of Project site.

"Description" Paragraph below is an example of a generic description that can be retained and revised for a nonproprietary specification.

* + - * 1. Description: Uniform, [**fine**] [**medium**]-grained, [**white**] [**pink**] [**gray**] [**black**] <**Insert color**> stone[**without veining**].

For a more explicit specification, retain "Varieties and Sources" Paragraph below and name specific products.

* + - * 1. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

Retain "Cut" Paragraph below if variety has veining and is cut parallel (fleuri cut) as well as perpendicular (vein cut) to the plane of the veining.

* + - * 1. Cut: [**Vein**] [**Fleuri**].

Retain "Orientation of Veining" Subparagraph below if retaining vein cut.

Orientation of Veining: [**Horizontal**] [**Vertical**] [**As indicated**].

Retain first paragraph below only if available and applicable.

* + - * 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
				2. Finish: [**Polished**] [**Honed**] [**Thermal**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. LIMESTONE <**Insert drawing designation**>
				1. Material Standard: Comply with ASTM C 568.

Usually retain one of three options in "Classification" Subparagraph below. If naming varieties and sources, 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 very porous limestone, such as shell limestone; second, to oolitic limestone; and third, to dolomitic limestone.

Classification: [**I Low**] [**II Medium**] [**III High**] Density.

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Limestone shall be fabricated within 500 miles (800 km) of Project site.

If retaining "Description" Paragraph below, retain one of three options. Coordinate with classification choice above. Description can serve as a salient characteristic if varieties other than those named are allowed and can be deleted if only specific named varieties are allowed.

* + - * 1. Description: [**Dolomitic**] [**Oolitic**] [**Shell**] limestone.
				2. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

Retain "Varieties and Sources" Paragraph below if Indiana limestone is required. If retaining below, retain "II Medium Density" and "Oolitic" options above. Revise below if stone from a particular quarry is required.

* + - * 1. Varieties and Sources: Indiana oolitic limestone quarried in Lawrence, Monroe, or Owen Counties, Indiana.

Select and Standard grades are hard to get in large sizes; gray is more plentiful than buff. Verify availability with producers.

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.

Retain "Cut" Paragraph below if variety has veining and is cut parallel (fleuri cut) as well as perpendicular (vein cut) to the plane of the veining. Delete if variety retained, such as Indiana limestone, has no veining.

* + - * 1. Cut: [**Vein**] [**Fleuri**].

Retain "Orientation of Veining" Subparagraph below if retaining vein cut.

Orientation of Veining: [**Horizontal**] [**Vertical**] [**As indicated**].

Retain first paragraph below only if available and applicable. Matched blocks are not possible with Indiana limestone.

* + - * 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.

Retain last option in "Finish" Paragraph below for Indiana limestone.

* + - * 1. 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**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. MARBLE <**Insert drawing designation**>

Many marble varieties that are suitable for interior use do not comply with ASTM C 503; verify that marble selected will comply before retaining "Material Standard" Paragraph below.

* + - * 1. Material Standard: Comply with ASTM C 503[**, Classification I Calcite**] [**, Classification II Dolomite**] [**, Group A**] [**, Group B**] [**, Group C**] [**, Group D**].

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Marble shall be fabricated within 500 miles (800 km) of Project site.

"Description" Paragraph below is an example of a generic description that can be retained and revised for a nonproprietary specification. Description is for a crystalline calcite marble; revise to describe other marble varieties if required.

* + - * 1. Description: Uniform, fine- to medium-grained, [**white**] <**Insert color**> stone with only slight veining.

For a more explicit specification, retain "Varieties and Sources" Paragraph below and name specific products.

* + - * 1. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

Retain "Cut" Paragraph below if variety has veining and is available either cut parallel (fleuri cut) or perpendicular (vein cut) to the plane of the veining.

* + - * 1. Cut: [**Vein**] [**Fleuri**].

Retain "Orientation of Veining" Subparagraph below if retaining vein cut.

Orientation of Veining: [**Horizontal**] [**Vertical**] [**As indicated**].

Retain first paragraph below only if available and applicable.

* + - * 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
				2. Finish: [**Polished**] [**Honed**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. QUARTZ-BASED STONE <**Insert drawing designation**>

Retain one of first three options in "Material Standard" Paragraph below; for bluestone, retain third and fourth options.

* + - * 1. Material Standard: Comply with ASTM C 616, [**Classification I Sandstone**] [**Classification II Quartzitic Sandstone**] [**Classification III Quartzite**] [**, except for minimum free silica content**].

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Quartz-based stone shall be fabricated within 500 miles (800 km) of Project site.
				2. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

* + - * 1. Finish: [**Sand rubbed**] [**Natural cleft**] [**Thermal**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. SERPENTINE <**Insert drawing designation**>

If retaining this article, retain one of two options in "Material Standard" Paragraph below. Classification I Exterior requires lower absorption and higher strength; verify that serpentine selected complies with this classification before retaining.

* + - * 1. Material Standard: Comply with ASTM C 1526, [**Classification I Exterior**] [**Classification II Interior**].

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Serpentine shall be fabricated within 500 miles (800 km) of Project site.
				2. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

Retain first paragraph below only if available and applicable.

* + - * 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
				2. Finish: [**Polished**] [**Honed**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. SLATE <**Insert drawing designation**>

If retaining this article, retain one of two options in "Material Standard" Paragraph below. Classification I Exterior requires lower absorption and better acid resistance in addition to higher strength; verify that slate selected complies with this classification before retaining.

* + - * 1. Material Standard: Comply with ASTM C 629, [**Classification I Exterior**] [**Classification II Interior**].

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Slate shall be fabricated within 500 miles (800 km) of Project site.
				2. 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.

"Description" Paragraph above is an example of a generic description that can be retained and revised for a nonproprietary specification. For a more explicit specification, retain "Varieties and Sources" Paragraph below and name specific products.

* + - * 1. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

* + - * 1. Finish: [**Honed**] [**Sand rubbed**] [**Natural cleft**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. TRAVERTINE <**Insert drawing designation**>

If retaining this article, retain one of two options in "Material Standard" Paragraph below. Classification I Exterior requires higher strength; verify that travertine selected complies with this classification before retaining.

* + - * 1. Material Standard: Comply with ASTM C 1527, [**Classification I Exterior**] [**Classification II Interior**].

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Travertine shall be fabricated within 500 miles (800 km) of Project site.
				2. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

Usually retain vein cut in "Cut" Paragraph below. Fleuri-cut travertine is often called "cross cut travertine." See Evaluations.

* + - * 1. Cut: [**Vein**] [**Fleuri**].

Retain "Orientation of Veining" Subparagraph below if retaining vein cut.

Orientation of Veining: [**Horizontal**] [**Vertical**] [**As indicated**].

Retain first paragraph below only if available and applicable.

* + - * 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.

Retain "Filling" Paragraph below if filling is required.

* + - * 1. Filling: Fill pores on faces of stone with cementitious filler of color [**selected by Architect**] [**matching Architect's sample**].
				2. Finish: [**Polished**] [**Honed**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. OTHER STONE <**Insert drawing designation**>

Usually replace "Other Stone" in title of this article with common name or varietal name of stone, as used on Drawings.

* + - * 1. Material Standards:

Maximum Absorption per ASTM C 97/C 97M: <**Insert required value**>.

Minimum Compressive Strength per ASTM C 170/C 170M: <**Insert required value**>.

Minimum Flexural Strength per ASTM C 880/C 880M: <**Insert required value**>.

Retain first "Regional Materials" Paragraph below for LEED-NC, LEED-CS, or LEED for Schools Credit MR 5 and LEED-CI Credit MR 5, Option 2; before retaining, verify availability of materials that comply.

* + - * 1. 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.

Retain "Regional Materials" Paragraph below for LEED-CI Credit MR 5, Option 1; before retaining, verify availability of materials that comply.

* + - * 1. Regional Materials: Stone shall be fabricated within 500 miles (800 km) of Project site.
				2. 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**]:

<**Insert, in separate subparagraphs, names of varieties and producers, distributors, or importers**>.

* + - * 1. Finish: [**Polished**] [**Honed**] [**Sand rubbed**] [**Natural cleft**] [**As indicated**] [**Match Architect's sample**] <**Insert finish**>.

Retain paragraph below for added quality control if required.

* + - * 1. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. SETTING MATERIALS

Retain "Molding Plaster" Paragraph below for standard setting of stone in locations where moisture is not a concern. For wet areas, use mortar for setting spots.

* + - * 1. Molding Plaster: ASTM C 59/C 59M.

Retain "Portland Cement," "Hydrated Lime," and "Aggregate" paragraphs below if using mortar for setting spots.

* + - * 1. Portland Cement: ASTM C 150, Type I or Type II.

Retain "Low-Alkali Cement" Subparagraph below if recommended by stone source to limit staining.

Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.

* + - * 1. Hydrated Lime: ASTM C 207, Type S.
				2. Aggregate: ASTM C 144.
				3. Water: Potable.
			1. GROUT

Retain this article if using grouts. Grouts may be used for stone joints less than 3/16 inch (5 mm) wide; point wider joints with mortar.

* + - * 1. Grout Colors: [**Match stone**] [**As indicated by manufacturer's designations**] [**Match Architect's samples**] [**As selected by Architect from manufacturer's full range**].

Retain grout types from "Sand-Portland Cement Grout, "Standard Cement Grout," "Polymer-Modified Tile Grout," and "Water-Cleanable Epoxy Grout" paragraphs below. Coordinate with installation requirements. Insert colors for each grout type or indicate in a schedule.

Grout in "Sand-Portland Cement Grout" Paragraph below is field-mixed portland cement and fine-graded sand. Delete if only prepackaged products are acceptable or if sanded grout is not required. Sanded grout is generally used for joint widths 1/8 inch (3 mm) or wider. Avoid sand-portland cement grout for stone with honed or polished finish; sand can scratch the stone when grout is spread and wiped.

* + - * 1. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate to produce required color.

Standard cement grouts and polymer-modified tile grouts are prepackaged products and are available either sanded or unsanded. Sanded grout is generally used for joint widths 1/8 inch (3.2 mm) or wider; unsanded grout is generally used for joint widths 1/8 inch (3 mm) or narrower. Avoid sanded grouts for stone with honed or polished finish; sand can scratch the stone when grout is spread and wiped.

* + - * 1. Standard Cement Grout: ANSI A118.6, packaged.

Grout Type: [**Sanded**] [**Unsanded**].

* + - * 1. Polymer-Modified Tile Grout: ANSI A118.7, packaged.

Retain "Manufacturers" Subparagraph and list of manufacturers below to require products from manufacturers listed or a comparable product from other manufacturers.

[Manufacturers](http://www.specagent.com/LookUp/?ulid=6735&mf=04&src=wd): 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**]:

[Bostik, Inc](http://www.specagent.com/LookUp/?uid=123456835347&mf=04&src=wd).

[C-Cure](http://www.specagent.com/LookUp/?uid=123456835348&mf=04&src=wd).

[Custom Building Products](http://www.specagent.com/LookUp/?uid=123456835349&mf=04&src=wd).

[DAP Inc](http://www.specagent.com/LookUp/?uid=123456835350&mf=04&src=wd).

[Jamo Inc](http://www.specagent.com/LookUp/?uid=123456835351&mf=04&src=wd).

[Laticrete International, Inc.](http://www.specagent.com/LookUp/?uid=123456835352&mf=04&src=wd)

[MAPEI Corporation.](http://www.specagent.com/LookUp/?uid=123456835353&mf=04&src=wd)

[Mer-Krete Systems; ParexLahabra, Inc.](http://www.specagent.com/LookUp/?uid=123456835354&mf=04&src=wd)

[Prospec; Bonsal American; a division of Oldcastle Architectural Products Group.](http://www.specagent.com/LookUp/?uid=123456835355&mf=04&src=wd)

[Southern Grouts & Mortars, Inc.](http://www.specagent.com/LookUp/?uid=123456835356&mf=04&src=wd)

[Summitville Tiles, Inc.](http://www.specagent.com/LookUp/?uid=123456835357&mf=04&src=wd)

[TEC, Specialty Construction Brands, Inc.; an H. B. Fuller company.](http://www.specagent.com/LookUp/?uid=123456835358&mf=04&src=wd)

<**Insert manufacturer's name**>.

Retain one of two "Polymer Type" subparagraphs below or delete both and allow Contractor to choose polymer type.

Polymer Type: [**Acrylic resin**] [**or**] [**ethylene vinyl acetate**], in dry, redispersible form, packaged with other dry ingredients.

Polymer Type: [**Acrylic resin**] [**or**] [**styrene-butadiene rubber**] in liquid-latex form for addition to packaged dry-grout mix.

Grout Type: [**Sanded**] [**Unsanded**].

Water-cleanable epoxy grout is more resistant to staining than portland cement-based grouts. Water-cleanable epoxy grout is also the preferred grout for certain stone types that are prone to warping due to water absorption from setting materials and grouts (water-cleanable epoxy grout contains very little water). See Evaluations.

* + - * 1. Water-Cleanable Epoxy Grout: ANSI A118.3, packaged, chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.

Retain "Manufacturers" Subparagraph and list of manufacturers below to require products from manufacturers listed or a comparable product from other manufacturers.

[Manufacturers](http://www.specagent.com/LookUp/?ulid=6736&mf=04&src=wd): 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**]:

[Boiardi Products; a QEP company](http://www.specagent.com/LookUp/?uid=123456835359&mf=04&src=wd).

[Bostik, Inc](http://www.specagent.com/LookUp/?uid=123456835360&mf=04&src=wd).

[C-Cure](http://www.specagent.com/LookUp/?uid=123456835361&mf=04&src=wd).

[Custom Building Products](http://www.specagent.com/LookUp/?uid=123456835362&mf=04&src=wd).

[Jamo Inc](http://www.specagent.com/LookUp/?uid=123456835363&mf=04&src=wd).

[Laticrete International, Inc](http://www.specagent.com/LookUp/?uid=123456835364&mf=04&src=wd).

[MAPEI Corporation](http://www.specagent.com/LookUp/?uid=123456835365&mf=04&src=wd).

[Mer-Krete Systems; ParexLahabra, Inc](http://www.specagent.com/LookUp/?uid=123456835366&mf=04&src=wd).

[Prospec; Bonsal American; a division of Oldcastle Architectural Products Group](http://www.specagent.com/LookUp/?uid=123456835367&mf=04&src=wd).

[Summitville Tiles, Inc](http://www.specagent.com/LookUp/?uid=123456835368&mf=04&src=wd).

[TEC, Specialty Construction Brands, Inc.; an H. B. Fuller company](http://www.specagent.com/LookUp/?uid=123456835369&mf=04&src=wd).

<**Insert manufacturer's name**>.

* + - 1. POINTING MORTAR MATERIALS

Use pointing mortar instead of grout for joints 3/16 inch (5 mm) and wider.

Retain "Portland Cement" Paragraph below for portland cement-lime mixes or for mortar mixed at Project site.

* + - * 1. Portland Cement: ASTM C 150, Type I or Type II. Provide natural color or white cement as required to produce mortar color indicated.

Retain "Low-Alkali Cement" Subparagraph below if recommended by stone source to limit staining.

Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.

* + - * 1. Hydrated Lime: ASTM C 207, Type S.

Retain "Mortar Pigments" Paragraph below for colored portland cement-lime mix or for pigments added to mortar mixed at Project site.

* + - * 1. 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.

Retain "Products" Subparagraph and list of manufacturers and products below to require specific products or a comparable product from other manufacturers.

[Products](http://www.specagent.com/LookUp/?ulid=6737&mf=04&src=wd): 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**]:

[Davis Colors; True Tone Mortar Colors](http://www.specagent.com/LookUp/?uid=123456835371&mf=04&src=wd).

[Lanxess Corporation; Bayferrox Iron Oxide Pigments](http://www.specagent.com/LookUp/?uid=123456835372&mf=04&src=wd).

[Solomon Colors; SGS Mortar Colors](http://www.specagent.com/LookUp/?uid=123456835373&mf=04&src=wd).

<**Insert manufacturer's name; product name or designation**>.

* + - * 1. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime.

Colored portland cement-lime mix allows better color control than does job-mixed, portland cement-lime mortar with pigment added.

* + - * 1. 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.

Retain "Products" Subparagraph and list of manufacturers and products below to require specific products or a comparable product from other manufacturers.

[Products](http://www.specagent.com/LookUp/?ulid=6738&mf=04&src=wd): 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**]:

[Holcim (US) Inc.](http://www.specagent.com/LookUp/?uid=123456835374&mf=04&src=wd); Rainbow Mortamix Custom Color Cement/Lime.

[Lafarge North America Inc.](http://www.specagent.com/LookUp/?uid=123456835375&mf=04&src=wd); Eaglebond.

[Lehigh Cement Company](http://www.specagent.com/LookUp/?uid=123456835376&mf=04&src=wd); Lehigh Custom Color Portland/Lime Cement.

<**Insert manufacturer's name; product name or designation**>.

* + - * 1. Aggregate: ASTM C 144, except with 100 percent passing No. 16 (1.18-mm) sieve.

White Aggregates: Natural white sand or ground white stone.

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

* + - * 1. Water: Potable.
			1. SEALANTS
				1. 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.

Use mildew-resistant joint sealant at plumbing fixtures and for control and expansion joints in toilet rooms[**and other wet locations**].

Coordinate joint sealant types retained in "Mildew-Resistant Joint Sealant" and "Joint Sealant" subparagraphs below with applicable subparagraph titles used in Part 2 articles in Section 079200 "Joint Sealants" in which various sealant types are specified.

Acid-curing silicone sealants may etch polished marble. Before retaining products, verify that they will not stain stone.

Mildew-Resistant Joint Sealant: [**Mildew resistant, single component, nonsag, neutral curing, silicone**] [**Single component, nonsag, mildew resistant, acid curing, silicone**] <**Insert joint sealant**>.

Joint Sealant: [**Latex**] [**Acrylic based**] [**Butyl rubber based**] [**Single component, nonsag, neutral curing, silicone; Class 25**] <**Insert joint sealant**>.

Retain "VOC Content" Subparagraph below if required for LEED-NC, LEED-CI, or LEED-CS Credit IEQ 4.1. VOC content limit is that for architectural sealants.

VOC Content: [**250**] <**Insert value**> g/L.

Retain first subparagraph below if required for LEED for Schools Credit IEQ 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."

Revise subparagraph below if color matching is not possible with sealant products selected, which may be the case with mildew-resistant sealants from some manufacturers.

Colors: Provide colors of exposed sealants to match other joints in stone adjoining sealed joints unless otherwise indicated.

Retain "Sealant for Filling Kerfs" Paragraph below with one of three options for stone set with anchors other than wire tiebacks. If using sealant-filled joints, using same sealant eliminates compatibility problems. If retaining first option, delete three following subparagraphs and list of manufacturers and products. If retaining third option, verify suitability of sealant. Silicone sealants often stain porous, light-colored stone. See Evaluations in Section 079200 "Joint Sealants" for sealant information.

* + - * 1. Sealant for Filling Kerfs: [**Same sealant used for joints in dimension stone**] [**Single-component, nonsag, urethane sealant; Class 25, Use T (traffic), and Use M (masonry) that complies with applicable requirements in Section 079200 "Joint Sealants" and that does not stain stone**] [**Single-component, nonsag, neutral-curing, medium- to high-modulus silicone sealant; Class 25, Use NT (nontraffic), and Use M (masonry) that complies with applicable requirements in Section 079200 "Joint Sealants" and that does not stain stone**].

Retain "Products" Subparagraph and list of manufacturers and products below to require specific products or a comparable product from other manufacturers.

[Products](http://www.specagent.com/LookUp/?ulid=6739&mf=04&src=wd): 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**]:

First four products below are urethane sealants.

BASF Building Systems; MasterSealNP.

BASF Building Systems; MasterSeal CR195.

[Sika Corporation](http://www.specagent.com/LookUp/?uid=123456835378&mf=04&src=wd); Sikaflex - 1a.

[Tremco Incorporated](http://www.specagent.com/LookUp/?uid=123456835380&mf=04&src=wd); Vulkem 116.

First four products below are silicone sealants.

[BASF Building Systems](http://www.specagent.com/LookUp/?uid=123456835377&mf=04&src=wd); Omniseal 50.

Tremco; Spectrem 2.

<**Insert manufacturer's name; product name or designation**>.

Retain "VOC Content" Subparagraph below if required for LEED-NC, LEED-CI, or LEED-CS Credit IEQ 4.1. VOC content limit is that for architectural sealants.

VOC Content: [**250**] <**Insert value**> g/L.

Retain subparagraph below if required for LEED for Schools Credit IEQ 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."

* + - 1. STONE ANCHORS AND ATTACHMENTS
				1. Fabricate anchors from stainless steel, ASTM A 240/A 240M or ASTM A 666, Type 304.

Fasteners for Stainless-Steel Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F 593 (ASTM F 738M) for bolts and ASTM F 594 (ASTM F 836M) for nuts, Alloy Group 1 (A1).

* + - * 1. Fabricate dowels from stainless steel, ASTM A 276, Type 304.

Retain first paragraph below if required.

* + - * 1. Fabricate anchors from extruded aluminum, ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

Fasteners for Extruded-Aluminum Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F 593 (ASTM F 738M) for bolts and ASTM F 594 (ASTM F 836M) for nuts, Alloy Group 1 (A1).

Revise "Anchor Support Grids" Paragraph below if other finishes or materials are required or are acceptable. Grids are also available in stainless steel or with factory-applied paint in lieu of hot-dip galvanized coating.

* + - * 1. Anchor Support Grids: Roll-formed steel channels, of size and shape required for application indicated, formed from galvanized-steel sheet not less than 0.108 inch (2.8 mm) thick and complying with ASTM A 653/A 653M, G90 (Z275).

Fittings and Fasteners: System manufacturer's standard components of design, size, and material required to securely attach grids to building structure and stone anchors to grids. Fabricate components in contact with stone from same material specified for anchors.

No ASTM standard exists for wire used as a tie or anchor, but building codes do define wire gage or diameter and noncorrosive requirements. See details in MIA's "Dimension Stone - Design Manual VII." Retain third option in "Wire Tiebacks" Paragraph below if staining might be a problem.

* + - * 1. Wire Tiebacks: [**No. 9 AWG copper or copper-alloy**] [**or**] [**0.120-inch- (3.0-mm-) diameter, stainless-steel**] wire.

Delete "Dovetail Slots" Paragraph below if not applicable or if specifying products in Section 033000 "Cast-in-Place Concrete."

* + - * 1. Dovetail Slots: Furnish dovetail slots with filler strips of slot size required to receive anchors provided, fabricated from 0.034-inch- (0.86-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275).

Surface-mounted anchors are an effective means of meeting seismic requirements without compromising fire ratings. Systems that use grids or setting spots may project farther from wall surface than some that do not; verify dimensional requirements of various systems before revising "Direct-Mount Anchoring Systems" Paragraph below.

* + - * 1. Direct-Mount Anchoring Systems: Stainless-steel[**or aluminum**] stone anchors designed to be applied directly to wall surfaces[**or to metal grids**]. System is secured to wall framing, furring, or sheet-metal reinforcing strips built into wall with[**stainless-steel**] self-drilling screws. Anchors fit into kerfs or holes in edges of stone panels[**and do not need setting spots**].

Retain "Products" Subparagraph and list of manufacturers and products below to require specific products or a comparable product from other manufacturers.

[Products](http://www.specagent.com/LookUp/?ulid=6740&mf=04&src=wd): 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**]:

[Halfen Anchoring Systems; Meadow Burke](http://www.specagent.com/LookUp/?uid=123456835381&mf=04&src=wd).

[Heckmann Building Products Inc](http://www.specagent.com/LookUp/?uid=123456835382&mf=04&src=wd).

[Hohmann & Barnard, Inc](http://www.specagent.com/LookUp/?uid=123456835383&mf=04&src=wd).

<**Insert manufacturer's name**>.

* + - 1. STONE ACCESSORIES
				1. Temporary Setting Shims: Rigid plastic shims, nonstaining to stone, sized to suit joint thickness.
				2. Setting Shims for Direct-Mount Anchoring Systems: Strips of resilient plastic or neoprene, nonstaining to stone, of thickness needed to prevent point loading of stone on anchors and of depths to suit anchors without intruding into required depths of pointing materials.
				3. 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.

Before retaining "Stone Sealer" Paragraph below, verify that it is required and recommended for stone type used.

* + - * 1. 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.

Retain "Manufacturers" Subparagraph and list of manufacturers below to require products from manufacturers listed or a comparable product from other manufacturers.

[Manufacturers](http://www.specagent.com/LookUp/?ulid=6741&mf=04&src=wd): 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**]:

[Bostik, Inc](http://www.specagent.com/LookUp/?uid=123456835384&mf=04&src=wd).

[Custom Building Products](http://www.specagent.com/LookUp/?uid=123456835385&mf=04&src=wd).

[Hillyard, Inc](http://www.specagent.com/LookUp/?uid=123456835386&mf=04&src=wd).

[HMK Stone Care; ACI International](http://www.specagent.com/LookUp/?uid=123456835387&mf=04&src=wd).

[Miracle Sealants Company](http://www.specagent.com/LookUp/?uid=123456835388&mf=04&src=wd).

[Stone Care International](http://www.specagent.com/LookUp/?uid=123456835389&mf=04&src=wd).

[Summitville Tiles, Inc](http://www.specagent.com/LookUp/?uid=123456835390&mf=04&src=wd).

<**Insert manufacturer's name**>.

* + - 1. STONE FABRICATION, GENERAL
				1. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.

Retain subparagraph below if stone varieties used require repairs.

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.

* + - * 1. Fabricate stone paneling in sizes and shapes required to comply with requirements indicated.

Retain applicable references in three subparagraphs below. No specific reference for slate or sandstone currently exists, but related information is included in MIA's "Dimension Stone - Design Manual VII." Data are also available from product sources and fabricators.

For granite, comply with recommendations in NBGQA's "Specifications for Architectural Granite."

For marble, comply with recommendations in MIA's "Dimension Stone - Design Manual VII."

For limestone, comply with recommendations in ILI's "Indiana Limestone Handbook."

* + - * 1. Cut stone to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by applicable stone association.

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.

Clean sawed backs of stones to remove rust stains and iron particles.

Dress joints straight and at right angle to face unless otherwise indicated.

Cut and drill sinkages and holes in stone for anchors, supports, and lifting devices as indicated or needed to set stone securely in place; shape beds to fit supports.

Provide openings, reveals, and similar features as needed to accommodate adjacent work.

* + - * 1. 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.
				2. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

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**].

* + - 1. STONE WALL PANELING

Usually delete first paragraph below. Review and approval of actual panel layout can provide a high degree of control over aesthetic effect, but can also add considerable cost.

* + - * 1. Arrange panels in shop or other suitable space in proposed orientation and sequence for examination by Architect. Mark units with temporary sequence numbers to indicate position in proposed layout.

Lay out one elevation at a time if approved by Architect.

Notify Architect seven days in advance of date and time when layout will be available for viewing.

Provide lighting of similar type and level as that of final installation for viewing layout unless otherwise approved by Architect.

Rearrange panels as directed by Architect until layout is approved.

Retain first subparagraph below for maximum flexibility in rearranging layout. If all units are not cut from modular-size panels or if more than one unit is cut from a single modular-size panel, some exceptions may have to be allowed.

Do not trim nonmodular-size units to less than modular size until after Architect's approval of layout, unless otherwise approved by Architect.

Mark backs of units and Shop Drawings with sequence numbers based on approved layout. Mark backs of units to indicate orientation of units in completed Work.

Retain size from "Nominal Thickness" Paragraph below or revise to suit Project. 3/4 inch (20 mm) is minimum thickness for granite, marble, and serpentine, and is typical for most interior paneling. 1 inch (25 mm) is minimum thickness for interior panels of slate and travertine. Minimum thickness of limestone and quartz-based stone depends on the variety used; typically 1-1/4 inches (32 mm) for dolomitic limestone and 2 inches (50 mm) for oolitic limestone and quartzite. Large panels require thicker stone, and ceiling heights more than 96 inches (2400 mm) require thicker panels or intermediate support.

* + - * 1. Nominal Thickness: [**3/4 inch (20 mm)**] [**7/8 inch (22 mm)**] [**1 inch (25 mm)**] [**1-1/4 inches (32 mm)**] [**2 inches (50 mm)**] unless otherwise indicated.

Options in first paragraph below are examples only. Retain one or revise to suit Project. Back checking of stone paneling less than 1 inch (25 mm) thick is not a preferred method to allow clearance of substrate projections.

* + - * 1. Control depth of stone to maintain minimum clearances of [**3/4 inch (20 mm)**] [**1 inch (25 mm)**] between backs of panels and structural members, fireproofing if any, backup walls, and other work behind stone. Do not back check stone less than 1 inch (25 mm) thick.

Options in first paragraph below are examples only. Grouted joints are typically 1/16 or 1/8 inch (1.5 or 3 mm) wide; mortar pointed joints 1/4 or 3/8 inch (6 or 10 mm) wide; and sealant-filled joints 1/8, 1/4, or 3/8 inch (3, 6, or 10 mm) wide. Revise to suit Project.

* + - * 1. Cut stone to produce uniform joints [**1/16 inch (1.5 mm)**] [**1/8 inch (3 mm)**] [**1/4 inch (6 mm)**] [**3/8 inch (10 mm)**] <**Insert dimension**> wide and in locations indicated.

First paragraph below is an example only. Usually delete and detail corners on Drawings. Delete for stone varieties not mitered.

* + - * 1. Quirk-miter corners unless otherwise indicated. Fabricate for anchorage in top and bottom bed joints of corner units.

Depending on nature and extent of carving involved, it may be necessary to develop an allowance for this work and specify providers.

* + - * 1. Carve and cut [**inscriptions**] [**and**] [**decorative surfaces**]. Use skilled stone carvers experienced in the successful performance of work similar to that indicated.

Alternative in first paragraph below is less expensive than above; it also does not have depth of relief of above.

* + - * 1. Abrasively etch [**inscriptions**] [**and**] [**decorative surfaces**].

Laser etching in first paragraph below produces virtually no relief but can be used to reproduce photographic images on polished stone.

* + - * 1. Laser etch [**inscriptions**] [**and**] [**decorative surfaces**].

Retain "Pattern Arrangement" Paragraph below if using marble or other stone with natural markings that allow pattern arrangement.

* + - * 1. Pattern Arrangement: Fabricate and arrange panels with veining and other natural markings to comply with the following requirements:

Retain one of first four subparagraphs below. First three apply only to vein-cut stone (cut perpendicular to bedding plane); fourth applies to fleuri-cut stone (cut parallel to bedding plane).

Arrange panels with veining horizontal.

Arrange panels with veining vertical.

Arrange panels with veining as indicated on Drawings.

Arrange panels in blend pattern.

Retain applicable requirement(s) in six subparagraphs below for vein-cut stone (cut perpendicular to bedding plane). Complement pattern description with drawing indications as required.

Book match units, single-course height.

First subparagraph below is suitable only for paneling that is two courses high.

Book match units, both vertically and horizontally.

First subparagraph below is suitable for paneling that is two or more courses high.

Book match units in each course. No matching is required between successive courses.

Slip match units, single-course height.

First subparagraph below is suitable only for paneling that is two courses high.

Slip match units, both vertically and horizontally.

Subparagraph below is suitable for paneling that is two or more courses high.

Slip match units in each course. No matching is required between successive courses.

* + - 1. STONE COLUMN FACING

Retain size from "Nominal Thickness" Paragraph below or revise to suit Project. 3/4 inch (20 mm) is minimum thickness for granite, marble, and serpentine, and is typical for most interior paneling. 1 inch (25 mm) is minimum thickness for interior panels of slate and travertine. Minimum thickness of limestone and quartz-based stone depends on the variety used; typically 1-1/4 inches (32 mm) for dolomitic limestone and 2 inches (50 mm) for oolitic limestone and quartzite. Large panels require thicker stone, and ceiling heights more than 96 inches (2400 mm) require thicker panels or intermediate support.

* + - * 1. Nominal Thickness: [**3/4 inch (20 mm)**] [**7/8 inch (22 mm)**] [**1 inch (25 mm)**] [**1-1/4 inches (32 mm)**] [**2 inches (50 mm)**] unless otherwise indicated.
				2. Joints: [**1/16-inch- (1.5-mm-) wide grouted**] [**1/8-inch- (3-mm-) wide grouted**] [**1/8-inch- (3-mm-) wide, sealant-filled**] [**1/4-inch- (6-mm-) wide, mortar-pointed**] [**1/4-inch- (6-mm-) wide, sealant-filled**] [**3/8-inch- (10-mm-) wide, mortar-pointed**] [**3/8-inch- (10-mm-) wide, sealant-filled**] <**Insert dimension and description**> joints.

First paragraph below is an example only. Usually delete and detail corners on Drawings. Delete for stone varieties not mitered.

* + - * 1. Quirk-miter corners unless otherwise indicated. Install anchorage in top and bottom bed joints of corner units.

Retain "Pattern Arrangement" Paragraph below if using marble or other stone with natural markings that allow pattern arrangement.

* + - * 1. Pattern Arrangement: Fabricate and arrange panels with veining and other natural markings to comply with the following requirements:

Arrange panels with veining horizontal.

Arrange panels with veining vertical.

Arrange panels with veining as indicated on Drawings.

* + - 1. MIXES
				1. Spotting Plaster: Stiff mix of molding plaster and water.
				2. 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.

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.

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.

* + - * 1. Setting Mortar: Comply with ASTM C 270, Proportion Specification.

Retain one of two options in "Type" Subparagraph below or retain "Mix Proportions" Subparagraph below. Setting mortar does not need to be very strong because it primarily acts as a shim, holding the stone out from the wall. Mortar with a low portland cement content will shrink less as it sets.

Type: [**N**] [**O**].

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.

* + - * 1. 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:

Retain "Pigmented Pointing Mortar," "Packaged Portland Cement-Lime Mix Mortar," or "Colored-Aggregate Pointing Mortar" Subparagraph below. Ratio in first applies only to pigment types included in "Pointing Mortar Materials" Article. Other pigments, if inserted, may require different limitations.

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.

Packaged Portland Cement-Lime Mix Mortar: Use portland cement-lime mix of selected color.

Colored-Aggregate Pointing Mortar: Produce color required by combining colored aggregates with portland cement of selected color.

Retain one of two options in "Type" Subparagraph below or retain "Mix Proportions" Subparagraph below. Pointing mortar does not need to be very strong unless it is subject to vandalism or is supporting the weight of stone panels above. Mortar with a low portland cement content will shrink less as it sets, minimizing cracking.

Type: [**N**] [**O**].

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.

* + - * 1. Grout: Comply with mixing requirements of referenced ANSI standards and with manufacturer's written instructions.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine surfaces to receive stone paneling and conditions under which stone paneling will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone paneling.
				2. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of stone paneling.
				3. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. SETTING STONE, GENERAL

Retain or revise paragraphs in this article if applicable to Project; delete if not.

* + - * 1. 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.
				2. 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.
				3. Contiguous Work: Provide reveals and openings as required to accommodate contiguous work.
				4. 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.
				5. Erect stone units level, plumb, and true with uniform joint widths. Use temporary shims to maintain joint width.
				6. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.

Retain first subparagraph below if sealing joints is not specified in this Section.

Sealing of expansion and other joints is specified in Section 079200 "Joint Sealants."

Keep expansion joints free of plaster, mortar, grout, and other rigid materials.

* + - 1. CONSTRUCTION TOLERANCES

Tolerances in "Variation from Plumb," "Variation from Level," "Variation of Linear Building Line," "Variation in Cross-Sectional Dimensions," "Variation in Joint Width," and "Variation in Plane between Adjacent Stone Units (Lipping)" paragraphs below are more stringent than those published by the Brick Industry Association for unit masonry and are generally appropriate for smooth-finished stone. Revise tolerances for natural-cleft, thermal, and similar finishes.

* + - * 1. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/8 inch in 96 inches (3 mm in 2400 mm), 1/4 inch (6 mm) maximum.
				2. 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.
				3. Variation of Linear Building Line: For position shown in plan and related portion of walls and partitions, 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.
				4. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed plus or minus 1/8 inch (3 mm).
				5. 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.

Revise or delete "Variation in Plane between Adjacent Stone Units (Lipping)" Paragraph below for natural-cleft, thermal, and similar finishes.

* + - * 1. Variation in Plane between Adjacent Stone Units (Lipping): Do not exceed 1/32-inch (0.8-mm) difference between planes of adjacent units.
			1. INSTALLATION OF STONE PANELING

Delete first paragraph below if using direct-mount anchoring system without setting spots.

* + - * 1. Set units firmly against setting spots. Locate setting spots at anchors and spaced not more than 18 inches (450 mm) apart across back of unit, but provide no fewer than one setting spot per 2 sq. ft. (0.18 sq. m) unless otherwise indicated.

Retain "Moisture Exposure" Subparagraph below if stone paneling is subject to moisture, including condensation.

Moisture Exposure: Use portland cement mortar for setting spots where stone is applied to inside face of exterior walls and [**where indicated**] <**Insert wet locations**>.

Retain first paragraph below if using direct-mount anchoring system.

* + - * 1. Set units on direct-mount anchoring system with anchors securely attached to stone and to backup surfaces. Comply with anchoring recommendations in ASTM C 1242.

Provide compressible filler in ends of dowel holes and bottoms of kerfs to prevent end bearing of dowels and anchor tabs on stone. Fill remainder of anchor holes and kerfs with sealant for filling kerfs.

Set stone supported on clips or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths and to prevent point loading of stone on anchors. Hold shims back from face of stone a distance at least equal to width of joint.

Retain one of two "Minimum Anchors" paragraphs below and revise to suit Project. First is based on anchorage requirement in the International Building Code for slab-type exterior veneer panels not more than 20 sq. ft. (1.86 sq. m) in area; second is based on MIA's "Dimension Stone - Design Manual VII" for stone paneling.

* + - * 1. Minimum Anchors: Provide anchors at a maximum of 24 inches (600 mm) o.c. around perimeter of stone panels with a minimum of four anchors per panel.
				2. Minimum Anchors: Provide a minimum of four anchors per panel up to 12 sq. ft. (1.1 sq. m) in face area, plus a minimum of two additional anchors for each additional 8 sq. ft. (0.7 sq. m).

Delete first paragraph below if all joints are filled with sealant.

* + - * 1. [**Grout**] [**Point**] joints after setting stone.
				2. Fill[**indicated**] joints with sealant after setting [**and grouting**] [**and pointing**] stone.
			1. GROUTING JOINTS
				1. Grout stone to comply with ANSI A108.10.

Retain two subparagraphs below if retaining both sanded and unsanded grouts in "Grout" Article. Do not use sanded grout for joints with polished stone, especially softer stones such as marble; sand can scratch the stone when grout is spread and wiped.

Use sanded grout mixture for joints wider than 1/8 inch (3 mm).

Use unsanded grout mixture for joints 1/8 inch (3 mm) and narrower.

* + - * 1. Remove temporary shims before grouting.
				2. Tool joints uniformly and smoothly with plastic tool.
			1. POINTING JOINTS WITH MORTAR
				1. 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).
				2. 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.
				3. 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.
			2. JOINT-SEALANT INSTALLATION
				1. 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. ADJUSTING AND CLEANING
				1. In-Progress Cleaning: Clean stone paneling as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
				2. Remove and replace stone paneling of the following description:

Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.

Defective stone paneling.

Defective joints, including misaligned joints.

Stone paneling and joints not matching approved Samples and mockups.

Stone paneling not complying with other requirements indicated.

* + - * 1. Replace in a manner that results in stone paneling that matches approved Samples and mockups, complies with other requirements, and shows no evidence of replacement.

Revise the words "six days" in first paragraph below to minimum needed for curing mortar and sealants as applicable.

* + - * 1. Clean stone paneling 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.
				2. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions and recommendations.
			1. PROTECTION
				1. Protect stone surfaces, edges, and corners from construction damage. Use securely fastened untreated wood, plywood, or heavy cardboard to prevent damage.
				2. Before inspection for Substantial Completion, remove protective coverings and clean surfaces.