SECTION 097519 - STONE TRIM

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

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 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section includes interior [**stone trim**] [**, including**] [**stone base**] [**and**] [**stone window stools**].
				2. Related Requirements:

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

Section 079200 "Joint Sealants" for sealing joints in interior stone trim with elastomeric sealants.

* + - 1. DEFINITIONS
				1. ILI – Indiana Limestone Institute.
				2. MIA – Marble Institute of America.
				3. NBGQA – North American Building Granite Quarriers Association.
			2. 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.

If needed, insert list of conference participants.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each variety of stone, stone accessory, and manufactured product.
				5. Sustainable Design Submittals:
				6. Shop Drawings: Show fabrication and installation details for stone trim, including dimensions and profiles of stone units.

Show locations and details of joints.

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

* + - * 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, and so forth.

* + - * 1. Samples for Verification:

For each stone type indicated, in sets of Samples not less than 12 inches square. Include [**two**] [**three**] [**four**] [**five**] 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.

Coordinate "Qualification Data" paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.

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 five 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. 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 similar to that required for this Project, and whose products have a record of successful in-service performance.
				2. Installer Qualifications: A firm or individual experienced in installing interior stone trim 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. 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 typical interior stone trim as shown on Drawings.

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

* + - 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.
				2. 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 units, so that they are right side up when units are installed.
				3. 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.
				4. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
			2. FIELD CONDITIONS
				1. Maintain air and material temperatures to comply with requirements of installation material manufacturers, but not less than 50 deg F during installation and for seven days after completion.
				2. Field Measurements: Verify dimensions of construction to receive interior stone trim by field measurements before fabrication, and indicate measurements on Shop Drawings.
			3. COORDINATION
				1. Time delivery and installation of interior stone trim to avoid extended on-site storage and to coordinate with work adjacent to interior stone trim.
1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 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, from a single quarry 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.

Retain one or more of first eight articles below to describe stone types used. 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 C615; verify that granite selected will comply before retaining "Material Standard" paragraph below.

* + - * 1. Material Standard: Comply with ASTM C615.

"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**] 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 Director’s Representative's sample**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative's samples for color, finish, and other stone characteristics relating to aesthetic effects.
			1. LIMESTONE <**Insert drawing designation**>
				1. Material Standard: Comply with ASTM C568.

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.

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" option in "Classification" paragraph and "Oolitic" option in "Description" paragraph. 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**] [**Machine tooled, six bats per 1 inch**] [**Machine tooled, eight bats per 1 inch**] [**As indicated**] [**Match Director’s Representative's sample**] [**, matching standard ILI finish**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative'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 C503; verify that marble selected will comply before retaining "Material Standard" paragraph below.

* + - * 1. Material Standard: Comply with ASTM C503[**, Classification I Calcite**] [**, Classification II Dolomite**] [**, Group A**] [**, Group B**] [**, Group C**] [**, Group D**].

"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 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 Director’s Representative's sample**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative'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 C1526, [**Classification I Exterior**] [**Classification II Interior**].
				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 Director’s Representative's sample**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative'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 C629, [**Classification I Exterior**] [**Classification II Interior**].
				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 Director’s Representative's sample**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative'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 C1527, [**Classification I Exterior**] [**Classification II Interior**].
				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 the 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 Director’s Representative**] [**matching Director’s Representative's sample**].
				2. Finish: [**Polished**] [**Honed**] [**As indicated**] [**Match Director’s Representative's sample**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative'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 according to ASTM C97: <**Insert required value**>.

Minimum Compressive Strength according to ASTM C170: <**Insert required value**>.

Minimum Flexural Strength according to ASTM C880: <**Insert required value**>.

* + - * 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: [**Polished**] [**Honed**] [**Sand rubbed**] [**Natural cleft**] [**As indicated**] [**Match Director’s Representative's sample**].

Retain paragraph below for added quality control if required.

* + - * 1. Match Director’s Representative'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 C59.

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

* + - * 1. Portland Cement: ASTM C150, 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 C114.

* + - * 1. Hydrated Lime: ASTM C207, Type S.
				2. Aggregate: ASTM C144.
				3. Water: Potable.
				4. Adhesives, General: Use only adhesives formulated for stone and ceramic tile and recommended by their manufacturer for the application indicated.

Adhesive in "Organic Adhesive" paragraph below can be used for adhering stone trim to gypsum board partitions; water-cleanable epoxy adhesive has higher bond strength than organic adhesive, but organic adhesive is easier to use.

* + - * 1. Organic Adhesive: ANSI A136.1, Type I.

[Products:](http://www.specagent.com/Lookup?ulid=6759) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457035990); OmniGrip® Premium Lightweight Tile Adhesive.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457035993).; Laticrete 15 Premium Mastic.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457035994); Type 1™.

Or equal.

Water-cleanable epoxy adhesive can be used for adhering stone trim to gypsum board partitions or to stone paneling. Water-cleanable epoxy adhesive is the preferred setting material for certain stone types that are prone to warping due to water absorption from various mortar types and from water-emulsion organic adhesives. (Although below is water cleanable, it contains very little water.)

* + - * 1. Water-Cleanable Epoxy Adhesive: ANSI A118.3.

[Products:](http://www.specagent.com/Lookup?ulid=6760) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457036003); EBM­Lite™ Premium Epoxy Bonding Mortar - 100% Solids.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457036006).; Laticrete Latapoxy® 300 Adhesive.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457036007); Kerapoxy® 410.

Or equal.

Retain "Stone Adhesive" paragraph below if joints are required for trim and are bonded rather than grouted, pointed, or sealant filled.

* + - * 1. Stone Adhesive: Two-part, epoxy-resin stone adhesive with an initial set time of not more than two hours at 70 deg F.

Color: [**Clear**] [**Match stone**].

Epoxy Adhesive:

[Products:](http://www.specagent.com/Lookup?ulid=6761) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Akemi North America](http://www.specagent.com/Lookup?uid=123457036050); Akepox.

[Axson North America, Inc](http://www.specagent.com/Lookup?uid=123457036051).; Akabond Epoxy.

[Bonstone Materials Corporation](http://www.specagent.com/Lookup?uid=123457036052); Touchstone.

Or equal.

* + - 1. GROUT

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

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

Retain grout types from "Sand-Portland Cement Grout, "Standard Cement Grout," "High-Performance Cement 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 or wider. Avoid sand-portland cement grout for stone with honed or polished finish; sand can scratch 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 or wider; unsanded grout is generally used for joint widths 1/8 inch or narrower. Avoid sanded grouts for stone with honed or polished finish; sand can scratch stone when grout is spread and wiped.

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

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

* + - * 1. High-Performance Cement Grout: ANSI A118.7, packaged.

[Products:](http://www.specagent.com/Lookup?ulid=6735) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457128643); Prism® Ultimate Performance Grout.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457128646).; Laticrete Permacolor® Grout.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457128647); Ultracolor® Plus FA.

Or equal.

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 the Evaluations.

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

[Products:](http://www.specagent.com/Lookup?ulid=6736) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457128656); CEG-IG 100% Solids Industrial Grade Epoxy Grout.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457128658).; Laticrete Spectralock® 2000 IG.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457128659); Kerapoxy® IEG CQ.

Or equal.

* + - 1. POINTING MORTAR MATERIALS

Use pointing mortar instead of grout for joints 3/16 inch and wider.

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

* + - * 1. Portland Cement: ASTM C150, 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 C114.

* + - * 1. Hydrated Lime: ASTM C207, 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 C979. Pigments shall have a record of satisfactory performance in mortar.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=6737) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Davis Colors](http://www.specagent.com/Lookup?uid=123457128664).

[Euclid Chemical Company (The); an RPM company](http://www.specagent.com/Lookup?uid=123457128667).

[Solomon Colors, Inc](http://www.specagent.com/Lookup?uid=123457128666).

Or equal.

* + - * 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.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=6738) Subject to compliance with requirements, available manufacturers offering 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=123457128668).

[Lafarge North America Inc](http://www.specagent.com/Lookup?uid=123457128669).

[Lehigh Hanson; HeidelbergCement Group](http://www.specagent.com/Lookup?uid=123457128670).

Or equal.

* + - * 1. Aggregate: ASTM C144, except with 100 percent passing No. 16 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. STONE ANCHORS AND ATTACHMENTS
				1. Fabricate anchors from stainless steel, ASTM A240 or ASTM A666, Type 304.

Fasteners for Stainless-Steel Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.

* + - * 1. Fabricate dowels from stainless steel, ASTM A276, Type 304.

Retain first paragraph below if required.

* + - * 1. Fabricate anchors from extruded aluminum, ASTM B221, Alloy 6063-T6.

Fasteners for Extruded-Aluminum Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.

No ASTM standard exists for wire used as a tie or anchor; however, 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- diameter, stainless-steel**] wire.
			1. STONE ACCESSORIES
				1. Temporary Setting Shims: Rigid plastic shims, nonstaining to stone, sized to suit joint thickness.
				2. 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.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=6741) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457128679).

[HMK Stone Care System; ACI International](http://www.specagent.com/Lookup?uid=123457128681).

Prosoco, Inc.

Or equal.

* + - 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 Director’s Representative.

* + - * 1. Fabricate stone trim 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.

* + - * 1. 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.

Retain subparagraphs below for polished or honed granite and marble. Delete if not using moldings or if moldings are simple, flat shapes with chamfered or eased edges.

Produce moldings with machines having abrasive shaping wheels made to reverse contour of molding shape; do not sculpt moldings.

Miter moldings at corners, unless otherwise indicated, with edges of miters slightly eased at outside corners.

* + - * 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 TRIM
				1. Flat Stone Trim:

Nominal Thickness: [**3/4 inch**] [**7/8 inch**] [**1-1/4 inches**] [**1-1/2 inches**] unless otherwise indicated.

Edge Detail: [**Straight, slightly eased at corners**] [**3/8-inch bevels**] [**3/4-inch radii**] [**3/8-inch radii**] [**As indicated**].

Joints: [**1/16-inch- wide grouted joints**] [**1/8-inch- wide grouted joints**] [**1/8-inch- wide, sealant-filled joints**] [**Bonded joints, 1/32 inch or less in width**].

* + - * 1. Molded Stone Trim:

Profile: Match [**profiles indicated on Drawings**] [**existing**].

Joints: [**1/16-inch- wide grouted joints**] [**1/8-inch- wide grouted joints**] [**1/8-inch- wide, sealant-filled joints**] [**Bonded joints, 1/32 inch or less in width**].

* + - * 1. Stone Base:

Nominal Thickness: [**3/4 inch**] [**7/8 inch**] [**1-1/4 inches**] unless otherwise indicated.

Top-Edge Detail: [**Straight, slightly eased at corner**] [**3/8-inch bevel**] [**3/4-inch radius**] [**3/8-inch radius**] [**As indicated**].

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.

Joints: [**1/16-inch- wide grouted joints**] [**1/8-inch- wide grouted joints**] [**1/8-inch- wide, sealant-filled joints**] [**Bonded joints, 1/32 inch or less in width**].

Usually delete subparagraph below and indicate locations of joints on Drawings.

Locate joints at midpoints between adjacent paneling joints unless otherwise indicated.

* + - * 1. Stone Window Stools:

Nominal Thickness: [**3/4 inch**] [**7/8 inch**] [**1-1/4 inches**] unless otherwise indicated.

Edge Detail: [**Straight, slightly eased at corners**] [**3/8-inch bevel at top edge, bottom corner slightly eased**] [**3/8-inch radius at top edge, bottom corner slightly eased**] [**3/4-inch bullnose**] [**1-1/2-inch laminated bullnose**] [**As indicated**].

Ends: Extend stools beyond opening as indicated and finish ends to match exposed edge.

Joints: [**1/16-inch- wide grouted joints**] [**1/8-inch- wide grouted joints**] [**1/8-inch- wide, sealant-filled joints**] [**Bonded joints, 1/32 inch or less in width**] [**Fabricate in one piece without joints**].

Fabricate window stools in one piece unless otherwise indicated.

Retain subparagraph below if window stools are assembled with bonded joints in shop. If units are too long to be shop assembled, delete below and retain paragraph in Part 3 that specifies assembly during setting.

Assemble window stools that consist of more than one piece by bonding joints with stone adhesive. Mask areas adjacent to joints to prevent adhesive smears. Clamp units to temporary bracing to ensure that window stools are properly aligned and joints are minimum width.

* + - 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 C270, Proportion Specification.

Retain one of two options in first 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**] [**Type 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 C270, Proportion Specification, for mortar types indicated. Provide pointing mortar mixed to match Director’s Representative'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 first 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**] [**Type 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 trim and conditions under which stone trim will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone trim.
				2. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of stone trim.
				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 six 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, 1/4 inch maximum.
				2. Variation from Level: For lintels, sills, window stools, chair rails, horizontal bands, horizontal grooves, and other conspicuous lines, do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 3/8 inch 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, 1/4 inch in 20 feet, or 3/8 inch maximum.
				4. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed plus or minus 1/8 inch.
				5. Variation in Joint Width: Do not vary from average joint width more than plus or minus 1/16 inch 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 difference between planes of adjacent units.
			1. INSTALLATION

Retain first "Stone Trim at Stone Paneling" paragraph below for trim applied over interior stone facing. Retain second "Stone Trim at Paneling" paragraph for trim set adjacent to or slightly overlapping rather than applied over stone facing.

* + - * 1. Stone Trim at 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.
				2. Stone Trim at Stone Paneling: Set units firmly against setting spots. Locate setting spots at anchors and spaced not more than 18 inches apart unless otherwise indicated. Provide no fewer than two anchors per piece for stone trim up to 48 inches in length, plus one additional anchor for each additional 24 inches of length.

For best work, retain first "Stone Trim at Gypsum Board" paragraph below and use plywood strips, slightly narrower than stone units, in place of gypsum board.

* + - * 1. Stone Trim at Gypsum Board: 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.

Retain "Stone Trim at Gypsum Board" paragraph below for cost saving and for fire-rated partitions; reinforce gypsum board behind base and trim with metal bridging or fire-retardant wood blocking.

* + - * 1. Stone Trim at Gypsum Board: 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.

Retain first "Stone Base at Stone Paneling" paragraph below for base applied over interior stone facing. Retain second "Stone Base at Stone Paneling" paragraph for base set adjacent to or slightly overlapping rather than applied over stone facing.

* + - * 1. Stone Base at 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.
				2. Stone Base at Stone Paneling: Set units firmly against setting spots. Locate setting spots at anchors and spaced not more than 18 inches apart unless otherwise indicated. Provide no fewer than two anchors per piece for stone base up to 48 inches in length, plus one additional anchor for each additional 24 inches of length.

For best work, retain first "Stone Base at Gypsum Board" paragraph below and use plywood strips, slightly narrower than stone units, in place of gypsum board.

* + - * 1. Stone Base at Gypsum Board: 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.

Retain "Stone Base at Gypsum Board" paragraph below for cost saving and for fire-rated partitions; reinforce gypsum board behind base and trim with metal bridging or fire-retardant wood blocking.

* + - * 1. Stone Base at Gypsum Board: 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.

Retain one of two "Stone Window Stools" paragraphs below.

* + - * 1. Stone Window Stools: Set stone window stools on masonry in a full bed of mortar.
				2. Stone Window Stools: Set stone window stools on wood or metal framing or wood blocking in a full bed of [**organic**] [**water-cleanable epoxy**] adhesive. Hold adhesive back from exposed edges of joints to allow for [**grouting**] [**pointing with sealant**].

Retain first paragraph below if stone trim is assembled with bonded joints at Project site.

* + - * 1. Assemble indicated multiple-piece units 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.

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.

Use unsanded grout mixture for joints 1/8 inch 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.
				2. Point stone joints by placing pointing mortar in layers of not more than 3/8 inch. 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 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 interior stone trim as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
				2. Remove and replace interior stone trim of the following description:

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

Defective stone trim.

Defective joints, including misaligned joints.

Interior stone trim and joints not matching approved Samples and mockups.

Interior stone trim not complying with other requirements indicated.

* + - * 1. Replace in a manner that results in interior stone trim 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 interior stone trim 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.

END OF SECTION 097519