SECTION 123640 - STONE COUNTERTOPS

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. SUMMARY
				1. Section includes stone countertops.

Refer to sections listed below for cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Sections listed below are for spec editor’s and design team coordination and are to remain as Editor’s Notes. Remove referenced specification sections within the body of the specification if not applicable to the project.

* + - 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. Quality Control Submittals

Qualification Data: For fabricator.

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

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, 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.

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

Include manufacturer’s installation instructions.

* + - * 1. Sustainable Design Submittals:
				2. Shop Drawings:

Include plans, sections, details, and attachments to other work.

Show locations and details of joints.

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

Samples may serve to define acceptable range of colors, patterns, and so forth, if other methods cannot be used due to cost. Stone Samples may not show full range of appearance characteristics, especially with highly variable stone types.

* + - * 1. Samples for Verification: For each stone type indicated, in sets of Samples not less than 12 inches square.

Include [**two**] [**three**] or more Samples in each set and show the full range of variations in appearance characteristics expected in the completed Work.

* + - * 1. Contract Closeout Submittals:

Maintenance Data: For stone countertops 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.

* + - 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 countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
				2. Installer Qualifications: Fabricator of stone countertops.

A mockup may be a reasonable precaution for projects that require many stone countertops but may be impractical for other applications.

* + - * 1. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.

Indicate portion of countertop represented by mockup on Drawings or draw mockup as separate element.

Build mockup of typical countertop as shown on Drawings.

* + - 1. PRECONSTRUCTION TESTING

Testing in "Preconstruction Laboratory Testing" Paragraph below is performed off-site by sealant manufacturer. Tests require many Samples, and some tests may require up to seven weeks to complete. If retaining below, also retain "Material Test Reports" Paragraph in "Quality Control Submittals" Article.

* + - * 1. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturer, for compatibility and adhesion testing according to sealant manufacturer's standard testing methods and according to Section 079200 "Joint Sealants," Samples of materials that will contact or affect joint sealants.
			1. DELIVERY, STORAGE, AND HANDLING

Consider deleting this article. Most stone countertops are lifted by hand and delivered right before installation, not stored.

* + - * 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. FIELD CONDITIONS

Indicating field measurements on Shop Drawings may be impractical. Field measurements are often taken and corresponding adjustments made right before delivering countertops for installation.

* + - * 1. Field Measurements: Verify dimensions of construction to receive stone countertops by field measurements before fabrication[**and indicate measurements on Shop Drawings**].
1. PRODUCTS

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. 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 Specification Section,**] 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.

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 Director’s Representative.

Director’s Representative 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 Director’s Representative.

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."

Delete "Varieties and Sources" Paragraph above and retain one or more of first five 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, the generic name can be retained and used on Drawings instead of a stone-type designation; otherwise, copy and re-edit article retained for each type required, inserting a drawing designation each time.

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

"Material Standard" Paragraph below is useful for nonproprietary specifications; if specific varieties and sources are named, it may not be of any value. Some varieties of granite suitable for interior use do not comply with ASTM C615; verify that granite selected will comply before retaining paragraph.

* + - * 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**] <**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 first paragraph below only if available and applicable.

* + - * 1. Cut stone from contiguous, matched slabs in which natural markings occur.
				2. Finish: [**Polished**] [**Honed**] [**Thermal**] [**As indicated**] [**Match Director’s Representative's sample**] <**Insert 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**>

"Material Standard" Paragraph below is useful for nonproprietary specifications; if specific varieties and sources are named, it may not be of any value. Many marble varieties suitable for interior use do not comply with ASTM C503; verify that marble selected complies before retaining paragraph.

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

Consider retaining "Stone Abrasion Resistance" Subparagraph below. A value of 10 is required by ASTM C503 for floors and can be considered appropriate for countertops. Verify that stone selected complies before retaining.

Stone Abrasion Resistance: Minimum value of [**10**] <**Insert value**>, based on testing according to ASTM C241 or ASTM C1353.

"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 first paragraph below only if available and applicable.

* + - * 1. Cut stone from contiguous, matched slabs in which natural markings occur.

Because marble is easily etched by food acids and is easily scratched, a honed finish is often preferred, especially in kitchens.

* + - * 1. Finish: [**Polished**] [**Honed**] [**As indicated**] [**Match Director’s Representative's sample**] <**Insert 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. SERPENTINE <**Insert drawing designation**>

"Material Standard" Paragraph below is useful for nonproprietary specifications; if specific varieties and sources are named, it may not be of any value. If retaining this article, retain one of two options in paragraph. 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**].

Consider retaining "Stone Abrasion Resistance" Subparagraph below. A value of 10 is required by ASTM C1526 for floors and can be considered appropriate for countertops. Verify that stone selected complies before retaining.

Stone Abrasion Resistance: Minimum value of [**10**] <**Insert value**>, based on testing according to ASTM C241 or ASTM C1353.

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 first paragraph below only if available and applicable.

* + - * 1. Cut stone from contiguous, matched slabs in which natural markings occur.
				2. Finish: [**Polished**] [**Honed**] [**As indicated**] [**Match Director’s Representative's sample**] <**Insert 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. SLATE <**Insert drawing designation**>

"Material Standard" Paragraph below is useful for nonproprietary specifications; if specific varieties and sources are named, it may not be of any value. If retaining this article, retain one of two options in paragraph. 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**].

Consider retaining "Stone Abrasion Resistance" Subparagraph below. A value of 8 is required by ASTM C629 for floors and may be considered appropriate for countertops. Verify that stone selected complies before retaining.

Stone Abrasion Resistance: Minimum value of [**8**] <**Insert value**>, based on testing according to ASTM C241 or ASTM C1353.

* + - * 1. 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**] <**Insert 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. 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. "Material Standards" Paragraph below is useful for nonproprietary specifications; if specific varieties and sources are named, it may not be of any value.

* + - * 1. Material Standards:

Maximum Absorption per ASTM C97: <**Insert value**>.

Minimum Compressive Strength per ASTM C170: <**Insert value**>.

Minimum Flexural Strength per ASTM C880: <**Insert value**>.

Consider retaining "Minimum Stone Abrasion Resistance per ASTM C241 or ASTM C1353" Subparagraph below. A value of 10 is generally recommended for floors and can be considered appropriate for countertops. Verify that stone selected complies before retaining.

Minimum Stone Abrasion Resistance per ASTM C241 or ASTM C1353: [**10**] <**Insert value**>.

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: [**Polished**] [**Honed**] [**Sand rubbed**] [**Natural cleft**] [**As indicated**] [**Match Director’s Representative's sample**] <**Insert 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. ADHESIVES, GROUT, SEALANTS, AND STONE ACCESSORIES
				1. General: Use only adhesives formulated for stone and ceramic tile and that are recommended by their manufacturer for the application indicated.

Generally, use water-cleanable epoxy adhesive for setting stone countertops.

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

MIA recommends water-cleanable epoxy grout for joints in countertops.

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

Retain one of two "Stone Adhesive" paragraphs below if joints in countertops are bonded rather than grouted or sealant filled.

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

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

* + - * 1. Stone Adhesive: Two-part polyester adhesive, formulated specifically for bonding stone to stone, with an initial set time of not more than two hours at 70 deg F.

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

Sealant may be required where the backsplash meets the wall even if countertop joints are grouted or bonded. If retaining "Sealant for Countertops" Paragraph below, coordinate with Section 079200 "Joint Sealants."

* + - * 1. Sealant for Countertops: Manufacturer's standard sealant that complies with applicable requirements in Section 079200 "Joint Sealants" and that will not stain the stone it is applied to.

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**] [**Single component, nonsag, neutral curing, silicone; Class 25**] <**Insert joint sealant**>.

Color: [**Clear**] [**As selected by Director’s Representative from manufacturer's full range**].

Delete "Stone Joint Splines" Paragraph below if joints are not allowed or if splined joints are not required.

* + - * 1. Stone Joint Splines: Stainless-steel or brass washers approximately 1 inch in diameter and of thickness to fit snugly in saw-cut kerf in edge of stone units.

Retain "Particleboard Subtops" or "Plywood Subtops" Paragraph below if subtops are required.

* + - * 1. Particleboard Subtops: ANSI A208.1, [**Grade M-2**] [**Grade M-2-Exterior Glue**].
				2. Plywood Subtops: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.
				3. Stone Cleaner: Specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer[**and, if a sealer is specified, by sealer manufacturer**]. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

Delete "Stone Sealer" Paragraph below if not required or recommended for stone type.

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

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.

Retain first paragraph below for multiple countertops that require a degree of matching, such as those with applied backsplashes.

* + - * 1. Grade and mark stone for final locations to produce assembled countertop units with an overall uniform appearance.
				2. Fabricate stone countertops in sizes and shapes required to comply with requirements indicated.

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 attachments.

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

Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge and with precisely formed arris slightly eased to prevent snipping, and matched at joints between units. Form corners of molded edges as indicated with outside corners slightly eased unless otherwise indicated.

Finish exposed faces of stone to comply with requirements indicated for finish of each stone type required and to match approved Samples and mockups. Provide matching finish on exposed edges of countertops, splashes, and cutouts.

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

MIA's "Dimension Stone - Design Manual VII" includes general recommendations applicable to all varieties of stone, not just marble.

* + - * 1. General: Comply with recommendations in MIA's "Dimension Stone - Design Manual VII."

Although 3/4-inch stone will generally provide adequate strength for countertops without large cutouts, where cutouts leave only a narrow strip of stone at front and back of counter, 1-1/4-inch material will provide better resistance against breakage.

* + - * 1. Nominal Thickness: Provide thickness indicated, but not less than [**3/4 inch**] [**7/8 inch**] [**1-1/4 inches**]. Gage backs to provide units of identical thickness.

Options in "Edge Detail" Paragraph below are examples only. See MIA's "Dimension Stone - Design Manual VII."

* + - * 1. Edge Detail: [**Straight, slightly eased at top**] [**3/8-inch bevel**] [**3/4-inch full bullnose**] [**1-1/4-inch full bullnose**] [**3/8-inch radius with 2-inch apron**] [**1-1/2-inch laminated bullnose**] [**As indicated**].

Revise height and thickness in "Splashes" Paragraph below to suit Project. Delete if not required.

* + - * 1. Splashes: Provide 3/4-inch thick [**backsplashes**] [**and**] [**end splashes**] unless otherwise indicated.

Height: [**4 inches**] [**As indicated**] <**Insert dimension**>.

Options in "Top-Edge Detail" Subparagraph below are examples only; retain one of first four options or revise subparagraph if details are not indicated on Drawings.

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

Retain one of two "Joints" paragraphs below. First paragraph is impossible with very large or complex countertops. If retaining second paragraph and option, indicate joint locations on Drawings.

* + - * 1. Joints: Fabricate countertops without joints.
				2. Joints: Fabricate countertops in sections for joining in field[**, with joints at locations indicated**].

Consider retaining "Joint Locations" Subparagraph below if joint locations are not indicated on Drawings.

Joint Locations: Not within 18 inches of a sink or cooktop and not where a countertop section less than 36 inches long may result, unless unavoidable.

Retain one of three "Joint Type" subparagraphs below or revise to suit Project.

Joint Type: Bonded, 1/32 inch or less in width.

Joint Type: Grouted, 1/16 inch in width.

Joint Type: Sealant-Filled, 1/16 inch in width.

Consider retaining "Splined Joints" Subparagraph below for higher-quality work. Metal splines may be an unnecessary expense at typical joints but may be advantageous if using narrow strips of stone between joints to form large openings for kitchen sinks, cooktops, and so forth. See details in MIA's "Dimension Stone - Design Manual VII."

Splined Joints: Accurately cut kerfs in edges at joints for insertion of metal splines to maintain alignment of surfaces at joints[**where indicated**]. Make width of cuts slightly more than thickness of splines to provide snug fit.[**Provide at least three splines in each joint.**]

* + - * 1. Cutouts and Holes:

Retain "Undercounter Fixtures" Subparagraph below for undercounter lavatories and sinks. Replace the word "fixtures" with "cooktops," "lavatories," "sinks," and so forth, if required. Shop fabrication usually provides better results, but large openings, such as for kitchen sinks, are better completed after top is in place to avoid possibility of breakage during delivery or installation.

Undercounter Fixtures: Make cutouts for undercounter fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

Retain one of first three subparagraphs below to describe profile of cutout edges or indicate on Drawings.

Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.

Provide vertical edges, rounded to 3/8-inch radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch into fixture opening.

Provide 3/4-inch full bullnose edges projecting 3/8 inch into fixture opening.

Retain "Counter-Mounted Fixtures" Subparagraph below for counter-mounted cooktops, lavatories, sinks, and so forth. Replace the word "fixtures" with "cooktops," "lavatories," "sinks," and so forth, if required. Shop fabrication usually provides better results, but large openings, such as for kitchen sinks, are better completed after top is in place to avoid possibility of breakage during delivery or installation.

Counter-Mounted Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

Retain "Fittings" Subparagraph below if using deck-mounted fittings or soap dispensers.

Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

1. EXECUTION
	* + 1. EXAMINATION

Coordinate conditions required by Work of this Section with requirements in other Sections in which substrates are specified.

* + - * 1. Examine substrates to receive stone countertops and conditions under which stone countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone countertops.
				2. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of stone countertops.
				3. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION

Delete first paragraph below if no preset inserts are required.

* + - * 1. Advise installers of other work about specific requirements for placement of inserts and similar items to be used by stone countertop Installer for anchoring stone countertops. Furnish installers of other work with Drawings or templates showing locations of these items.
				2. Before installing stone countertops, clean dirty or stained stone surfaces by removing soil, stains, and foreign materials. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives and rinse with clear water. Allow stone to dry before installing.
			1. CONSTRUCTION TOLERANCES

Retain, delete, or revise tolerances in this article to suit Project and office practice.

* + - * 1. Variation from Level: Do not exceed 1/8 inch in 96 inches, 1/4 inch maximum.
				2. Variation in Joint Width: Do not vary joint thickness more than one-fourth of nominal joint width.
				3. Variation in Plane at Joints (Lipping): Do not exceed 1/64-inch difference between planes of adjacent units.
				4. Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64-inch difference between edges of adjacent units, where edge line continues across joint.
			1. INSTALLATION OF COUNTERTOPS

Retain first two paragraphs below if stone countertop is installed over a plywood or particleboard subtop.

* + - * 1. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
				2. Install countertops over subtops with full spread of water-cleanable epoxy adhesive.

Retain first paragraph below if stone countertops are fastened directly to cabinets or other supports. This installation method is generally suitable only for residential work and only if countertops are adequately supported. This installation method may also be used with lavatory tops supported by steel angle framing if framing is adequately spaced for stone strength and thickness and has flush top surface.

* + - * 1. Install countertops by adhering to supports with water-cleanable epoxy adhesive.

Retain one of first two paragraphs below.

* + - * 1. Do not cut stone in field unless otherwise indicated. If stone countertops or splashes require additional fabrication not specified to be performed at Project site, return to fabrication shop for adjustment.
				2. Do necessary field cutting as stone is set. Use power saws with diamond blades to cut stone. Cut lines straight, true, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
				3. Set stone to comply with requirements indicated. Shim and adjust stone to locations indicated, with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances.[**Install anchors and other attachments indicated or necessary to secure stone countertops in place.**]

Retain one of first two paragraphs below unless joints are not allowed. Retain first paragraph for bonded joints and second paragraph for grout- or sealant-filled joints. Delete both if joints are not allowed.

* + - * 1. Bond joints with stone adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

Consider retaining one of two subparagraphs below, or both. Metal splines may be an unnecessary expense at typical joints but may be advantageous if using narrow strips of stone between joints to form large openings for kitchen sinks, cooktops, and so forth. See details in MIA's "Dimension Stone - Design Manual VII."

Install metal splines in kerfs in stone edges at joints[**where indicated**]. Fill kerfs with stone adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.

Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

* + - * 1. Space joints with 1/16-inch gap for filling with [**grout**] [**sealant**]. Use temporary shims to ensure uniform spacing.

Consider retaining one of two subparagraphs below, or both. Metal splines may be an unnecessary expense at typical joints but may be advantageous if using narrow strips of stone between joints to form large openings for kitchen sinks, cooktops, and so forth. See details in MIA's "Dimension Stone - Design Manual VII."

Install metal splines in kerfs in stone edges at joints[**where indicated**]. Fill kerfs with [**setting adhesive**] [**sealant**] before inserting splines and remove excess immediately after adjoining units are drawn into position.

Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

Retain first paragraph below if field cutting is allowed.

* + - * 1. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Use power saws with diamond blades to cut stone. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

Retain one of first two paragraphs below depending on joining methods chosen. Usually adhere splashes to either countertop or wall, but not both, and fill remaining joint with sealant to allow some movement. MIA recommends adhering to wall and applying sealant to joint at countertop.

* + - * 1. Install backsplashes and end splashes by adhering to countertops with stone adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Leave 1/16-inch gap between splashes and wall for filling with sealant. Use temporary shims to ensure uniform spacing.
				2. Install backsplashes and end splashes by adhering to wall with water-cleanable epoxy adhesive. Leave 1/16-inch gap between countertop and splashes for filling with sealant. Use temporary shims to ensure uniform spacing.
				3. Grout joints to comply with ANSI A108.10. Remove temporary shims before grouting. Tool grout uniformly and smoothly with plastic tool.
				4. Apply sealant to [**joints**] [**and**] [**gaps specified for filling with sealant**]; comply with Section 079200 "Joint Sealants." Remove temporary shims before applying sealant.
			1. ADJUSTING AND CLEANING
				1. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
				2. Remove and replace stone countertops 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 countertops.

Defective joints, including misaligned joints.

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

Interior stone countertops not complying with other requirements indicated.

* + - * 1. Replace in a manner that results in stone countertops matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.

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

* + - * 1. Clean stone countertops no fewer than six days after completion of [**sealant installation**] [**installation**], using clean water and soft rags. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that may damage stone.
				2. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions.

END OF SECTION 123640