SECTION 093033 - STONE TILING

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:

Dimension stone tile.

Stone thresholds.

Tile backing panels.

Waterproof membrane[**for thinset applications**].

Crack isolation membrane.

Metal edge strips.

* + - * 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 071326 "Self-Adhering Sheet Waterproofing"**] [**Section 071353 "Elastomeric Sheet Waterproofing"**] [**Section 071354 "Thermoplastic Sheet Waterproofing"**] [**Section 071416 "Cold Fluid-Applied Waterproofing"**] for waterproofing under thickset mortar beds.

Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in stone tile surfaces.

Section 090561.13 “Moisture Vapor Emission Control” for membranes that reduce concrete moisture vapor emissions.

Delete first subparagraph below if scratch coat is specified in this Section.

Section 092400 "Cement Plastering" for scratch coat over metal lath on wall surfaces.

Delete first subparagraph below if cementitious backer units are specified in this Section. See the Evaluations.

Section 092613 "Gypsum Veneer Plastering" for cementitious backer units.

Delete first option in first subparagraph below if cementitious backer units are specified in this Section. See the Evaluations.

Section 092900 "Gypsum Board" for glass-mat, water-resistant backer board.

Section 096340 "Stone Flooring" for stone paving and flooring other than dimension stone tile.

Section 097519 "Stone Trim" for stone base in the form of running trim rather than tile.

If allowances, unit prices, or alternates apply to Work of this Section, insert brief paragraphs here to alert Contractor, and reference appropriate Division 01 Sections for specific details. Coordinate descriptions with applicable paragraphs in Parts 2 and 3.

* + - 1. DEFINITIONS

Retain definition (s) remaining after this Section has been edited for a project.

* + - * 1. General: Definitions in the ANSI A108 series of tile installation standards apply to Work of this Section unless otherwise specified.
        2. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

"Dimension Stone Tile" paragraph below is based on definitions in ASTM C119 and in MIA's "Dimension Stone Design Manual VI."

* + - * 1. Dimension Stone Tile: Modular stone units less than 3/4 inch thick.
        2. Module Size: Actual tile size plus joint width.

Not all finishes in five paragraphs below are available for all stone varieties.

Visual test for polished finish in "Polished Finish" paragraph below requires surface flatness better than that which can be measured with a straightedge.

* + - * 1. Polished Finish: Smooth surface that produces sharp, mirrorlike reflections. Reflected images of overhead fluorescent tubes have straight lines without visible distortion when viewed at arm's length.
        2. Honed Finish: Smooth, nonreflective surface similar to that produced by grinding with a 400- to 1200-grit abrasive; with a gap not exceeding 0.005 inch when faces are tested for flatness with a 24-inch straightedge.
        3. Sand-Rubbed Finish: Uniform, fine-textured surface similar to that produced by grinding with a 40-grit abrasive; with a gap not exceeding 1/32 inch when faces are tested for flatness with a 24-inch straightedge.

The profile depth of thermal-finished stone varies, depending on stone selected. Flatness in "Thermal Finish" paragraph below is suitable for specifying most stone; increase or decrease allowable gap to suit stone selected and Project requirements.

* + - * 1. Thermal Finish: Uniform, coarse-textured surface produced by thermal shock; with a gap not exceeding 3/16 inch when faces are tested for flatness with a 24-inch straightedge.

Flatness in "Natural-Cleft Finish" paragraph below is suitable for specifying most slate and other natural-cleft stone; increase or decrease allowable gap to suit stone selected and Project requirements.

* + - * 1. Natural-Cleft Finish: Uneven surface produced by splitting stone along a natural cleavage plane; without visible tool marks and with a gap not exceeding 3/16 inch when faces are tested for flatness with a 24-inch straightedge.
      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.
      1. SEQUENCING AND SCHEDULING
         1. Sequence stone tile installation with other work to minimize possibility of damage and soiling during remainder of construction period.

Delete paragraph below if requirement is considered impractical.

* + - * 1. Install stone tile and accessories only after other finishing operations, including painting, are completed.
      1. SUBMITTALS
         1. General: 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’re specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.
         5. Sustainable Design Submittals:

Retain "Shop Drawings" paragraph below if tile installations are complex enough to justify Shop Drawings.

* + - * 1. Shop Drawings: Show locations of each type of stone tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in substrates and finished stone tile surfaces.[**Show stone thresholds.**]
        2. Samples for Initial Selection: For tile, grout, and accessories involving color selection.

Delete "Samples for Initial Selection" paragraph above if colors and other characteristics are preselected and specified or scheduled. Retain "Samples for Verification" paragraph below with or without above. Revise list of Samples to correspond with products specified.

* + - * 1. Samples for Verification:

Retain one or more of first three subparagraphs below.

Full-size units of each type of stone tile in each finish required.

Samples in first subparagraph below may be good alternatives to mockups; they will generally be smaller than most mockups but have the advantage that they can be submitted before Project is ready for constructing a mockup.

Assembled Samples with grouted joints for each type of stone tile and for each finish required, at least 36 inches square and mounted on a rigid panel. Use grout of type and in color(s) approved for completed Work.

Range Samples consisting of at least five full-size units of each type of stone tile, exhibiting extremes of the full range of color and other visual characteristics expected. Range Samples establish the standard by which individual stone tiles[**and thresholds**] are judged.

Stone thresholds in 6-inch lengths.

Metal edge strips in 6-inch lengths.

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

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

Name of each person who will be performing the work, trade certificates, and their employer’s name, business address, and telephone number.

Names and addresses of 3 similar projects that each person has worked on during the past 5 years.

Retain option if needed to establish compliance of products with characteristics specified.

* + - * 1. Product Test Reports: For tile-setting and -grouting products and stone tile.
      1. CLOSEOUT SUBMITTALS
         1. Maintenance Data: For dimension stone tile to include in maintenance manuals.
      2. MAINTENANCE MATERIAL SUBMITTALS
         1. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Revise "Dimension Stone Tile" subparagraph below to suit Project; 5 percent may be advisable for custom installations.

Dimension Stone Tile: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

* + - 1. QUALITY ASSURANCE
         1. Installer Qualifications:

Installer employs only Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.

Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of [**mud floors**] [**mud walls**] [**membranes**] [**shower receptors**] [**and**] [**large format tile**].

* + - * 1. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Build mockup of each type of stone floor tile installation.

Build mockup of each type of stone wall tile installation.

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

Procedure in "Dry-Laid Mockups" paragraph below may be more practical and less costly than typical mockups.

* + - * 1. Dry-Laid Mockups: Lay out tiles in dry-laid mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Lay out mockup of each type of stone floor tile installation.

Lay out mockup of each type of stone wall tile installation.

Maintain dry-laid mockups in an undisturbed condition until equivalent areas of the completed Work are approved to serve as mockups.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use.
         2. Store stone tile and cementitious materials on elevated platforms, under cover, and in a dry location.
         3. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
         4. Store liquid materials in unopened containers and protected from freezing.
      2. FIELD CONDITIONS
         1. Environmental Limitations: Do not install stone tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

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
         1. Source Limitations for Stone Tile[**and Thresholds**]: Obtain each stone product type from single source from single producer.

Delete first three subparagraphs below if a single named variety is required for each stone tile and threshold type.

For each stone product type, provide one stone variety.

Where two or more stone product types are identical, except for size or finish, provide same variety for each type.

Where threshold types are identical to stone tile types, except for size or finish, provide same variety.

Subparagraph below may help provide consistent appearance for each stone variety but may not always be practical or necessary. Unless large quantities of a variety of stone are used, tiles and possibly thresholds may be stock items; in which case, the supplier will have no control over which quarry location and possibly even quarry the material comes from. For varieties that exhibit a high degree of consistency, subparagraph below may be unnecessary.

Obtain each variety of stone from same location in a single quarry with resources to provide materials of consistent quality in appearance and physical properties.

* + - * 1. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.

Obtain waterproof membrane and crack isolation membrane, except for sheet products, from manufacturer of setting and grouting materials.

* + - * 1. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:

Waterproof membrane.

Crack isolation membrane.

Cementitious backer units.

Metal edge strips.

* + - 1. STONE PRODUCTS
         1. Varieties and Sources: Subject to compliance with requirements, stone products that may be incorporated into the Work include, but are not limited to, those indicated.

First option in "Abrasion Resistance of Stone Tile for Floors" Paragraph below is value required by ASTM standards for slate, quartzitic sandstone, and quartzite; second option is for limestone, marble, serpentine, and travertine; fourth option is for granite. Third option is recommended for commercial floors, stairs, and other floors with heavy foot traffic. Verify that stone varieties selected comply with requirement specified, or revise minimum value.

* + - * 1. Abrasion Resistance of Stone Tile for Floors: Provide stone with a value of not less than [**8**] [**10**] [**12**] [**25**] according to ASTM C1353 or ASTM C241.

If retaining "Minimum Static Coefficient of Friction of Stone Tile for Floors" paragraph below, verify that stone tile products selected for flooring comply with requirements. See the Evaluations for discussion on slip resistance and values of static coefficient of friction.

* + - * 1. Minimum Static Coefficient of Friction of Stone Tile for Floors: According to ASTM C1028:

Level Surfaces: 0.5 minimum.

Step Treads: 0.5 minimum.

Ramp Surfaces: 0.8 minimum.

Revise first paragraph below to suit Project. Some stones selected for specific appearance characteristics may be unable to comply with paragraph.

* + - * 1. Provide stone products that are free of defects impairing their function for use indicated, including cracks, seams, and starts.

Retain "Pattern Orientation" paragraph below only if stone varieties selected have a directional pattern. If more than one stone type is used and it is unclear whether a variety has a directional pattern, it may be better to delete paragraph and indicate pattern orientation requirements in stone tile schedules.

* + - * 1. Pattern Orientation: For stone varieties with a directional pattern, provide tile with pattern [**oriented parallel to one side of tile**] [**randomly oriented at various angles to sides of tiles**].

For stone varieties that exhibit a directional pattern, provide thresholds with pattern [**oriented parallel to**] [**oriented at an angle of 45 degrees or less to**] [**randomly oriented at various angles to**] long edges of thresholds.

Copy first paragraph below and re-edit for each stone tile type required.

Insert drawing designation. Use this designation on Drawings to identify each product.

* + - * 1. Stone Tile Type[**ST-**<**#**>]:

Generally retain one of seven "Stone Type" subparagraphs below. If acceptable varieties and sources of stone are specified and substitutions are not allowed, verify that stone selected can comply with requirements in appropriate subparagraph or delete all seven. Retaining applicable subparagraphs below can help ensure that stone supplied is sound enough for intended use.

Stone Type: Granite, complying with ASTM C615.

Stone Type: Limestone, complying with ASTM C568, Classification [**II (Medium Density)**] [**III (High Density)**].

Revise first "Stone Type" subparagraph below if marble variety selected does not comply with ASTM C503. If using marble that does not comply, consider inserting some physical property requirements that stone selected can comply with and that will help ensure that stone supplied is sound enough for intended use.

Stone Type: Marble, complying with ASTM C503, Classification [**I, Calcite**] [**II, Dolomite**].

Stone Type: Quartz-based stone, complying with ASTM C616, Classification [**II, Quartzitic Sandstone**] [**III, Quartzite**].

Stone Type: Serpentine, complying with ASTM C1526, Classification [**I, Exterior**] [**II, Interior**].

Stone Type: Slate, complying with ASTM C629, Classification [**I, Exterior**] [**II, Interior**].

Stone Type: Travertine, complying with ASTM C1527, Classification [**I, Exterior**] [**II, Interior**].

Varieties and Sources:

<**Insert name of variety and producer, distributor, or importer**>.

Retain "Cut" subparagraph below only for stones with veining that are available in different cuts; many variety names are specific to a particular cut.

Cut: [**Vein**] [**Fleuri**].

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

Edges: [**Square**] [**Beveled**] [**Eased**].

Module Size: [**6 by 6 inches**] [**6 by 12 inches**] [**12 by 12 inches**] [**300 by 300 mm**] [**18 by 18 inches**] [**500 by 500 mm**] [**As indicated**].

Nominal Tile Thickness: [**1/4 inch**] [**3/8 inch**] [**1/2 inch**] [**5/8 inch**].

Joint Width: [**Hand tight**] [**1/16 inch**] [**1/8 inch**] [**1/4 inch**] [**3/8 inch**] [**1/2 inch**].

Copy paragraph below and re-edit for each stone threshold type required.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Stone Threshold Type[**TH-**<**#**>]:

Generally retain one of seven "Stone Type" subparagraphs below. If acceptable varieties and sources of stone are specified and substitutions are not allowed, verify that stone selected can comply with requirements in appropriate subparagraph or delete all seven. Retaining applicable subparagraphs below can help ensure that stone supplied is sound enough for intended use.

Stone Type: Granite, complying with ASTM C615.

Stone Type: Limestone, complying with ASTM C568, Classification [**II (Medium Density)**] [**III (High Density)**].

Revise first "Stone Type" subparagraph below if marble variety selected does not comply with ASTM C503. If using marble that does not comply, consider inserting some physical property requirements that stone selected can comply with and that will help ensure that stone supplied is sound enough for intended use.

Stone Type: Marble, complying with ASTM C503, Classification [**I, Calcite**] [**II, Dolomite**].

Stone Type: Quartz-based stone, complying with ASTM C616, Classification [**II, Quartzitic Sandstone**] [**III, Quartzite**].

Stone Type: Serpentine, complying with ASTM C1526, Classification [**I, Exterior**] [**II, Interior**].

Stone Type: Slate, complying with ASTM C629, Classification [**I, Exterior**] [**II, Interior**].

Stone Type: Travertine, complying with ASTM C1527, Classification [**I, Exterior**] [**II, Interior**].

Varieties and Sources:

<**Insert name of variety and producer, distributor, or importer**>.

Retain "Cut" subparagraph below only for stones with veining that are available in different cuts; many variety names are specific to a particular cut.

Cut: [**Vein**] [**Fleuri**].

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

Edges: [**Square**] [**Beveled**] [**Eased**] [**As indicated**].

Nominal Threshold Thickness: [**1/4 inch**] [**3/8 inch**] [**1/2 inch**] [**5/8 inch**] [**3/4 inch**].

* + - 1. TILE BACKING PANELS
         1. Cementitious Backer Units: ANSI A118.9 or ASTM C1325, Type A, in maximum lengths available to minimize end-to-end butt joints.

[Products:](http://www.specagent.com/Lookup?ulid=277) 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=123457138802); WonderBoard® Lite Backerboard.

[Georgia-Pacific Gypsum LLC](http://www.specagent.com/Lookup?uid=123457138804); DensShield® Tile Backer.

[USG Corporation](http://www.specagent.com/Lookup?uid=123457138806); DUROCK Cement Board.

Approved equivalent.

Coordinate thickness in "Thickness" subparagraph below with products selected.

Thickness: [**1/2 inch**] [**5/8 inch**] [**As indicated**].

* + - 1. WATERPROOF MEMBRANE

ANSI A118.10 specifies waterproof membranes for use under thinset tile installations.

* + - * 1. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
        2. Chlorinated Polyethylene Sheet: ASTM D4068; Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric.

[Products:](http://www.specagent.com/Lookup?ulid=9324) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Noble Company (The)](http://www.specagent.com/Lookup?uid=123457138656); Chloraloy®.

Approved equivalent.

Nominal Thickness: 0.030 inch.

Nominal Thickness: 0.040 inch.

* + - * 1. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch minimum nominal thickness.

[Products:](http://www.specagent.com/Lookup?ulid=9326) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Mapei Corporation; Mapeguard® WP 200.

[Schluter Systems L.P](http://www.specagent.com/Lookup?uid=123457138529); KERDI.

[Schönox; HPS North America, Inc](http://www.specagent.com/Lookup?uid=123457138532).; Schonox AB.

Approved equivalent.

* + - * 1. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.

[Products:](http://www.specagent.com/Lookup?ulid=9328) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Boiardi Products Corporation; a QEP company](http://www.specagent.com/Lookup?uid=123457138534); Elastiment 344 Reinforced Waterproofing and Anti-Fracture/Crack Suppression Membrane.

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457138537); Custom® 9240 Waterproofing and Anti­Fracture Membrane.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138538).; Laticrete 9235 Waterproofing Membrane.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138539); Mapelastic 315.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138542).; S-9000.

Approved equivalent.

* + - * 1. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.

[Products:](http://www.specagent.com/Lookup?ulid=9329) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Boiardi Products Corporation; a QEP company](http://www.specagent.com/Lookup?uid=123457138549); Elastiment 644 Membrane Waterproofing System.

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457138553); RedGard® Waterproofing and Crack Prevention Membrane.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138555).; Laticrete Hydro Ban®.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138556); [**Mapelastic WaterStop**][**Mapelastic AquaDefense**] [**Mapelastic HPG**].

Approved equivalent.

* + - * 1. Latex-Portland Cement Waterproof Mortar: Flexible, waterproof mortar consisting of cement-based mix and latex additive.

[Products:](http://www.specagent.com/Lookup?ulid=9330) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Boiardi Products Corporation; a QEP company](http://www.specagent.com/Lookup?uid=123457138672); Elastiment 323 Cement Based Waterproofing, Anti-Fracture/Crack Suppression Membrane.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457186637).; Laticrete Hydro Ban® Cementitious Waterproofing Membrane.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138674); Mapelastic Turbo.

Approved equivalent.

* + - 1. CRACK ISOLATION MEMBRANES

Before retaining products listed in this article, verify that they comply with ANSI A118.12 performance level retained in "General" paragraph below. Standard performance corresponds to a 1/16-inch gap; high performance to a 1/8-inch gap.

* + - * 1. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for [**standard performance**] [**high performance**] and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
        2. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch nominal thickness.

[Products:](http://www.specagent.com/Lookup?ulid=9332) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Noble Company (The)](http://www.specagent.com/Lookup?uid=123457138684); Nobleseal CIS.

Approved equivalent.

* + - * 1. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness.

[Products:](http://www.specagent.com/Lookup?ulid=9334) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Mapei Corporation; Mapeguard® WP 200.

[Schluter Systems L.P](http://www.specagent.com/Lookup?uid=123457138692); KERDI.

[Schönox; HPS North America, Inc](http://www.specagent.com/Lookup?uid=123457138053).; Schonox AB.

Approved equivalent.

* + - * 1. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 1/8-inch nominal thickness.

[Products:](http://www.specagent.com/Lookup?ulid=9335) 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=123457160113); RedGard® Uncoupling Mat.

[Schluter Systems L.P](http://www.specagent.com/Lookup?uid=123457138696); DITRA.

Approved equivalent.

* + - * 1. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.

[Products:](http://www.specagent.com/Lookup?ulid=9337) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Boiardi Products Corporation; a QEP company](http://www.specagent.com/Lookup?uid=123457138708); Elastiment 344 Reinforced Waterproofing and Anti-Fracture/Crack Suppression Membrane.

[Custom Building Products](http://www.specagent.com/Lookup?uid=123457138711); Custom® 9240 Waterproofing and Anti­Fracture Membrane.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138712).; Laticrete Blue 92 Anti-Fracture Membrane.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138713); Mapelastic 315.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138716).; S-9000.

Approved equivalent.

* + - * 1. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.

[Products:](http://www.specagent.com/Lookup?ulid=9338) 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=123457138567); RedGard® Waterproofing and Crack Prevention Membrane.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138569).; Laticrete Fracture Ban SC.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138570); Mapeleastic CI.

Approved equivalent.

* + - * 1. Latex-Portland Cement Crack-Resistant Mortar: Flexible mortar consisting of cement-based mix and latex additive.

[Products:](http://www.specagent.com/Lookup?ulid=9339) Subject to compliance with requirements, provide one of the following:

[Boiardi Products Corporation; a QEP company](http://www.specagent.com/Lookup?uid=123457138722); Elastiment 323 Cement Based Waterproofing, Anti-Fracture/Crack Suppression Membrane.

Laticrete International, Inc.; Laticrete Hydro Ban® Cementitious Waterproofing Membrane.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138724); Mapelastic Turbo.

Approved equivalent.

* + - 1. SETTING MATERIALS
         1. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

Cleavage Membrane: Asphalt felt, ASTM D226, Type I (No. 15); or polyethylene sheeting, ASTM D4397, 4.0 mils thick.

Retain "Reinforcing Wire Fabric" subparagraph below for reinforced mortar bed.

Reinforcing Wire Fabric: Galvanized, welded-wire fabric, 2 by 2 inches by 0.062 inch in diameter; comply with ASTM A185 and ASTM A82 except for minimum wire size.

Retain "Expanded Metal Lath" subparagraph below for portland cement plaster scratch coat. Delete if scratch coat is specified in Section 092400 "Cement Plastering."

Expanded Metal Lath: Diamond-mesh lath complying with ASTM C847.

Base Metal and Finish for Interior Applications: Uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel sheet painted after fabrication into lath.

Base Metal and Finish for Exterior Applications: Zinc-coated (galvanized) steel sheet.

Configuration over Studs and Furring: Flat.

Configuration over Solid Surfaces: Self furring.

Weight: [**2.5 lb/sq. yd.**] [**3.4 lb/sq. yd.**].

A moisture mitigation system may be required over the existing concrete floor slab on grade pending existing conditions and moisture test results. Good practice is to verify and confirm during design phase so that the DOR will know if to specify and design for a moisture mitigation system to be installed prior to the installation of the mortar bed and tile. Include Section 090561.13 if required.

Moisture Vapor Emission Control Membranes: As specified in Section 090561.13 “Moisture Vapor Emission Control”.

* + - * 1. Polymer Modified Portland Cement Mortar (Thickset and Sloping Bed): ANSI A108.1.

Products: 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: Thickbed Mortar with CustomCrete Latex Mortar Admixture.

Laticrete International, Inc.: 3701 Fortified Mortar Bed.

Mapei Corporation: Plainslope RS.

Summitville Tiles, Inc. S-780 Floor Mortar Bed Mix with S-800 Mortar Bed Latex.

Approved equivalent.

* + - * 1. Standard Dry-Set Mortar (Thinset): ANSI A118.1.

[Products:](http://www.specagent.com/Lookup?ulid=12353) 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=123457138760); PremiumPlus® Non-Modified Thin-Set Mortar.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138762).; Laticrete 317 Mortar.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138763); Kerabond®.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138765).; S-777 Thin Set Mortar.

Approved equivalent.

See the Evaluations for discussion on difference between normal and nonsagging mortar.

For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.1.

Some manufacturers produce medium-bed, standard dry-set mortars. Insert a paragraph in this article if required, with wording similar to that used for "Medium-Bed, Modified Dry-Set Mortar" paragraph.

* + - * 1. Modified Dry-Set Mortar (Thinset): ANSI A118.4.

[Products:](http://www.specagent.com/Lookup?ulid=12354) 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=123457138773); FlexBond® Premium Crack Prevention Thin­set Mortar.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138775).; Laticrete 253 Gold.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138776); Ultraflex 3.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138779).; S-1100 Multi-Purpose Premium Thin Set Latex Mortar.

Approved equivalent.

Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.

See the Evaluations for discussion on difference between normal and nonsagging mortar.

For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

Some manufacturers recommend medium-bed mortars for setting large tile, although ANSI A118.4 does not contain any requirements distinguishing medium-bed mortars from other modified dry-set mortars. Medium bed mortars are typically used for large format tiles.

* + - * 1. Medium-Bed, Modified Dry-Set Mortar: Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of 5/8 inch.

[Products:](http://www.specagent.com/Lookup?ulid=12355) 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=123457138785); Complete Contact™ Fortified Mortar.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138787).; Laticrete Tri-Lite™.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138788); Ultraflor Plus.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138791).; S-1200 Multi-Purpose Premium Medium Bed Mortar.

Approved equivalent.

Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.

* + - * 1. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.

[Products:](http://www.specagent.com/Lookup?ulid=12356) 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=123457138796); FlexBond® Premium Crack Prevention Thin­set Mortar.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138797).; Laticrete 254 Platinum.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138798); Ultraflex 3.

Approved equivalent.

Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.

See the Evaluations for discussion on difference between normal and nonsagging mortar.

For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.15.

* + - * 1. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.

[Products:](http://www.specagent.com/Lookup?ulid=9345) 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=123457138739); EBM­Lite™ Premium Epoxy Bonding Mortar — 100% Solids.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138741).; Laticrete Latapoxy® 300 Adhesive.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138742); Kerapoxy 410.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138745).; S-300 Epoxy Setting Adhesive.

Approved equivalent.

Type II organic adhesive is also available but is suitable only for interior ceilings and walls subject to dry, light service or limited water exposure.

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

[Products:](http://www.specagent.com/Lookup?ulid=9346) 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=123457138582); OmniGrip® Premium Lightweight Tile Adhesive.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138584).; Laticrete 15 Premium Mastic.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138585); Type 1.

Approved equivalent.

* + - 1. GROUT MATERIALS

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 tile installed with joint widths of 1/8 inch or wider. Avoid sand-portland cement grout for stone tile with honed or polished finish.

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

Grouts in "Standard Cement Grout" and "High-Performance Tile Grout" paragraphs below are prepackaged products and are available either sanded or unsanded. Sanded grout is generally used for tile installed with joint widths of 1/8 inch or wider; unsanded grout is generally used for tile installed with joint widths of 1/8 inch or narrower. Avoid sanded grouts for stone tile with honed or polished finish.

* + - * 1. Standard Cement Grout: ANSI A118.6; with antimicrobial enhanced properties.

[Products:](http://www.specagent.com/Lookup?ulid=9347) 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=123457138597); Fusion Pro® Single Component® Grout.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138599).; 1500 Sanded Grout.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138600); Ultracolor® Plus FA.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138602).; S-687 Fungus and Mildew Resistant Unsanded Grout.

Approved equivalent.

* + - * 1. High-Performance Tile Grout: ANSI A118.7.

[Products:](http://www.specagent.com/Lookup?ulid=9348) 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=123457138614); Prism® Ultimate Performance Grout.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138616).; Laticrete Permacolor® Grout.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138617); Ultracolor® Plus FA.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138620).; S-730 ProMax Grout.

Approved equivalent.

Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.

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

[Products:](http://www.specagent.com/Lookup?ulid=9349) 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=123457138630); CEG-IG 100% Solids Industrial Grade Epoxy Grout.

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457138632).; Laticrete Spectralock® 2000 IG.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457138633); Kerapoxy® IEG CQ.

[Summitville Tiles, Inc](http://www.specagent.com/Lookup?uid=123457138636).; S-600 Setting & Grouting Epoxy.

Approved equivalent.

* + - 1. MISCELLANEOUS MATERIALS

Retain "Trowelable Patching Compounds" paragraph below if required for concrete substrates.

* + - * 1. Trowelable Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
        2. Vapor-Retarder Membrane: Polyethylene sheeting, ASTM D4397, 4.0 mils thick.

Retain "Metal Edge Strips" paragraph below if metal edge strips are required at junction with other floor finishes; revise if metal edge control joints are required.

* + - * 1. Metal Edge Strips: Angle or L-shaped, height to match stone tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; [**half-hard brass**] [**white zinc alloy**] [**nickel silver**] [**stainless steel, ASTM A276 or ASTM A666, 300 Series**] exposed-edge material.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9351) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Blanke Corporation; [www.blankecorp.com](http://www.blankecorp.com).

Dural; us.dural.com.

Schluter Systems L.P.; [www.schluter.com](http://www.schluter.com).

Approved equivalent.

Retain "Protective Coating" paragraph below if temporary protective coating is required.

* + - * 1. Protective Coating: Liquid grout-release coating that is formulated to protect exposed surfaces of stone tile against adherence of mortar and grout; compatible with stone, mortar, and grout products; easily removable after grouting is completed without damaging grout or stone tile; and recommended for use as temporary protective coating for stone tile.

Delete subparagraph below if not using floor sealer.

Floor sealer complying with "Floor Sealer" Paragraph below may be used provided it is recommended by manufacturer for use as a grout release.

* + - * 1. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming stone tile and grout surfaces, specifically approved for materials and installations indicated by stone tile producers and grout manufacturers.
        2. Floor Sealer: Colorless, stain- and slip-resistant sealer, not affecting color or physical properties of stone surfaces as recommended by stone tile producers for application indicated.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9351) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

ColorSealPro; [www.colorsealpro.com](http://www.colorsealpro.com).

[Laticrete International, Inc](http://www.specagent.com/Lookup?uid=123457194629).

Modern Stone Technologies; [www.modernstonecare.com](http://www.modernstonecare.com).

Approved equivalent.

* + - 1. FABRICATION
         1. Facial Dimensions of Stone Tiles with Polished or Honed Faces: Do not vary facial dimensions from specified dimensions by more than plus or minus 1/64 inch.
         2. Facial Dimensions of Stone Tiles with Sand-Rubbed, Natural-Cleft, or Thermal-Finished Faces: Do not vary facial dimensions from specified dimensions by more than plus or minus 1/32 inch.

Tolerance in first paragraph below is suitable for thinset applications; most stone tiles with polished and honed finishes are more precisely gaged. Revise to suit Project.

* + - * 1. Thickness of Stone Tiles with Polished, Honed, or Sand-Rubbed Finish: Do not vary from specified thickness by more than plus or minus 1/32 inch.

If retaining first paragraph below, retain one of first two options for tolerance. 1/32 inch requires gaged backs; 1/16 inch is typical of natural-cleft stone with ungaged backs. Coordinate selection with setting method.

* + - * 1. Thickness of Stone Tiles with Natural-Cleft or Thermal Finish: Do not vary average thickness of each stone tile from specified thickness by more than plus or minus [**1/32 inch**] [**1/16 inch**].
        2. Joint Surfaces: Except for specified beveled or eased edges if any, dress joint surfaces square for full depth of stone tile.

Tolerance in "Backs of Tiles" paragraph below is suitable for thinset applications; backs of most stone tiles are more precisely dressed. Revise to suit Project.

* + - * 1. Backs of Tiles: Gage units by dressing backs of tiles smooth and flat. When tested with a 24-inch straightedge, gap shall not exceed 1/32 inch.

Retain subparagraph below if ungaged slate is allowed. Revise tolerance if required and if setting method will allow.

Natural-cleft stone need not be gaged if gap does not exceed 1/16 inch when tested with a 24-inch straightedge on backs of units.

* + - * 1. Thresholds: Fabricate to size and profile as indicated or required to provide transition between adjacent floor finishes.

Revise subparagraph below as necessary or delete if accessibility for people with disabilities is not required. Where difference in floor levels exceeds 1/2 inch, a ramp with a slope not exceeding 1:12 must be used to accommodate people with disabilities; show ramps on Drawings.

Bevel edges of thresholds at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Limit height of bevel to 1/2 inch or less, and finish bevel to match face of threshold.

* + - 1. MIXING MORTARS AND GROUT
         1. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
         2. Add materials, water, and additives in accurate proportions.
         3. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

1. EXECUTION
   * + 1. EXAMINATION

Coordinate substrate tolerances, finishes, and curing methods specified in Section 033000 "Cast-in-Place Concrete" with requirements in the ANSI A108 series of tile installation standards.

* + - * 1. Examine substrates, areas, and conditions where stone tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Verify that substrates for setting stone tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

Verify that concrete substrates for stone tile floors installed with [**adhesives**] [**bonded mortar bed**] [**or**] [**thinset mortar**] comply with surface finish requirements in ANSI A108.01 for installations indicated.

Verify that surfaces that received a steel trowel finish have been mechanically scarified.

Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind stone tile has been completed.

Verify that joints and cracks in stone tile substrates are coordinated with stone tile joint locations; if not coordinated, adjust joint locations in consultation with Director’s Representative.

Typically, retain "Moisture Testing" subparagraph below; excessive moisture vapor can cause tile flooring failure. ASTM F2170 (relative humidity test) recommends one test per 1000 sq. ft., but no fewer than three tests per test area.

* + - * 1. Moisture Testing of Concrete Slabs on Grade: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement or a level acceptable to the setting bed manufacturer.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
      1. PREPARATION
         1. Fill cracks, holes, and depressions in concrete substrates for stone tile floors installed with adhesives or thinset mortar with trowelable patching compound specifically recommended by tile-setting material manufacturer.
         2. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

Retain first paragraph below for critical work or show locations of stone tile joints on Drawings.

* + - * 1. Lay out stone tile patterns by marking joint lines on substrates to verify joint placement at edges, corners, doors, and other critical elements.

Notify Director’s Representative seven days in advance of dates and times when layout will be done.

Obtain Director’s Representative's approval of layout before starting stone tile installation.

Retain first paragraph below for extremely critical work with highly variable stone. Procedure in paragraph generally works only for small areas with suitable adjacent workspace for organizing materials.

* + - * 1. Lay out stone tiles on substrates or on an adjacent surface to establish placement of individual stone tiles for balance of color and pattern variations.

Notify Director’s Representative seven days in advance of dates and times when layout will be done.

Director’s Representative may relocate specific stone tiles with other stone tiles of same type and will determine final location of each stone tile within indicated patterns.

Identify each stone tile with a temporary number marked on face of stone tile that corresponds with an identical number marked on a layout drawing, and obtain Director’s Representative's approval before starting stone tile installation.

* + - * 1. Field-Applied Temporary Protective Coating: If indicated under stone tile type or needed to prevent grout from staining or adhering to exposed stone tile surfaces, precoat stone tiles with continuous film of temporary protective coating, taking care not to coat unexposed stone tile surfaces.
      1. INSTALLATION OF STONE TILE
         1. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in stone tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods specified in stone tile installation schedules, and apply to types of setting and grouting materials used.

Retain first subparagraph below if stone tile types and sizes and Project conditions warrant specifying 95 percent coverage and if mortar installation is specified.

For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:

Subparagraphs below are examples only; revise to suit Project.

Exterior stone tile floors.

Stone tile floors in wet areas.

Stone tile floors consisting of stone tiles 8 by 8 inches or larger.

* + - * 1. Wipe backs of stone tiles with a damp cloth to remove dirt and dust before units are installed.
        2. Extend stone tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
        3. Accurately form intersections and returns. Perform cutting and drilling of stone tile without marring visible surfaces. Carefully grind cut edges of stone tile abutting trim, finish, or built-in items for straight aligned joints. Fit stone tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap stone tile.

Retain one of first two options in first paragraph below unless stone tile has straight edges. Retain third option and detail special conditions, such as outside corners, on Drawings or describe in a separate paragraph if they are to be finished differently than factory-fabricated edges.

* + - * 1. Finish cut stone tile edges that will not be concealed by other construction by grinding and honing cut surfaces [**and beveling edges**] [**and easing edges**] to match factory-fabricated edges[**unless otherwise indicated**].

If accent tile is used, verify tile thicknesses and retain first paragraph below if necessary. If difference in thickness is significant, consider providing a thicker substrate under thinner tile.

* + - * 1. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
        2. Jointing Pattern: Lay stone tile in grid pattern unless otherwise indicated. Lay out stone tile work and center stone tile fields in both directions in each space or on each wall area. Lay out stone tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

Where adjoining stone tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.

Where stone tiles are specified or indicated to be whole integer multiples of adjoining stone tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

Retain first paragraph below for wainscots. Verify that instruction agrees with detailing.

* + - * 1. Lay out stone tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
        2. Match stone tiles within each space by selecting tiles to achieve uniformity of color and pattern. Reject or relocate stone tiles that do not match color and pattern of adjacent tiles.

Retain last paragraph above or first paragraph below to suit colors and patterns of stone varieties selected. Delete both if stone tile layout requirement is retained in "Preparation" Article.

* + - * 1. Mix stone tiles to achieve a uniformly random distribution of color shadings and patterns.
        2. Pattern Orientation: For stone varieties with directional pattern, orient pattern as [**indicated**] [**directed by Director’s Representative**].

See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" and the ANSI A108 series of tile installation standards for data on expansion joints. These standards require that joint locations be indicated on Drawings.

* + - * 1. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and stone tile. Do not saw-cut joints after installing stone tiles.

Where joints occur in concrete substrates, locate joints in stone tile surfaces directly above them.

* + - * 1. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.

At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in [**modified dry-set**] [**improved modified dry-set**] mortar (thinset).

Do not extend [**cleavage membrane**] [**waterproof membrane**] [**or**] [**crack isolation membrane**] under thresholds set in [**standard dry-set**] [**modified dry-set**] [**improved modified dry-set**] mortar. Fill joints between such thresholds and adjoining stone tile with elastomeric sealant.

* + - * 1. Metal Edge Strips: Install [**at locations indicated**] [**where exposed edge of stone tile flooring meets carpet, wood, or other flooring that finishes flush with top of stone tile**] [**where exposed edge of stone tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of stone tile and no threshold is indicated**].
      1. INSTALLATION OF TILE BACKING PANEL
         1. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.
      2. INSTALLATION OF WATERPROOF MEMBRANE
         1. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
         2. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.
      3. INSTALLATION OF CRACK ISOLATION MEMBRANE
         1. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
         2. Allow crack isolation membrane to cure before installing tile or setting materials over it.
      4. INSTALLATION TOLERANCES

Retain "Variation from Plumb" and "Variation in Level" paragraphs below for stone tile used on walls. Revise first paragraph to suit height of stone tile on walls. MIA does not recommend installing individually set stone tile above 8 feet on walls.

* + - * 1. Variation from Plumb: For vertical joints, external corners, and other conspicuous lines, do not exceed 1/8 inch in 8 ft..
        2. Variation in Level: For horizontal joints and other conspicuous lines, do not exceed 1/8 inch in 10 ft., or 1/2 inch.
        3. Variation in Surface Plane of Flooring: Do not exceed 1/8 inch in 10 ft. from level or slope indicated when tested with a 10-foot straightedge.
        4. Variation in Plane between Adjacent Units (Lipping): Do not exceed the following differences between faces of adjacent units as measured from a straightedge parallel to stone tiled surface:

Units with Polished Faces: 1/64 inch.

Units with Honed Faces: [**1/64 inch**] [**1/32 inch**].

Units with Sand-Rubbed Faces: 1/32 inch.

Units with Thermal-Finished Faces: Depth of thermal finish or 3/16 inch, whichever is less.

Units with Natural-Cleft Faces: Depth of natural-cleft finish or 3/16 inch, whichever is less.

* + - * 1. Variation in Joint Width: Do not vary joint thickness more than 1/16 inch or one-fourth of nominal joint width, whichever is less.
        2. Hand-Tight Joints: Do not exceed [**1/64 inch**] [**1/32 inch**].
      1. ADJUSTING AND CLEANING
         1. Remove and replace tile that is damaged or that does not match adjoining stone tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
         2. Cleaning: On completion of placement and grouting, clean stone tile surfaces so they are free of foreign matter.

Remove grout residue from stone tile as soon as possible.

Clean grout smears and haze from stone tile according to stone tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by stone tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of stone tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

Delete subparagraph below if protective coating is not used; delete option if floor sealer is not used.

Remove temporary protective coating by method recommended by coating manufacturer and acceptable to stone tile and grout manufacturer. Trap and remove coating to prevent drain clogging.[**Do not remove floor sealer if used as protective coating.**]

* + - * 1. Apply sealer to cleaned stone tile flooring according to sealer manufacturer's written instructions.
      1. PROTECTION
         1. Protect installed stone tile floors with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by stone tile manufacturer, apply coat of neutral protective cleaner to completed stone tile walls and floors.
         2. Prohibit foot and wheel traffic from stone tiled floors for at least seven days after grouting is completed.
         3. Before final inspection, remove protective coverings and rinse neutral protective cleaner from stone tile surfaces.
      2. EXTERIOR STONE TILE INSTALLATION SCHEDULE

"Stone Tile Installation" subparagraphs in this article are based on TCNA installation methods. Have a copy of TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" at hand while revising this schedule. Not all exterior installation methods in the "TCNA Handbook" are included in this schedule; insert others if required.

Stone tile installation designations in this article can be used on Drawings. If substrate descriptions are sufficient to indicate where each installation type is required, stone-tile-type designations can be indicated on Drawings instead of stone tile installation designations, and stone tile types can be deleted from stone tile installation subparagraphs. If stone tile installation designations are used on Drawings and more than one stone tile type is required for a particular installation method, copy and re-edit an installation subparagraph for each stone tile type.

* + - * 1. Exterior Floor Installations:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA F101 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) [**bonded to concrete**] [**over waterproof membrane on concrete**] [**over waterproof membrane on concrete where indicated and bonded to concrete where membrane is not indicated**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA F102 STONE; thinset mortar [**on concrete**] [**over waterproof membrane on concrete**] [**over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

* + - * 1. Exterior Roof/Deck Floor Installations:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: [**TCNA F103 STONE**] [**TCNA F103B STONE**] and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over drainage material on roof membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA F104 STONE; thinset mortar [**on concrete**] [**over waterproof membrane on concrete**] [**over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

* + - * 1. Exterior Wall Installations, Masonry or Concrete:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W201 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) on metal lath[**over vapor-retarder membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Dry-set**] [**Latex-**] portland cement mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA W202 STONE; thinset mortar[**over waterproof membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

* + - * 1. Exterior Wall Installations, Wood or Metal Studs:

Stone Tile Installation <**Insert designation**>: TCNA W244E STONE; thinset mortar [**over waterproof membrane on cementitious backer units**] [**on cementitious backer units over vapor-retarder membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

* + - 1. INTERIOR STONE TILE INSTALLATION SCHEDULE

"Stone Tile Installation" subparagraphs in this article are based on TCNA installation methods. Have a copy of TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" at hand while editing this schedule. Some of the installation methods included may only be suitable for residential or light commercial applications; see the "TCNA Handbook" for information on suitable applications. Not all interior installation methods in the "TCNA Handbook" are included in this schedule; insert others if required.

Stone tile installation designations in this article can be used on Drawings. If substrate descriptions are sufficient to indicate where each installation type is required, stone-tile-type designations can be indicated on Drawings instead of stone tile installation designations, and stone tile types can be deleted from stone tile installation subparagraphs. If stone tile installation designations are used on Drawings and more than one stone tile type is required for a particular installation method, copy and re-edit an installation subparagraph for each stone tile type.

* + - * 1. Interior Floor Installations, Concrete Subfloor:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA F111 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) with cleavage membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA F112 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) bonded to concrete.

Stone Tile Type: <**Insert stone tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA F113 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA F121 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) on waterproof membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA F122 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on waterproof membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: High-performance [**sanded**] [**unsanded**] grout.

"Stone Tile Installation (Insert designation)" subparagraph below is for full-coverage application of crack isolation membrane; if partial coverage is required, change designation to TCNA F125-Partial STONE and specify or indicate location and extent of coverage.

Stone Tile Installation <**Insert designation**>: TCNA F125-Full STONE; thinset mortar on crack isolation membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Interior Floor Installations, Wood Subfloor:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA F141 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over [**cleavage membrane**] [**waterproof membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

"Stone Tile Installation (Insert designation)" subparagraph below is for joists 16 inches (406 mm) o.c. or closer.

Stone Tile Installation <**Insert designation**>: TCNA F250 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on[**waterproof membrane over**] cementitious backer units or fiber-cement backer board.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Interior Radiant-Heat Floor Installations, Concrete Subfloor:

Stone Tile Installation <**Insert designation**>: TCNA RH110 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] [**on crack isolation membrane**]; hydronic piping installed in concrete.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA RH117 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) with hydronic piping installed in mortar bed.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Interior Radiant-Heat Floor Installations, Wood Subfloor:

Stone Tile Installation <**Insert designation**>: TCNA RH141 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) with hydronic piping installed in mortar bed with [**cleavage membrane**] [**waterproof membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Interior Wall Installations, Masonry or Concrete:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W211 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) bonded to substrate.

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W221 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**], cement mortar bed (thickset) on metal lath [**over cleavage membrane**] [**over waterproof membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in last "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W222 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; one-coat cement mortar bed (thickset) on metal lath [**over cleavage membrane**] [**over waterproof membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in last "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Interior Wall Installations, Wood or Metal Studs or Furring:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W221 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) [**over cleavage membrane**] [**over waterproof membrane**] on solid backing.

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W222 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; one-coat cement mortar bed (thickset) [**over cleavage membrane**] [**over waterproof membrane**] on solid backing.

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in last "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Note that TCNA installation method in first "Stone Tile Installation (Insert designation)" subparagraph below is for cleavage membrane and lath applied directly to studs or furring without solid backing. If retaining subparagraph, retain one of three options for ANSI standard. ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA W231/W241 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over [**cleavage membrane**] [**waterproof membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in last "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in last "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA W243 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on gypsum board.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Dry-set**] [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA W244 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on cementitious backer units or fiber-cement backer board[**over vapor-retarder membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA W245 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on coated glass-mat, water-resistant gypsum backer board.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Bathtub Wall Installations with no Shower Head, Wood or Metal Studs or Furring:

Stone Tile Installation <**Insert designation**>: TCNA B413 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on water-resistant gypsum board.

Note that TCNA's " Handbook for Ceramic, Glass, and Stone Tile Installation " states that TCNA B413 is "not to be used on bathtub walls incorporating a shower head."

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Retain option for high-performance grout (sanded or unsanded) in "Grout" subparagraph below if organic adhesive and metal studs or furring are used.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Bathtub/Shower Wall Installations, Wood or Metal Studs or Furring:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA B411 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over vapor-retarder membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Standard dry-set mortar**] [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA B412 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on cementitious backer units or fiber-cement backer board.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA B419 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on coated glass-mat, water-resistant gypsum backer board.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

* + - * 1. Shower Receptor and Wall Installations:

ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

Stone Tile Installation <**Insert designation**>: TCNA B414 STONE and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over vapor-retarder membrane.

Stone Tile Type: <**Insert stone-tile-type designation**>.

"Bond Coat for Wet-Set Method" subparagraph below is optional with ANSI A108.1A and ANSI A108.1C. If retaining either standard in "Stone Tile Installation (Insert designation)" subparagraph above, retain one mortar type from options below or delete subparagraph if unmodified portland cement is acceptable. Delete below if retaining ANSI A108.1B.

Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.

Retain "Bond Coat for Cured-Bed Method" subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "Stone Tile Installation (Insert designation)" subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

Bond Coat for Cured-Bed Method: [**Modified dry-set mortar**] [**Medium-bed, modified dry-set mortar**] [**Improved modified dry-set mortar**] [**Water-cleanable, tile-setting epoxy**].

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.

Stone Tile Installation <**Insert designation**>: TCNA B415 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on [**waterproof membrane over cementitious backer units or fiber-cement backer board**] [**cementitious backer units or fiber-cement backer board over vapor-retarder membrane**]

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA B420 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on [**waterproof membrane over coated glass-mat, water-resistant gypsum backer board**] [**coated glass-mat, water-resistant gypsum backer board over vapor-retarder membrane**].

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA B421 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on waterproof membrane over solid backing.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Stone Tile Installation <**Insert designation**>: TCNA B422 STONE; [**thinset mortar**] [**water-cleanable, tile-setting epoxy**] on waterproof membrane with integrated bonding flange for bonded membranes.

Stone Tile Type: <**Insert stone-tile-type designation**>.

Delete "Thinset Mortar" subparagraph below if water-cleanable, tile-setting epoxy is used.

Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

Insert additional paragraphs for ceilings, stairs, countertops, renovations, etc., to suit Project.

END OF SECTION 093033