

SECTION 09 30 13 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Quarry tile.
2. Pressed floor tile.
3. Porcelain tile.
4. Ceramic mosaic tile.
5. Glazed wall tile.
6. Thresholds.

Tile backing panels in first subparagraph below may be specified in this Section or in Section 09 29 00 "Gypsum Board."

7. Tile backing panels.
8. Waterproof membranes.
9. Crack isolation membranes.
10. Setting material.
11. Grout materials.

B. Related Requirements:

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

1. **[Section 07 13 26 "Self-Adhering Sheet Waterproofing"]****[Section 07 13 53 "Elastomeric Sheet Waterproofing"]****[Section 07 13 54 "Thermoplastic Sheet Waterproofing"]****[Section 07 14 13 "Hot Fluid-Applied Rubberized Asphalt Waterproofing"]****[Section 07 14 16 "Cold Fluid-Applied Waterproofing"]** for waterproofing under thickset mortar beds.
2. Section 07 92 00 "Joint Sealants" for sealing of movement joints in tile surfaces.

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

3. Section 09 24 00 "Cement Plastering" for scratch coat for thickset mortar setting-bed installations.

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

4. Section 09 26 13 "Gypsum Veneer Plastering" for cementitious backer units.

Delete first subparagraph below if tile backing panels are specified in this Section. See the Evaluations.

5. Section 09 29 00 "Gypsum Board" for tile backing panels.
6. Section 09 30 23 "Glass Tiling."
7. Section 09 30 33 "Stone Tiling."

Delete subparagraph below if stone thresholds are specified in this Section.

8. Section 09 63 40 "Stone Flooring" for stone thresholds.

1.2 PREINSTALLATION MEETINGS

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

- A. Preinstallation Conference: Conduct conference at **[Project site]<Insert location>**.
 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.3 ACTION SUBMITTALS

Action submittals are submittals requiring responsive action and return of reviewed documents to Contractor.

- A. Product Data: For each type of product.

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

- B. Shop Drawings: Show locations, plans, and elevations, of each type of tile and tile pattern. Show widths, details, and locations of movement joints in tile substrates and finished tile surfaces. **[Show thresholds.]**

Retain "Samples for Initial Selection" or "Samples for Verification" Paragraph below, or both.

- C. Samples for Initial Selection: For tile, grout, and accessories involving color selection or shade variation.
- D. Samples for Verification:

Retain one of first two subparagraphs below.

1. Full-size units of each type and composition of tile and for each color and finish required. **[For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.][For tile with aesthetic classification V3 or V4, provide 12 tiles from same production run.]**
2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least **[12 inches square][36 inches square]<Insert size>**, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
3. Full-size units of each type of trim and accessory **[for each color and finish**

required].

4. Stone thresholds in **6-inch** lengths.
5. Metal flooring transitions **6-inch** lengths.

Retain "Sustainable Design Submittals" Paragraph below if required to attain sustainability rating or to track sustainability submittals.

E. Sustainable Design Submittals:

Retain first three subparagraphs below to be eligible for LEED v4 credit. See the Evaluations.

"Environmental Product Declaration" Subparagraph below applies to LEED v4 (all) MR Credit, "Building Product Disclosure and Optimization - Environmental Product Declarations." Confirm with manufacturer that EPDs are available for each product.

1. Environmental Product Declaration: For each product.

"Health Product Declaration" Subparagraph below applies to LEED v4 (all) MR Credit, "Building Product Disclosure and Optimization - Material Ingredients, Option 1 - Material Ingredient Reporting." Confirm with manufacturer that HPDs are available and meet requirements of the HPD Open Standard or approved USGBC program.

2. Health Product Declaration: For each product.

"Sourcing of Raw Materials" Subparagraph below applies to LEED v4 (all) MR Credit, "Building Project Disclosure and Optimization - Sourcing of Raw Materials, Option 1 - Raw Material Source and Extraction Reporting." Confirm with manufacturer that corporate sustainability reports are available, have been prepared within the last year or are applicable to the year of production, and are by an organization approved by the USGBC.

3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

Retain "Environmental Product Declaration" Subparagraph below if products specified in the Section are required to have an EPD to meet the IgCC/ASHRAE 189.1's requirement of 55 percent recycled materials.

4. Environmental Product Declaration: For each product.

"Environmental Product Declaration" Subparagraph below applies to ASHRAE 189.1 if products specified in the Section are used to meet the requirements of paragraph 9.4.1.4, "Multiple-Attribute Product Declaration or Certification," which requires EPDs for a minimum of 10 products.

5. Environmental Product Declaration: For each product.

Subparagraphs below apply to Green Globes v1.4 if products specified in the Section are used to meet the requirements of paragraph 3.5.1.2 "Path B: Prescriptive Path for Building Core and Shell" -which requires that a certain percentage of the materials used in the core and shell have EPDs, third-party certifications, and/or third-party life cycle assessments.

6. Environmental Product Declaration: For each product.

7. Third-Party Certifications: For each product.
8. Third-Party Certified Life Cycle Assessment: For each product.

"Product Data" Subparagraph below applies to LEED v4, IgCC/ASHRAE 189.1, and Green Globes. Coordinate with requirements for adhesives.

9. Product Data: For adhesives, indicating VOC content.

"Laboratory Test Reports" Subparagraph below applies to LEED v4, IgCC/ASHRAE 189.1, and Green Globes. Coordinate with requirements for adhesives.

10. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

"Laboratory Test Reports" Subparagraph below applies to LEED v4, IgCC/ASHRAE 189.1, and Green Globes. Coordinate with requirements for sealers.

11. Laboratory Test Reports: For sealers, indicating compliance with requirements for low-emitting materials.

1.4 INFORMATIONAL SUBMITTALS

Informational submittals are submittals that require review by Architect, but they do not require Architect's responsive action and return of reviewed documents to Contractor, provided submittals comply with requirements. If rejected, submittals with responsive action must be returned to Contractor.

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 01 40 00 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

- A. Qualification Data: For Installer.

Certificates in "Master Grade Certificates" Paragraph below are issued by manufacturers, indicating type and grade of tile in accordance with ANSI A137.1 and that tile complies with this standard. Delete if not required or not available, as may be the case with imported tile.

- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

Retain "Product Certificates" Paragraph below to require submittal of product certificates from manufacturers.

- C. Product Certificates: For each type of product, including product use classification.

Coordinate "Product Test Reports" Paragraph below with qualification requirements in Section 01 40 00 "Quality Requirements."

- D. Product Test Reports:
 1. Tile-setting and -grouting products.
 2. Certified porcelain tile.

3. Slip-resistance test reports from qualified independent testing agency.

Retain "Field Quality-Control Reports" Paragraph below where receptor portions of ceramic tile shower floors, roman bathtubs, and similar areas are on-site. Comply with requirements of the International Plumbing Code and standards adopted by the Project municipality.

- E. Field Quality-Control Reports: Water test reports of membrane in wet areas.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:

Consider retaining one or more of four subparagraphs below. Qualifications in subparagraphs are not equivalent; investigate them and consider retaining those that can help ensure that Installer is qualified for Project. If retaining fourth subparagraph, retain options based on applications for Project.

1. Installer is [**a Five-Star member of the National Tile Contractors Association**][or][**a Trowel of Excellence member of the Tile Contractors' Association of America**].
2. Installer's supervisor for Project holds the International Masonry Institute's Supervisor Certification.
3. 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.
4. 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**].

1.6 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Section 01 40 00 "Quality Requirements" states "build mockups in location and of size indicated or, if not indicated, as directed." Consider inserting size and location requirements in first two subparagraphs below or indicate on Drawings. Consider mockups for tile with shade variation classified V3 or V4.

1. Build mockup of [**each type of**] floor tile installation.
2. Build mockup of [**each type of**] wall tile installation.

Retain subparagraph below if the intention is to make an exception to the default requirement in Section 01 40 00 "Quality Requirements" for demolishing and removing mockups.

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

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install 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.

1.8 WARRANTY

When warranties are required and available, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

System warranties are limited to the setting material manufacturers' list of products when installed in accordance with written instructions, specifications, and industry standards and guidelines for installation.

- A. System Warranty: Manufacturer's non-prorated comprehensive warranty that agrees to repair and replace defective installation areas, material, and labor that fail under normal usage within specified warranty period.

Coordinate "Warranty Period" Subparagraph below with manufacturers in "Source Limitations" Article. See manufacturers' list of acceptable recommended products for warranty period. Not all manufacturers offer all warranty periods listed. Coordinate starting date of warranty terms with manufacturer.

- 1. Warranty Period: **[Five years][10 years][25 years][Lifetime]** from date of Product Purchase.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

Retain this article to limit sources for the entire Section. Source limitations may also be specified in individual articles if desired.

Retain one of four options in "Tile" Paragraph below, depending on complexity of Project and degree of restriction desired.

- A. Tile: Obtain **[tile of each type and color or finish][tile of each type][tile of each color or finish][tile]** from single source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

Retain "Tiling System" Paragraph below if requiring a tiling system warranty in Part 1.

- B. Tiling System: Obtain system products from single manufacturer and each aggregate from single source or producer.

Retain "Manufacturers" Subparagraph and list of manufacturers below who offer system warranties. Coordinate with warranty period in Part 1.

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[ARDEX Americas]**
 - b. **[Custom Building Products]**
 - c. **[Laticrete International, Inc.]**
 - d. **[MAPEI Corporation]**
 - e. **<Insert manufacturer's name>**
 2. Obtain setting and grouting materials, except for unmodified portland cement and aggregate, from single manufacturer.
 3. Obtain underlayment from manufacturer of setting and grouting materials.
 4. Obtain waterproof membrane, crack isolation, and other required membranes from manufacturer of setting and grouting materials.
 5. Obtain joint sealants from manufacturer of setting and grouting materials.
- C. Accessory Products: Obtain each of the following products specified in this Section from a single manufacturer:
1. Stone thresholds.
 2. Backer units.

2.2 PRODUCTS, GENERAL

Revise or delete "ANSI Ceramic Tile Standard" Paragraph below if another standard is used to specify tile products.

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

Revise subparagraph below if seconds (Second Grade tile units) are acceptable. Second Grade tile must comply with all requirements for Standard Grade tile, except that examination for facial defects is done at a distance of 10 ft. (3 m) instead of 3 ft. (914 mm).

1. Provide tile complying with Standard Grade requirements **[unless otherwise indicated]**.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

Retain subparagraph below if tile is used in swimming pools, on exteriors, or in wet areas. In accordance with ANSI A137.1, manufacturers must specify whether back- or edge-mounted tile assemblies are suitable for these installations, because mounting materials decrease contact area of setting material to tile, and mounting materials may not be as strong or as waterproof as setting materials.

1. Where tile is indicated for installation [**in swimming pools**][**on exteriors**][**or**][**in wet areas**], do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 QUARRY TILE

Copy paragraphs below and re-edit for each type of tile required. Insert drawing designation and use these designations on Drawings to indicate where each ceramic tile type is required; and in schedules at the end of Part 3.

Descriptions used in ceramic tile type paragraphs below are based on categories and requirements in ANSI A137.1. Note that categories do not necessarily coincide with applications (e.g., pressed floor tile can be used for applications other than floors, and glazed wall tile can be used for applications other than walls, although glazed wall tiles may be unsuitable for some applications). See the Evaluations. If tile is required that does not fit any category, it can be described as "specialty tile," and additional ceramic tile type paragraphs can be inserted to specify requirements.

- A. Quarry Tile Type: [**Unglazed**][**Glazed**][**Chemical resistant**].

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

1. Manufacturers: Subject to compliance with requirements, [**provide products by the following**][**provide products by one of the following**][**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:
 - a. [**American Olean; a brand of Dal-Tile Corporation**]
 - b. [**Daltile; a brand of Dal-Tile Corporation**]
 - c. [**Elgin Butler Company**]
 - d. [**Florida Tile, Inc.**]
 - e. [**Interceramic**]
 - f. [**Metropolitan Ceramics**]
 - g. [**Quarry Tile Company.**]

- h. **[Summitville Tiles, Inc.]**
 - i. **<Insert manufacturer's name>**
- 2. Face Size: **[3 by 3 inches][4 by 4 inches][6 by 3 inches][6 by 6 inches][8 by 3-7/8 inches][8 by 8 inches]<Insert dimensions>**.
 - 3. Thickness: **[3/8 inch][1/2 inch][3/4 inch]**.

Retain "Wearing Surface" Subparagraph below for unglazed tile. If striated surface or raised pattern is required, insert description.

- 4. Wearing Surface: **[Nonabrasive, smooth][Abrasive aggregate embedded in surface]<Insert description>**.

Retain option in "Product Use Classification" Subparagraph below to indicate tile classification based on slip resistance if used for flooring. See the Evaluations and ANSI A326.3 for more information.

- 5. Product Use Classification: **[Interior, Dry (ID)][Interior, Wet (IW)][Interior, Wet Plus (IW+)][Exterior, Wet (EW)][Oil/Greases (O/G)]**.

Retain "Physical Properties" Subparagraph below for chemical resistant tile. Designer should consider the chemical and staining agents that tile might be exposed to and validate that tile is in compliance with ASTM C650.

- 6. Physical Properties: Chemical resistant when tested with indicated chemicals in accordance with ASTM C650.
 - a. **<Insert chemical reagent>**.
- 7. Tile Color and Pattern: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color and pattern>**.
- 8. Grout Color: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color>**.

Retain first subparagraph below if applicable. A protective coating may be required on unglazed quarry tile in chemical resistant applications. If retaining, coordinate with coating requirements specified elsewhere in this Section.

- 9. Precoat with temporary protective coating.

If trim units do not match adjoining flat tile, copy and re-edit "Quarry Tile Type" Paragraph separately for trim units, deleting option in "Trim Units" Subparagraph below.

- 10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable **[and matching characteristics of adjoining flat tile]**. Provide shapes as follows, selected from manufacturer's standard shapes:

Retain shape requirements from options in subparagraphs below that suit installation methods. Revise or supplement subparagraphs to suit Project.

- a. Base: Coved [**with surface bullnose top edge**], face size **[6 by 6 inches][8 by 3-7/8 inches]<Insert dimensions>**.
- b. Wainscot Cap: Surface bullnose, face size **[6 by 6 inches][8 by 3-7/8 inches]<Insert dimensions>**.
- c. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it, same size as adjoining flat tile.

2.4 PRESSED FLOOR TILE

- A. Pressed Floor Tile Type: **[Unglazed][Glazed][Chemical resistant]**.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **[American Olean; a brand of Dal-Tile Corporation]**
 - b. **[Daltile; a brand of Dal-Tile Corporation]**
 - c. **[Florim USA]**
 - d. **[Interceramic]**
 - e. **[Marazzi USA; a brand of Dal-Tile Corporation]**
 - f. **[Vitromex USA, Inc.]**
 - g. **<Insert manufacturer's name>**
2. Face Size: **[3 by 3 inches][4 by 4 inches][6 by 6 inches][7-3/4 by 3-7/8 inches][7-7/8 by 7-7/8 inches][11-13/16 by 11-13/16 inches]<Insert dimensions>**.

Retain "Face Size Variation" Subparagraph below if required for narrow joints. Calibrated tiles are sorted by manufacturer to reduce face size variation; rectified tiles have their edges ground to minimize face size variation. See the Evaluations.

3. Face Size Variation: **[Calibrated or rectified][Rectified]**.
4. Thickness: **[1/4 inch][3/8 inch][1/2 inch]**.

Retain option in "Product Use Classification" Subparagraph below to indicate tile classification based on slip resistance if used for flooring. See the Evaluations and ANSI A326.3 for more information.

5. Product Use Classification: **[Interior, Dry (ID)][Interior, Wet (IW)][Interior, Wet Plus (IW+)][Exterior, Wet (EW)][Oil/Greases (O/G)]**.

Retain "Physical Properties" Subparagraph below for chemical resistant tile. Designer should consider the chemical and staining agents that tile might be exposed to and validate that tile is in compliance with ASTM C650.

6. Physical Properties: Chemical resistant when tested with indicated chemicals in accordance with ASTM C650.
 - a. **<Insert chemical reagent>.**
7. Tile Color and Pattern: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color and pattern>.**
8. Grout Color: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color>.**

Verify availability before retaining "Trim Units" Subparagraph below. If trim units do not match adjoining flat tile, copy and re-edit "Pressed Floor Tile Type" Paragraph separately for trim units, deleting option below.

9. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable **[and matching characteristics of adjoining flat tile]**. Provide shapes as follows, selected from manufacturer's standard shapes:

Retain shape requirements from options in subparagraphs below that suit installation methods. Verify availability of specific shapes before retaining any of 11 subparagraphs below. Revise or supplement subparagraphs to suit Project.

- a. Base Cove: Cove, module size **[same as adjoining flat tile]<Insert size>.**
- b. Base Cap for Portland Cement Mortar Installations: Bead (bullnose), module size **[same as adjoining flat tile]<Insert size>.**
- c. Base Cap for Thinset Mortar Installations: Surface bullnose, module size **[same as adjoining flat tile]<Insert size>.**
- d. Wainscot Cap for Portland Cement Mortar Installations: Bead (bullnose), module size **[same as adjoining flat tile]<Insert size>.**
- e. Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size **[same as adjoining flat tile]<Insert size>.**
- f. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it; same size as adjoining flat tile.
- g. External Corners for Portland Cement Mortar Installations: Bead (bullnose), module size **[same as adjoining flat tile]<Insert size>.**
- h. External Corners for Thinset Mortar Installations: Surface bullnose, module size **[same as adjoining flat tile]<Insert size>.**

Retain "Internal Corners" or "Tapered Transition Tile" Subparagraph below if required.

- i. Internal Corners:
 - 1) Cove, module size **[same as adjoining flat tile]<Insert size>.**
 - 2) Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

Units in "Tapered Transition Tile" Subparagraph below are available from some manufacturers. Before retaining, verify availability with manufacturers.

- j. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from **1/2 to 1/4 inch** across nominal **4-inch** dimension.

2.5 PORCELAIN TILE

- A. Porcelain Tile Type: **[Unglazed][Glazed][Chemical resistant]**.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **[American Olean; a brand of Dal-Tile Corporation]**
 - b. **[Crossville, Inc.]**
 - c. **[Daltile; a brand of Dal-Tile Corporation]**
 - d. **[Florida Tile, Inc.]**
 - e. **[Florim USA]**
 - f. **[Interceramic]**
 - g. **[Iris Ceramics U.S., a division of Stonepeak Ceramics, Inc.]**
 - h. **[Marazzi USA; a brand of Dal-Tile Corporation]**
 - i. **[Portobello America, Inc.]**
 - j. **[Vitromex USA, Inc.]**
 - k. **<Insert manufacturer's name>**

Retain "Certification" Subparagraph below if applicable. The Porcelain Tile Certification Agency is a joint effort of the Ceramic Tile Distributors Association and TCNA to verify the properties of tile that is advertised as porcelain.

2. Certification: Tile certified by the Porcelain Tile Certification Agency.
3. Face Size: **[3 by 3 inches][4 by 4 inches][6 by 6 inches][7-3/4 by 3-7/8 inches][7-7/8 by 7-7/8 inches][11-13/16 by 11-13/16 inches]<Insert dimensions>**.

Retain "Face Size Variation" Subparagraph below if required for narrow joints. Rectified tiles have their edges ground to minimize face size variation. See the Evaluations.

4. Face Size Variation: Rectified.
5. Thickness: **[1/4 inch][3/8 inch][1/2 inch]**.

Retain option in "Product Use Classification" Subparagraph below to indicate tile classification based on slip resistance if used for flooring. See the Evaluations and ANSI A326.3 for more information.

6. Product Use Classification: **[Interior, Dry (ID)][Interior, Wet (IW)][Interior, Wet Plus (IW+)][Exterior, Wet (EW)][Oil/Greases (O/G)]**.

Retain "Physical Properties" Subparagraph below for chemical resistant tile. Designer should consider the chemical and staining agents that tile might be exposed to and validate that tile is in compliance with ASTM C650.

7. Physical Properties: Chemical resistant when tested with indicated chemicals in accordance with ASTM C650.
 - a. **<Insert chemical reagent>.**
8. Tile Color, Glaze, and Pattern: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color, glaze, and pattern>.**
9. Grout Color: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color>.**

Retain first subparagraph below if applicable. A protective coating may be required on unglazed porcelain tile in chemical resistant applications. If retaining, coordinate with coating requirements specified elsewhere in this Section.

10. Precoat with temporary protective coating.

Verify availability before retaining "Trim Units" Subparagraph below. If trim units do not match adjoining flat tile, copy and re-edit "Porcelain Tile Type" Paragraph separately for trim units, deleting option below.

11. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable **[and matching characteristics of adjoining flat tile]**. Provide shapes as follows, selected from manufacturer's standard shapes:

Retain shape requirements from options in subparagraphs below that suit installation methods. Verify availability of specific shapes before retaining any of six subparagraphs below. Revise or supplement subparagraphs to suit Project.

- a. Base Cap: Surface bullnose, module size **[same as adjoining flat tile]<Insert size>.**
- b. Wainscot Cap: Surface bullnose, module size **[same as adjoining flat tile]<Insert size>.**
- c. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it; same size as adjoining flat tile.
- d. External Corners: Surface bullnose, module size **[same as adjoining flat tile]<Insert size>.**
- e. Internal Corners: Field-buttet square corners.

Units in "Tapered Transition Tile" Subparagraph below are available from some manufacturers. Before retaining, verify availability with manufacturers.

- f. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from **1/2 to 1/4 inch** across

nominal **4-inch** dimension.

2.6 CERAMIC MOSAIC TILE

- A. Ceramic Mosaic Tile Type: [**Unglazed**][**Glazed**][**Chemical resistant**].

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

1. Manufacturers: Subject to compliance with requirements, [**provide products by the following**][**provide products by one of the following**][**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:
 - a. [**American Olean; a brand of Dal-Tile Corporation**]
 - b. [**Crossville, Inc.**]
 - c. [**Daltile; a brand of Dal-Tile Corporation**]
 - d. [**Jeffrey Court Inc.**]
 - e. [**Marazzi USA; a brand of Dal-Tile Corporation**]
 - f. [**Portobello America, Inc.**]
 - g. **<Insert manufacturer's name>**

Retain "Certification" Subparagraph below if applicable. The Porcelain Tile Certification Agency is a joint effort of the Ceramic Tile Distributors Association and TCNA to verify the properties of tile that is advertised as porcelain.

2. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
3. Module Size: [**1 by 1 inch**][**1 by 2 inches**][**2 by 2 inches**]**<Insert dimensions>**.
4. Thickness: **1/4 inch**.
5. Face: [**Plain**][**Pattern of design indicated,**] with cushion edges.

Retain "Surface" Subparagraph below for unglazed tile.

6. Surface: [**Smooth, without**][**Slip resistant, with**] abrasive admixture.

Retain option in "Product Use Classification" Subparagraph below to indicate tile classification based on slip resistance if used for flooring. See the Evaluations and ANSI A326.3 for more information.

7. Product Use Classification: [**Interior, Dry (ID)**][**Interior, Wet (IW)**][**Interior, Wet Plus (IW+)**][**Exterior, Wet (EW)**][**Oil/Greases (O/G)**].

Retain "Physical Properties" Subparagraph below for chemical resistant tile. Designer should consider the chemical and staining agents that tile might be exposed to and validate that tile is in compliance with ASTM C650.

8. Physical Properties: Chemical resistant when tested with indicated chemicals in accordance with ASTM C650.
 - a. **<Insert chemical reagent>**.

9. Tile Color and Pattern: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color and pattern>.**
10. Grout Color: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color>.**

If trim units do not match adjoining flat tile, copy and re-edit "Trim Units" Subparagraph below separately for trim units, deleting option.

11. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable **[and matching characteristics of adjoining flat tile]**. Provide shapes as follows, selected from manufacturer's standard shapes:

Retain shape requirements from options in subparagraphs below that suit installation methods. Revise or supplement subparagraphs to suit Project.

- a. Base Cove: Cove, module size **[1 by 1 inch][2 by 1 inch]<Insert dimensions>.**
- b. Base Cap for Portland Cement Mortar Installations: Bead (bullnose), module size **[1 by 1 inch][2 by 1 inch]<Insert dimensions>.**
- c. Base Cap for Thinset Mortar Installations: Surface bullnose, module size **[1 by 1 inch][2 by 1 inch][2 by 2 inches]<Insert dimensions>.**
- d. Wainscot Cap for Portland Cement Mortar Installations: Bead (bullnose), module size **[1 by 1 inch][2 by 1 inch]<Insert dimensions>.**
- e. Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size **[1 by 1 inch][2 by 1 inch][2 by 2 inches]<Insert dimensions>.**
- f. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it; same size as adjoining flat tile.
- g. External Corners for Portland Cement Mortar Installations: Bead (bullnose), module size **[1 by 1 inch][2 by 1 inch]<Insert dimensions>.**
- h. External Corners for Thinset Mortar Installations: Surface bullnose, module size **[1 by 1 inch][2 by 1 inch][2 by 2 inches]<Insert dimensions>.**

Retain "Internal Corners" or "Tapered Transition Tile" Subparagraph below if required.

- i. Internal Corners:
 - 1) Cove, module size **[1 by 1 inch][2 by 1 inch]<Insert dimensions>.**
 - 2) Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

Units in "Tapered Transition Tile" Subparagraph below are available from some manufacturers. Before retaining, verify availability with manufacturers.

- j. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from **1/2 to 1/4 inch** across nominal **4-inch** dimension.

2.7 GLAZED WALL TILE

A. Glazed Wall Tile Type:

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **[American Olean; a brand of Dal-Tile Corporation]**
 - b. **[Crossville, Inc.]**
 - c. **[Daltile; a brand of Dal-Tile Corporation]**
 - d. **[Interceramic]**
 - e. **[Jeffrey Court Inc.]**
 - f. **[Marazzi USA; a brand of Dal-Tile Corporation]**
 - g. **[Vitromex USA, Inc.]**
 - h. **<Insert manufacturer's name>**
2. Module Size: **[4-1/4 by 4-1/4 inches][6 by 4-1/4 inches][6 by 6 inches]<Insert dimensions>**.

Retain "Face Size Variation" Subparagraph below if required for narrow joints. Rectified tiles have their edges ground to minimize face size variation. See the Evaluations.

3. Face Size Variation: Rectified.
4. Thickness: **5/16 inch**.
5. Tile Color and Pattern: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color and pattern>**.
6. Grout Color: **[As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range]<Insert color>**.
7. Mounting:

Delete first subparagraph below if tile selected is available in loose form only. Delete second subparagraph if pregrouted tile is not required.

- a. Factory, back mounted.
- b. Pregrouted sheets of tiles are factory assembled and grouted with manufacturer's standard white silicone rubber.

Verify availability before retaining "Trim Units" Subparagraph below. If trim units do not match adjoining flat tile, copy and re-edit this "Glazed Wall Tile Type" Paragraph separately for trim units, deleting option in subparagraph below.

8. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable **[and matching characteristics of adjoining flat tile]**. Provide shapes as follows, selected from manufacturer's standard shapes:

Retain shape requirements from options in subparagraphs below that suit installation methods. Revise or supplement subparagraphs to suit Project.

- a. Base for Portland Cement Mortar Installations: Coved, module size **[4-1/4 by 4-1/4 inches][6 by 6 inches][6 by 3-3/4 inches]<Insert dimensions>**.
- b. Base for Thinset Mortar Installations: Straight, module size **[4-1/4 by 4-1/4 inches][6 by 6 inches][6 by 2 inches]<Insert dimensions>**.
- c. Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap, module size **[4-1/4 by 4-1/4 inches][6 by 6 inches][6 by 2 inches]<Insert dimensions>**.
- d. Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size **[4-1/4 by 4-1/4 inches][6 by 6 inches][6 by 2 inches]<Insert dimensions>**.
- e. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it; same size as adjoining flat tile.
- f. External Corners for Portland Cement Mortar Installations: Bullnose shape with radius of at least **3/4 inch** unless otherwise indicated.
- g. External Corners for Thinset Mortar Installations: Surface bullnose; same size as adjoining flat tile.

Revise "Internal Corners" Subparagraph below if coved internal angles are required.

- h. Internal Corners: Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

Insert other shapes if required.

Insert paragraphs for special-purpose tile if required.

Accessories in "Accessories" Paragraph below are generally used with glazed wall tile; retain if applicable. Verify availability with manufacturers.

- B. Accessories: Provide vitreous china accessories of type and size indicated; suitable for installing by same method as used for adjoining wall tile.

First two subparagraphs below are examples only; revise to suit Project or delete both and indicate accessories on Drawings. Insert descriptions or "Basis-of-Design Product" subparagraphs under each if needed to limit products to certain designs.

- 1. One soap holder [**with grab handle**] for each shower and tub indicated.
- 2. One paper holder at each water closet.
- 3. Color and Finish: **[Match adjoining glazed wall tile][As indicated by manufacturer's designations][Match Architect's sample][As selected by Architect from manufacturer's full range][White, bright glaze]<Insert color and finish>**.

2.8 Medium-Bed, Modified Dry-Set Mortar

"Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed."

- A. Basis-of-Design Product: Subject to compliance with requirements, provide **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
1. **[Laticrete International, Inc.]**
 2. **<Insert manufacturer's name>**

2.9 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges in maximum lengths available to minimize end-to-end butt joints.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[C-Cure]**
 - b. **[CertainTeed; SAINT-GOBAIN]**
 - c. **[Custom Building Products]**
 - d. **[FinPan, Inc.]**
 - e. **[James Hardie Building Products, Inc.]**
 - f. **[PermaBASE Building Products, LLC provided by National Gypsum Company]**
 - g. **[USG Corporation]**
 - h. **<Insert manufacturer's name>**
2. Thickness: **[1/4 inch][1/2 inch][5/8 inch][As indicated on Drawings].**
3. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

According to the International Building Code, water-resistant gypsum backing board is not permitted for use as a backing board for tile in tub and shower areas or as wall board or ceiling panels in shower areas.

- B. Water-Resistant Gypsum Backing Board: ASTM C1396/C1396M, with manufacturer's standard edges.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[American Gypsum]**
 - b. **[CertainTeed; SAINT-GOBAIN]**
 - c. **[Georgia-Pacific Gypsum LLC]**
 - d. **[Gold Bond Building Products, LLC provided by National Gypsum Company]**
 - e. **[PABCO Gypsum]**
 - f. **[Panel Rey]**
 - g. **[USG Corporation]**
 - h. **<Insert manufacturer's name>**
2. Core: **[As indicated on Drawings][1/2 inch, regular type][5/8 inch, Type X][Type C as required by fire-resistance-rated assembly indicated on Drawings].**

"Glass-Mat, Water-Resistant Gypsum Panel" Paragraph below is specifically designed for tiling applications on walls and ceilings.

- C. Glass-Mat, Water-Resistant Gypsum Panel: ASTM C1658/C1658M, with fiberglass mat partially or completely embedded into the core.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[CertainTeed; SAINT-GOBAIN]**
 - b. **[Georgia-Pacific Gypsum LLC]**
 - c. **[Gold Bond Building Products, LLC provided by National Gypsum Company]**
 - d. **[PABCO Gypsum]**
 - e. **[Panel Rey]**
 - f. **[USG Corporation]**
 - g. **<Insert manufacturer's name>**
2. Core: **[As indicated on Drawings][1/2 inch, regular type][1/2 inch, Type C][5/8 inch, Type X][5/8 inch, abuse resistant].**
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

"Coated Glass-Mat, Water-Resistant Gypsum Backing Panel" Paragraph below is specifically designed for tiling applications on walls and ceilings in shower or bath areas.

- D. Coated Glass-Mat, Water-Resistant Gypsum Backing Panel: ASTM C1178/C1178M, with a water-resistant coating on one surface, and manufacturer's standard edges.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **[CertainTeed; SAINT-GOBAIN]**
 - b. **[Georgia-Pacific Gypsum LLC]**
 - c. **[USG Corporation]**
 - d. **[USG Corporation]**
 - e. **<Insert manufacturer's name>**
2. Core: **[As indicated on Drawings][1/2 inch, regular type][5/8 inch, Type X]**.
3. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

2.10 Floor Sealer

"Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed."

- A. Basis-of-Design Product: Subject to compliance with requirements, provide **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
1. **[Laticrete International, Inc.]**
 2. **<Insert manufacturer's name>**

2.11 WATERPROOF MEMBRANES

ANSI A118.10 specifies waterproof membranes for use under thinset tile installations. Most waterproof membranes have crack isolation properties and, if so, must also comply with ANSI A118.12.

- A. General: Manufacturer's standard product [, **selected from the following,**] that complies with ANSI A118.10 **[and ANSI A118.12]** and is recommended by manufacturer for application indicated. Include reinforcement and accessories recommended by manufacturer.

Polyester in "Waterproof Membrane, Sheet" Paragraph below includes polyester, polypropylene, and fleece fabric.

- B. Waterproof Membrane, Sheet: Polyethylene sheet faced on one or both sides with polyester fabric.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[ARDEX Americas]**
 - b. **[Blanke Corporation]**
 - c. **[Laticrete International, Inc.]**
 - d. **[MAPEI Corporation]**
 - e. **[Noble Company (The)]**
 - f. **[Schluter Systems L.P.]**
 - g. **[Schonox HPS North America, Inc.]**
 - h. **<Insert manufacturer's name>**

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

2. Basis-of-Design Product: Subject to compliance with requirements, provide **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **[ARDEX Americas]**
 - b. **[Blanke Corporation]**
 - c. **[Laticrete International, Inc.]**
 - d. **[MAPEI Corporation]**
 - e. **[Noble Company (The)]**
 - f. **[Schluter Systems L.P.]**
 - g. **[Schonox HPS North America, Inc.]**
 - h. **<Insert manufacturer's name>**
3. Nominal Thickness: **[0.02 inch][0.03 inch][0.008 inch]<Insert thickness>**.

Products in "Waterproof Membrane, Fluid Applied" Paragraph below can be single- or multi-component membranes applied in liquid/paste form. They can be installed by brush, roller, or trowel and sometimes sprayed. Some offer options for fabric reinforcing for tensile strength and minor crack-bridging properties.

- C. Waterproof Membrane, Fluid Applied: Liquid-latex rubber or elastomeric polymer [**with continuous fabric reinforcement**].

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

- a. [ARDEX Americas]
- b. [Boiardi Products Corporation; a QEP company]
- c. [Bostik; Arkema]
- d. [C-Cure]
- e. [Custom Building Products]
- f. [H.B. Fuller Construction Products Inc. / TEC]
- g. [Laticrete International, Inc.]
- h. [MAPEI Corporation]
- i. [National Applied Construction Products, Inc.]
- j. [Noble Company (The)]
- k. [Parex, a Sika brand]
- l. [Proflex USA]
- m. [Schonox HPS North America, Inc.]
- n. [Sika Corporation]
- o. [Southern Grouts & Mortars, Inc]
- p. <Insert manufacturer's name>

2.12 Standard Dry-Set Mortar (Thick Bed)

"Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed."

- A. Basis-of-Design Product: Subject to compliance with requirements, provide <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - 1. [Custom Building Products]
 - 2. <Insert manufacturer's name>

2.13 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 (1.5-mm) gap; high performance to a 1/8-inch (3.2-mm) gap.

- A. General: Manufacturer's standard product [, **selected from the following,**] that complies with ANSI A118.12 for [**standard performance**][**high performance**] and is recommended by manufacturer for application indicated. Include reinforcement and accessories recommended by manufacturer.

Polyester in "Crack Isolation Membrane, Polyethylene Sheet" Paragraph below includes polyester, polypropylene, and fleece fabric.

- B. Crack Isolation Membrane, Polyethylene Sheet: Polyethylene faced on both sides with polyester fabric.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

- a. **[Custom Building Products]**
- b. **[Laticrete International, Inc.]**
- c. **[MAPEI Corporation]**
- d. **[Noble Company (The)]**
- e. **[Proflex USA]**
- f. **[Schluter Systems L.P.]**
- g. **<Insert manufacturer's name>**

- C. Crack Isolation Membrane, Asphaltic Sheet: Self-adhering, modified-asphalt sheet **[with fabric reinforcement facing]**.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

- a. **[Boiardi Products Corporation; a QEP company]**
- b. **[Custom Building Products]**
- c. **[Laticrete International, Inc.]**
- d. **[MAPEI Corporation]**
- e. **[National Applied Construction Products, Inc.]**
- f. **[Sika Corporation]**
- g. **[Sika Corporation; Flooring]**
- h. **<Insert manufacturer's name>**

- D. Crack Isolation Membrane, Fluid Applied: Liquid-latex rubber or elastomeric polymer **[with continuous fabric reinforcement]**.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

- a. **[Bostik; Arkema]**
- b. **[C-Cure]**
- c. **[Custom Building Products]**
- d. **[H.B. Fuller Construction Products Inc. / TEC]**
- e. **[Jamo Inc]**
- f. **[Laticrete International, Inc.]**
- g. **[MAPEI Corporation]**

- h. **[Parex, a Sika brand]**
- i. **[Siena Tile & Stone Installation Products; Omega Products International]**
- j. **[Sika Corporation]**
- k. **[Southern Grouts & Mortars, Inc]**
- l. **<Insert manufacturer's name>**

2.14 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

Cleavage membranes allow mortar bed, in thickset installations, to "float" free of the substrate to prevent minor cracking and movement of substrate from transferring to tile.

1. Cleavage Membrane: Installer's option of material that complies with ANSI A108.02, paragraph 3.8.

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

2. Reinforcing Wire Fabric: Galvanized, welded-wire fabric, **2 by 2 inches** by **0.062-inch** diameter; comply with ASTM A1064/A1064M 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 09 24 00 "Cement Plastering."

3. Expanded Metal Lath: Diamond-mesh lath complying with ASTM C847.
 - a. Base Metal and Finish for Interior Applications: Uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel sheet painted after fabrication into lath.
 - b. Base Metal and Finish for Exterior Applications: Zinc-coated (galvanized) steel sheet.
 - c. Configuration over Studs and Furring: Flat.
 - d. Configuration over Solid Surfaces: Self-furring.
 - e. Weight: **[2.5 lb/sq. yd.][3.4 lb/sq. yd.]**.

Retain "Latex Additive" Subparagraph below if latex additive is required to improve flexibility and other properties of mortar setting bed.

4. Latex Additive: **[Manufacturer's standard][acrylic resin][or][styrene-butadiene-rubber]** water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed.

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

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by**

the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

- a. **[ARDEX Americas]**
 - b. **[Boiardi Products Corporation; a QEP company]**
 - c. **[Bostik; Arkema]**
 - d. **[C-Cure]**
 - e. **[Custom Building Products]**
 - f. **[H.B. Fuller Construction Products Inc. / TEC]**
 - g. **[Laticrete International, Inc.]**
 - h. **[MAPEI Corporation]**
 - i. **[Parex, a Sika brand]**
 - j. **[Proflex USA]**
 - k. **[Siena Tile & Stone Installation Products; Omega Products International]**
 - l. **[Southern Grouts & Mortars, Inc]**
 - m. **[Summitville Tiles, Inc.]**
 - n. **<Insert manufacturer's name>**
2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.1.

C. Modified Dry-Set Mortar (Thinset): ANSI A118.4.

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

1. **Manufacturers: Subject to compliance with requirements, [provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[ARDEX Americas]**
 - b. **[Boiardi Products Corporation; a QEP company]**
 - c. **[Bostik; Arkema]**
 - d. **[C-Cure]**
 - e. **[Custom Building Products]**
 - f. **[H.B. Fuller Construction Products Inc. / TEC]**
 - g. **[Laticrete International, Inc.]**
 - h. **[MAPEI Corporation]**
 - i. **[Parex, a Sika brand]**
 - j. **[Proflex USA]**
 - k. **[Schluter Systems L.P.]**
 - l. **[Siena Tile & Stone Installation Products; Omega Products International]**
 - m. **[Southern Grouts & Mortars, Inc]**
 - n. **[Summitville Tiles, Inc.]**
 - o. **<Insert manufacturer's name>**

Retain one of first two subparagraphs below, or delete both and allow Contractor to select type

of mortar.

2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
3. Provide prepackaged, dry-mortar mix combined with **[acrylic resin][or][styrene-butadiene-rubber]** liquid-latex additive at Project site.

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

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

D. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **[ARDEX Americas]**
 - b. **[Custom Building Products]**
 - c. **[H.B. Fuller Construction Products Inc. / TEC]**
 - d. **[Laticrete International, Inc.]**
 - e. **[MAPEI Corporation]**
 - f. **[Parex, a Sika brand]**
 - g. **[Proflex USA]**
 - h. **[Siena Tile & Stone Installation Products; Omega Products International]**
 - i. **<Insert manufacturer's name>**

Retain one of first two subparagraphs below, or delete both and allow Contractor to select type of mortar.

2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
3. Provide prepackaged, dry-mortar mix combined with **[acrylic resin][or][styrene-butadiene-rubber]** liquid-latex additive at Project site.
4. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.15.

E. EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar (Thinset): ANSI A118.11.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work**

include, but are not limited to, the following]:

- a. [ARDEX Americas]
- b. [C-Cure]
- c. [Custom Building Products]
- d. [H.B. Fuller Construction Products Inc. / TEC]
- e. [Laticrete International, Inc.]
- f. [MAPEI Corporation]
- g. [Parex, a Sika brand]
- h. [Proflex USA]
- i. [Southern Grouts & Mortars, Inc]
- j. [Summitville Tiles, Inc.]
- k. <Insert manufacturer's name>

Retain one of two subparagraphs below, or delete both and allow Contractor to select type of mortar.

- 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
- 3. Provide prepackaged, dry-mortar mix combined with **[acrylic resin][or][styrene-butadiene-rubber]** liquid-latex additive at Project site.

F. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.

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

- 1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. [ARDEX Americas]
 - b. [Atlas Minerals & Chemicals, Inc]
 - c. [Bostik; Arkema]
 - d. [C-Cure]
 - e. [Custom Building Products]
 - f. [Laticrete International, Inc.]
 - g. [MAPEI Corporation]
 - h. [Parex, a Sika brand]
 - i. [Southern Grouts & Mortars, Inc]
 - j. [Summitville Tiles, Inc.]
 - k. <Insert manufacturer's name>

Subparagraph below applies to LEED v4, IgCC/ASHRAE 189.1, and Green Globes. VOC content limit is that for ceramic tile adhesives.

- 2. Adhesives shall have a VOC content of **[65]<Insert value>** g/L or less.

Subparagraph below applies to LEED v4.

3. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

Subparagraph below applies to IgCC/ASHRAE 189.1.

4. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.

Subparagraph below applies to Green Globes.

5. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit or 33 mcg/cu. m and that of acetaldehyde shall not exceed 9 mcg/cu. m.

Subparagraph below is an example only. Delete if not required or revise to suit Project. Some products claim resistance of up to 350 deg F (176 deg C). See the Evaluations.

6. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to **140 and 212 deg F**, respectively, and certified by manufacturer for intended use.

Type I organic adhesive is used for interior areas; Type II organic adhesive is suitable only for interior dry, light service or limited water exposure.

G. Organic Adhesive: ANSI A136.1, **[Type I][Type II]**.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. **[ARDEX Americas]**
 - b. **[Bostik; Arkema]**
 - c. **[C-Cure]**
 - d. **[Custom Building Products]**
 - e. **[H.B. Fuller Construction Products Inc. / TEC]**
 - f. **[Laticrete International, Inc.]**
 - g. **[MAPEI Corporation]**
 - h. **[Parex, a Sika brand]**
 - i. **[Siena Tile & Stone Installation Products; Omega Products]**

- j. **International]**
- k. **[Southern Grouts & Mortars, Inc]**
<Insert manufacturer's name>

Subparagraph below applies to LEED v4, IgCC/ASHRAE 189.1, and Green Globes. VOC content limit is that for ceramic tile adhesives.

- 2. Adhesives shall have a VOC content of **[65]<Insert value>** g/L or less.

Subparagraph below applies to LEED v4.

- 3. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

Subparagraph below applies to IgCC/ASHRAE 189.1.

- 4. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.

Subparagraph below applies to Green Globes.

- 5. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit or 33 mcg/cu. m and that of acetaldehyde shall not exceed 9 mcg/cu. m.

Insert additional subparagraphs specifying chemical-resistance performance criteria if required. See ANSI A118.3 and ASTM C267.

Chemical-resistant furan mortar has better heat resistance than epoxies but cannot generally be used directly over concrete. Revise "Chemical-Resistant Furan Mortar" Paragraph below if silica or other fillers are required.

- H. Chemical-Resistant Furan Mortar: ANSI A118.5, with **[carbon]<Insert material>** filler.

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

- 1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[Atlas Minerals & Chemicals, Inc]**

- b. [Sauereisen]
- c. [Summitville Tiles, Inc.]
- d. <Insert manufacturer's name>

2.15 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 (3.2 mm) or wider.

- A. 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 (3.2 mm) or wider; unsanded grout is generally used for tile installed with joint widths of 1/8 inch (3.2 mm) or narrower.

- B. Standard Cement Grout: ANSI A118.6.

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

- 1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**

- a. [ARDEX Americas]
- b. [Boiardi Products Corporation; a QEP company]
- c. [Bostik; Arkema]
- d. [C-Cure]
- e. [Custom Building Products]
- f. [H.B. Fuller Construction Products Inc. / TEC]
- g. [Laticrete International, Inc.]
- h. [MAPEI Corporation]
- i. [Parex, a Sika brand]
- j. [Sakrete; CRH Americas, Oldcastle APG]
- k. [Siena Tile & Stone Installation Products; Omega Products International]
- l. [Sika Corporation]
- m. [Southern Grouts & Mortars, Inc]
- n. [Summitville Tiles, Inc.]
- o. <Insert manufacturer's name>

- C. High-Performance Tile Grout: ANSI A118.7.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[ARDEX Americas]**
 - b. **[Bostik; Arkema]**
 - c. **[Custom Building Products]**
 - d. **[H.B. Fuller Construction Products Inc. / TEC]**
 - e. **[Laticrete International, Inc.]**
 - f. **[MAPEI Corporation]**
 - g. **[Parex, a Sika brand]**
 - h. **[Proflex USA]**
 - i. **[Southern Grouts & Mortars, Inc]**
 - j. **[Summitville Tiles, Inc.]**
 - k. **<Insert manufacturer's name>**

2. Polymer Type:

Retain one of two subparagraphs below, or delete both and allow Contractor to select type of grout.

- a. Dry, redispersible form, prepackaged with other dry ingredients.
- b. Liquid-latex form for addition to prepackaged dry-grout mix.

D. Water-Cleanable Epoxy Grout: ANSI A118.3 [, **with a VOC content of 65 g/L or less**].

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[ARDEX Americas]**
 - b. **[Boiardi Products Corporation; a QEP company]**
 - c. **[Bostik; Arkema]**
 - d. **[C-Cure]**
 - e. **[Custom Building Products]**
 - f. **[H.B. Fuller Construction Products Inc. / TEC]**
 - g. **[Laticrete International, Inc.]**
 - h. **[MAPEI Corporation]**
 - i. **[Parex, a Sika brand]**
 - j. **[Sika Corporation]**
 - k. **[Southern Grouts & Mortars, Inc]**
 - l. **[Summitville Tiles, Inc.]**
 - m. **<Insert manufacturer's name>**

Subparagraph below is an example only. Some products claim resistance of up to 350 deg F (176 deg C). Revise to suit Project. See the Evaluations.

2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to **140 and 212 deg F**, respectively, and certified by manufacturer for intended use.

Insert additional subparagraphs specifying chemical-resistance performance criteria if required. See ANSI A118.3 and ASTM C267; the latter is test method for determining chemical resistance of mortars and grouts. See the Evaluations.

Chemical-resistant furan grout can withstand higher temperatures than those of epoxies but is available only in black color and requires special precautions, because smears can be impossible to remove.

- E. Chemical-Resistant Furan Grout: ANSI A118.5, with carbon filler.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[Atlas Minerals & Chemicals, Inc]**
 - b. **[Sauereisen]**
 - c. **[Summitville Tiles, Inc.]**
 - d. **<Insert manufacturer's name>**

- F. Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

2.16 MISCELLANEOUS MATERIALS

Delete "Trowelable Underlayments and Patching Compounds" Paragraph below if tile is not applied over concrete substrates.

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

Retain "Metal Flooring Transitions" Paragraph below if metal edge strips are required at junction with other floor finishes; revise if metal edge control joints are required.

- C. Metal Flooring Transitions: Profile designed specifically for flooring applications; height to match tile and setting-bed thickness.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available**

manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

- a. **[Blanke Corporation]**
 - b. **[Dural USA, Inc.]**
 - c. **[Profilitec Corp.]**
 - d. **[Progress Profiles America Inc.]**
 - e. **[Schluter Systems L.P.]**
 - f. **<Insert manufacturer's name>**
2. Description: **[L-shaped][Square]<Insert profile>**.
 3. Material and Finish: Metallic or combination of metal and PVC or neoprene base; **[chrome-plated brass][polished chrome anodized aluminum][polished nickel anodized aluminum][color-coated aluminum][half-hard brass][white zinc alloy]<Insert finish>** exposed-edge material.
 - a. Color: **[Brown][White][Gray]<Insert color>**.

Retain "Metal Edge Trim" Paragraph below if metal finishing or edge-protection is required at tiled wall edges.

- D. Metal Edge Trim: Profile designed for wall terminations and edge protection.

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

1. Manufacturers: Subject to compliance with requirements, **[provide products by the following][provide products by one of the following][available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
 - a. **[Blanke Corporation]**
 - b. **[Dural USA, Inc.]**
 - c. **[Profilitec Corp.]**
 - d. **[Progress Profiles America Inc.]**
 - e. **[Schluter Systems L.P.]**
 - f. **<Insert manufacturer's name>**
 2. Description: **[L-shaped][Square][Beveled]<Insert profile>**.
 3. Terminations: **[End caps][Inside corners][Outside corners]** matching edge-protection profile.
 4. Material and Finish: **[Chrome-plated brass][Polished chrome anodized aluminum][Polished nickel anodized aluminum][Color-coated aluminum]<Insert finish>** exposed-edge material.
 - a. Color: **[Brown][White][Gray]<Insert color>**.
- E. Temporary Protective Coating: Formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products and easily removable after grouting is completed without damaging grout or tile.

- F. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- G. Grout Sealer: Grout manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.

PART 3 - EXECUTION

3.1 INSTALLATION OF CERAMIC TILE SYSTEM

- A. Install tile backing panels and treat joints in accordance with ANSI A108.11 and manufacturer's written instructions for type of application indicated.
- B. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
 - 1. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.
- C. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.
 - 1. Allow crack isolation membrane to cure before installing tile or setting materials over it.
- D. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
 - 1. Add materials, water, and additives in accurate proportions.
 - 2. 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.
- E. Install tile in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of ANSI A108 series that are referenced in TCNA installation methods and specified in tile installation schedules, and apply to types of setting and grouting materials used.

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

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

First six subparagraphs below are examples only; revise to suit Project.

- a. Exterior tile floors and walls.
 - b. Tile floors in wet areas.
 - c. Tile swimming pool decks.
 - d. Tile floors in laundries.
 - e. Tile floors consisting of tiles **8 by 8 inches** or larger.
 - f. Tile floors consisting of rib-backed tiles.
2. Extend 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 tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

Usually, retain first subparagraph below unless trim shapes are unavailable for specified tile.

4. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

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

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

Retain first subparagraph below for mounted tile.

- a. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets, so joints between sheets are not apparent in finished Work.
 - b. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - c. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

Retain subparagraph below for wainscots. Verify that instruction agrees with detailing.

7. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

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

- F. Movement Joints: Provide movement joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated on Drawings. Form joints during installation of setting materials, mortar beds, and tile. Keep joints free of dirt, debris, and setting materials prior to filling with sealants. Do not saw-cut joints after installing tiles.
1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- G. Thresholds: Install stone and solid surface thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
1. 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).
 2. Do not extend **[cleavage membrane][waterproof membrane][or][crack isolation membrane]** under thresholds set in **[standard dry-set][modified dry-set][or][improved modified dry-set]** mortar. Fill joints between such thresholds and adjoining tile set on **[cleavage membrane][waterproof membrane][or][crack isolation membrane]** with elastomeric sealant.
- H. Metal Flooring Transitions: Install **[at locations indicated][where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile][where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated]**.
- I. Metal Wall Trim: Install at locations indicated on Drawings.

Retain first option in "Grout Sealer" Paragraph below if using epoxy or furan grouts.

- J. Grout Sealer: Apply grout sealer to **[cementitious]** grout joints **[in tile floors]** in accordance with manufacturer's written instructions. As soon as sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.2 FIELD QUALITY CONTROL

A. Water Test:

1. Test of waterproofing membrane in showers and similar areas to be performed by Installation Contractor before setting tile.
 - a. Perform test after 24 hours of waterproof membrane installation.
 - b. Insert test plug in drain or waste line.
 - c. Fill shower base with water, high enough that the membrane-to-drain connection and floor-to-wall transition can be evaluated, and mark wall.
 - d. Check for leaks after 24 hours.
2. Test to be witnessed by **[Architect][authorities having jurisdiction]<Insert names or titles of witnesses>**.

B. Nonconforming Work:

1. Waterproof membrane will be considered defective if water level has dropped.
2. Remove and replace defective components and retest.

3.3 EXTERIOR CERAMIC TILE INSTALLATION SCHEDULE

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. This schedule is intended to be a guide, and not all exterior installation methods in the "TCNA Handbook" are included; insert others if required.

Coordinate with ceramic tile type drawing designations in Part 2. If more than one tile type is required for a particular installation method, copy and re-edit an installation subparagraph for each tile type.

A. 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. ANSI A108.1B is the required method if installing a waterproof membrane.

1. TCNA F101 <Insert designation>: Method [**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**].

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <**Insert tile-type designation**>.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA F101" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: [**Dry-set**][**Modified dry-set**][**Improved modified dry-set**] mortar.
- c. Grout: [**Sand-portland cement**][**Standard sanded cement**][**Standard unsanded cement**][**High-performance sanded cement**][**High-performance unsanded cement**] grout.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of waterproof membrane. Delete if not required.

- d. Waterproof Membrane: [**As recommended by setting material manufacturer**][**Polyethylene sheet**][**Fluid applied**][**Fabric reinforced, fluid applied**].

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

2. TCNA F102 **<Insert designation>**: Thinset mortar **[on concrete][over waterproof membrane on concrete][over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated][over crack isolation membrane on concrete][over crack isolation membrane on concrete where indicated and on concrete where membrane is not indicated]**.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
b. Thinset Mortar: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement]** grout.

Waterproof or crack isolation membrane is optional with this installation method. Retain first option in "Waterproof Membrane" or "Crack Isolation Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of membrane for this installation method. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.
e. Crack Isolation Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Asphaltic sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- f. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- g. Movement Joints: Types located on Drawings.

B. 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. ANSI A108.1B is the required method if installing a waterproof membrane.

1. TCNA F103 <Insert designation>: Method [ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]. Cement mortar bed (thickset) [over waterproof membrane on concrete][over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated] over drainage material on roof membrane.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <Insert tile-type designation>.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA F103" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: [Modified dry-set][Improved modified dry-set] mortar.
- c. Grout: [Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement] grout.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of waterproof membrane. Delete if not required.

- d. Waterproof Membrane: [As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane].

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: [1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

2. TCNA F104 <Insert designation>: Thinset mortar [on concrete][over

waterproof membrane on concrete][over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated][over crack isolation membrane on concrete][over crack isolation membrane on concrete where indicated and on concrete where membrane is not indicated].

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>.**
- b. Thinset Mortar: **[Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement]** grout.

Waterproof or crack isolation membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" or "Crack Isolation Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of membrane for this installation method. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane].**
- e. Crack Isolation Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Asphaltic sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane].**

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- f. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>.**

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- g. Movement Joints: Types located on Drawings.

C. 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. ANSI A108.1B is the required method if installing a membrane.

- 1. TCNA W201 **<Insert designation>**: Method **[ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]**. Cement mortar bed (thickset) installed on metal lath **[over waterproof membrane][over water-resistant barrier][over vapor-retarder membrane].**

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.

Retain "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA W201" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: **[Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement]** grout.

Waterproof membrane, water-resistive barrier or vapor retarder membrane is optional feature with this installation method but may be required by local codes. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for recommended location of membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.
- e. Water-Resistive Barrier: Compliant with local code requirements **[and][specified in Division 07]**.
- f. Vapor Retarder: Compliant with local code requirements **[and][specified in Division 07]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- g. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- h. Movement Joints: Types located on Drawings.

2. TCNA W202E **<Insert designation>**: Thinset mortar **[over waterproof membrane][over water-resistive barrier][over vapor retarder membrane]**.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement]** grout.

Waterproof membrane, water-resistive barrier or vapor retarder membrane is optional feature with this installation method but may be required by local codes. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for recommended location of membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.
- e. Water-Resistive Barrier: Compliant with local code requirements **[and][specified in Division 07]**.
- f. Vapor Retarder: Compliant with local code requirements **[and][specified in Division 07]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- g. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- h. Movement Joints: Types located on Drawings.

D. Exterior Wall Installations, Wood or Metal Studs:

- 1. TCNA W244E **<Insert designation>**: Thinset mortar **[over waterproof membrane on cementitious backer units][on cementitious backer units over vapor-retarder membrane][on cementitious backer units over water-resistive barrier]**.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement]** grout.

Waterproof membrane, water-resistive barrier or vapor retarder membrane is optional feature with this installation method but may be required by local codes. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for recommended location of membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-**

- e. **reinforced, fluid-applied membrane**.
Water-Resistive Barrier: Compliant with local code requirements **[and][specified in Division 07]**.
- f. Vapor Retarder: Compliant with local code requirements **[and][specified in Division 07]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- g. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- h. Movement Joints: Types located on Drawings.

3.4 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

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. This schedule is intended to be a guide, and not all interior installation methods in the "TCNA Handbook" are included in this schedule; insert others if required.

Coordinate with ceramic tile type drawing designations in Part 2. If more than one tile type is required for a particular installation method, copy and re-edit an installation subparagraph for each tile type.

A. 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.

1. TCNA F111 **<Insert designation>**: Method **[ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]**. Cement mortar bed (thickset) installed over cleavage membrane.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA F111" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Sand-portland cement][Standard sanded cement][Standard**

unsanded cement][High-performance sanded cement][High-performance unsanded cement] grout.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- d. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- e. Movement Joints: Types located on Drawings.

TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" includes installation method F125-Full and a TCNA F125-Partial variation. If partial coverage of crack isolation membrane is required, specify installation method F125-Partial or indicate location and extent of coverage on Drawings.

2. TCNA F125-Full **<Insert designation>**: Thinset mortar on crack isolation membrane.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.
- d. Crack Isolation Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Asphaltic sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

B. 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. ANSI A108.1B is the required method if epoxy grout or bond coat is used.

1. TCNA F141 <Insert designation>: Method **[ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]**. Cement mortar bed (thickset) installed over cleavage membrane **[over waterproof membrane]**.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <Insert tile-type designation>.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA F141" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of waterproof membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

TCNA F142 is for residential dry areas with joists 16 inches (406 mm) o.c. or closer and only suitable for tile 8 by 8 inches (200 by 200 mm) or smaller.

2. TCNA F142 <Insert designation>: Organic adhesive on plywood underlayment.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <Insert tile-type designation>.

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

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- c. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- d. Movement Joints: Types located on Drawings.

C. Interior Radiant Heat Floor Installations, Concrete Subfloor:

- 1. TCNA RH110 **<Insert designation>**: Thinset mortar **[on crack isolation membrane]**; hydronic piping installed in concrete.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.

Crack isolation membrane is optional feature with this installation method. Retain first option in "Crack Isolation Membrane" Subparagraph below if specifying-sole source setting material manufacturer. See TCNA installation method for recommended location of membrane for this installation method. Delete if not required.

- d. Crack Isolation Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Asphaltic sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

2. TCNA RH115 <Insert designation>: Thinset mortar; electric radiant system encapsulated in thinset mortar.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <Insert tile-type designation>.
- b. Thinset Mortar: [Modified dry-set][Improved modified dry-set] mortar.
- c. Grout: [Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy] grout.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- d. Joint Width: [1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- e. Movement Joints: Types located on Drawings.

D. Interior Radiant Heat Floor Installations, Wood Subfloor:

TCNA RH130 is for dry areas with joists 16 inches (406 mm) o.c. or closer.

1. TCNA RH130 <Insert designation>: Thinset mortar on exterior-glue plywood; electric radiant system encapsulated in thinset mortar.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <Insert tile-type designation>.
- b. Thinset Mortar: [EGP (exterior glue plywood) latex-portland cement][Modified dry-set][Improved modified dry-set] mortar.
- c. Grout: [Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy] grout.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- d. Joint Width: [1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- e. Movement Joints: Types located on Drawings.

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. ANSI A108.1B is the required method if installing a membrane.

- 2. TCNA RH141 <Insert designation>: Method [**ANSI A108.1A**][**ANSI A108.1B**][**ANSI A108.1C**]. Cement mortar bed (thickset) installed over cleavage membrane [**and waterproof membrane**] with hydronic piping installed in mortar bed.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: <Insert stone tile-type designation>.

Retain bond coat from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA RH141" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: [**Modified dry-set**][**Improved modified dry-set**] mortar.
- c. Grout: [**Sand-portland cement**][**Standard sanded cement**][**Standard unsanded cement**][**High-performance sanded cement**][**High-performance unsanded cement**][**Water-cleanable epoxy**] grout.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of membrane for this installation method. Delete if not required.

- d. Waterproof Membrane: [**As recommended by setting material manufacturer**][**Polyethylene sheet**][**Fluid-applied membrane**][**Fabric-reinforced, fluid-applied membrane**].

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: [**1/8 inch**][**3/16 inch**][**1/4 inch**][**3/8 inch**]<Insert width>.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

E. Interior Wall Installations, Masonry or Concrete:

- 1. TCNA W202I <Insert designation>: Thinset mortar [**over waterproof membrane**].

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Dry-set][Modified dry-set][Improved modified dry-set][Water-cleanable epoxy]** mortar.
- c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of membrane for this installation method. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

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. ANSI A108.1B is the required method if installing a waterproof membrane.

- 2. TCNA W211 **<Insert designation>**: Method **[ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]**. Cement mortar bed (thickset) bonded to substrate **[over waterproof membrane]**.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA W211" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-**

performance unsanded cement][Water-cleanable epoxy] grout.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of waterproof membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

F. Interior Wall Installations, Wood or Metal Studs or Furring:

- 1. TCNA W242 **<Insert designation>**: Organic adhesive on gypsum board.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Grout: **[Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- c. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- d. Movement Joints: Types located on Drawings.

- 2. TCNA W245 **<Insert designation>**: Thinset mortar on glass-mat, water-resistant gypsum backer board **[over waterproof membrane]**.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Sand-portland cement][Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.

Waterproof membrane is optional feature with this installation method. Retain "Waterproof Membrane" Subparagraph below if waterproof membrane is required for application indicated.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

G. Bathtub Wall Installations with No Shower Head, Wood or Metal Studs or Furring:

- 1. TCNA B413 **<Insert designation>**: **[Thinset mortar][Organic adhesive]** on **[water-resistant gypsum][coated glass-mat, water-resistant gypsum]** backer board.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.

Delete "Thinset Mortar" Subparagraph below if organic adhesive is used.

- b. Thinset Mortar: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.

Retain high-performance grout in "Grout" Subparagraph below if organic adhesive and metal studs or furring are used.

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

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with

grout selections and tile module sizes specified in Part 2.

- d. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- e. Movement Joints: Types located on Drawings.

H. Bathtub/Shower Wall Installations:

- 1. TCNA B419 **<Insert designation>**: Thinset mortar [**over waterproof membrane**] on coated glass-mat, water-resistant gypsum backer board.

Insert drawing designation from Part 2.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: **[Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: **[Standard sanded cement][Standard unsanded cement][High-performance sanded cement][High-performance unsanded cement][Water-cleanable epoxy]** grout.

Waterproof membrane is optional feature with this installation method. Retain "Waterproof Membrane" Subparagraph below if waterproof membrane is required for application indicated.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

3.5 CHEMICAL-RESISTANT TILE INSTALLATION SCHEDULE

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. This schedule is intended to be a guide, and not all interior installation methods in the "TCNA Handbook" are included in this schedule; insert others if required.

Coordinate with ceramic tile type drawing designations in Part 2. If more than one tile type is required for a particular installation method, copy and re-edit an installation subparagraph for each tile type.

A. Interior Floor Installations, 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. Note that most furan grouts are incompatible with portland cement setting materials. If epoxy grout is used and floors are to be cleaned by hosing with extremely hot water, include requirements for heat resistance in "Water-Cleanable Epoxy Grout" Paragraph in "Grout Materials" Article.

1. TCNA F115 **<Insert designation>**: Thinset mortar [**over crack isolation membrane**].

Insert drawing designation from Part 2. Check with manufacturer to confirm that tile complies with ASTM C650 for chemical resistance needed.

- a. Chemical-Resistant Tile Type: **<Insert tile-type designation>**.
- b. Thinset Mortar: [**Dry-set**][**Modified dry-set**][**Improved modified dry-set**] mortar.
- c. Grout: [**Water-cleanable epoxy**][**Chemical-resistant furan**].

Crack isolation membrane is optional feature with this installation method. Retain first option in "Crack Isolation Membrane" Subparagraph below if specifying-sole source setting material manufacturer. See TCNA installation method for recommended location of membrane for this installation method. Delete if not required.

- d. Crack Isolation Membrane: [**As recommended by setting material manufacturer**][**Polyethylene sheet**][**Asphaltic sheet**][**Fluid-applied membrane**][**Fabric-reinforced, fluid-applied membrane**].

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes in Part 2.

- e. Joint Width: [**1/8 inch**][**3/16 inch**][**1/4 inch**][**3/8 inch**]**<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

If floors are to be cleaned by hosing with extremely hot water, include requirements for heat resistance in "Water-Cleanable, Tile-Setting Epoxy" Paragraph in "Setting Materials" Article.

2. TCNA F131 **<Insert designation>**: Water-cleanable, tile-setting epoxy.

Insert drawing designation from Part 2. Check with manufacturer to confirm that tile complies

with ASTM C650 for chemical resistance needed.

- a. Chemical-Resistant Tile Type: **<Insert tile-type designation>**.
- b. Grout: Water-cleanable epoxy.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- c. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- d. Movement Joints: Types located on Drawings.

B. 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. ANSI A108.1B is required method if installing a waterproof membrane.

- 1. TCNA W211 **<Insert designation>**: Method **[ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]**. Cement mortar bed (thickset) bonded to substrate **[over waterproof membrane]**.

Insert drawing designation from Part 2. Check with manufacturer to confirm that tile complies with ASTM C650 for chemical resistance needed.

- a. Chemical-Resistant Tile Type: **<Insert tile-type designation>**.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA W211" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: **[Dry-set][Latex-]** portland cement mortar.
- c. Grout: Water-cleanable epoxy.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of waterproof membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise

after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

C. Interior Wall Installations, Solid Backing:

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.

1. TCNA W222 **<Insert designation>**: Method **[ANSI A108.1A][ANSI A108.1B][ANSI A108.1C]**. One-coat cement mortar bed (thickset) installed **[over cleavage membrane][over waterproof membrane]** on solid backing.

Insert drawing designation from Part 2. Check with manufacturer to confirm that tile complies with ASTM C650 for chemical resistance needed.

- a. Chemical-Resistant Tile Type: **<Insert tile-type designation>**.

Retain one thinset mortar from options in "Bond Coat for Cured-Bed Method" Subparagraph below if retaining ANSI A108.1B or ANSI A108.1C in "TCNA W222" Subparagraph above; delete subparagraph below if retaining ANSI A108.1A.

- b. Bond Coat for Cured-Bed Method: **[Dry-set][Modified dry-set][Improved modified dry-set]** mortar.
- c. Grout: Water-cleanable epoxy.

Waterproof membrane is optional feature with this installation method. Retain first option in "Waterproof Membrane" Subparagraph below if specifying sole-source setting material manufacturer. See TCNA installation method for recommended location of waterproof membrane. Delete if not required.

- d. Waterproof Membrane: **[As recommended by setting material manufacturer][Polyethylene sheet][Fluid-applied membrane][Fabric-reinforced, fluid-applied membrane]**.

Joint widths in "Joint Width" Subparagraph below are examples only. Retain one width, or revise after verifying width with tile manufacturers of product selected. Coordinate joint widths with grout selections and tile module sizes specified in Part 2.

- e. Joint Width: **[1/8 inch][3/16 inch][1/4 inch][3/8 inch]<Insert width>**.

Tile perimeter and field movement joints are essential and required in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation," Ch. EJ171. See TCNA's "Handbook

for Ceramic, Glass, and Stone Tile Installation" for descriptions and locate each type where required on Drawings.

- f. Movement Joints: Types located on Drawings.

END OF SECTION 09 30 13