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## SECTION 093013 - CERAMIC TILING

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## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Ceramic mosaic tile.
  - 2. Quarry tile.
  - 3. Pressed floor tile.
  - 4. Porcelain tile.
  - 5. Glazed wall tile.

6. Stone thresholds.
7. Tile backing panels.
8. Waterproof membrane[ **for thinset applications**].
9. Crack isolation membrane.
10. Metal edge strips.

B. Related Requirements:

1. [Section 071326 "Self-Adhering Sheet Waterproofing"] [Section 071353 "Elastomeric Sheet Waterproofing"] [Section 071354 "Thermoplastic Sheet Waterproofing"] [Section 071413 "Hot Fluid-Applied Rubberized Asphalt Waterproofing"] [Section 071416 "Cold Fluid-Applied Waterproofing"] for waterproofing under thickset mortar beds.
2. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
3. Section 092400 "Cement Plastering" for scratch coat for thickset mortar setting-bed installations.
4. Section 092613 "Gypsum Veneer Plastering" for cementitious backer units.
5. Section 092900 "Gypsum Board" for [cementitious backer units] [glass-mat, water-resistant backer board].
6. Section 093023 "Glass Mosaic Tiling."
7. Section 093033 "Stone Tiling."
8. Section 093500 "Chemical-Resistant Tiling."
9. Section 096340 "Stone Flooring" for stone thresholds.

### 1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."
- C. Face Size: Actual tile size, excluding spacer lugs.
- D. Module Size: Actual tile size plus joint width indicated.

### 1.4 PREINSTALLATION MEETINGS

- 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.

## 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
  - 1. Product Data: For adhesives, indicating VOC content.
  - 2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
  - 3. Laboratory Test Reports: For sealers, indicating compliance with requirements for low-emitting materials.
- C. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- D. Samples for Initial Selection: For tile, grout, and accessories involving color selection.
- E. Samples for Verification:
  - 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.]**
  - 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 (300 mm) square]** **[36 inches (900 mm) 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 (150-mm)** lengths.
  - 5. Metal edge strips in **6-inch (150-mm)** lengths.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product.
- D. Product Test Reports: For tile-setting and -grouting products **[ and certified porcelain tile]**.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: [ **Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.** ]
  - a. **<Insert, in separate subparagraphs, tile-type designation or description and quantity required for each category of tile for which extra material is required>.**
2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

## 1.8 QUALITY ASSURANCE

### A. Installer Qualifications:

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 Foreman 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** ] [ **gauged porcelain tile/gauged porcelain tile panels and slabs** ] [ **and** ] [ **large format tile** ].

### B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockup of [ **each type of** ] floor tile installation.
2. Build mockup of [ **each type of** ] wall tile installation.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile, cementitious materials, and plywood backer boards on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

## 1.10 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.

## 1.11 WARRANTY

- A. Delamination Warranty: Manufacturer agrees to repair or replace crack isolation membrane or membrane on face of backer board that fail(s) in materials within specified warranty period.
1. Limitations include, but are not limited to, the following:
    - a. Not to exceed 95-percent RH in accordance with ASTM F2170.
    - b. MVER not to exceed **8 lb/1000 sq. ft. (3.6 kg/92.9 sq. m)** over 24 hours in accordance with ASTM F1869.
    - c. pH not to exceed 11 in accordance with ASTM F710.
    - d. Debonded substrates.
  2. Warranty Period: **[15] [25]** years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations for 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.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
  2. Obtain [**waterproof membrane**] [**and**] [**crack isolation membrane**], except for sheet products, from manufacturer of setting and grouting materials.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
1. Stone thresholds.
  2. Waterproof membrane.
  3. Crack isolation membrane.
  4. Plywood backer boards.
  5. Cementitious backer units.

6. Metal edge strips.

## 2.2 PRODUCTS, GENERAL

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

## 2.3 TILE PRODUCTS

- A. Ceramic Tile Type[ **CT-<#>**]: Factory-mounted [**unglazed**] [**glazed**] ceramic mosaic tile.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Marazzi Tile, Inc.
    - b. American Olean; a division of Dal-Tile Corporation.
    - c. Crossville, Inc.
    - d. Daltile.
    - e. Deutsche Steinzeug America, Inc.
    - f. Grupo Porcelanite.
    - g. Interceramic.
    - h. Iris US.
    - i. Jeffrey Court Inc.
    - j. Lone Star Ceramics; Elgin Butler.
    - k. Portobello America, Inc.
    - l. Seneca Tiles, Inc.
    - m. **<Insert manufacturer's name>**.
  2. Composition: [**Porcelain**] [**Impervious natural clay or porcelain**] [**Vitreous or impervious natural clay or porcelain**].

3. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
4. Module Size: [1 by 1 inch (25.4 by 25.4 mm)] [1 by 2 inches (25.4 by 50.8 mm)] [2 by 2 inches (50.8 by 50.8 mm)] <Insert dimensions>.
5. Thickness: 1/4 inch (6.4 mm).
6. Face: [Plain] [Pattern of design indicated,] with cushion edges.
7. Surface: [Smooth, without] [Slip resistant, with] abrasive admixture.
8. Dynamic Coefficient of Friction: Not less than 0.42.
9. Finish: [Bright, opaque] [Bright, clear] [Mat, opaque] [Mat, clear] [Semimat, opaque] [Semimat, clear] [Vellum, opaque] [Vellum, clear] [Crystalline] <Insert description> glaze.
10. 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>.
11. Grout Color: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from manufacturer's full range] <Insert color>.
12. 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:
  - a. Base Cove: Cove, module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] <Insert dimensions>.
  - b. Base Cap for Portland Cement Mortar Installations: Bead (bullnose), module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] <Insert dimensions>.
  - c. Base Cap for Thinset Mortar Installations: Surface bullnose, module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] [2 by 2 inches (50.8 by 50.8 mm)] <Insert dimensions>.
  - d. Wainscot Cap for Portland Cement Mortar Installations: Bead (bullnose), module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] <Insert dimensions>.
  - e. Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] [2 by 2 inches (50.8 by 50.8 mm)] <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 (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] <Insert dimensions>.
  - h. External Corners for Thinset Mortar Installations: Surface bullnose, module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] [2 by 2 inches (50.8 by 50.8 mm)] <Insert dimensions>.
  - i. Internal Corners: Cove, module size [1 by 1 inch (25.4 by 25.4 mm)] [2 by 1 inch (50.8 by 25.4 mm)] <Insert dimensions>.
  - j. Internal Corners: Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.
  - k. 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 (12.7 to 6.4 mm) across nominal 4-inch (100-mm) dimension.

B. Ceramic Tile Type [CT-#]: [Unglazed] [Glazed] square-edged quarry tile.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Olean; a division of Dal-Tile Corporation.
  - b. Atlas Minerals & Chemicals, Inc.
  - c. Daltile.
  - d. Deutsche Steinzeug America, Inc.
  - e. Endicott Tile LLC.
  - f. Florida Brick & Clay Company Inc.
  - g. Florida Tile, Inc.
  - h. Interceramic.
  - i. Jeffrey Court Inc.
  - j. Metropolitan Ceramics.
  - k. Portobello America, Inc.
  - l. Quarry Tile Co.
  - m. **<Insert manufacturer's name>**.
2. Face Size: **[3 by 3 inches (76 by 76 mm)] [4 by 4 inches (102 by 102 mm)] [6 by 3 inches (152 by 76 mm)] [6 by 6 inches (152 by 152 mm)] [8 by 3-7/8 inches (200 by 98 mm)] [8 by 8 inches (200 by 200 mm)]** **<Insert dimensions>**.
3. Thickness: **[3/8 inch (9.5 mm)] [1/2 inch (12.7 mm)] [3/4 inch (19 mm)]**.
4. Wearing Surface: **[Nonabrasive, smooth] [Abrasive aggregate embedded in surface]** **<Insert description>**.
5. Dynamic Coefficient of Friction: Not less than 0.42.
6. Finish: **[Bright, opaque] [Bright, clear] [Mat, opaque] [Mat, clear] [Semimat, opaque] [Semimat, clear] [Vellum, opaque] [Vellum, clear] [Crystalline]** **<Insert description>** glaze.
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>**.
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:
  - a. Base: Coved **[with surface bullnose top edge]**, face size **[6 by 6 inches (152 by 152 mm)] [8 by 3-7/8 inches (200 by 98 mm)]** **<Insert dimensions>**.
  - b. Wainscot Cap: Surface bullnose, face size **[6 by 6 inches (152 by 152 mm)] [8 by 3-7/8 inches (200 by 98 mm)]** **<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.

C. Ceramic Tile Type **[CT-#>]**: **[Unglazed] [Glazed]** pressed floor tile.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Marazzi Tile, Inc.
  - b. American Olean; a division of Dal-Tile Corporation.
  - c. Daltile.

- d. Florim USA.
  - e. Grupo Porcelanite.
  - f. Interceramic.
  - g. Seneca Tiles, Inc.
  - h. Vitromex USA.
  - i. **<Insert manufacturer's name>**.
2. Composition: **[Impervious natural clay or porcelain]** **[Vitreous or impervious natural clay or porcelain]** **[Natural clay or porcelain]**.
  3. Face Size: **[3 by 3 inches (76 by 76 mm)]** **[4 by 4 inches (102 by 102 mm)]** **[6 by 6 inches (152 by 152 mm)]** **[7-3/4 by 3-7/8 inches (197 by 98 mm)]** **[7-7/8 by 7-7/8 inches (200 by 200 mm)]** **[11-13/16 by 11-13/16 inches (300 by 300 mm)]** **[165 by 333 mm]** **[200 by 250 mm]** **[250 by 250 mm]** **[333 by 333 mm]** **[400 by 400 mm]** **<Insert dimensions>**.
  4. Face Size Variation: **[Calibrated or rectified]** **[Rectified]**.
  5. Thickness: **[1/4 inch (6.4 mm)]** **[3/8 inch (9.5 mm)]** **[1/2 inch (12.7 mm)]**.
  6. Face: **[Plain with square or cushion edges]** **[Plain with square edges]** **[Plain with cushion edges]** **[Pattern of design indicated, with square or cushion edges]** **[As indicated]**.
  7. Dynamic Coefficient of Friction: Not less than 0.42.
  8. Glaze: **[Bright, opaque]** **[Bright, clear]** **[Mat, opaque]** **[Mat, clear]** **[Semimat, opaque]** **[Semimat, clear]** **[Vellum, opaque]** **[Vellum, clear]** **[Crystalline]** **<Insert description>**.
  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>**.
  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:
    - 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>**.
    - i. Internal Corners: Cove, module size **[same as adjoining flat tile]** **<Insert size>**.
    - j. Internal Corners: Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

- k. 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 (12.7 to 6.4 mm)** across nominal **4-inch (100-mm)** dimension.
- D. Ceramic Tile Type [CT-#>]: [Unglazed] [Glazed] porcelain tile.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Marazzi Tile, Inc.
    - b. American Olean; a division of Dal-Tile Corporation.
    - c. Crossville, Inc.
    - d. Daltile.
    - e. Florida Tile, Inc.
    - f. Florim USA.
    - g. Grupo Porcelanite.
    - h. Interceramic.
    - i. Iris US.
    - j. Seneca Tiles, Inc.
    - k. <Insert manufacturer's name>.
  2. Certification: Tile certified by the Porcelain Tile Certification Agency.
  3. Face Size: [**3 by 3 inches (76 by 76 mm)**] [**4 by 4 inches (102 by 102 mm)**] [**6 by 6 inches (152 by 152 mm)**] [**7-3/4 by 3-7/8 inches (197 by 98 mm)**] [**7-7/8 by 7-7/8 inches (200 by 200 mm)**] [**11-13/16 by 11-13/16 inches (300 by 300 mm)**] [165 by 333 mm] [200 by 250 mm] [250 by 250 mm] [333 by 333 mm] [400 by 400 mm] <Insert dimensions>.
  4. Face Size Variation: Rectified.
  5. Thickness: [**1/4 inch (6.4 mm)**] [**3/8 inch (9.5 mm)**] [**1/2 inch (12.7 mm)**].
  6. Face: [Plain with square or cushion edges] [Plain with square edges] [Plain with cushion edges] [Polished with square edges] [As indicated].
  7. Dynamic Coefficient of Friction: Not less than 0.42.
  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>.
  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:
    - 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.

- 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 (12.7 to 6.4 mm) across nominal 4-inch (100-mm) dimension.
- E. Ceramic Tile Type[ CT-#>]: Glazed wall tile.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Marazzi Tile, Inc.
    - b. American Olean; a division of Dal-Tile Corporation.
    - c. Daltile.
    - d. Grupo Porcelanite.
    - e. Jeffrey Court Inc.
    - f. Seneca Tiles, Inc.
    - g. <Insert manufacturer's name>.
  2. Module Size: [4-1/4 by 4-1/4 inches (108 by 108 mm)] [6 by 4-1/4 inches (152 by 108 mm)] [6 by 6 inches (152 by 152 mm)] [200 by 200 mm] [250 by 250 mm] [200 by 300 mm] <Insert dimensions>.
  3. Face Size Variation: Rectified.
  4. Thickness: 5/16 inch (8 mm).
  5. Face: [Plain with modified square edges or cushion edges] [Plain with modified square edges] [Plain with cushion edges] [Pattern of design indicated, with manufacturer's standard edges].
  6. Finish: [Bright, opaque] [Bright, clear] [Mat, opaque] [Mat, clear] [Semimat, opaque] [Semimat, clear] [Vellum, opaque] [Vellum, clear] [Crystalline] <Insert description> glaze.
  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>.
  9. Mounting: Factory, back mounted.
  10. Mounting: PregROUTED sheets of tiles are factory assembled and grouted with manufacturer's standard white silicone rubber.
  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:
    - a. Base for Portland Cement Mortar Installations: Coved, module size [4-1/4 by 4-1/4 inches (108 by 108 mm)] [6 by 6 inches (152 by 152 mm)] [6 by 3-3/4 inches (152 by 95 mm)] <Insert dimensions>.
    - b. Base for Thinset Mortar Installations: Straight, module size [4-1/4 by 4-1/4 inches (108 by 108 mm)] [6 by 6 inches (152 by 152 mm)] [6 by 2 inches (152 by 51 mm)] <Insert dimensions>.
    - c. Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap, module size [4-1/4 by 4-1/4 inches (108 by 108 mm)] [6 by 6 inches (152 by 152 mm)] [6 by 2 inches (152 by 51 mm)] <Insert dimensions>.

- d. Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size [**4-1/4 by 4-1/4 inches (108 by 108 mm)**] [**6 by 6 inches (152 by 152 mm)**] [**6 by 2 inches (152 by 51 mm)**] <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 (19 mm)** unless otherwise indicated.
  - g. External Corners for Thinset Mortar Installations: Surface bullnose, same size as adjoining flat tile.
  - h. Internal Corners: Field-buttet square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.
- F. Accessories: Provide vitreous china accessories of type and size indicated, suitable for installing by same method as used for adjoining wall tile.
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>.

## 2.4 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to **1/16 inch (1.5 mm)** above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to **1/2 inch (12.7 mm)** or less above adjacent floor surface.
- B. Granite Thresholds: ASTM C615/C615M, with [**polished**] [**honed**] <Insert finish> finish.
1. Description: Uniform, [**fine**] [**medium**]-grained, [**white**] [**gray**] [**black**] <Insert color> stone without veining.
  2. Description: Match Architect's sample.
  3. Description: Provide[ **one of**] the following:
    - a. <Insert, in separate subparagraphs, name of variety and producer, distributor, or importer>.
- C. Marble Thresholds: ASTM C503/C503M, with a minimum abrasion resistance of [**10**] [**12**] in accordance with ASTM C1353 or ASTM C241/C241M and with honed finish.
1. Description: Uniform, fine- to medium-grained white stone with gray veining.
  2. Description: Match Architect's sample.
  3. Description: Provide[ **one of**] the following:
    - a. <Insert, in separate subparagraphs, name of variety and producer, distributor, or importer>.

- D. Slate Thresholds: ASTM C629/C629M, Classification [**I Exterior**] [**II Interior**], with fine, even grain and honed finish.
1. Description: Uniform, [**black**] [**blue-black**] [**gray**] [**blue-gray**] [**green**] <Insert color> stone[ **and unfading**].
  2. Description: Match Architect's sample.
  3. Description: Provide[ **one of**] the following:
    - a. <Insert, in separate subparagraphs, name of variety and producer, distributor, or importer>.

## 2.5 TILE BACKING PANELS

- A. Plywood Backer Board with Membrane Facing: DOC PS 1, exterior plywood with polyolefin foam sheet membrane facing.
1. Basis-of-Design Product: Subject to compliance with requirements, provide NUE TILE; DemoFlex TMS Plus Panels or comparable product by one of the following:
    - a. <Insert manufacturer's name>.
  2. Thickness: Nominal [**3/8 inch (9.7 mm)**] [**1/2 inch (12.9 mm)**] [**5/8 inch (16.8 mm)**] [**3/4 inch (20 mm)**].
  3. Sound Control: Sound reduction consisting of plywood backer board with membrane facing impact-absorbing composite.
    - a. Minimum Sound Transmission Class (STC) of [**59**] [**66**] when tested in accordance with ASTM E492.
    - b. Minimum Impact Insulation Class (IIC) of [**52**] [**66**] [**71**] when tested in accordance with ASTM E492.
  4. Plywood: Exposure 1, Group 1 species. Grade B or Grade C.
    - a. Basis-of-Design Product: Subject to compliance with requirements, provide 84 Lumber Company.
    - b. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of the Architectural Woodwork Standards for each type of interior architectural woodwork and quality grade specified unless otherwise indicated.
    - c. Composite Wood Products: Products shall be made without urea formaldehyde.
    - d. Composite Wood Products: Products 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."
    - e. Composite Wood Products: Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.
    - f. Composite Wood Products: Formaldehyde emission rates shall not be greater than the following when tested in accordance with ASTM D6007 or ASTM E1333:

- 1) Hardwood Plywood: 0.05 ppm.
  - 2) Particleboard: 0.09 ppm.
  - 3) MDF More Than **5/16 Inch (8 mm)** Thick: 0.11 ppm.
  - 4) MDF **5/16 Inch (8 mm)** or Less in Thickness: 0.13 ppm.
- g. Composite Wood Products: Products shall be made without urea formaldehyde.
- B. Cementitious Backer Units: ANSI A118.9 or ASTM C1325, Type A, in maximum lengths available to minimize end-to-end butt joints.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. C-Cure.
    - b. Custom Building Products.
    - c. FinPan, Inc.
    - d. Georgia-Pacific Gypsum LLC.
    - e. USG Corporation.
    - f. **<Insert manufacturer's name>**.
  2. Thickness: [**1/4 inch (6.4 mm)**] [**1/2 inch (12.7 mm)**] [**5/8 inch (16 mm)**] [**As indicated**].
- C. Fiber-Cement Backer Board: ASTM C1288, in maximum lengths available to minimize end-to-end butt joints.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation.
    - b. Custom Building Products.
    - c. James Hardie Building Products, Inc.
    - d. **<Insert manufacturer's name>**.
  2. Thickness: [**1/4 inch (6.4 mm)**] [**1/2 inch (12.7 mm)**] [**As indicated**].
- 2.6 WATERPROOF MEMBRANE
- A. General: Manufacturer's standard product[, **selected from the following**,] that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Noble Company (The).
    - b. **<Insert manufacturer's name>**.

2. Nominal Thickness: **0.030 inch** (0.76 mm).
  3. Nominal Thickness: **0.040 inch** (1 mm).
- C. PVC Sheet: PVC heat-fused on both sides to facings of nonwoven polyester.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Compotite Corporation.
    - b. Noble Company (The).
    - c. **<Insert manufacturer's name>**.
  2. Nominal Thickness: **0.025 inch** (0.6 mm).
  3. Nominal Thickness: **0.040 inch** (1 mm).
- D. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; **0.008-inch** (0.2-mm) nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Schluter Systems L.P.
    - b. Schönox; HPS North America, Inc.
    - c. **<Insert manufacturer's name>**.
- E. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, SBS-modified-bituminous sheet with fabric reinforcement facing; **0.040-inch** (1 -mm) nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boiardi Products Corporation; a QEP company.
    - b. H.B. Fuller Construction Products Inc. / TEC.
    - c. National Applied Construction Products, Inc.
    - d. **<Insert manufacturer's name>**.
- F. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boiardi Products Corporation; a QEP company.
    - b. Bonsal American, an Oldcastle company.
    - c. Bostik, Inc.
    - d. Custom Building Products.
    - e. H.B. Fuller Construction Products Inc. / TEC.
    - f. LATICRETE SUPERCAP, LLC.
    - g. MAPEI Corporation.
    - h. Merkrete; a Parex USA, Inc. brand.
    - i. Schönox; HPS North America, Inc.

- j. Southern Grouts & Mortars, Inc.
- k. Summitville Tiles, Inc.
- l. <Insert manufacturer's name>.

G. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ARDEX Americas.
  - b. Boiardi Products Corporation; a QEP company.
  - c. Bonsal American, an Oldcastle company.
  - d. Bostik, Inc.
  - e. C-Cure.
  - f. Custom Building Products.
  - g. H.B. Fuller Construction Products Inc. / TEC.
  - h. Jamo Inc.
  - i. LATICRETE SUPERCAP, LLC.
  - j. MAPEI Corporation.
  - k. Merkrete; a Parex USA, Inc. brand.
  - l. National Applied Construction Products, Inc.
  - m. Siena Products; Omega.
  - n. Southern Grouts & Mortars, Inc.
  - o. <Insert manufacturer's name>.

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

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ARDEX Americas.
  - b. Boiardi Products Corporation; a QEP company.
  - c. C-Cure.
  - d. H.B. Fuller Construction Products Inc. / TEC.
  - e. MAPEI Corporation.
  - f. <Insert manufacturer's name>.

I. Waterproofing and Tile-Setting Adhesive: One-part, fluid-applied product intended for use as both waterproofing and tile-setting adhesive in a two-step process.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Boiardi Products Corporation; a QEP company.
  - b. Bostik, Inc.
  - c. <Insert manufacturer's name>.
- 2. Adhesives shall have a VOC content of [65] <Insert value> g/L or less.
- 3. Verify adhesive complies 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."

## 2.7 CRACK ISOLATION MEMBRANE

- 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 the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Composite Polyethylene and Kraft Paper Sheet: Resin-faced, Polyethylene sheet membrane with bleached or natural kraft paper; nominal **0.02 inch (0.5 mm)** thickness.
1. Basis of Design Product: Subject to compliance with requirements, provide NUE TILE; DemoFlex TMS crack suppression membrane or comparable product by one of the following:
    - a. Custom Building Products.
    - b. MAPEI Corporation.
    - c. **<Insert manufacturer's name>**.
  2. Adhesive and Tape System: One-part, spray or fluid-applied product intended for use as an adhesive in a three-step process including taping.
    - a. Basis of Design Product: Subject to compliance with requirements, provide NUE TILE; DemoFlex Adhesive and Tape System or comparable product.
    - b. Verify adhesives have a VOC content of 0.02 g/L or less.
    - c. Verify adhesive complies 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."
- C. Polyolefin Foam Sheet: Cross-linked polyolefin foam sheet membrane; **0.04 inch (1 mm)** thickness.
1. Basis of Design Product: Subject to compliance with requirements, provide NUE TILE; DemoFlex TMS Plus crack suppression membrane or comparable product by one of the following:
    - a. Custom Building Products.
    - b. MAPEI Corporation.
    - c. **<Insert manufacturer's name>**.
  2. Adhesive and Tape System: One-part, spray or fluid-applied product intended for use as an adhesive in a three-step process including taping.
    - a. Basis of Design Product: Subject to compliance with requirements, provide NUE TILE; DemoFlex Adhesive and Tape System or comparable product.
    - b. Verify adhesives have a VOC content of 0.02 g/L or less.

- c. Verify adhesive complies 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."
- D. Self-Adhering Composite Polyethylene and Kraft Paper Sheet: Polyethylene sheet membrane with bleached- or natural-kraft paper with PSA self-stick adhesive; nominal **0.02 inch (0.5 mm)** thickness.
1. Basis-of-Design Product: Subject to compliance with requirements, provide NUE TILE; WallGrip VSM membrane or comparable product by one of the following:
    - a. Custom Building Products.
    - b. MAPEI Corporation.
    - c. **<Insert manufacturer's name>**.
- E. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; **0.030-inch (0.76-mm)** nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Noble Company (The).
    - b. **<Insert manufacturer's name>**.
- F. PVC Sheet: PVC heat-fused on both sides to facings of nonwoven polyester; **0.040-inch (1-mm)** nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Compotite Corporation.
    - b. **<Insert manufacturer's name>**.
- G. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; **0.008-inch (0.2-mm)** nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Schluter Systems L.P.
    - b. **<Insert manufacturer's name>**.
- H. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; **3/16-inch (4-mm)** nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Custom Building Products.

- c. Schluter Systems L.P.
  - d. **<Insert manufacturer's name>**.
- I. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, modified-bituminous sheet with fabric reinforcement facing; **0.040-inch (1-mm)** nominal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boiardi Products Corporation; a QEP company.
    - b. Custom Building Products.
    - c. MAPEI Corporation.
    - d. National Applied Construction Products, Inc.
    - e. **<Insert manufacturer's name>**.
- J. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boiardi Products Corporation; a QEP company.
    - b. Bonsal American, an Oldcastle company.
    - c. Bostik, Inc.
    - d. Custom Building Products.
    - e. H.B. Fuller Construction Products Inc. / TEC.
    - f. LATICRETE SUPERCAP, LLC.
    - g. MAPEI Corporation.
    - h. Merkrete; a Parex USA, Inc. brand.
    - i. Southern Grouts & Mortars, Inc.
    - j. Summitville Tiles, Inc.
    - k. **<Insert manufacturer's name>**.
- K. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. C-Cure.
    - c. Custom Building Products.
    - d. H.B. Fuller Construction Products Inc. / TEC.
    - e. Jamo Inc.
    - f. LATICRETE SUPERCAP, LLC.
    - g. MAPEI Corporation.
    - h. Merkrete; a Parex USA, Inc. brand.
    - i. Siena Products; Omega.
    - j. Southern Grouts & Mortars, Inc.
    - k. **<Insert manufacturer's name>**.

- L. Latex-Portland Cement Crack-Resistant Mortar: Flexible mortar consisting of cement-based mix and latex additive.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Boiardi Products Corporation; a QEP company.
    - c. C-Cure.
    - d. H.B. Fuller Construction Products Inc. / TEC.
    - e. MAPEI Corporation.
    - f. **<Insert manufacturer's name>**.
- M. Crack Isolation Membrane and Tile-Setting Adhesive: One-part, fluid-applied product intended for use as both a crack isolation membrane and tile-setting adhesive in a two-step process.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boiardi Products Corporation; a QEP company.
    - b. Bostik, Inc.
    - c. **<Insert manufacturer's name>**.
  2. Verify adhesives have a VOC content of [65] **<Insert value>** g/L or less.
  3. Verify adhesive complies 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."

## 2.8 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
1. Cleavage Membrane: Asphalt felt, ASTM D226/D226M, Type I (No. 15); or polyethylene sheeting, ASTM D4397, **4.0 mils (0.1 mm)** thick.
  2. Reinforcing Wire Fabric: Galvanized, welded-wire fabric, **2 by 2 inches (50.8 by 50.8 mm)** by **0.062-inch (1.57-mm)** diameter; comply with ASTM A185/A185M and ASTM A82/A82M, except for minimum wire size.
  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. (1.4 kg/sq. m)**] [**3.4 lb/sq. yd. (1.8 kg/sq. m)**].

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.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boiardi Products Corporation; a QEP company.
    - b. Bonsal American, an Oldcastle company.
    - c. Bostik, Inc.
    - d. C-Cure.
    - e. Custom Building Products.
    - f. H.B. Fuller Construction Products Inc. / TEC.
    - g. Jamo Inc.
    - h. LATICRETE SUPERCAP, LLC.
    - i. MAPEI Corporation.
    - j. Siena Products; Omega.
    - k. Southern Grouts & Mortars, Inc.
    - l. Summitville Tiles, Inc.
    - m. <**Insert manufacturer's name**>.
  2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.1.
- C. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Boiardi Products Corporation; a QEP company.
    - c. Bonsal American, an Oldcastle company.
    - d. Bostik, Inc.
    - e. C-Cure.
    - f. Custom Building Products.
    - g. H.B. Fuller Construction Products Inc. / TEC.
    - h. Jamo Inc.
    - i. LATICRETE SUPERCAP, LLC.
    - j. MAPEI Corporation.
    - k. Merkrete; a Parex USA, Inc. brand.
    - l. Siena Products; Omega.
    - m. Southern Grouts & Mortars, Inc.
    - n. Summitville Tiles, Inc.
    - o. <**Insert manufacturer's name**>.
  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 the other requirements in ANSI A118.4.
- D. Medium-Bed, Modified Dry-Set Mortar: Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of [**5/8 inch (16 mm)**] **<Insert thickness>**.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bonsal American, an Oldcastle company.
    - c. Bostik, Inc.
    - d. C-Cure.
    - e. Custom Building Products.
    - f. H.B. Fuller Construction Products Inc. / TEC.
    - g. Jamo Inc.
    - h. LATICRETE SUPERCAP, LLC.
    - i. MAPEI Corporation.
    - j. Merkrete; a Parex USA, Inc. brand.
    - k. Siena Products; Omega.
    - l. Southern Grouts & Mortars, Inc.
    - m. Summitville Tiles, Inc.
    - n. **<Insert manufacturer's name>**.
  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.
- E. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bonsal American, an Oldcastle company.
    - c. C-Cure.
    - d. Custom Building Products.
    - e. H.B. Fuller Construction Products Inc. / TEC.
    - f. LATICRETE SUPERCAP, LLC.
    - g. MAPEI Corporation.
    - h. Merkrete; a Parex USA, Inc. brand.
    - i. Siena Products; Omega.
    - j. **<Insert manufacturer's name>**.
  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 the other requirements in ANSI A118.15.
- F. EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar (Thinset): ANSI A118.11.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bonsal American, an Oldcastle company.
    - c. Bostik, Inc.
    - d. C-Cure.
    - e. Custom Building Products.
    - f. H.B. Fuller Construction Products Inc. / TEC.
    - g. Jamo Inc.
    - h. LATICRETE SUPERCAP, LLC.
    - i. MAPEI Corporation.
    - j. Southern Grouts & Mortars, Inc.
    - k. Summitville Tiles, Inc.
    - l. <**Insert manufacturer's name**>.
  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.
- G. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Atlas Minerals & Chemicals, Inc.
    - c. Bonsal American, an Oldcastle company.
    - d. Bostik, Inc.
    - e. C-Cure.
    - f. Custom Building Products.
    - g. H.B. Fuller Construction Products Inc. / TEC.
    - h. Jamo Inc.
    - i. LATICRETE SUPERCAP, LLC.
    - j. MAPEI Corporation.
    - k. Merkrete; a Parex USA, Inc. brand.
    - l. Southern Grouts & Mortars, Inc.
    - m. Summitville Tiles, Inc.
    - n. <**Insert manufacturer's name**>.
  2. Verify adhesives have a VOC content of [65] <**Insert value**> g/L or less.
  3. Verify adhesive complies 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."

4. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to **140 and 212 deg F (60 and 100 deg C)**, respectively, and certified by manufacturer for intended use.

H. Organic Adhesive: ANSI A136.1, Type I.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ARDEX Americas.
  - b. Bonsal American, an Oldcastle company.
  - c. Bostik, Inc.
  - d. C-Cure.
  - e. Custom Building Products.
  - f. H.B. Fuller Construction Products Inc. / TEC.
  - g. Jamo Inc.
  - h. LATICRETE SUPERCAP, LLC.
  - i. MAPEI Corporation.
  - j. Siena Products; Omega.
  - k. Southern Grouts & Mortars, Inc.
  - l. Summitville Tiles, Inc.
  - m. **<Insert manufacturer's name>**.
2. Verify adhesives have a VOC content of [**65**] **<Insert value>** g/L or less.
3. Verify adhesive complies 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."

## 2.9 GROUT MATERIALS

- 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.
- B. Standard Cement Grout: ANSI A118.6.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Boiardi Products Corporation; a QEP company.
    - c. Bonsal American, an Oldcastle company.
    - d. Bostik, Inc.
    - e. C-Cure.
    - f. Custom Building Products.
    - g. H.B. Fuller Construction Products Inc. / TEC.
    - h. Jamo Inc.
    - i. LATICRETE SUPERCAP, LLC.

- j. MAPEI Corporation.
- k. Siena Products; Omega.
- l. Southern Grouts & Mortars, Inc.
- m. Summitville Tiles, Inc.
- n. **<Insert manufacturer's name>**.

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

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. ARDEX Americas.
  - b. Boiardi Products Corporation; a QEP company.
  - c. Bonsal American, an Oldcastle company.
  - d. Bostik, Inc.
  - e. C-Cure.
  - f. Custom Building Products.
  - g. H.B. Fuller Construction Products Inc. / TEC.
  - h. Jamo Inc.
  - i. LATICRETE SUPERCAP, LLC.
  - j. MAPEI Corporation.
  - k. Southern Grouts & Mortars, Inc.
  - l. Summitville Tiles, Inc.
  - m. **<Insert manufacturer's name>**.
- 2. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.
- 3. Polymer Type: [**Acrylic resin**] [**or**] [**styrene-butadiene rubber**] in 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**].

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Atlas Minerals & Chemicals, Inc.
  - b. Boiardi Products Corporation; a QEP company.
  - c. Bonsal American, an Oldcastle company.
  - d. Bostik, Inc.
  - e. C-Cure.
  - f. Custom Building Products.
  - g. H.B. Fuller Construction Products Inc. / TEC.
  - h. Jamo Inc.
  - i. LATICRETE SUPERCAP, LLC.
  - j. MAPEI Corporation.
  - k. Merkrete; a Parex USA, Inc. brand.
  - l. Sauereisen.
  - m. Siena Products; Omega.
  - n. Southern Grouts & Mortars, Inc.
  - o. Summitville Tiles, Inc.
  - p. **<Insert manufacturer's name>**.

2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to **140 and 212 deg F (60 and 100 deg C)**, respectively, and certified by manufacturer for intended use.

E. Grout for PregROUTed Tile Sheets: Same product used in factory to pregrout tile sheets.

## 2.10 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Vapor-Retarder Membrane: Polyethylene sheeting, ASTM D4397, **4.0 mils (0.1 mm)** thick.

C. Metal Edge Strips: Angle or L-shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; [**half-hard brass**] [**white zinc alloy**] [**nickel silver**] [**stainless steel, ASTM A276/A276M or ASTM A666, 300 Series**] exposed-edge material.

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

- a. Blanke Corporation.
- b. Ceramic Tool Company, Inc.
- c. Schluter Systems L.P.
- d. **<Insert manufacturer's name>**.

D. 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.

E. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

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

- a. Bonsal American, an Oldcastle company.
- b. Custom Building Products.
- c. Jamo Inc.
- d. Southern Grouts & Mortars, Inc.
- e. Summitville Tiles, Inc.
- f. **<Insert manufacturer's name>**.

2. Verify products comply with the 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."

## 2.11 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. 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.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  - 2. Verify that concrete substrates for tile floors installed with **[adhesives]** **[bonded mortar bed]** **[or]** **[thinset mortar]** comply with surface finish requirements in ANSI A108.01 for installations indicated.
    - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
  - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
  - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with **[adhesives]** **[or]** **[thinset mortar]** with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped **1/4 inch per foot (1:50)** toward drains.

- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

### 3.3 INSTALLATION OF CERAMIC TILE

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
    - a. Exterior tile floors.
    - 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 (200 by 200 mm) or larger.
    - f. Tile floors consisting of rib-backed tiles.
- B. 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.
- C. 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.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- F. 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 the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
1. 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.
  2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
  3. 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.
- G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Ceramic Mosaic Tile: [**1/16 inch (1.6 mm)**] [**1/8 inch (3.2 mm)**].
  2. Quarry Tile: [**1/4 inch (6.4 mm)**] [**3/8 inch (9.5 mm)**].
  3. Pressed Floor Tile: [**1/4 inch (6.4 mm)**] [**3/8 inch (9.5 mm)**].
  4. Glazed Wall Tile: [**1/16 inch (1.6 mm)**] [**1/8 inch (3.2 mm)**].
  5. Porcelain Tile: [**1/4 inch (6.4 mm)**] [**3/8 inch (9.5 mm)**].
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- J. Stone Thresholds: Install stone 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.
- K. Metal Edge Strips: 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].
- L. Floor Sealer: Apply floor sealer to [**cementitious**] grout joints[ **in tile floors**] in accordance with floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- ### 3.4 INSTALLATION OF TILE BACKING PANEL
- A. Install panels and treat joints in accordance with ANSI A108.11, APA guidelines, and manufacturer's written instructions for type of application indicated.[ **Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.**]
- B. Plywood backer board not to be adhered to subfloor or fastened directly into joists through subfloor.

### 3.5 INSTALLATION OF WATERPROOF MEMBRANE

- A. 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.
- B. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

### 3.6 INSTALLATION OF CRACK ISOLATION MEMBRANE

- A. Install crack isolation membrane to comply with ANSI A108/A118/A136 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.
- B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

### 3.7 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Remove grout residue from tile as soon as possible.
  - 2. Clean grout smears and haze from tile in accordance with tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

### 3.8 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

### 3.9 EXTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Exterior Floor Installations:

1. Ceramic Tile Installation <Insert designation>: TCNA F101 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) [bonded to concrete] [over waterproof membrane on concrete] [over waterproof membrane on concrete where indicated and bonded to concrete where membrane is not indicated].
    - a. Ceramic Tile Type: <Insert tile-type designation>.
    - b. Bond Coat for Cured-Bed Method: [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
  
  2. Ceramic Tile Installation <Insert designation>: TCNA F102; thinset mortar [on concrete] [over waterproof membrane on concrete] [over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated].
    - a. Ceramic Tile Type: <Insert tile-type designation>.
    - b. Thinset Mortar: [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
- B. Exterior Roof/Deck Floor Installations:
1. Ceramic Tile Installation <Insert designation>: [TCNA F103] [TCNA F103B] and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) over drainage material on roof membrane.
    - a. Ceramic Tile Type: <Insert tile-type designation>.
    - b. Bond Coat for Cured-Bed Method: [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
  
  2. Ceramic Tile Installation <Insert designation>: TCNA F104; thinset mortar [on concrete] [over waterproof membrane on concrete] [over waterproof membrane on concrete where indicated and on concrete where membrane is not indicated].
    - a. Ceramic Tile Type: <Insert tile-type designation>.
    - b. Thinset Mortar: [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] portland cement mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
- C. Exterior Wall Installations, Masonry or Concrete:

1. Ceramic Tile Installation <Insert designation>: TCNA W201 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) on metal lath[ over vapor-retarder membrane].
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Wet-Set Method: [Standard] [Modified] [Improved modified] dry-set mortar.
  - c. Bond Coat for Cured-Bed Method: [Modified dry-set] [Improved modified dry-set] mortar.
  - d. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
  
2. Ceramic Tile Installation <Insert designation>: TCNA W202; thinset mortar[ over waterproof membrane].
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Thinset Mortar: [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.

D. Exterior Wall Installations, Wood or Metal Studs:

1. Ceramic Tile Installation <Insert designation>: TCNA W244E; thinset mortar [over waterproof membrane on cementitious backer units] [on cementitious backer units over vapor-retarder membrane].
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Thinset Mortar: [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] portland cement mortar.
  - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.

### 3.10 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:

1. Ceramic Tile Installation <Insert designation>: TCNA F111 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) with cleavage membrane.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.

2. Ceramic Tile Installation <Insert designation>: TCNA F112 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) bonded to concrete.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
3. Ceramic Tile Installation <Insert designation>: TCNA F113; thinset mortar.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Thinset Mortar: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy] grout.
4. Ceramic Tile Installation <Insert designation>: TCNA F114 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) with cleavage membrane; epoxy grout.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: Water-cleanable epoxy grout.
5. Ceramic Tile Installation <Insert designation>: TCNA F115; thinset mortar; epoxy grout.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Thinset Mortar: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: Water-cleanable epoxy grout.
6. Ceramic Tile Installation <Insert designation>: TCNA F116; [organic adhesive] [water-cleanable, tile-setting epoxy].
  - 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.
7. Ceramic Tile Installation <Insert designation>: TCNA F121 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) on waterproof membrane.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.

- c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.
8. Ceramic Tile Installation **<Insert designation>**: TCNA F122; thinset mortar on waterproof membrane.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**]mortar.
    - c. Grout: High-performance [**sanded**] [**unsanded**] grout.
  9. Ceramic Tile Installation **<Insert designation>**: [**TCNA F125-Full**] [**TCNA F125-Full, except where partial coverage is indicated**] [**TCNA F125-Partial**]; thinset mortar on crack isolation membrane.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**]mortar.
    - c. Grout: [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  10. Ceramic Tile Installation **<Insert designation>**: TCNA F131; water-cleanable, tile-setting epoxy; epoxy grout.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Grout: Water-cleanable epoxy grout.
  11. Ceramic Tile Installation **<Insert designation>**: TCNA F132; water-cleanable, tile-setting epoxy on cured cement mortar bed [**bonded to concrete subfloor**] [**installed over cleavage membrane**]; epoxy grout.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Grout: Water-cleanable epoxy grout.

B. Interior Floor Installations, Wood Subfloor:

1. Ceramic Tile Installation **<Insert designation>**: TCNA F121 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) on waterproof membrane.
  - a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Bond Coat for Cured-Bed Method: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

2. Ceramic Tile Installation **<Insert designation>**: TCNA F141 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) with cleavage membrane.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy] grout.
  3. Ceramic Tile Installation **<Insert designation>**: TCNA F142; organic adhesive.
    - 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.
  4. Ceramic Tile Installation **<Insert designation>**: TCNA F143; water-cleanable, tile-setting epoxy; epoxy grout.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Grout: Water-cleanable epoxy grout.
  5. Ceramic Tile Installation **<Insert designation>**: TCNA F144; [thinset mortar] [water-cleanable epoxy adhesive] on [waterproof membrane over] cementitious backer units or fiber-cement backer board.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Thinset Mortar: [Standard dry-set] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy] grout.
  6. Ceramic Tile Installation **<Insert designation>**: TCNA F150 or TCNA F160; thinset mortar on exterior-glue plywood.
    - a. Ceramic Tile Type: **<Insert tile-type designation>**.
    - b. Thinset Mortar: [EGP (exterior glue plywood) latex-portland cement] [Modified dry-set] [Medium-bed, modified dry-set] [Improved modified dry-set] mortar.
    - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy] grout.
- C. Interior Radiant Heat Floor Installations, Concrete Subfloor:
1. Ceramic Tile Installation **<Insert designation>**: TCNA RH110; thinset mortar [on crack isolation membrane]; hydronic piping installed in concrete.

- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
2. Ceramic Tile Installation **<Insert designation>**: TCNA RH117 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) with hydronic piping installed in mortar bed.
- a. Ceramic Tile Type: **<Insert stone tile-type designation>**.
  - b. Bond Coat for Cured-Bed Method: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
3. Ceramic Tile Installation **<Insert designation>**: TCNA RH112; thinset mortar [**on crack isolation membrane**]; hydronic piping encapsulated in cementitious self-leveling underlayment.
- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Cementitious Self-Leveling Underlayment: Specified in Section 035416 "Hydraulic Cement Underlayment."
  - c. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
  - d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
4. Ceramic Tile Installation **<Insert designation>**: TCNA RH115; thinset mortar; electric radiant system encapsulated in thinset mortar.
- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
5. Ceramic Tile Installation **<Insert designation>**: TCNA RH116; thinset mortar [**on crack isolation membrane**]; electric radiant system encapsulated in cementitious self-leveling underlayment.
- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Cementitious Self-Leveling Underlayment: Specified in Section 035416 "Hydraulic Cement Underlayment."
  - c. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

- d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
- D. Interior Radiant Heat Floor Installations, Wood Subfloor:
1. Ceramic Tile Installation <**Insert designation**>: TCNA RH123; thinset mortar[ **on crack isolation membrane**]; hydronic piping encapsulated in cementitious self-leveling underlayment.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Cementitious Self-Leveling Underlayment: Specified in Section 035416 "Hydraulic Cement Underlayment."
    - c. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
    - d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  2. Ceramic Tile Installation <**Insert designation**>: TCNA RH130; thinset mortar on exterior-glue plywood; electric radiant system encapsulated in thinset mortar.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Thinset Mortar: [**EGP (exterior glue plywood) latex-portland cement**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  3. Ceramic Tile Installation <**Insert designation**>: TCNA RH135; thinset mortar on cementitious backer units or fiber-cement backer board; electric radiant system encapsulated in thinset mortar.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  4. Ceramic Tile Installation <**Insert designation**>: TCNA RH140; thinset mortar[ **on crack isolation membrane**]; electric radiant system encapsulated in cementitious self-leveling underlayment.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Cementitious Self-Leveling Underlayment: Specified in Section 035416 "Hydraulic Cement Underlayment."
    - c. Thinset Mortar: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.

- d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
5. Ceramic Tile Installation <**Insert designation**>: TCNA RH141 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) with hydronic piping installed in mortar bed.
    - a. Ceramic Tile Type: <**Insert stone tile-type designation**>.
    - b. Bond Coat for Cured-Bed Method: [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
- E. Interior Wall Installations, Masonry or Concrete:
1. Ceramic Tile Installation <**Insert designation**>: TCNA W202; thinset mortar.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Medium-bed, modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  2. Ceramic Tile Installation <**Insert designation**>: TCNA W211 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) bonded to substrate.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Bond Coat for Cured-Bed Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  3. Ceramic Tile Installation <**Insert designation**>: TCNA W221 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**], cement mortar bed (thickset) on metal lath [**over cleavage membrane**] [**over waterproof membrane**].
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Bond Coat for Cured-Bed Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

4. Ceramic Tile Installation <Insert designation>: TCNA W222 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; one-coat cement mortar bed (thickset) on metal lath [over cleavage membrane] [over waterproof membrane].
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Wet-Set Method: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
  - c. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
  - d. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.
  
5. Ceramic Tile Installation <Insert designation>: TCNA W223; organic adhesive.
  - 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] grout.
  
- F. Interior Wall Installations, Wood or Metal Studs or Furring:
  1. Ceramic Tile Installation <Insert designation>: TCNA W221 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; cement mortar bed (thickset) [over cleavage membrane] [over waterproof membrane] on solid backing.
    - a. Ceramic Tile Type: <Insert tile-type designation>.
    - b. Bond Coat for Wet-Set Method: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
    - c. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
    - d. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy] grout.
  
  2. Ceramic Tile Installation <Insert designation>: TCNA W222 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]; one-coat cement mortar bed (thickset) [over cleavage membrane] [over waterproof membrane] on solid backing.
    - a. Ceramic Tile Type: <Insert tile-type designation>.
    - b. Bond Coat for Wet-Set Method: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
    - c. Bond Coat for Cured-Bed Method: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
    - d. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy] grout.
  
  3. Ceramic Tile Installation <Insert designation>: TCNA W223; organic adhesive on solid backing.

- 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]** grout.
4. Ceramic Tile Installation **<Insert designation>**: TCNA W231/W241 and **[ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C]**; cement mortar bed (thickset).
- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Bond Coat for Wet-Set Method: **[Standard dry-set] [Modified dry-set] [Improved modified dry-set]** mortar.
  - c. Bond Coat for Cured-Bed Method: **[Standard dry-set] [Modified dry-set] [Improved modified dry-set]** mortar.
  - d. Grout: **[Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded]** grout.
5. Ceramic Tile Installation **<Insert designation>**: TCNA W242; organic adhesive on gypsum board.
- 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]** grout.
6. Ceramic Tile Installation **<Insert designation>**: TCNA W243; thinset mortar on gypsum board.
- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Thinset Mortar: **[Standard dry-set] [Modified dry-set] [Improved modified dry-set]** mortar.
  - c. Grout: **[Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy]** grout.
7. Ceramic Tile Installation **<Insert designation>**: TCNA W244C or TCNA W244F; thinset mortar on cementitious backer units or fiber-cement backer board **[over vapor-retarder membrane]**.
- a. Ceramic Tile Type: **<Insert tile-type designation>**.
  - b. Thinset Mortar: **[Standard dry-set] [Modified dry-set] [Improved modified dry-set]** mortar.
  - c. Grout: **[Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] [Water-cleanable epoxy]** grout.
8. Ceramic Tile Installation **<Insert designation>**: TCNA W245 or TCNA W248; thinset mortar on glass-mat, water-resistant gypsum backer board.
- a. Ceramic Tile Type: **<Insert tile-type designation>**.

- b. Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
- G. Bathtub Wall Installations with No Shower Head, Wood or Metal Studs or Furring:
- 1. Ceramic Tile Installation <**Insert designation**>: TCNA B413; [**thinset mortar**] [**organic adhesive**] on water-resistant gypsum board.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.
- H. Bathtub/Shower Wall Installations, Wood or Metal Studs or Furring:
- 1. Ceramic Tile Installation <**Insert designation**>: TCNA B411 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over vapor-retarder membrane.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Bond Coat for Cured-Bed Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] grout.
  - 2. Ceramic Tile Installation <**Insert designation**>: TCNA B412; [**thinset mortar**] [**organic adhesive**] [**water-cleanable, tile-setting epoxy**] on cementitious backer units or fiber-cement backer board.
    - a. Ceramic Tile Type: <**Insert tile-type designation**>.
    - b. Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
    - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
  - 3. Ceramic Tile Installation <**Insert designation**>: TCNA B419; thinset mortar on coated glass-mat, water-resistant gypsum backer board.
    - 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**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.

I. Shower Receptor and Wall Installations:

1. Ceramic Tile Installation <Insert designation>: TCNA B414 and [**ANSI A108.1A**] [**ANSI A108.1B**] [**ANSI A108.1C**]; cement mortar bed (thickset) over vapor-retarder membrane.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Bond Coat for Wet-Set Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Bond Coat for Cured-Bed Method: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
  - d. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
2. Ceramic Tile Installation <Insert designation>: TCNA B415; [**thinset mortar**] [**organic adhesive**] [**water-cleanable, tile-setting epoxy**] on [**waterproof membrane over cementitious backer units or fiber-cement backer board**] [**cementitious backer units or fiber-cement backer board over vapor-retarder membrane**].
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Thinset Mortar: [**Standard dry-set**] [**Modified dry-set**] [**Improved modified dry-set**] mortar.
  - c. Grout: [**Sand-portland cement**] [**Standard sanded cement**] [**Standard unsanded cement**] [**High-performance sanded**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
3. Ceramic Tile Installation <Insert designation>: TCNA B420; thinset mortar on [**waterproof membrane over coated glass-mat, water-resistant gypsum backer board**] [**coated glass-mat, water-resistant gypsum backer board over vapor-retarder membrane**].
  - 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**] [**High-performance unsanded**] [**Water-cleanable epoxy**] grout.
4. Ceramic Tile Installation <Insert designation>: TCNA B421; thinset mortar on waterproof membrane over solid backing.
  - 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**] [**High-performance unsanded**] grout.

5. Ceramic Tile Installation <Insert designation>: TCNA B422; thinset mortar on waterproof membrane with integrated bonding flange for bonded membranes.
  - a. Ceramic Tile Type: <Insert tile-type designation>.
  - b. Thinset Mortar: [Standard dry-set] [Modified dry-set] [Improved modified dry-set] mortar.
  - c. Grout: [Sand-portland cement] [Standard sanded cement] [Standard unsanded cement] [High-performance sanded] [High-performance unsanded] grout.

END OF SECTION 093013