

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Ceramic mosaic tile.
 - 2. Paver tile.
 - a. Glazed porcelain tile.
 - b. Slip-resistant, textured porcelain tile.
 - 3. Glazed wall tile and trim.
 - 4. Stone thresholds installed as part of installation.
 - 5. Waterproof membrane for thin set tile installations.
 - 6. Crack suppression membrane for thin-set tile installations.
 - 7. Metal edge strips installed as part of installation.
 - 8. Joint sealants for sealing of expansion contraction, control and isolating joints in tile surfaces.
- B. Related Sections:
 - 1. Section 024119 "Selective Structure Demolition" for removing existing finishes.
 - 2. Section 03300 "Cast-in-Place Concrete" for monolithic slab finishes specified for tile substrates.
 - 3. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 4. Section 092400 "Portland Cement Plastering" for portland cement scratch coat over metal lath on wall surfaces.
 - 5. Section 092613 "Gypsum Veneer Plastering" for cementitious backer units.
 - 6. Section 092900 "Gypsum Board" for cementitious backer units.

1.03 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 "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.04 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces:
 - a. Ceramic Mosaic and Glazed Porcelain Paver Tile: Minimum 0.8 dry and 0.6 wet.
 - b. Slip Resistant, Textured Porcelain Tile: Minimum 1.2 dry and 1.0 wet.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:

1. Product Data for Credit IEQ 4.1: For adhesives and sealants, documentation including printed statement of VOC content.
 2. Product Data for Credit IEQ 4.3: For adhesives and grouts, documentation including printed statement of VOC content.
 3. Product Data for Credit IEQ 4.3: For tile floors, documentation from an independent testing agency indicating compliance with the FloorScore Standard.
 4. Laboratory Test Reports for Credit IEQ 4: For adhesives, sealants and tile flooring systems, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- 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 each type of tile and grout indicated. Include Samples of 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.
 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, but not fewer than 4 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.
 6. Assembled sample of sealant joints.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified 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, signed by product manufacturer.
- D. Material Test Reports: For each tile-setting and -grouting product and special purpose tile.

1.07 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 5 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.08 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one 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 one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 1. Stone thresholds.
 2. Waterproof membrane.

3. Crack isolation membrane.
 4. Joint sealants.
 5. Metal edge strips.
- D. Preinstallation Conference: Conduct conference at Project site.
1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.09 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 and cementitious materials 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.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.10 PROJECT 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.

PART 2 PRODUCTS

2.01 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 TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.
- D. Low-Emitting Materials: Tile flooring systems shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. 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.
- F. 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 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.
- G. Colors, Textures and Patterns: Where manufacturer's standard products are indicated for tile, grout and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 1. As selected by Architect from manufacturer's full range.
- H. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.02 TILE PRODUCTS

- A. Tile Type CT-2: Factory-mounted unglazed ceramic mosaic tile.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Daltile "Keystones," Price Groups 1 and 2, or comparable product by one of the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Crossville, Inc.
 - 2. Composition: Porcelain.
 - 3. Module Size: 2 by 2 inches (50.8 by 50.8 mm).
 - 4. Thickness: 1/4 inch (6.35 mm).
 - 5. Face: Plain with cushion edges.
 - 6. Surface: Smooth, without abrasive admixture.
 - 7. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
 - 8. Grout Color: As selected by Architect from manufacturer's full range.
- B. Tile Type CT-3: Unglazed paver tile.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Crossville, Inc. "Cross Blox", or comparable product by one of the following:
 - a. American Marazzi Tile, Inc.
 - b. American Olean; Division of Dal-Tile International Inc.
 - c. Daltile; Division of Dal-Tile International Inc.
 - 2. Composition: Porcelain.
 - 3. Face Size: 6 by 6 inches (152 by 152 mm)
 - 4. Thickness: 3/8 inch (9.5 mm).
 - 5. Face: Plain with cushion edges.
 - 6. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
 - 7. Grout Color: Match Architect's sample as selected by Architect from manufacturer's full range.
 - 8. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Base Cove: Cove, module size 6 inches by 12 inches.
- C. Tile Type CT-4: Unglazed paver tile.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Crossville, Inc. "Cross Grip", or comparable product by one of the following:
 - a. American Marazzi Tile, Inc.
 - b. American Olean; Division of Dal-Tile International Inc.
 - c. Daltile; Division of Dal-Tile International Inc.
 - d. Florida Tile Industries, Inc.
 - e. Florim USA
 - f. GranitiFiandre; c/o Trans Ceramica, Ltd.
 - g. Interceramic.
 - 2. Composition: Porcelain.
 - 3. Face Size: 7-3/4 inches by 7-3/4 inches
 - 4. Thickness: 5/16 inch (7.94 mm).
 - 5. Face: Plain with cushion edges.
 - a. Pattern of Design indicated with specified coefficient of friction.
 - 6. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
 - 7. Grout Color: Match Architect's sample as selected by Architect from manufacturer's full range.
 - 8. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - 9. Base Cove: Cove, module size 5-7/8 inches by 7-3/4 inches.

- D. Tile Type CT-5: Glazed wall tile.
1. Basis-of-Design Product: Subject to compliance with requirements, Daltile "Wall/Counter Tile-Glazed" or comparable product by one of the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Deutsche Steinzeug America, Inc.
 - c. Florida Tile Industries, Inc.
 - d. United States Ceramic Tile Company.
 2. Module Size: 4-1/4 by 4-1/4 inches (108 by 108 mm).
 3. Thickness: 5/16 inch (8 mm).
 4. Face: Plain with modified square edges or cushion edges.
 5. Finish: Semi-Gloss.
 6. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
 7. Grout Color: As selected by Architect from manufacturer's full range.
 8. Mounting: Factory, back mounted.
 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 for Thin-Set Mortar Installations: Straight, module size 4-1/4 by 4-1/4 inches (108 by 108 mm).
 - b. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size 4-1/4 by 4-1/4 inches (108 by 108 mm).
 - c. External Corners for Thin-Set Mortar Installations: Surface bullnose, same size as adjoining flat tile.
 - d. Internal Corners: Field-buttet square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.

2.03 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. Marble Thresholds: ASTM C 503, with a minimum abrasion resistance of 12 per ASTM C 1353 or ASTM C 241 and with honed finish.
1. Description: Uniform, fine- to medium-grained white stone with gray veining.
 2. Size: Full width and depth of door frames.

2.04 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

- A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Corrugated-Polyethylene Product: Corrugated polyethylene with dovetail-shaped corrugations for adhering to latex-portland cement mortar and with anchoring webbing on the underside; 39 inches (1000 mm) wide by 3/16-inch (4 mm) nominal thickness.
1. For use under slip-resistant, textured porcelain tiles installed in C-18.1 Cooler and C-18.3 Freezer.
 2. Available Product: Schluter Systems L.P.; DITRA.

2.05 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02, for C-18.1 Cooler and C-18.3 Freezer.
1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, 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 A 185 and ASTM A 82 except for minimum wire size.
- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.5.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Laticrete, as noted, or comparable product by one of the following:
 - a. Atlas Minerals and Chemicals, Inc.
 - b. Boiardi Products; a QEP company.
 - c. Bonsal American; an Oldcastle company.
 - d. Bostik, Inc.
 - e. C-Cure.
 - f. Custom Building Products.
 - g. Jamo Inc.
 - h. Laticrete International, Inc.
 - i. MAPEI Corporation.
 - j. Southern Grouts & Mortars, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
- C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:
1. Pre-packaged dry mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive (Do not add water).
 - a. Basis-of-Design: Laticrete 272 "Premium Floor N Wall Thin Set Mortar" with Laticrete 2701 "Mortar Admix."
 - b. For application of porcelain floor tile to the corrugated polyethylene waterproofing and crack suppression membrane (Schluter "Ditra"), use a rapid-set latex additive.
 - c. Basis-of-Design: Laticrete 272 "Floor N' Wall Thin Set Mortar" with Laticrete 101 "Rapid Set Latex Admix."
 - d. For wall applications, provide non-sagging mortar that complies in addition to the other requirements in ANSI A118.4.

2.06 GROUT MATERIALS

- A. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
1. Subject to compliance with requirements, provide product by one of the following:
 - a. Atlas Minerals & Chemicals, Inc.
 - b. Boiardi Products; a QEP company.
 - c. Bonsal American; an Oldcastle company.
 - d. Bostik, Inc.
 - e. C-Cure.
 - f. Custom Building Products.
 - g. Jamo Inc.
 - h. Laticrete International, Inc.
 - i. MAPEI Corporation.
 - j. Southern Grouts & Mortars, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
 2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, and certified by manufacturer for intended use.

2.07 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Section 079200 "Joint Sealants."
- B. Retain first subparagraph below if required for LEED-NC, or LEED-CI, or LEED-CS Credit IEQ 4.1.

1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 3. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
- C. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- D. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Corning Corporation; Dow Corning 786.
 - b. GE Silicones; a division of GE Specialty Materials; Sanitary 1700.
 - c. Laticrete International, Inc.; Latacil Tile & Stone Sealant.
 - d. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.

2.08 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. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; nickel silver or stainless-steel, ASTM A 666, 300 Series exposed-edge material.
- C. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- 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. Grout Sealer: Manufacturer's standard penetrating product for sealing grout joints and that does not change color or appearance of grout.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bonsal American; an Oldcastle company; Grout Sealer.
 - b. Bostik, Inc.; CeramaSeal.
 - c. C-Cure; Penetrating Sealer 978.
 - d. Custom Building Products; Grout and Tile, Grout Sealer.
 - e. Jamo Inc.; Penetrating Sealer.
 - f. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
 - g. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
 - h. TEC; a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.

2.09 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials and additives in accurate proportions.
 - 1. Do not add water.
- 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

3.01 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 installed tile.
 - 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 bonded mortar bed or thin-set 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.

3.02 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing 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.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.03 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA 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 TCA 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 composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
 - f. Tile floors composed 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. 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.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
- 1. Ceramic Mosaic Tile: 1/16 inch (1.6 mm).
 - 2. Paver Tile: 1/4 inch (6.35 mm).
 - 3. Glazed Wall Tile: 1/16 inch (1.6 mm).
- G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- H. 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.
- I. 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 latex-portland cement mortar (thin set).
 - 2. Do not extend cleavage membrane, waterproofing or crack isolation membrane under thresholds set in latex-portland cement mortar. Fill joints between such thresholds and adjoining tile set on cleavage membrane, waterproofing or crack isolation membrane with elastomeric sealant.
- J. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.04 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.05 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove latex-portland cement grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to 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. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. 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.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.06 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
1. Tile Installation F111: Cement mortar bed (thickset) with cleavage membrane; TCA F111 and ANSI A108.1A, ANSI A108.1B, ANSI A108.1C.
 - a. Tile Type: Slip-Resistant Porcelain Paver.
 - b. Thin-Set Mortar for Cured-Bed Method: Latex-portland cement mortar.
 - c. Grout: Polymer-modified unsanded grout.
 2. Tile Installation F113: Thin-set mortar; TCA F113.
 - a. Tile Type: Ceramic Mosaic and Porcelain Paver.
 - b. Thin-Set Mortar: Latex-portland cement mortar.
 - c. Grout: Polymer-modified unsanded grout.
- B. Interior Wall Installations, Masonry or Concrete:
1. Tile Installation W202: Thin-set mortar; TCA W202.
 - a. Tile Type: Glazed Wall Tile.
 - b. Thin-Set Mortar: Latex-portland cement mortar.
 - c. Grout: Polymer-modified unsanded grout.
 2. Tile Installation W244: Thin-set mortar on cementitious backer units or fiber cement underlayment over cleavage membrane; TCA W244.
 - a. Tile Type: Glazed Wall Tile.
 - b. Thin-Set Mortar: Latex-portland cement mortar.
 - c. Grout: Polymer-modified unsanded grout.
- C. Interior Wall Installations, Metal Studs or Furring:
1. Tile Installation W243: Thin-set mortar on gypsum board; TCA W243.
 - a. Tile Type: Glazed Wall Tile.
 - b. Thin-Set Mortar: Latex-portland cement mortar.
 - c. Grout: Polymer-modified unsanded grout.

END OF SECTION