

SECTION 09 30 00 - TILING

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.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
 - 1. *Uniform General Conditions for Construction Contracts, State of Texas, 2010 (UGC).*
 - 2. *The University of Houston's Supplemental General Conditions and Special Conditions for Construction.*

1.2 SUMMARY

- A. Section Includes:
 - 1. Ceramic tile.
 - 2. Stone thresholds.
 - 3. Waterproof membrane.
 - 4. Crack isolation membrane.
 - 5. Metal edge strips.
- B. Related Sections:
 - 1. Section 07 14 13 "Hot Fluid-Applied Rubberized Asphalt Waterproofing" for waterproofing under thickset mortar beds.
 - 2. Section 07 92 00 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 3. Section 09 63 40 "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 "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.

1.4 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: Minimum 0.5.
 - 2. Step Treads: Minimum 0.5.
 - 3. Ramp Surfaces: Minimum 0.8.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. 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.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
 - 3. Stone thresholds in 6-inch lengths.
 - 4. Metal edge strips in 6-inch lengths.

1.6 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.

1.7 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.
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. 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. Cementitious backer units.
 5. Metal edge strips.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and 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. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- E. Preinstallation Conference: Conduct conference at Project site .
 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

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 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

2.1 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. 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."
- D. 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.
- E. 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 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.
- F. 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.

2.2 TILE PRODUCTS

A. Tile Type [CT-<#>]: Factory-mounted unglazed ceramic mosaic tile.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Keystones by Daltile; Division of Dal-Tile International Inc. or comparable product by one of the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Crossville, Inc.
 - c. Substitutions: see Section 01 25 00 – Substitution Procedures.
2. Composition: Impervious natural clay or porcelain .
3. Module Size: 1 by 1 inch .
4. Thickness: 1/4 inch.
5. Face: Pattern of design indicated, 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 .
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 Cove: Cove, module size 1 by 1 inch .
 - b. Base Cap for Portland Cement Mortar Installations: Bead (bullnose), module size 1 by 1 inch .
 - c. Base Cap for Thin-Set Mortar Installations: Surface bullnose, module size 1 by 1 inch .
 - d. Wainscot Cap for Portland Cement Mortar Installations: Bead (bullnose), module size 1 by 1 inch .
 - e. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size 1 by 1 inch .
 - 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 .
 - h. External Corners for Thin-Set Mortar Installations: Surface bullnose, module size 1 by 1 inch .
 - i. Internal Corners: Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.
 - j. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from 1/2 to 1/4 inch across nominal 4-inch dimension.

B. Tile Type [CT-<#>]: Unglazed square-edged quarry tile.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Quarry Tile by Daltile; Division of Dal-Tile International Inc. or comparable product by one of the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Summitville Tiles, Inc.
 - c. Substitutions: see Section 01 25 00 – Substitution Procedures.
 2. Face Size: 6 by 6 inches .
 3. Thickness: 3/8 inch .
 4. Wearing Surface: Nonabrasive, smooth .
 5. Tile Color and Pattern: As selected by Architect from manufacturer's full range .
 6. Grout Color: As selected by Architect from manufacturer's full range .
 7. 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 .
 - b. Wainscot Cap: Surface bullnose, face size 6 by 6 inches .
 - 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. Tile Type [CT-<#>]: Unglazed paver tile.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Identity by Daltile; Division of Dal-Tile International Inc. or comparable product by one of the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Crossville, Inc.
 - c. Substitutions: see Section 01 25 00 – Substitution Procedures.
 2. Composition: Impervious natural clay or porcelain .
 3. Face Size: 11-13/16 by 11-13/16 inches .
 4. Thickness: 3/8 inch .
 5. Face: Pattern of design indicated, with square or cushion edges .
 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. 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 .
 - b. Base Cap for Portland Cement Mortar Installations: Bead (bullnose), module size same as adjoining flat tile .
 - c. Base Cap for Thin-Set Mortar Installations: Surface bullnose, module size same as adjoining flat tile .
 - d. Wainscot Cap for Portland Cement Mortar Installations: Bead (bullnose), module size same as adjoining flat tile .

- e. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size same as adjoining flat tile .
- 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 .
- h. External Corners for Thin-Set Mortar Installations: Surface bullnose, module size same as adjoining flat tile .
- i. Internal Corners: Cove, module size same as adjoining flat tile .
- j. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from 1/2 to 1/4 inch across nominal 4-inch dimension.

D. Tile Type [CT-<#>]: Glazed wall tile .

1. Basis-of-Design Product: Subject to compliance with requirements, provide Stratford Place by Daltile; Division of Dal-Tile International Inc. or comparable product by one of the following:
 - a. American Olean; Division of Dal-Tile International Inc.
 - b. Crossville, Inc.
 - c. Substitutions: see Section 01 25 00 – Substitution Procedures.
2. Module Size: 6 by 6 inches .
3. Thickness: 5/16 inch.
4. Face: Plain with modified square edges or cushion edges .
5. Tile Color and Pattern: As selected by Architect from manufacturer's full range .
6. Grout Color: As selected by Architect from manufacturer's full range .
7. Mounting: Factory, back mounted.
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 for Portland Cement Mortar Installations: Coved, module size 6 by 6 inches
 - b. Base for Thin-Set Mortar Installations: Straight, module size 6 by 6 inches .
 - c. Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap, module size 6 by 6 inches .
 - d. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size 6 by 6 inches .
 - e. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it, same size as adjoining flat tile.
 - f. External Corners for Portland Cement Mortar Installations: Bullnose shape with radius of at least 3/4 inch unless otherwise indicated.
 - g. External Corners for Thin-Set 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.

2.3 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 above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.
 - 2. Description: Match Architect's sample.

2.4 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; 0.030-inch nominal thickness.
 - 1. Products: Subject to compliance with requirements, provide the following provide one of the following :
 - a. Noble Company (The); Nobleseal TS.
 - b. Substitutions: see Section 01 25 00 – Substitution Procedures.
- C. PVC Sheet: Two layers of PVC sheet heat-fused together and to facings of nonwoven polyester; 0.040-inch nominal thickness.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Comopite Corporation; Composeal Gold.
 - b. Substitutions: see Section 01 25 00 – Substitution Procedures.
- D. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness.
 - 1. Products: Subject to compliance with requirements, provide one of the following :
 - a. Schluter Systems L.P.; KERDI.
 - b. Substitutions: see Section 01 25 00 – Substitution Procedures.
- E. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, SBS-modified-bituminous sheet with woven reinforcement facing; 0.040-inch nominal thickness.
 - 1. Products: Subject to compliance with requirements, provide the following :
 - a. National Applied Construction Products, Inc.; Strataflex.
 - b. Substitutions: see section 01 25 00 – Substitution Procedures.

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

1. Products: Subject to compliance with requirements, **provide one of the following** :

- a. Bostik, Inc.; Hydroment Blacktop 90210.
- b. Laticrete International, Inc.; Laticrete 9235 Waterproof Membrane.
- c. MAPEI Corporation; Mapelastic AquaDefense with MAPEI Reinforcing Fabric.
- d. Mer-Kote Products, Inc.; Hydro-Guard 2000.
- e. Summitville Tiles, Inc.; S-9000.
- f. Substitutions: see section 01 25 00 – Substitution Procedures.

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

1. Products: Subject to compliance with requirements, provide one of the following :

- a. Bostik, Inc.; Durabond D-222 Duraguard Membrane .
- b. Laticrete International, Inc.; Latapoxy 24hr HydroProofing .
- c. MAPEI Corporation; AquaDefense.
- d. Southern Grouts & Mortars, Inc.; Southcrete 1100 Crack Suppression and Waterproofing.
- e. TEC; a subsidiary of H. B. Fuller Company; HydraFlex - Waterproofing Crack Isolation Membrane.
- f. **<Insert manufacturer's name; product name or designation>**Substitutions: see section 01 25 00 – Substitution Procedures.

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

1. Products: Subject to compliance with requirements, provide one of the following :

- a. Boiardi Products; a QEP company; Elastiment 323 Cement Based Waterproofing, Anti-Fracture/Crack Suppression Membrane.
- b. C-Cure; UltraCure 971.
- c. MAPEI Corporation; Mapelastic 315.
- d. Substitutions: see section 01 25 00 – Substitution Procedures.

2.5 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance 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; 0.030-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide the following :

- a. Noble Company (The); Nobleseal CIS.

- b. Substitutions: see section 01 25 00 – Substitution Procedures.
- C. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, modified-bituminous sheet with fabric reinforcement facing; 0.040-inch nominal thickness.
 - 1. Products: Subject to compliance with requirements, provide one of the following :
 - a. MAPEI Corporation; Mapeguard 2.
 - b. National Applied Construction Products, Inc.; Strataflex.
 - c. Substitutions: see section 01 25 00 – Substitution Procedures.
 - .
- D. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.
 - 1. Products: Subject to compliance with requirements, provide one of the following :
 - a. Bostik, Inc.; Hydroment Blacktop 90210.
 - b. Laticrete International, Inc.; Laticrete Blue 92 Anti-Fracture Membrane .
 - c. MAPEI Corporation; Mapelastc AquaDefense with MAPEI Reinforcing Fabric.
 - d. Mer-Kote Products, Inc.; Hydro-Guard 2000.
 - e. Summitville Tiles, Inc.; S-9000.
 - f. Substitutions: see section 01 25 00 – Substitution Procedures.
 - .
- E. Latex-Portland Cement: Flexible mortar consisting of cement-based mix and latex additive.
 - 1. Products: Subject to compliance with requirements, provide one of the following :
 - a. C-Cure; UltraCure 971.
 - b. MAPEI Corporation; Mapelastc 315.
 - c. Substitutions: see section 01 25 00 – Substitution Procedures.
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2.6 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
 - 1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, 4.0 mils thick.
 - 2. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches by 0.062-inch diameter; comply with ASTM A 185 and ASTM A 82 except for minimum wire size.
 - 3. Latex Additive: Manufacturer's standard 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. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - d. Substitutions: see section 01 25 00 – Substitution Procedures.
 2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.1.
- C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - d. **<Insert manufacturer's name>**Substitutions: see section 01 25 00 – Substitution Procedures.
 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. 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, Latex-Portland Cement Mortar: Comply with requirements in ANSI A118.4, ISO C2TS1. Provide product that is approved by manufacturer for application thickness of 5/8 inch
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - d. Substitute: see section 01 25 00 – Substitution Procedures.
 2. Provide prepackaged, dry-mortar mix combined with acrylic resin liquid-latex additive at Project site.
- E. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3[.], with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.

- d. Substitutions: see section 01 25 00 – Substitution Procedures.
- F. Organic Adhesive: ANSI A136.1, Type I[.], with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - d. Substitutions: see section 01 25 00 – Substitution Procedures.

2.7 GROUT MATERIALS

- A. Sand-Portland Cement Grout: ANSI A108.10, composed 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. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - d. Substitutions: see section 01 25 00 – Substitution Procedures.
- C. Polymer-Modified Tile Grout: ANSI A118.7.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - d. Substitutions: see section 01 25 00 – Substitution Procedures.
- D. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Laticrete International, Inc.

- c. MAPEI Corporation.
- d. Substitutions: see section 01 25 00 – Substitution Procedures.

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

2.8 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; stainless-steel, ASTM A 666, 300 Series exposed-edge material.

C. Temporary Protective Coating: 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 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 silicone product for sealing grout joints and that does not change color or appearance of grout.

- 1. Products: Subject to compliance with requirements, provide one of the following :
 - a. Bonsal American; an Oldcastle company; Pro Spec Grout Sealer.
 - b. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
 - c. TEC; a subsidiary of H. B. Fuller Company; Grout Guard Penetrating Silicone Grout Sealer.
 - d. Substitutions: see section 01 25 00 – Substitution Procedures.

2.9 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 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 adhesives 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.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thin-set mortar 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 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.

3.3 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 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.
- 2. Quarry Tile: 3/8 inch.

3. Paver Tile: 3/8 inch.
4. Glazed Wall Tile: 1/16 inch.
5. Decorative Thin Wall Tile: 1/16 inch.

- 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 dry-set portland cement or 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. Metal Edge Strips: Install 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.
- K. Grout Sealer: Apply grout sealer to cementitious grout joints 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.

3.4 TILE BACKING PANEL INSTALLATION

- A. Install cementitious backer units and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.5 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.6 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.

3.7 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 epoxy and 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.

3.8 EXTERIOR TILE INSTALLATION SCHEDULE

- A. Exterior Floor Installations:
 - 1. Tile Installation: Cement mortar bed (thickset) over waterproof membrane on concrete ; TCA F101 and ANSI A108.1A .
 - a. Thin-Set Mortar for Cured-Bed Method: Dry-set portland cement mortar.
 - b. Grout: Standard sanded cement grout.

3.9 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:

1. Tile Installation: Cement mortar bed (thickset) with cleavage membrane; TCA F111 and ANSI A108.1A .
 - a. Thin-Set Mortar for Cured-Bed Method: Dry-set portland cement mortar.
 - b. Grout: Standard sanded cement grout.

END OF SECTION 09 30 00