

SECTION 09 30 13
CERAMIC TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for all ceramic tile work indicated on the Drawings and as specified herein, including, but not limited to:
 - 1. Glazed ceramic tile.
 - 2. Unglazed quarry tile.
 - 3. Ceramic mosaic tile.
 - 4. Porcelain tile.
 - 5. All trim units.
 - 6. Setting and grouting materials.
 - 7. Waterproofing membrane for thin-set applications.
 - 8. Marble saddles.

1.02 SUSTAINABILITY REQUIREMENTS

- A. Sustainability requirements included in the Section are as follows:
 - 1. Documentation of Recycled materials.
 - 2. Documentation of Regional materials.
- B. The Contractor shall implement practices and procedures to meet the Project's sustainable requirements. The Contractor shall ensure that the requirements related to these goals, as defined in Specification Section S01352, Sustainability Requirements, and as specified in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be proposed by the Contractor or their sub-contractors if such changes compromise the stated Sustainable Design Performance Criteria.

1.03 REFERENCE STANDARDS

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2013.1.
- C. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- D. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).
- E. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).
- F. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).
- G. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).
- H. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2010 (Revised).
- I. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior glue plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

- J. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).
- K. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.
- L. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.
- M. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition.
- N. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.
- O. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.

1.04 SUBMITTALS

A. Product Data

Submit manufacturers' specifications and installation instructions for the following:

1. Each type of tile and trim unit specified.
2. Setting materials specified.
3. Grouting materials specified.
4. Waterproofing materials specified.
5. Sealer material specified.

B. Shop Drawings

1. Where the Drawings indicate tile pattern or joint locations, or where more than one type or color of tile is indicated, submit Shop Drawings showing tile pattern, colors, and types, as well as locations and widths of control and expansion joints in tile surfaces.

C. Samples

1. Initial Selection: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures, and patterns available for each type of tile indicated. Include grout manufacturers standard range of colors for each grout type required.
2. Verification Samples:
 - a. Samples of each type of tile, color and pattern indicated, 12" x 12" sample with tile mounted on plywood or hardboard panels and grouted.
 - b. 12" long sample of marble saddle, beveled and finished.
 - c. Trim units: 2, each type, color and shape specified.
3. Field Samples: as specified.

D. Quality Control Submittals

1. Master Grade Certificate
 - a. Before setting any tiles, furnish to the Authority (for each shipment and type of tile) a certificate of grade, properly filled in on a Master Grade Certificate of the form approved in ANSI 137.1.
 - b. Certificate shall be signed by the manufacturer of the tiles and by the subcontractor for the Work, stating the grade, kind and full quantities of tiles; and give identification marks for all packages of tiles furnished under this Contract.
 - c. Brand packages with corresponding identification marks.
2. Affidavit certifying experience of the installation company, as specified.
3. Dynamic Coefficient of Friction (DCOF) for floor tiles.

E. Project Closeout Submittals:

1. Maintenance materials, as specified.

F. Low Emitting Materials Compliance Submittals:

1. Provide documentation for each sealant to be used indicating that the sealants comply with low V.O.C. requirements as stated in Specification Section G01600.

2. Provide documentation of compliance with the testing and product requirements of CDPH-SPTVOE or applicable rules of SCAQMD as specified, and documentation as required for compliance with local regulations.
- G. Sustainability Submittals
1. Recycled Content
 - a. Submit documentation of recycled content consisting of product data, mix design information, or manufacturer's statement as applicable for the following:
 - 1) Ceramic wall tile
 - 2) Ceramic floor tile
 - 3) Quarry tile
 - 4) Porcelain Pavers
 - b. Submit Contractor's Sustainable Materials Form with complete information on recycled content for materials provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of materials and percentage, by weight, of materials that have post-consumer or pre-consumer recycled content.
 2. Regional Content
 - a. Submit documentation of regional materials consisting of product data, mix design information, or manufacturer's statement as applicable for the following:
 - 1) Ceramic wall tile
 - 2) Ceramic floor tile
 - 3) Quarry tile
 - 4) Porcelain Pavers
 - b. Submit Contractor's Sustainable Materials Form with complete information on regional content for materials provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of all materials and distance in miles to point of materials extraction and manufacture.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.
- B. Manufacturer
 1. Furnish tile of the same manufacturer and from the same origin for each tile type and color.
 2. Furnish setting and grouting materials of the same manufacturer and from the same origin for each tile type and method of installation, unless otherwise specified.
- C. Qualifications
 1. Installer is to be a firm that has a minimum of five years experience with the installation of specified materials.
- D. Pre-installation Conference
 1. Prior to the start of the concrete and waterproofing construction schedule, the Contractor shall conduct a meeting to review the proposed waterproofing and tile design and to discuss the required methods and procedures to achieve the required quality and waterproofing integrity. The meeting shall include, at a minimum, the Contractor, the waterproofing installer, waterproofing manufacturer, the Authority's Construction Manager and CID Inspector. The Contractor shall send a conference agenda to all attendees prior to the scheduled date of the conference.
- E. Field Sample
 1. Prior to proceeding with installation of tile, provide a field sample of each proposed tile installation. The field sample shall include both floor and wall applications of tile and, where applicable, shall also include a representative portion of any special color and joint pattern indicated.

2. The quantity and extent of such field sample(s) shall be coordinated with the Authority's Representative. With the approval of the Authority's Representative any acceptable field sample may be incorporated into the final Work.
- F. Inspection of Liquid Applied Waterproof Membrane
1. Following installation of liquid applied waterproof membrane, and prior to proceeding with installation of thinset floor tile, obtain the Authority's Representative's written approval of the membrane.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Storage
1. Deliver all materials of this Section to the job site in their original unopened containers with grade seals unbroken and labels intact and legible.
 2. Store all materials under cover in a manner to prevent damage and contamination by water, freezing, foreign matter or other causes. Store only the specified materials at the job site in location designated by the Authority's Representative.
- B. Protection (General)
1. Use all means necessary to protect ceramic tile materials before, during, and after installation and to protect the installed Work and materials of all other trades.
- C. Replacements
1. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Project Architect and at no additional cost to the Authority.

1.07 MAINTENANCE MATERIALS (EXTRA STOCK)

- A. General
1. Deliver extra stock of maintenance materials to Authority's Representative (to be transferred to the custodian). Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
 2. Tile: Furnish not less than one box for each 25 boxes or fraction thereof, for each type, color, pattern and size installed.
 3. Wall Base: Furnish not less than 40 linear feet of each type, color, and size installed.
 4. Sealer: Furnish one quart sealer in container with factory label with instructions for use.

1.08 FIELD CONDITIONS

- A. Maintain environmental conditions and protect Work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent injury to persons or damage to tile work from carbon dioxide or carbon monoxide buildup.
- C. Maintain temperatures at not less than 50oF (10oC) in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: All products to be by the same manufacturer and same origin..
1. All tile indicated to be used on floor surfaces, as manufactured, shall bear a Dynamic Coefficient of Friction (DCOF) of 0.42 wet when measured per DCOF AcuTest in accordance with ANSI A137.1 Section 9.6.
- B. Glazed Ceramic Wall Tile
1. American-Olean Tile Co., Lansdale, PA. Type: "Bright".
 2. Daltile Corporation, Dallas, TX. Type: "Semigloss".
 3. ROCA Group - U.S. Ceramic Tile Co., Series: "Color Collection".
- C. Quarry Tile

1. American Olean Tile Co., Lansdale, PA.
 2. Daltile Corporation, Dallas, TX.
 3. Summitville Tiles, Inc., Summitville, Ohio.
 4. Metropolitan Ceramics, Canton, Ohio
- D. Unglazed Porcelain Pavers
1. American Olean
 2. Daltile
 3. Crossville Ceramics Co.
 4. Casalgrande-Padana
 5. Graniti Fiandre
 6. StonePeak Ceramics Inc.
- E. Unglazed Porcelain Mosaics
1. American Olean, Lansdale, PA
 2. Daltile, Dallas, TX
 3. Vitra Tiles, Pelham Manor, NY
- F. Mortars and Grout
1. Laticrete International, Inc., Bethany, Connecticut 06524-3498.
 2. Mapei, Deerfield Beach, FL
 3. Pro Spec/Bonsal, Fairless Hills, PA
- G. Cold Applied Liquid Waterproof Membrane
1. Laticrete International, Inc., Bethany, Connecticut 06524-3498.
 2. Mapei, Deerfield Beach, FL.
 3. Pro Spec/Bonsal, Fairless Hills, PA
- H. Water-Soluble Grout Release
1. Aquamix
 2. Miracle Sealants Co.
 3. DuPont StoneTech Professional
- I. Sealer
1. Miracle Sealants Co.
 2. DuPont StoneTech Professional
- J. Accent Wall Tiles
1. American-Olean Tile Co., Lansdale, PA.
 2. Daltile Corporation, Dallas, TX.
 3. ROCA Group - U.S. Ceramic Tile Co.

2.02 MATERIALS

- A. Tile Products
1. Unglazed Ceramic Mosaic Tile complying with Section 5.1 ANSI A137.1; Standard Grade.
 - a. Standard sizes: 1" x 1" x 1/4", 1" x 2" x 1/4", 2" x 2" x 1/4".
 - b. Colors: shall be selected by Project Architect from clear and/or textured porcelain tile. Floor and base tile of same colors.
 - c. Factory mounted.
 - d. Edges: Smooth, all purpose edge.
 - e. Average absorption: not to exceed 1/2 of 1%.
 2. Unglazed Quarry Tile complying with Section 5.2 ANSI A137.1; Standard Grade.
 - a. Standard size: 6" x 6" x 1/2", flat tile.
 - b. Edges: Square edges, ground four-sided after firing.
 - c. Finish: non-slip, impregnated with abrasive aggregate.
 - d. Colors: shall be selected by Project Architect with floor and base tile of same colors.
 - e. If necessary to prevent soiling of exposed surfaces with setting and grouting materials, provide temporary wax coating or water soluble factory prepared grout release on exposed tile surfaces. Material shall be approved by manufacturer of tile

and grout as being compatible with their materials and cleaning methods. Unexposed tile surfaces shall not be treated.

3. Glazed ceramic wall tile complying with Section 6.1 ANSI A137.1; Standard Grade.
 - a. Standard sizes: 4 $\frac{1}{4}$ " x 4 $\frac{1}{4}$ " x 5/16", 6" x 6" x 5/16" - unless otherwise indicated.
 - b. Colors: shall be selected by Project Architect.
 - c. Edges: square, cushion edged.
 4. Unglazed porcelain paver tiles complying with Section 5.3 ANSI A137.1; Standard Grade.
 - a. Thickness: 5/16" min.
 - 1) Colors: shall be selected by Project Architect.
 - 2) To prevent soiling of exposed surfaces with setting and grouting materials, precoat with temporary protective coating of water soluble grout release on exposed tile surfaces. Material shall be approved by manufacturer of tile and grout as being compatible with their materials and cleaning methods. Unexposed tile surfaces shall not be treated.
 5. Trim units including cap, bullnose, cove, external & internal corners to match characteristics of adjoining flat tile in size and color.
 - a. Cove Base: 6" x 6" with 3/4" to 1" maximum radius sanitary cove.
 - b. Shapes: Provide manufacturers standard special shapes to suit installation. Provide bullnosed units at external corners and wainscot. Provide square corners at internal corners.
 6. Accent wall tile complying with ANSI A137.1
 - a. Standard sizes: 1" x 1", 2" x 2"- or other size where indicated on drawings. Thickness to be 1/8" to 3/16".
 - b. Colors: Shall be selected by Project Architect.
 - c. Edges: square
 - d. Factory mounted nominal 12"x12" sheets
- B. Marble Saddles
1. General: Provide marble which is uniform in color and finish, fabricated to sizes and profiles indicated or required to provide transition between tile surfaces and adjoining finished floor surfaces.
 2. Saddles shall be accessible for the disabled and conform to the requirements of the NYC Building Code and the Americans with Disabilities Act.
 3. Marble:
 - a. Provide marble complying with MIA Group "A" requirements for soundness.
 - b. Minimum abrasion hardness (Ha) of 10.0 when tested in accordance with ASTM C241.
 - c. Marble saddles shall be low absorption, Grade "A", full door jamb width by full width of opening, notched for door stops, corners rounded, edges beveled or straight for flush saddles. Marble 3/4" thick, minimum. All exposed surfaces to have a honed finish.
- C. Setting Materials
1. Portland Cement Mortar: Complying with ANSI A108.1
 - a. Portland Cement - ASTM C150 Type 1
 - b. Sand - ASTM C144
 - c. Hydrated Lime - ASTM C206 or ASTM C207 Type S
 - d. Water - Clean and potable.
 - e. Follow recommendations outlined in TCA Handbook for Ceramic Tile Installation for mortar mix proportions.
 2. Latex Portland Cement Mortar: Thin-setting bed - complying with ANSI A118.4.
 - a. Prepackaged dry set mix mortar incorporating dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site, or latex additive, serving as a replacement for part or all of gauging water, added at job site to dry mortar mix. Comply with mixing directions of latex additive manufacturer and mortar

manufacturer. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1168.

- 1) Mapei: Ultraflex 2 with Dust-Free Technology.
 - 2) Laticrete: No. 253. For walls 255 MultiMax may be used.
 - 3) Pro Spec: Permaflex 400.
3. Dryset mortar with latex additive serving as replacement for all of gauging water, added at jobsite to dryset mortar mix. Use with porcelain paver tile installations. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1168.
 - a. Mapei Kerabond premium floor and wall thinset mortar with Mapei Keralastic super flexible additive.
 - b. Laticrete No. 272 premium floor and wall thinset mortar with Laticrete No. 333 super flexible additive.
 - c. Pro Spec Permalastic System - Two component, highly flexible mortar, with additive.
 4. Follow recommendations outlined in TCA Handbook for Ceramic Tile Installation.

D. Grouting Materials

1. Polymer modified tile grout: a factory prepared compound of Portland cement, dry polymers and special additives complying with ANSI A 118.7. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1168.
 - a. Laticrete 1500 Sanded, for joints 1/8" or greater.
 - b. Laticrete 1600 Unsanded, for joints less than 1/8".
 - c. Mapei Keracolor S (Ker 200), for joints 1/8" or greater.
 - d. Mapei Keracolor U (Ker 800), for joints less than 1/8".
 - e. Pro Spec Sanded Grout 700, for joints 1/8" or greater.
 - f. Pro Spec Unsanded Grout 800, for joints less than 1/8".
2. Epoxy Grout: Solvent free, non-allergenic, two-component, 100% solids epoxy that is water cleanable, non-sagging, chemical and stain resistant, with long term color retention. Comply with ANSI 118.3. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1168.
 - a. Laticrete SpectraLOCK 2000 IG.
 - b. Mapei Opticolor, factory blended.
 - c. Pro Spec B-7000 Epoxy Mortar and Grout
3. Colors: Unless otherwise indicated, wall type grout shall be white and floor type grout shall be grey.
4. All sealants shall comply with V.O.C. requirements specified in Section G01600.

E. Cold Applied Liquid Waterproof Membrane (for thinset floor applications):

1. Waterproof membrane shall be resistant to urine, dilute acids, alkalis, food wastes, and brine. Materials shall be non-hazardous and meet all volatile content (V.O.C) requirements. Comply with ANSI A118.10. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1168.
 - a. Laticrete 9235; Waterproof Membrane, cold applied liquid rubber and reinforcing fabric.
 - b. Mapei Mapelastc AquaDefense cold-applied, roller applied synthetic liquid rubber and fiber reinforcing fabric.
 - c. Pro Spec B-6000; Latex polymer based waterproofing membrane and reinforcing mesh.

F. Miscellaneous Materials

1. Tile Cleaner: Product acceptable to tile and grout manufacturers and as recommended by Ceramic Tile Institute.
2. Sealer: Miracle Sealants Company "511 Porous Plus" or "511 H2O Plus", or DuPont StoneTech "Heavy Duty Sealer", subject to approval of quarry tile and grout manufacturers, and compliance with local regulations. Penetrating sealer, causing no reduction of tile's slip resistance, and no change in tile appearance. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1113.

3. Crack Isolation Membrane:
 - a. Comply with requirements of CDPH-SPTVOE, or SCAQMD rule #1168.
 - 1) Laticrete "Hydro Ban"
 - 2) Mapei "Mapelastic AquaDefense"
 - 3) Pro Spec B-6000 Waterproofing/Crack Isolation Membrane with reinforcing mesh.

2.03 MIXES

- A. Mix mortars, grouts and additives to comply with referenced standards and manufacturers recommendations. Accurately proportion materials for mixing to produce mortars and grouts of uniform quality with optimum performance characteristics.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Surfaces to receive tile shall be clean, firm and smooth.
- B. Inspect all surfaces prepared by others before starting tile work and report all unsatisfactory conditions to the Authority. Verify that wall surfaces are level, plumb and square and that floor slopes to drains. Starting tile work shall be considered acceptance of Work of others and existing substrate.
- C. Before proceeding with any tile work, verify:
 1. Prior to application of thick set tile flooring systems, that sheet membrane waterproofing has been installed over prepared substrate and tested for leakage as part of Work of Section 07110 - Sheet Membrane Waterproofing.
 2. That plumbing contractor has installed all sleeves, drains, flashings and piping and that all piping systems have been run and tested for leakage.
- D. No installation of ceramic tile shall proceed until the field samples have been approved by the Authority's Representative.
- E. Following installation of liquid applied waterproof membrane, and prior to proceeding with installation of thinset floor tile, obtain the Authority's Representative's written approval of the membrane.
- F.

3.02 PREPARATION

- A. Prepare floors, walls and base substrates for tile installation in accordance with Tile Council of America's and product manufacturer's recommendations and requirements for wall and floor systems specified.
- B. Prior to application of thin set floor tile, install cold applied liquid rubber waterproof membrane as per manufacturer's recommendations and specifications as part of Work of this Section.
- C. Prior to application of thin set wall tile at locations having sheet membrane waterproofing turned up at wall base, such as in kitchen areas, provide materials to prepare the substrate for proper bonding as recommended by the thinset mortar manufacturer.
- D. Allow waterproofing materials to cure in accordance with membrane manufacturer's recommendations.
- E. Where porcelain paver tile is indicated to be installed on stair landings, first provide crack isolation membrane on properly cured and prepared concrete.

3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. TCA Installation Guidelines
 1. Comply with Tile Council of America installation methods specified.

- C. All wall tile shall be laid up with vertical joints not over 1/16" thick, continuous and unbroken in perfect alignment. For tile mounted in sheets, make joints between tile sheets same width as joints within sheets so extent of each sheet is not apparent in finish Work.
- D. Tile shall be set to the required levels and planes with true lines and angles. Layout tile work and center tile fields in both directions in each space and on each wall area unless otherwise indicated on Drawings. Adjust to minimize tile cutting.
- E. Cut edges of tile shall be carefully ground and jointed. Do all cutting and drilling required for setting and as may be required by other contractors in a neat manner without marring the surface. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.
- F. The tile setter shall cut holes in the base tile of toilet rooms where bronze tubing extends through the partitions into the adjoining pipe spaces.
- G. Set rings for floor type water closets, as specified in Division 15 of this Specification.
- H. Provide tile base at convector enclosures where indicated on Drawings. Tile base and wainscot shall be terminated with bullnose units at top course unless otherwise shown.
- I. Start all wainscots and facings above a ceramic glazed tile base 6" x 6" with 3/4" minimum or 1" maximum radius sanitary cove except where other flooring or base are indicated.
- J. All trim including cap, bullnose, cove, external and internal corners to match field tile in size and color unless indicated otherwise.
- K. Eliminate all voids behind tiles.
- L. Provide expansion joints as indicated, where tilework abuts restraining surfaces, where expansion or control joints occur in the substrate, and where recommended in the TCA Handbook method EJ171. Spacing of expansion joints shall not exceed 30 feet in each direction, and shall not exceed 12 feet where tile will be exposed to direct sunlight or moisture.

3.04 INSTALLATION - FLOOR TILE

- A. Ceramic Mosaic Tile, Porcelain Paver Tile, and Quarry Tile.

Install tile to comply with requirements indicated below for setting methods, TCA installation methods related to types of subfloor construction, and grout types:

1. Thick set method, reinforced, on interior concrete subfloors, including Kitchen areas and other areas where indicated: mortar bed of uniform thickness of 1 1/4" to 2" thick depending on location, comply with TCA F121.
 - a. Commercial Portland Cement Mortar Bed: ANSI A108.1
 - b. Grout: Commercial Sanded Portland Cement type grout - acid resistant, ANSI A118.6. At Kitchen areas provide epoxy grout, ANSI A118.3.
 - c. Waterproof membrane: Provided as part of Work of Section 07110 - SHEET MEMBRANE WATERPROOFING.
 - d. Expansion joints mandatory. Provide in accordance with TCA Method EJ171.
 - e. Reinforcing: 16 gage, 2"x2", galvanized welded wire mesh, centered within mortar bed.
 - f. Mortar bed to be uniform depth within range specified above. Slope to be in fill installed as part of work of Section 03300 - CAST-IN-PLACE CONCRETE or Section 03733 - CONCRETE REPAIR WORK. Refer to Section 07110 for installation of sheet membrane waterproofing. Prior to starting work, confirm that all floor areas slope to drains, with no back pitch away from drains.
2. Thin set method, interior concrete subfloors, except lobbies, corridors and stair landings: mortar bed of 3/32" to 1/8", comply with TCA F122.
 - a. Latex Portland Cement Mortar Bed: ANSI A118.4
 - b. Grout: Polymer modified Portland cement tile grout, ANSI A118.7.
 - c. Waterproof membrane: Cold applied liquid rubber provided as part of Work of this Section. Prepare slab and install membrane, including reinforcing fabric, as per membrane manufacturer's recommendations and specifications. Pretreat cracks,

joints, coves, and corners with reinforcing fabric and waterproofing material. Turn membrane up onto wall, extending 2" above finished floor. Waterproof penetrations and around drains.

- d. Expansion joints: follow waterproof membrane manufacturer's directions and recommendations. Provide in accordance with TCA Method EJ171.
3. Thin set method, interior concrete subfloors, for lobbies, corridors, and stair landings: mortar bed of 3/32" to 1/8", comply with TCA F113.
 - a. Where porcelain paver tile is indicated to be installed on stair landings, first provide crack isolation membrane on properly cured and prepared concrete.
 - b. Latex Portland Cement Mortar Bed: ANSI A118.4
 - 1) For installation of porcelain paver tiles provide latex additive serving as replacement for all of gauging water, added at jobsite to dryset mortar mix. Premium thinset mortar, and flexible additive.
 - c. Grout: Polymer modified Portland cement tile grout, ANSI A118.7.
 - d. Provide expansion joints in accordance with TCA Method EJ171. Above grade provide joints spaced 8' to 12' apart in each direction.

3.05 INSTALLATION - WALL TILE

A. General

Install wall tile and base to comply with requirements indicated below for setting bed methods, TCA installation methods related to subsurface wall conditions and grout types.

1. Thick set method, on interior plaster, cement, and masonry: mortar bed of 3/4" to 1½" thick comply with TCA W221.
 - a. Commercial Portland Cement Mortar Bed: ANSI A108.1
 - b. Scratch Coat: Portland cement mortar proportioned as per TCA W221.
 - c. Bond Coat: Portland cement paste on workable mortar bed.
 - d. Grout: Commercial Portland Cement Grout. Compound of Portland cement and additives, factory blended to decrease shrinkage and increase moisture resistance, and complying with ANSI A118.6.
 - e. Metal Lath: Galvanized expanded metal.
 - f. 4 mil polyethylene membrane.
 - g. Expansion joints mandatory. Provide in accordance with TCA Method EJ171.
2. Thick set method, on interior plaster, cement, and masonry: mortar bed of 3/8" to 3/4" thick comply with TCA W222.
 - a. Commercial Portland Cement Mortar Bed: ANSI A108.1
 - b. Bond Coat: Portland cement paste on workable mortar bed.
 - c. Metal Lath: Galvanized expanded metal.
 - d. Grout: Commercial Portland Cement Grout. Compound of Portland cement and additives, factory blended to decrease shrinkage and increase moisture resistance, and complying with ANSI A118.6.
 - e. 4 mil polyethylene membrane.
 - f. Expansion joints mandatory. Provide in accordance with TCA Method EJ171.
3. Thin set method, gypsum board on metal studs: TCA W243.
 - a. Latex Portland Cement Mortar Bond Coat: ANSI A118.4.
 - b. Grout: Polymer modified Portland cement. ANSI A118.7.
 - c. Provide expansion joints in accordance with TCA Method EJ171.
4. Thin set method, tile backer board on metal studs: TCA W244.
 - a. Latex Portland Cement Mortar: ANSI A118.4.
 - b. Grout: Polymer modified Portland cement. ANSI A118.7.
 - c. 4 mil polyethylene membrane required.
 - d. Expansion joints mandatory. Provide in accordance with TCA Method EJ171.

3.06 GROUT APPLICATION

- A. Where possible, tile should not be grouted sooner than 48 hours after setting.

- B. Clean all joints of dust, dirt, and foreign materials.
- C. When grouting wall tile thoroughly soak all joints with clean water. This is important as grout will not cure properly unless thoroughly soaked.
- D. Mix grout with clean water to a consistency of thick cream. Completely fill all joints and allow to set for a few minutes. Remove the surplus grout and finish flush and true. As soon as the grout has reached its initial set, thoroughly wash with a sponge and clean water. Polish with clean, dry cloths.

3.07 REFRIGERATOR / FREEZER AREA (COMMUNITY CENTERS)

- A. Continue tile facing in kitchen at exposed portion of the walk-in refrigerator extending from floor to ceiling.
- B. After installation of the refrigerator-freezer in the kitchen, fill in solidly with concrete all spaces around the freezer and complete installation of floor tile and base around freezer. Tile base shall be secured to sides of freezer with waterproof mastic.
- C. Apply sealer to floor as specified in Article titled "Sealer Application".

3.08 WATER TEST - FOOD SERVICE AREAS (COMMUNITY CENTERS)

- A. After completion of thick-set tile application, apply water to floor to demonstrate that all floor areas are sloped to drains and do not back pitch away from the drains. Advise the Authority's Representative 48 hours prior to the test.

3.09 SEALER APPLICATION

- A. Apply sealer to quarry tile floors in kitchen, food preparation, and servery areas, in accordance with sealer manufacturer's printed instructions.

3.10 CLEANING

- A. Upon completion of all ceramic tile installation and grouting, thoroughly clean the exposed surfaces so they are free of foreign matter and stains. Clean grout from exposed tile surfaces.
- B. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning. Remove all traces of acid solution upon completion of cleaning process.

3.11 PROTECTION

- A. As soon as the tile work in each space has been grouted and cleaned, it shall be covered with either reinforced kraft paper (sisal kraft) or other heavy covering. Floor covering shall be kept and maintained until completion of the Work of all trades or as otherwise directed by the Authority, when it shall be removed without damage to tile or adjoining Work.

END OF SECTION