

SECTION 09 30 13

CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceramic mosaic tile.
2. Unglazed porcelain floor or wall tile.
3. Glazed or unglazed wall tile.
4. Waterproof membrane.
5. Crack isolation membrane.
6. Metal edge strips.

1.2 DEFINITIONS

- A. High-Performance Tile Grout: A factory-prepared grouting material mixture of cement and other ingredients, including a redispersible latex/polymer powder, to which only water is added at the jobsite, or a liquid latex additive.
- B. Improved Modified Dry-Set Mortar (Thinset): Modified Dry-Set Mortar with a minimum bond strength of 300 psi to impervious ceramic tile.
- C. Large and Heavy Tile (LHT): Any tile material weighing 5 lbs./sq. ft. or greater, or any tile with a least horizontal dimension of 15 inches or more.
- D. Modified Dry-Set Mortar for Large and Heavy Tile (LHT): Formerly "Medium Bed Mortar," is a modified dry-set mortar formulated to have a bond coat thickness between 3/32 and 1/2 inch after tile embedment, and declared as an "LHT" setting material by the manufacturer based on these characteristics.
- E. Modified Dry-Set Mortar (Thinset): A factory-prepared setting material mixture of cement and other ingredients, including a redispersible latex/polymer powder, to which only water is added at the jobsite, or a liquid latex additive.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide samples of each color blend.

- C. Shop Drawings: Indicate locations of each type of tile and tile pattern. Show layout, patterns, color arrangements, widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Installer having minimum 5 years documented experience who is trained and certified in the substrate preparation and installation of tile.
  - 1. Installer is a five star member of the National Tile Contractors Association, a Trowel of Excellence member of the Tile Contractors' Association of America or holds other acceptable memberships or associations.
- B. Source Limitations for Tile: Obtain tile of each type from single source or producer.
  - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- C. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
  - 1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
  - 2. Obtain waterproof membrane, except for sheet products, from manufacturer of setting and grouting materials.
- D. Source Limitations for Other Products: Obtain each of the following specified products from a single manufacturer:
  - 1. Waterproof membrane.
- E. 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 a 4 foot square mockup of each type of floor tile installation where directed by Architect.
  - 2. Build 4 foot square mockup of each type of wall tile installation where directed by Architect.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.5 WARRANTY

- A. Total System Warranty: Written total system warranty signed by setting material manufacturer and installer warranting installation materials are free from manufacturing defects and will not break down or deteriorate and labor to replace defective materials when the manufacturer's mortar, grout, and waterproofing membrane is installed as a system.
  - 1. Warranty Period: 5 years from date of Substantial Completion.

## 1.6 EXTRA MATERIAL

- 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.

## PART 2 - PRODUCTS

### 2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

### 2.2 TILE PRODUCTS

- A. Factory-Mounted Ceramic Mosaic Tile:
  - 1. Products: Subject to compliance with requirements, provide product indicated on Drawings.
  - 2. Composition: Impervious natural clay or porcelain.
  - 3. Module Size: As indicated by product designations on Drawings.
  - 4. Thickness: 1/4 inch.
  - 5. Face: As indicated by product designations on Drawings.
  - 6. Dynamic Coefficient of Friction: For products on floor surfaces, not less than 0.42.
  - 7. Finish: As indicated by product designations on Drawings.
  - 8. Tile Color and Pattern: As indicated on Drawings.
  - 9. Grout Color: As indicated on Drawings.
  - 10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide the following coordinating shapes where indicated on Drawings:
    - a. Base: Coves.
    - b. Base Caps: Surface bullnose.
    - c. Wainscot Caps: Surface bullnose.
    - d. External Corners. Bullnose.

e. Internal Corners: Coves.

B. Unglazed Porcelain Floor or Wall Tile:

1. Products: Subject to compliance with requirements, provide product indicated on Drawings.
2. Certification: Tile certified by the Porcelain Tile Certification Agency.
3. Face: As indicated by product designations on Drawings.
4. Face Size Variation: Rectified.
5. Thickness: As indicated by product designations on Drawings, but not less than 3/8 inch.
6. Face: As indicated by product designations on Drawings.
7. Dynamic Coefficient of Friction: For products on floor surfaces, not less than 0.42.
8. Tile Color and Pattern: As indicated on Drawings.
9. Grout Color: As indicated on Drawings.
10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide the following coordinating shapes where indicated on Drawings:
  - a. Base Cap: Surface bullnose, module as indicated on Drawings.
  - b. Wainscot Cap: Surface bullnose, module size as indicated on Drawings.
  - c. External Corners: Surface bullnose, module size as indicated on Drawings.

C. Glazed or Unglazed Wall Tile:

1. Products: Subject to compliance with requirements, provide product indicated on Drawings.
2. Module Size: As indicated by product designations on Drawings.
3. Face Size Variation: Rectified.
4. Thickness: 5/16 inch.
5. Face: As indicated by product designations on Drawings.
6. Finish: As indicated by product designations on Drawings.
7. Tile Color and Pattern: As indicated on Drawings.
8. Grout Color: As indicated on Drawings.
9. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide the following coordinating shapes where indicated on Drawings:
  - a. Base: Coved or straight as indicated.
  - b. Wainscot Cap: Bullnose cap.
  - c. External Corners: Bullnose, same size as adjoining flat tile.
  - d. Internal Corners: Field-butt square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.

## 2.3 WATERPROOF MEMBRANE

- 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. Floor Surfaces:
  - 1. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Bostik, Inc; Hydroment Blacktop 90210.
      - 2) Custom Building Products; 9240 Waterproofing and Anti-Fracture Membrane.
      - 3) Laticrete International, Inc; Laticrete 9235 Waterproof Membrane.
      - 4) MAPEI Corporation; Mapelastic™ 400 or Mapelastic™ HPG
- C. Wall Surfaces:
  - 1. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Bostik, Inc; Bostik GoldPlus or Durabond D-222 Duraguard Membrane.
      - 2) Custom Building Products; Custom 9240 or RedGard Waterproofing and Crack Prevention Membrane.
      - 3) Laticrete International, Inc; Laticrete Hydro Ban or Laticrete Hydro Barrier.
      - 4) MAPEI Corporation; Mapelastic HPG or Mapelastic™ AquaDefense.

## 2.4 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for high 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.
- 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. Custom Building Products; Crack Buster Pro-Crack Prevention Mat Underlayment.
  - b. MAPEI Corporation; Mapeguard™ 2or Mapesonic 2.
- 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. Custom Building Products; 9240 Waterproofing and Anti-Fracture Membrane.
    - c. Laticrete International, Inc; Laticrete Blue 92 Anti-Fracture Membrane.
    - d. MAPEI Corporation; Mapelastic HPG with MAPEI Fiberglass Mesh.

## 2.5 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
- B. Standard Dry-Set Mortar (Thinset): ANSI A118.1.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. TEC; H.B. Fuller Construction Products Inc.
- C. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. TEC; H.B. Fuller Construction Products Inc.
  2. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
  3. For wall applications, provide nonsagging mortar.

- D. Modified Dry-Set Mortar for Large and Heavy Tile (LHT): Comply with requirements in ANSI A118.4. 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. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. TEC; H.B. Fuller Construction Products Inc.
  2. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
  3. For wall applications, provide nonsagging mortar.
- E. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. TEC; H.B. Fuller Construction Products Inc.
  2. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
  3. For wall applications, provide nonsagging mortar.

## 2.6 GROUT MATERIALS

- A. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.
- B. Standard Cement Grout: ANSI A118.6.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.

- e. MAPEI Corporation.
  - f. TEC; H.B. Fuller Construction Products Inc.
2. Where joints size is 1/8 inch or less, use unsanded grout. Where joints are greater than 1/8 inch, use sanded grout.
- C. High-Performance Tile Grout: ANSI A118.7.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. TEC; H.B. Fuller Construction Products Inc.
  - 2. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.
  - 3. Where joints size is 1/8 inch or less, use unsanded grout. Where joints are greater than 1/8 inch, use sanded grout.
- D. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. ARDEX Americas.
    - b. Bostik, Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. TEC; H.B. Fuller Construction Products Inc.

## 2.7 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 and Trim Strips: Angle or L-shape, height to match tile and setting-bed thickness, designed specifically for application indicated; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
  - 1. Products: Subject to compliance with requirements, provide products indicated on Drawings.
- C. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Bonsal American, an Oldcastle company.
  - b. Custom Building Products.
  - c. Summitville Tiles, Inc.
  - d. TEC; H.B. Fuller Construction Products Inc.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  2. Verify that concrete substrates for tile floors installed with bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
- 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 thinset 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.

### 3.3 CERAMIC TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
  - a. Tile floors in wet areas.
  - b. Tile floors consisting of tiles 8 by 8 inches or larger.
  - c. Tile floors consisting of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary or indicated to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
- G. Joint Widths: Install tile with joint widths recommended by the manufacturer for products indicated.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints where indicated but not greater than 30 feet on center
  1. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  2. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
  3. Install control and expansion joints in accordance with TCNA Handbook Method No. EJ171.
- J. Metal Edge Strips: Install at locations indicated. If not indicated, install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

- K. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as floor has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- L. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.
- M. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- N. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

### 3.4 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- B. Allow waterproofing to cure and verify by testing that it is watertight before installing tile or setting materials over it.

### 3.5 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 that is bonded securely to substrate.
- B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

### 3.6 THICKSET INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Floor Installations, Concrete Subfloor:
  - 1. Commercial Kitchen Floors: TCNA F114 and ANSI A108.1B; cement mortar bed (thickset) with cleavage membrane; epoxy grout.
    - a. Bond Coat for Cured-Bed Method: Improved modified dry-set mortar.
    - b. Grout: Water-cleanable epoxy grout.
- B. Shower Receptor Installations:
  - 1. Ceramic Tile Installation: TCNA B414 and ANSI A108.1B; cement mortar bed (thickset) on waterproof membrane bonded to concrete.
    - a. Bond Coat for Cured-Bed Method: Modified dry-set mortar.

- b. Grout: High-performance grout.

### 3.7 THINSET INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

#### A. Floor Installations, Concrete Subfloor:

1. Slabs-On-Grade: Unless otherwise indicated, TCNA F113; thinset mortar.
  - a. Thinset Mortar: Modified dry-set mortar. Use modified dry-set mortar approved for LHT applications for large and heavy tile.
  - b. Grout: High-performance grout.
2. Restroom and Servery Floors on Slabs-On-Grade: TCNA F113; thinset mortar.
  - a. Thinset Mortar: Modified dry-set mortar. Use modified dry-set mortar approved for LHT applications for large and heavy tile.
  - b. Grout: Water-cleanable epoxy grout.
3. Elevated Slabs: Unless otherwise indicated, TCNA F125-Full; thinset mortar on crack isolation membrane.
  - a. Thinset Mortar: Modified dry-set mortar. Use modified dry-set mortar approved for LHT applications for large and heavy tile.
  - b. Grout: High-performance grout.
4. Restroom and Servery Area Floors on Elevated Slabs: TCNA F125-Full; thinset mortar on crack isolation membrane.
  - a. Thinset Mortar: Modified dry-set mortar. Use modified dry-set mortar approved for LHT applications for large and heavy tile.
  - b. Grout: Water-cleanable epoxy grout.

#### B. Wall Installations:

1. Dry Locations: Unless otherwise indicated, TCNA W244C or TCNA W244F; thinset mortar on cementitious backer units or fiber-cement backer board.
  - a. Thinset Mortar: Modified dry-set mortar. Use modified dry-set mortar approved for LHT applications for large and heavy tile.
  - b. Grout: High-performance grout.

#### C. Shower Wall Installations:

1. Wet Locations: TCNA B415; thinset mortar on waterproof membrane over cementitious backer units or fiber-cement backer board.
  - a. Thinset Mortar: Modified dry-set mortar. Use modified dry-set mortar approved for LHT applications for large and heavy tile.
  - b. Grout: High-performance grout.

### 3.8 PROTECTION

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

END OF SECTION

This page intentionally left blank.