**SECTION 093013**

 **TILING (CERAMIC TILE WITH POWER GROUT®)**

PART 1 GENERAL

 **1.01 SUMMARY**

 A. Section Includes:

 1. Ceramic Tile

 2. Surface Preparation

 3. Waterproofing and Crack Isolation Membrane System

 4. Crack Isolation Mortar System

 5. Setting Mortar

 6. Grout and Accessories

 **1.02 REFERENCES**

 A. Conform to requirements of ANSI A137.1 for standard grade tile and ANSI A137.3 for Gauged Porcelain Panels / Slabs. Second grade or worse material will not be permitted.

 B. Conform to Ceramic Tile Manual published for the Ceramic Tile Institute.

 C. Tile should be installed in compliance with ANSI standards and in accordance with the Tile Council of North America Handbook specifications.

 **1.03 SUBMITTALS**

 A. Product Data:

 1. Submit manufacturer’s descriptive literature and product specifications for each product.

 2. Submit manufacturer’s technical data indicating compliance with all applicable standards.

 3. Shop drawings showing layout, joint locations and transition treatments.

 B. Samples: Submit two (2) sets of physical samples for products specified herein.

 1. Full size samples of each tile and appropriate trim shapes of each tile.

 2. Grout color samples of each color and type. Prepare samples in specified dimensions using the same tools and techniques intended in actual work (including grout sealer application if specified). Manufacturer’s paper charts and plastic channels are to be used for initial color selection only and are not acceptable submittal samples.

 C. Certifications: Submit manufacturer’s letter of compliance that products will meet or exceed TCNA 137.1, including Master Grade Certificate.

 **1.04 QUALITY ASSURANCE**

 A. Manufacturer’s Qualifications:

 1. Company specializing in the manufacturing products specified in this Section with minimum five (5) years documented experience.

 2. Single source manufacturer: Waterproofing and crack isolation membrane system, setting materials and grout materials shall be provided by a single manufacturer.

 B. Installer Qualification: Choose one.

 1. Installer is **[a five-star member of the National Tile Contractors Association] [or] [a Trowel of Excellence member of the Tile Contractors' Association of America]**

 2. Installer's supervisor for the Project holds the International Masonry Institute's Foreman Certification.

 3. Installer employs **[Ceramic Tile Education Foundation Certified Installers] [or] [installers recognized by the U.S. Department of Labor as Journeyman Tile Layers]**

 4. Installer submits references reflecting competence with work of similar size, scope and complexity of the work required for this project.

 C. Field Mock-up: Install a fully finished mock-up for each type tile installation. Mock-up shall be a minimum of 10'0" X 10'0" and will be reviewed for joint quality, color range, pattern and workmanship.

 D. Extra Stock: At the end of the project, provide to the owner, unopened, clearly marked cartons of additional ceramic tile materials and grout utilized on the project.

 1. 100 square feet of each color porcelain floor tile.

 2. One container of each color porcelain base.

 3. Containers of each color grout required to install 100 square feet of tile (No less than one (1) container required).

 **1.05 PRE-INSTALLATION MEETING**

 A. Conduct pre-installation meeting in accordance with Section 01310.

 B. Convene pre-installation meeting one week prior to purchasing materials for field sample [mock-up].

 **1.06 DELIVERY, STORAGE, AND HANDLING**

 A. Comply with requirements of Section 01650 and Section 01660.

 B. All products supplied shall be delivered in original, unopened packages with labels identifying products legible and intact.

 C. All products supplied shall be stored in a dry enclosure and protected from the weather, direct sunlight, surface contamination, aging, damaging temperatures, damage from construction traffic, and other potential adversities.

 D. Damaged materials shall be removed from the jobsite.

 **1.07 ENVIRONMENTAL REQUIREMENTS**

 A. Environmental Conditions: Do not install ceramic tile setting materials or grouts when ambient air temperature or substrate temperature are below 50°F unless temporary protection and heat are provided to maintain ambient temperatures above 50°F during installation of wet materials and until they have cured thoroughly and become weather resistant.

 B. The General Contractor shall provide access to electrical power and clean potable water in the area where the ceramic or stone tile is being installed.

 **1.08 WARRANTY**

1. Comply with provisions of Section 01780.

**{NOTE:** Choose one for each application; choose time period for each warranty based on needs.}

1. **Waterproofing and 1⁄4" Crack Isolation System Limited Warranty**: The manufacturer of the installation materials shall warrant for **[LIFETIME] [25 years] [20 years] [15 years]** upon completion of the complete system\* installation, when installed per manufacturer’s installation instructions and published warranty: (1) the waterproofing and crack isolation membrane shall perform to the requirements set forth in ANSI A118.10 and ANSI A118.12 (2) the ceramic tile mortar will not transfer cracks from the approved substrate through the tile or stone and will maintain the bond between the tile or stone and approved substrate, when subjected to in-plane movement of cracks up to 1⁄4", and (3) not transfer cracks from the approved substrate through the grout when subjected to in-plane movement of cracks up to 1⁄4". If installation materials are shown to be defective, manufacturer shall supply replacement material and labor. **For warranty details and to assist in selecting years of coverage: http://www.tecspecialty.com/supporting-materials/warranty-info/?lang=English**

\* System = Membrane +Mortar + Grout as indicated on chart below

{**NOTE to Specifier:** Includes Crack Protection for Grout as well as tile}



1. 3⁄8” Crack Isolation System Limited Warranty: The manufacturer of the installation materials shall warrant for **[LIFETIME] [25 years] [20 years] [15 years]** upon completion of the complete system\* installation, when installed per manufacturer’s installation instructions and published warranty: **(1)** the crack isolation sheet membrane shall not transfer cracks from the approved substrate through the tile or stone and will maintain the bond between the tile or stone and approved substrate, when subjected to in-plane movement of cracks up to 3⁄8" and **(2)** not transfer cracks from the approved substrate through the grout when subjected to in-plane movement of cracks up to 3⁄8". If installation materials are shown to be defective, manufacturer shall supply replacement material and labor. **For warranty details and to assist in selecting years of coverage: http://www.tecspecialty.com/supporting-materials/warranty-info/?lang=English**

\* System = Sheet Membrane +Mortar + Grout as indicated on chart below

{**NOTE to Specifier:** Includes Crack Protection for Grout as well as Tile}



**PART 2 PRODUCTS**

 **2.01 MANUFACTURERS AND PRODUCTS**

 A. Ceramic Tile

1. Furnish tile complying with “Standard Grade” requirements per ANSI A137.1, for types of tile indicated.

 Furnish tile complying with “Gauged Porcelain Tile Panels / Slabs” requirements per ANSI A137.3.

 2. Pattern Name: Tile shall be [insert tile pattern name], as manufactured by [insert tile manufacturer name].

 3. Color: Tile shall be **[insert color name and number].**

 4. Size: Tile shall be manufactured to specific size after firing and shall be: 3" x 3" x 1⁄4" (actual 27⁄8" x 27⁄8" x 1⁄4");
nominal 6" x 6" x 5⁄16" (actual 53⁄4" x 53⁄4" x 5⁄16"); nominal 8" x 8" x 5⁄16" (actual 73⁄4" x 73⁄4" x 5⁄16"); nominal 12" x 12" x 5⁄16" (actual 113⁄4" x 113⁄4" x 5⁄16"); **Large and Heavy Tile:** 6” x 36”, 4 x 24, 6 x 24, 10 x 20, 16" x 16", 12” x 24”, 24” x 24”, 24” x 48”, 32” x 32”, 40” x 120”, 9” x 36”, 18” x 36”, 12” x 48”); and Gauged Porcelain Tile Panels / Slabs in 3mm and 5+mm thickness: 20” x 39”, 39” x 39”, 19.5 x 39”, 39” x 59”, 39” x 118”, 1M x 3M.

 5. Product shall exhibit the following minimum test results:

 a. Water Absorption (ASTM C373): [insert % water absorption].

 b. Abrasion Resistance (EN 154): [insert PEI class].

 c. Breaking Strength (ASTM C648): [insert minimum lbs. strength].

 d. Coefficient of Friction – Wet (ASTM C1028): [insert value].

 e. Coefficient of Friction – Dry (ASTM C1028): [insert value].

 f. Glaze Hardness: [if tile selected is glazed, insert MOH value].

 6. Provide matching trim shapes such as bullnose, corners and cove base where specified.

 B. Surface Preparation

 1. Provide cementious, trowelable, patch material to remedy any depressions in existing slab to allow for flat and level
installation of tile. Product shall be **TEC® VersaPatch® Latex Modified Floor Patch** and Leveler as manufactured by H.B. Fuller Construction Products Inc.

 2. For interior large format, floor tile installations using 15" or greater on one side tile, install self-leveling underlayment at 1⁄4" to insure flat, level floor installation and appropriate mortar coverage to back of tile and substrate. Prime all porous surfaces according to manufacturer’s instructions. Products shall be **TEC® Multipurpose Primer™**, **and TEC® Level Set 300® Self Leveling Underlayment** as manufactured by H.B. Fuller Construction Products Inc.

 C. Waterproofing and Crack Isolation **Fluid** Membrane System

1. Membrane shall meet all ANSI A118.10 specifications for ceramic tile waterproofing membranes and ANSI A118.12 for ceramic tile and stone crack isolation membranes providing up to 1⁄4" crack isolation protection. For residential to extra heavy commercial applications. **Membrane must be approved over control joints with no need to locate tile or stone field movement joints directly over concrete control joints.**

1. **1/4” In Plane Crack and Waterproofing Protection**: Trowel, Nap Roller or airless sprayer applied waterproofing membrane shall be full coverage of **TEC® HydraFlex™ Waterproofing Crack Isolation Membrane**, 1⁄4" in plane crack isolation and waterproofing membrane as manufactured by TEC® / H.B. Fuller Construction Products Inc. **TWO COATS** of continuous membrane of at least 46-50 mils wet film thickness total is required over the entire surface. Membrane shall be used over control joints per manufacturer’s installation instructions. Flashing with Waterproofing Mesh is required at all substrate joints; field seams; inside corners; outside corners; anywhere vertical surfaces meet horizontal surfaces such as curbs, bench seats, columns, etc.; or anywhere dissimilar materials meet. Flashing is also required for drains and expansion/ control joints.

**NOTE FOR “D” and “E”:** Choose 1/8” or ¼” Fluid Membrane in “D” or 3/8” Sheet Membrane in “E” for Crack Protection ONLY

D. Crack Isolation **Fluid** Membrane System (**Crack Protection Only**)

1. Membrane shall meet ANSI A118.12 for ceramic tile and stone crack isolation membranes providing up to 1⁄4" crack isolation protection. For residential to extra heavy commercial applications. **Membrane must be approved over control joints with no need to locate tile or stone field movement joints directly over concrete control joints.**

1. **1/8” In Plane Crack Protection**: Trowel, Nap Roller or airless sprayer applied waterproofing membrane shall be **TEC® HydraFlex™ Waterproofing Crack Isolation Membrane**, 1⁄8" in plane crack isolation and waterproofing membrane as manufactured by TEC® / H.B. Fuller Construction Products Inc. May be applied in one coat with wet film thickness of minimum **25 mils wet**, drying to 15 mil dry film thickness. Membrane shall be used over control joints per manufacturer’s installation instructions.
2. **1/4” In Plane Crack Protection**: Trowel, Nap Roller or airless sprayer applied waterproofing membrane shall be **TEC® HydraFlex™ Waterproofing Crack Isolation Membrane**, 1⁄4" in plane crack isolation and waterproofing membrane as manufactured by TEC® / H.B. Fuller Construction Products Inc. May be applied in one coat with wet film thickness of minimum **50 mils** wet, drying to 30 mil dry film thickness. Membrane shall be used over control joints per manufacturer’s installation instructions.

**{Note to Specifier:** TEC® HydraFlex™ can also be used to install tile over green concrete in as little as 3 days for time sensitive installations.}

E. Crack Isolation **Peel and Stick Sheet** Membrane System

1. Membrane shall meet all ANSI A118.12 for ceramic tile crack isolation membranes providing up to **3⁄8"** crack isolation protection.

1. Peel and Stick applied crack isolation membrane shall be **TEC® Crack Isolation Sheet Membrane,** 3/8” in plane crack isolation as manufactured by TEC® / H.B. Fuller Construction Products Inc.

**{Note to Specifier:** The use of Multipurpose Primer is required to install this product. See “G” below}

 E. Mortars

 1. **Latex Modified Cement Mortars** (for the installation of tile size smaller than 15” on one side)

 a. **TEC® Super Flex™ Premium Latex Modified Thin Set Mortar**, one-part, flexible latex thin set mortar conforming to ANSI A118.15 & ANSI A118.4 & A118.11, minimum 28 day shear strength (Porcelain) minimum 700psi, as manufactured by H.B. Fuller Construction Products Inc. Color: **[white] [gray].**

 b. **TEC® Full Flex® Premium Latex Modified Thin Set Mortar**, one-part, flexible latex thin set mortar conforming to ANSI A118.4 & A118.11, minimum 28 day shear strength (Porcelain) minimum 400psi, as manufactured by H.B. Fuller Construction Products Inc. Color: **[white] [gray].**

 2. **Large and Heavy Tile Format, Latex Modified Cement Mortars** (for the installation of tiles equal to and larger than 15" on one side)

 a. **TEC® 3N1® Performance Mortar**, one-part, light weight latex thin set mortar conforming to ANSI A118.15 & ANSI A118.4 & A118.11, minimum 28 day shear strength (Porcelain) minimum 425psi, Non Slump for floor, Non Sag for walls, as manufactured by H.B. Fuller Construction Products Inc. Color: **[white] [gray].**

 b. **TEC® Ultimate Large Tile Mortar**, one-part, light weight latex thin set mortar conforming to ANSI A118.4 & A118.11, minimum 28 day shear strength (Porcelain) minimum 330 psi as manufactured by H.B. Fuller Construction Products Inc. Color: **[white] [gray]**.

 3. **Latex Modified Thin Set Mortar (for glass tile installation)**

 a. **TEC® Super Flex™ Premium Latex Modified Thin Set Mortar** – White TA 393, one-part, high solids latex thin set mortar conforming to ANSI A118.11, as manufactured by H.B. Fuller Construction Products Inc. Color: white
\*\*\* Please note: Refer to glass tile manufacturer for instructions on specific details for installation.

 4. **Latex Modified Thin Set Mortar (for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; and Large and Heavy Tiles)**

 a. **TEC® Ultimate 6 Plus Large Tile Mortar**, one-part, light weight latex thin set mortar conforming to ANSI A118.4TE & A118.11, minimum 28 day shear strength (Porcelain) minimum 480 psi, Non Slump for floor, Non Sag for walls**,** as manufactured by H.B. Fuller Construction Products Inc. Color: white.

 F. Grouting Materials

1. High Performance Cementious Grout. Provide grout with less than 1.2% absorption, minimum of 10,000 psi 28 day compressive strength conforming to ANSI A118.7. This grout does not require sealing. For floors and walls for grouting joints 1⁄16" to 1⁄2" and is backed by a **limited lifetime product warranty**.
2. **TEC® Power Grout**®, stain resistant, crack resistant, zero efflorescence, polymer-modified, sanded High Performance cement grout mixed with water per manufacturer’s instructions as manufactured by H.B. Fuller Construction Products Inc. **[color]**

G. Primer

1. Acrylic latex based primer for the installation of self-leveling underlayments, and for peel and stick tile installation, primer can be used on dry, porous concrete, gypsum cement underlayments and plywood.
2. **TEC® Multipurpose Primer**, as manufactured by H.B. Fuller Construction Products Inc.

 H. Expansion Joints

 1. Refer to TCNA Handbook, Method EJ171 for recommendations on locating and detailing various types of construction joints.

 2. Use sealant complying with ASTM C920 according to Type, Grade, Class and Uses required.

**PART 3 EXECUTION**

 **3.01 EXAMINATION**

 A. Examine conditions under which ceramic or stone tile will be installed and proceed with work in accordance with Section 01710.

 B. Maximum variation from the required plane (as specified by Tile Council of North America):

 1. Tiles with no edges greater than 15 inches, floors and walls: 1⁄4 inch in 10 feet, and/or 1⁄16 inch in 1 foot.

 2. Tiles with at least one edge greater than 15 inches, and walls: 1⁄8 inch in 10 feet, and/or 1⁄16 inch in 2 feet.

 C. Notify Architect and General Contractor in writing of unsatisfactory conditions.

 D. Do not proceed until unsatisfactory conditions have been corrected.

 **3.02 PREPARATION AND SITE CONDITIONS**

 A. General:

 1. Surfaces to be tiled shall be structurally sound, dry and free from oil, grease, dust, loose or peeling paint, concrete sealers or curing compounds. All contaminants must be removed prior to system installation.

 2. Surfaces must be free of hydrostatic conditions or other moisture related problems.

 3. Confirm location of expansion, isolation or control joints required and details provided on the drawings.

 **3.03 INSTALLATION**

 A. General:

 1. Install work in accordance with manufacturer’s approved product installation procedures and as specified in this section.

 2. Install in accordance with [ANSI A108.5 Installation Specifications for Latex-Modified Portland Cement Mortar.] [A108.19 Standard Specifications for the Handling, Preparation, and Installation of Gauged Porcelain tile panels/slabs

**{NOTE TO Specifier:** For Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs, go to http://www.tecspecialty.com/supporting-materials/installation-guides/TEC-Thin-Porcelain-Panel-Installation-Guide.html?lang=English for TEC’s Installation Guide}

 B. Tile Installation

 1. General:

 a. Install tile in pattern shown on drawings. Joints shall be aligned and of same size when adjoining tiles on floor, base, walls and trim.

 b. Tile should be cut straight and have edges aligned with adjacent materials. Grind edges of cut tile.

 c. Install tile under equipment and fixtures and into recesses to form a complete tile covering.

 d. Terminate tile neatly at edges, corners and obstructions without disrupting the tile pattern or joint alignment.

 2. Walls: Install tile in accordance with latest version of TCNA method specifications.

 C. Grout Installation

 1. Install specified product in strict accordance with manufacturer’s installation instructions and following the guidelines of
ANSI A108.10.

 D. Expansion and Control Joints: Install expansion and control joints in accordance with TCNA method EJ171.

 **3.04 FIELD QUALITY REQUIREMENTS**

 A. General: Comply with requirements of Section 01450.

**3.05 CLEANING**

1. Wet a grout sponge in a pail containing cool, fresh water and wring out. Loosen the grout on the tile surface by moving the sponge in a circular motion across the tiles. Then use the sponge to smooth the joints. Completely rinse and wring out the sponge. Wipe diagonally across the tiles to remove grout residue. Use each side of the sponge once, then rinse, completely wring out and repeat. Change the water frequently.
2. Grout joints must be clean and free of standing water, dust and any foreign substances.

 **3.06 PROTECTION**

 A. Protect wall installations from impact or heavy vibration for at least 14 days after completed installation.

 B. Protect grout from mopping, routine cleaning or shower use 24 hours from completed installation.

 C. Protect tile installation from freezing and water immersion for at least 21 days after installation is complete.

 D. Protect the finished installation from foot traffic or impact for at least 4 hours.

 E. Do not expose to stains, complete water immersion or freezing for 7 days.

**END OF SECTION**