**SECTION 093013**

 **TILING (20 YR TILE & GROUT CRACK ISOLATION SYSTEM WARRANTY)**

PART 1 GENERAL

 1.01 SUMMARY

 A. Section Includes:

 1. Ceramic Tile

 2. Surface Preparation

 3. Setting Materials and Accessories

 4. Grout and Accessories

 5. Tile and Grout Sealer and Cleaners

 B. Related sections:

 1. Section 03150 - Concrete Expansion and Construction Joints

 2. Section 03350 - Concrete Floor Finishing

 3. Section 03540 - Cementitious Underlayment

 4. Section 05800 - Metal expansion or control joints and accessories

 5. Section 06160 - Rough Carpentry

 6. Section 07900 - Joint Sealants

 1.02 REFERENCES

 A American Society for Testing and Materials (ASTM)

 1. ASTM C-627-93 Evaluating Ceramic Tile Floor Tile Installation Systems

 2. ASTM C-920-98 Specifications for Elastomeric Joint Sealants

 3. ASTM C-1178-96 Glass-Mat Water Resistant Gypsum Backing Board

 B. American National Standards Institute (ANSI)

 1. A118.3 Chemical Resistant Epoxy Mortar and Grout

 2. A118.6 Ceramic Tile Standard Grouts

 3. A118.7 High Performance Cement Grouts

 4. A118.9 Cementitious Backer Units

5. A118.12 Crack Isolation Membranes

 6. A108.10 Installation of Grout in Tilework

 7. A108.11 Installation of Interior Cementitious Backer Units

 8. A137.1 Ceramic Tile

 C. Tile Council of North America (TCNA) Handbook for Ceramic Tile Installation: Applicable Tiling Installation Methods.

 1. EJ171 Movement Joint Essentials

 1.03 SUBMITTALS

 A. Product Data:

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

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

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

 B. Samples: Submit four (4) samples for each type, color, size and finish included in this project.

 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 for 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.

 3. Sealant color samples.

 1.04 QUALITY ASSURANCE

 A. Manufacturer Qualifications:

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

 2. Single source manufacturer: Surface preparation, primers, underlayments, crack isolation mortars, grout materials, and protecting sealer 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 tile is being installed.

 1.08 WARRANTY

 A. Comply with provisions of Section 01780.

 B. **20 Year** Tile Setting Limited System Warranty - **1⁄4" Tile and Grout Crack Isolation System Limited Warranty:** The manufacturer of the TEC® installation products shall warrant that the TEC brand Installation System\* will 1) not transfer cracks from the approved substrate through the tile and will maintain the bond between the tile and the approved substrate, under normal use, when subjected to in-plane movement of cracks2 up to **1⁄4"** , and 2) not transfer cracks from the approved substrate through the grout when subjected to in-plane movement of cracks2 up to **1⁄4", for 20 years** effective from the date of installation. The manufacturer’s products must be properly applied, using approved materials, following all applicable building code regulations and applicable standards.

 \*Note: System = Membrane + Mortar + Grout

 2 Existing substrate cracks cannot exhibit in-plane differences beyond 1⁄4"

 TEC® 20 Year **1⁄4" Crack Isolation System Limited Warranty**

 Membrane: **TEC® HydraFlex™ Crack Isolation Membrane**

 Mortar: **TEC® Full FlexTM Mortar** or **Ultimate 6 PlusTM Mortar**

 Grout Choice: **TEC® InColor™ Advanced Performance Tile Grout** **TEC® Power Grout® Grout
 TEC® AccuColor EFX® Epoxy Special Effects Grout**

C. The tile manufacturer shall warrant the performance of the ceramic tile as per the tile manufacturer’s product warranty.

PART 2 PRODUCTS

 2.01 SYSTEM PERFORMANCE

 A. Traffic Level Performance

 1. System shall meet traffic level performance [extra heavy commercial] [light commercial] [residential] when tested in accordance with ASTM C 627 Evaluating Ceramic Tile Floor Installations.

 2.02 MANUFACTURERS AND PRODUCTS

 A. Ceramic Tile

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

 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: nominal 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 sizes** 16" x 16" x 3/8", 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”. [16" x 16" x 3/8" (actual 15-7/8" x 15-7/8" x 3/8")]].

 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 Products

 1. **TEC®** **VersaPatch® Latex Modified Floor Patch** , as manufactured by H.B. Fuller Construction Products Inc.

 2. **TEC® Level Set 300®** Self Leveling Underlayment, as manufactured by H.B. Fuller Construction Products Inc.

 4. **TEC® Multipurpose Primer**, as manufactured by H.B. Fuller Construction Products Inc.

 5. **TEC® HydraFlex™ Crack Isolation Membrane**, as manufactured by H.B. Fuller Construction Products Inc.

1. **¼” In Plane Crack Protection**: Trowel, Nap Roller or airless sprayer applied membrane shall be TEC® HydraFlex™ Crack Isolation Membrane, 1⁄4" in plane crack isolation and 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, curing to 30 mil dry film thickness. Membrane shall be used over control joints per manufacturer’s installation instructions.

 C. Mortars

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

a. TEC® Full Flex® Latex Modified Thin Set Mortar, one part, flexible latex thin set mortar
conforming to ANSI A118.4 & A118.11, as manufactured by TEC® / H.B. Fuller Construction Products Inc. Color**: [white] [gray].**

 D. Grouting Materials

 1. Non Epoxy, High Performance Grouts

 a. **TEC® InColor™ Advanced Performance Tile Grout**, stain and crack resistant, chemical resistant, mold and mildew resistant, ready-to-use grout, as manufactured by H.B. Fuller Construction Products Inc. **Lifetime Product Warranty**. Color: **[specify color name and number**].

 b. **TEC® Power Grout® Grout**, High Performance, stain and crack resistant, efflorescence proof, mold and mildew resistant. **Water absorption shall be less than 1.2 percent, 28 Day Compressive Strength minimum shall be 10,000 psi or greater.** **Lifetime Product Warranty.** Shall meet ANSI A118.7.

 2. Epoxy Grouts

 a. **TEC® AccuColor EFX® Epoxy Special Effects Grout**, three component, 100% solids epoxy, chemically resistant grout conforming to ANSI A118.3 standards, as manufactured by H.B. Fuller Construction Products Inc. Color: [specify color name and number]. **{Note to Specifier: AccuColor EFX has 12 standard colors and more than 700 custom made colors.**

 E. 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 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, floors 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.

 a. For moisture concerns less than 20 lbs., per 1000 sq. ft. per 24 hours, contact TEC Technical Services 1-800-TEC-9023 (1-800-832-9023)Mon-Fri 7 a.m.-5 p.m. CST for additional solutions.

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

 B. When properly prepared, suitable substrates include:

1. Cured concrete, cured mortar beds, brick and masonry (interior and exterior installations)
2. APA Grade Trademarked Exposure 1 Plywood [Underlayment grade or better, two layers, 11⁄8" (28 mm) total minimum thickness for joists 16" (40 cm) o.c., interior floors only].
3. Gypsum wallboard (dry interior wall areas only)
4. Water resistant gypsum wallboard (i.e.: greenboard, interior walls only, dry to intermittent water exposure only)
5. Cementitious backer units (CBU) or glass mat backerboard
6. Existing ceramic tile and natural stone, provided existing flooring is well-bonded to an approved substrate.
7. Vinyl composition tile, asphalt tile, linoleum or non-cushioned vinyl sheetgoods provided such surfaces are single layered, well-bonded to an approved substrate and properly prepared.
8. Plastic laminate (interior countertops only) provided the counter is structurally sound and level.
9. Adhesive residue (except tacky or pressure-sensitive adhesive)

 3.03 INSTALLATION

 A. General:

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

 B. Surface Preparation Products Installation

 1. Prime the surface with **TEC® Multipurpose Primer** following TEC brand product installation procedures.

 2. Install **TEC® VersaPatch® Latex Modified Floor Patch** in accordance with TEC brand product installation procedures (dry areas only).

 3. Install **TEC® Level Set 300®** Self Leveling Underlayment in accordance with TEC brand product installation procedures.

 4. Install **TEC®** HydraFlex™ Waterproofing Crack Isolation Membrane in accordance with TEC brand product installation procedures.

 C. Mortar Installation

 1. Install **TEC Full Flex**™ mortar, in accordance with TEC brand product installation procedures.

 D. Tile Installation

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

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

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

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

 E. Grouting Materials Installation

 1. Install **TEC®InColor™ Advanced Performance Tile Grout** in strict accordance with TEC brand product installation and following the guidelines of ANSI A108.10.

 2. Install **TEC® Power Grout®** Grout in strict accordance with TEC brand product installation instructions and following the guidelines of ANSI A108.10.

 3. Install **TEC® AccuColor EFX®** Epoxy Special Effects Grout in strict accordance with TEC brand product installation instructions and following the guidelines of ANSI A108.6.

 F. 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.

 B. Field Testing: At waterproof locations, provide flood testing prior to floor finish application

 C. Substrates per TCNA 2017 requirements

 3.05 CLEANING

1. **TEC® InColor™:** Grout haze might be formed on some porous and absorptive tile. Grout haze shall not be removed the same day as this will disturb the grout during the initial curing process. To remove grout haze the next day, use a white scrub pad and common household glass cleaner.
2. **TEC® Power Grout®:** 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.

 C. **TEC® AccuColor EFX® Epoxy**: When using an epoxy grout, clean tiles immediately. Do not allow epoxy to harden on face of tile. Remove all grout haze and residue from the surface of the ceramic tile with TEC® AccuColor EFX® Clean-up Water Concentrate is highly recommended

 D. Grout joints must be clean and free of standing water, dust and any foreign substances.

 3.06 PROTECTION (dependent of grout used)

 A. Protect floors from general foot traffic for at least 72 hours after grouting has been completed.

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

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

 D. Protect all floor tile installations with Kraft paper or other heavy breathable covering during the construction period to prevent damage or staining.

END OF SECTION

