PORCELAIN TILE, SETTING MATERIALS AND ACCESSORIES

SECTION 09300 - CERAMIC TILE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish all labor, materials, tools, equipment and services necessary for and reasonably incidental to complete the tile work as shown on the drawings or specified.

B. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

Related Sections:

1. Division 7, sealing expansion joints and other joints in tile work (joint sealant types, colors and manufacturers to be specified by Architect). 07920

2. Division 3, Concrete. 03300

1.2 REFERENCE STANDARDS

Comply with current editions and applicable Specifications of the following:

1. American Society for Testing and Materials (ASTM).

2. American National Standards Institute (ANSI).

3. Tile Council of North America (TCNA) Handbook for Ceramic Tile Installation.

1.3 QUALITY ASSURANCE

A. Provide tile materials of each type, color and finish from Crossville Porcelain Stone / USA, Crossville, Tennessee. Provide setting, grouting and related materials of each type, color and finish obtained from one source.

B. Deliver, store and handle materials in accordance with manufacturer's instructions.

C. Tile contractor, by commencing the work of this section, assumes overall responsibility to assure that all assemblies, components and parts shown or required within the work of this section comply with contract documents and are compatible with each other and with the conditions and expected use.

D. Qualified Labor (Because tile is a permanent finish, the lowest bid should not be the deciding factor but rather, but who is the most qualified to perform the scope of the work being

specified. See TCNA Handbook for a list of recognized programs). Engage an installer with a minimum of five (5) commercial tile installations similar in material, design and scope to that indicated.

E. Pre-Installation Meeting: Prior to tile installation, conduct a pre-installation project meeting. Contractor, Subcontractor, Material Suppliers, Architect and Owner representative shall be notified of the meeting.

F. Field Mock-Up: Recommended scaled to appropriate size of the scope of the work _____ sq ft (Insert) and will be reviewed for joint quality, color range, pattern and workmanship.

G. Extra Stock: Furnish extra stock of quantity equal to _____% of amount installed, in full-size units, for each type, color, size and finish of tile.

1.4 SUBMITTALS

A. Verification Samples: Submit the following for each type, color, size, and finish included in the work.

1. Full size tile and trim shapes, (indicate number of pieces required).

2. Grout color samples.

3. Sealant color samples or Prefabricated Joint/Transition Strip Samples

B. Product and Installation Data:

1. Porcelain tile manufacturer's product and technical data indicating compliance with applicable standards.

2. Master Grade Certificates for each type of tile issued by tile manufacturer and signed by the installer, only available after the material has shipped from the manufacturer.

3. Mortar and grout manufacturer's technical data sheets indicating suitability for the installation specified and compliance with applicable standards.

4. Sealant or prefabricated joint manufacturer's product and technical data.

1.5 ENVIRONMENTAL

A. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during and after installation.

B. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

C. Maintain minimum and maximum temperature limits as recommended by manufacturers.

D. Protect adjacent surfaces during progress of the work in this section.

E. Illuminate the work area during installation providing the same level and angle of illumination as will be available for final inspection. The use grazing or cove type lighting where lights are located either at the wall/ceiling interface, or mounted directly to the wall prompts the light to strike the tile finish at a straight down angle, creating unwanted shadows from grout lines giving the tile layout an un-flat irregular appearance. Installing overhead lighting at a wide downward angle 18”-24” away from the tiled wall will provide a flatter more uniform appearance to the tiled surface.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Furnish tile complying with "Standard/First Grade" requirements per ANSI A137.1 - 2021, for types of tile indicated.

B. Comply with ANSI Standard for Tile Installation Material and current Tile Council of North America (TCNA) Handbook for products and materials indicated for setting and grouting.

2.2 TILE

A. Unglazed and glazed porcelain tile shall be standard/first grade quality as manufactured by Crossville Inc., Crossville, Tennessee, and shall conform to the requirements of ANSI A137.1 - 2021.

1. Size: Porcelain and ceramic tile shall be manufactured to specific size after firing and shall be Nominal -_____ (Insert). All measurements are in inches unless otherwise specified.

2. Type: Porcelain tile shall be_____(Insert)

3. Thickness: Porcelain tile shall be manufactured to specific thickness after firing and shall be nominal _____ ([8.0 mm or greater] for large unit tile or [6.0mm or greater] for Mosaics).

4. Color: _____ (Insert Crossville color name and number).

5. Product Test Data:

   a. Water Absorption (ASTM C373):_____%.

   b. Breaking Strength (ASTM C648):_____lbf.

   c. Bond Strength (ASTM C482):_____psi.

   d. DCOF Dynamic Coefficient of Friction (ANSI A326.3-2021)_____ wet.

6. According to availability, provide matching trim shapes such as bullnose, corners, borders and cove base when specified.

2.3 PERFORMANCE REQUIREMENTS

1. Materials Transparency – Material Ingredients. Provide copies of at least one current product disclosure:
    a. Declare Label: Third-party verified, red list free.
    b. Health Product Declaration (HPD):
        i. HPD requirements (must meet all of the following criteria): 100 ppm, Third-party verified, ≥ 75% of ingredients GreenScreen assessed
2. Materials Transparency – Environmental Product Declarations. Provide copy of current product disclosure:
    a. Product-specific EPD: Third-party verified, cradle-to-grave scope, current, and specific to the product.
3. Multi-Attribute Sustainable Product Certifications. Provide at least one of the following:
    a. ANSI 138.1 Green Squared Certification.
    b. Living Product Challenge (LPC) Certification (Shades 2.0, Retro Active 2.0, ColorBlox 2.0).
4. Embodied Carbon: Provide the following:
    a. Product-specific Environmental Product Declaration (EPD) documents Global Warming Potential (GWP) (A1-A3) for 1 m2 declared unit: 23.9 kg CO2-eq.
5. Low-Emitting Materials: Product is considered an inherently non-emitting source of VOCs resulting from its ceramic composition and lack of integral organic-based coatings.
6. Chemicals of Concern: Product does not contain any chemical ingredients from the following chemicals of concern lists:
    a. Living Building Challenge (LBC) Red List.

2.4 SETTING AND GROUTING MATERIALS:

A. Use appropriate installation mortars according to ANSI A118-2021.

B. Grouting Materials: Select grouting materials according to the following types: Tile setting and grouting epoxy: A118.6 Standard Cement Grout, A118.7, High Performance Cement Grout or A118.8, Modified Epoxy Emulsion Grout. Provide grout in colors selected by the Architect from standard colors available from the approved manufacturers.

C. Use waterproofing/Anti Fracture Membrane as required according to ANSI A118.12.

2.5 EXPANSION JOINTS, CONTROL, CONTRACTION, AND ISOLATION JOINTS:

A. Refer to most current TCNA Handbook, Method EJ171 for recommendations on locating, treating and detailing various types of construction joints. NOTE: Architect must specify type of expansion joints and show location and details on drawings.

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

D. Prefabricated expansion joints can also be used when suitable for installation.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates where tile will be installed for compliance with requirements for installation tolerances and other conditions effecting performance of installed tile. Before tiling concrete surfaces saturated dry (SSD), free of standing water verify that substrates for setting tile are well cured, structurally sound dry, clean, and free from oil or waxy films, curing compounds or other coatings and surface treatments. Nonstructural shrinkage cracks should be pretreated with a crack suppression membrane (to prevent telegraphing of cracks through the finished tile installation) ANSI A118.12.

B. Do not proceed with installation until unsatisfactory conditions have been corrected. Commencement of work signifies acceptance of substrate and installation conditions.

3.2 PREPARATION

A. Substrate Preparation: Prepare and clean substrate in accordance with installation standards and manufacturer's instructions, and as follows:

1. Remove protrusions, bumps and ridges by grinding or chipping.

2. Repair, fill, and level cracks, holes, depressions and rough or chipped areas in substrate using patching material recommended by setting materials manufacturer.

3. Slab to have light broom finish when tile is installed by thin-set method.

4. Before tiling, verify that all surfaces to be tiled are structurally sound true to plane, and fall within maximum variations shown below: Ensure that the substrate is within the following tolerances:

    a. Horizontal surfaces (floors) - Maximum variation in substrate shall not exceed 1/4 " in ten feet* from required plane, depending on substrate.

    b. Vertical surfaces (walls) - Maximum variation in substrate shall not exceed1/4 " in ten feet* from the required plane, depending on substrate.

* When using large format tile, normally considered as tiles with at least one edge 15” in length or greater; a more stringent tolerance 1/8” in 10’ or 1/16” in 24” when measure from the high points on the surface is required.

Report all unacceptable surfaces to the architect in writing, and do not tile such surfaces until they are leveled enough to meet above requirements.

B. Jobsite Blending: Blend tiles before installing in accordance with reference standards to produce an even range and distribution of color and finish.

3.3 INSTALLATION

A. Manufacturers' Instructions: Perform work in compliance with standard accepted installation guidelines, Crossville Porcelain Stone/USA instructions and setting materials manufacturers' instructions.

B. Comply with appropriate ANSI A108-2021 specification and current Tile Council of North America Handbook (TCNA) for appropriate method of installation for each specification. For thin set adhesive mortar application use following technique:

- With the flat side of trowel, key mortar into substrate.
- Using the appropriate size trowel, comb mortar in one direction with notched side of the trowel.
- Set tile with a sliding motion, perpendicular to the mortar ridges.
- Obtain as near 100% coverage as possible of mortar to tile.
- Mortar coverage shall be no less than 85% and shall be sufficiently distributed to give full support under all corners and edges of the tile.
- Note: 95-100% coverage is mandatory for wet and exterior areas. Periodically, remove sheets or individual tiles to assure proper bond coverage consistent with industry specifications.

C. Installing Tile:

1. Install tile in pattern indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Adjust to minimize tile cutting and to avoid tile less than half size.

2. When possible, smooth cut edges of tile and/or use appropriate cutter or wet saw to produce smooth cuts. Provide straight cuts which align with adjacent materials.

3. Extend tile into recesses and under equipment and fixtures to form a complete covering without interruption.

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

5. Provide tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints smooth and even, without voids, cracks, or excess mortar or grout.

6. Mix mortar in strict accordance with manufacturer's recommendations.

7. Apply setting material in accordance with manufacturer's directions and install tile before mortar has started initial cure. For thin set mortar application, use a notch trowel that will achieve the recommended coverage of mortar after tiles have been installed. Reference standard coverage information and follow manufacturer's recommendations for trowel size when using mortar.

8. Do not spread more material than can be covered within 10 to 15 minutes. If "skinning" occurs, remove mortar and spread fresh material. Spread mortar with notches running in one direction that shall be perpendicular to the pressing, pushing and pulling of tile during placement.

9. Place tile in fresh mortar, press, push and pull the tile slightly to achieve as near 100% coverage and contact of tile with setting material and substrate as possible. The coverage shall be no less than 85% and be sufficiently distributed to give full support of the tile. Make sure that all corners and edges are well supported with mortar. Leave no hollow corners or edges. NOTE: 95-100% coverage is mandatory for wet or exterior areas. A skim coat (“back-butter”) of mortar can be placed onto the entire back of the tile using a trowel in order to assist in optimum adhesion and coverage of the mortar being used.

10. Ensure there is a minimum 1/8" of mortar between tile and substrate after proper bedding. Installer must periodically remove sheets or individual tiles to assure proper bond coverage consistent with industry specifications. If coverage is found to be insufficient, use a larger size notch trowel.

11. Use a beating block and hammer or rubber mallet so that faces and edges of individual tiles are flush and level with faces and edges of adjacent tiles, and to reduce lippage.

12. For running bond/brick joint patterns utilizing tiles (square or rectangular) where the side being offset is greater than 18” (nominal dimension), the running bond offset will be a maximum of 33% unless otherwise specified by the tile manufacturer. If an offset greater than 33% is specified, specifier and owner must approve mock-up and lippage.

D. Grouting:

1. Install grout in accordance with ANSI A108.10, A108.6, A108.8, A108.9 correlating to grout type chosen and manufacturer’s recommendations.

2. Mix grout material in strict accordance with manufacturer's directions.

3. Apply grout to produce full, smooth grout joints of uniform width, and free of voids and gaps.

4. Before grouting entire area do a test area to assure there will be no permanent staining or discoloration of the tile and to verify that the grout is easily removed from the surface. If necessary, pre-coat exposed surfaces of tile with a grout release as recommended by the manufacturer, as this will facilitate removal of the grout.

5. Cure all setting and grouting materials in accordance with manufacturer's recommendations.

E. Cleaning and Protection:

1. If one has been used, remove grout release and clean tile surfaces so they are free of grout residue and foreign matter, in accordance with manufacturer's instructions. If a grout haze or residue remains, use a suitable grout haze remover or cleaner and contact grout manufacturer for recommendations. Flush surface with clean water before and after cleaning. Do not use harsh hydrochloric, muriatic or sulfuric acid or acid-based cleaners to clean glazed tiles or tiles grouted with latex modified grout.

2. When a heavy residue of Portland cement grout is present, acceptable tile cleaning acids may be used. However, the grout should be allowed to cure a minimum of 10 days before this aggressive cleaning method is employed. Tile and grout shall be soaked with water before cleaning. In the absence of a recommendation from the grout manufacturer, acid cleaning may be done with a saturated solution of phosphoric or sulfamic acid, mixed in accordance with manufacturer's recommendations.

3. Protect all floor tile installations with clean construction paper or other heavy covering during construction period to prevent staining or damage. After cleaning, provide protective covering and maintain conditions to protect tile work from damage or deterioration. Where tiled surfaces will be subject to equipment or wheel traffic or heavy construction traffic, and during move-in of furniture and equipment, cover protective covering with 1/4" hardboard, plywood or similar material. No foot or wheel traffic permitted on floor for at least 3 days after grouting. Owner/specifier is responsible for protecting tile from damage including allowing sufficient time for installed materials to cure properly typically 30-45 days is required for full cure of thin set bonding mortars.

4. Leave finished installation clean and free of cracked, chipped, broken, un-bonded, and otherwise defective tile work.

5. Consult most current Crossville Brochure "Care & Maintenance" for information on post installation cleanup and routine maintenance

This form document is intended as a general guideline only. It is the responsibility of the design professional to revise this form to suit specific requirements of the project. Crossville Porcelain Stone / USA makes no representation or warranties that the general information contained within this document is suitable for the specific requirements of the project. Consult your Crossville Porcelain Stone / USA representative and the installation and maintenance material manufacturers specified for technical assistance. The design professional should refer to the current edition of the TCNA handbook and other reference standards for additional information. The design professional should coordinate this section with the drawings and with general provisions of the contract, including general and supplementary conditions and Division I general requirements.

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