SECTION 093000 - Tiling

1. GENERAL
   * + 1. SUMMARY
          1. Related Documents:

Drawings and general provisions of the Subcontract apply to this Section.

Review these documents for coordination with additional requirements and information that apply to work under this Section.

* + - * 1. Section Includes:

Ceramic tile and related items necessary to complete the Project as indicated on the Drawings and specified herein. This Section also includes:

Installation of metal access doors in ceramic tile surfaces.

Flexible waterproof membrane system where waterproofing is required under thin-set tile floor finish.

Latex underlayment required for drainage slopes.

Granite thresholds.

* + - * 1. Related Sections:

Division 01 Section "General Requirements."

Division 01 Section "Special Procedures."

Division 01 Section "Division 4: Stone flooring.

Division 07 Section "Joint Sealants" (except as specified herein).

Division 08 Section "Access Doors and Frames" for furnishing of access doors in tile surfaces.

Division 09 Section "Gypsum Board" for backing for tile.

Division 10 Section "Toilet and Janitorial Accessories".

Coordinate with fire suppression, plumbing, HVAC, and electrical sections for furnishing of access doors in tile surfaces.

* + - 1. REFERENCES
         1. General:

The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

* + - * 1. ANSI American National Standards Institute:

ANSI A108 Series (A108.01, .02, .1A, .1B, .1C, .4, .5, .6, .8, .9, .10, .11, .12, .13, .14, .15, .16, and .17): Specifications for Installation of Ceramic Tile

ANSI A118.1 Specifications for Dry-Set Portland Cement Mortar

ANSI A118.3 Specifications for Chemical Resistant Water Cleanable Tile-Setting and Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive

ANSI A118.4 Specifications for Latex-Portland Cement Mortar

ANSI A118.5 Specifications for Chemical Resistant Furan Mortars and Grouts for Tile Installation

ANSI A118.6 Specifications for Standard Cement Grouts for Tile Installation

ANSI A118.7 Specifications for Polymer Modified Cement Grouts for Tile Installation

ANSI A118.9 Test Methods and Specifications for Cementitious Backer Units

ANSI A118.10 Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations

ANSI A118.11 Specification for EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar

ANSI A118.12 Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations

ANSI A136.1 Organic Adhesives for Installation of Ceramic Tile

ANSI A137.1 Specifications for Ceramic Tile

* + - * 1. BAAQMD Regulation 8-51 - Adhesive and Sealant Products.
        2. "Handbook for Ceramic Tile Installation", published by Tile Council of North America, Inc., latest eidition.
      1. SUBMITTALS
         1. Submit under provisions of Division 01 Section "General Requirements."
         2. Product Data: Material Safety Data Sheets.
         3. Samples:

Submit for approval of color, pattern and finish. Four samples each are required for each type, color and/or pattern selected and shall be submitted in sufficient size and quantity to portray overall range.

Where colored grouts are required (typical), submit with respective tiles for approval of color.

* + - * 1. Closeout Submittals:

Material Safety Data: Submit 7 copies of sealant and adhesive quantity use for in accordance with requirements of BAAQMD Regulation 8-51.

**<Retain first paragraph below if low-emitting materials are required for LEED-NC or LEED-CI Credit EQ 4.1>**

* + - * 1. LEED Submittal:

Product Data for Credit EQ 4.1: For [**adhesives**] [**and**] [**sealants**], including printed statement of VOC content.

**<Include Quality Assurance Article, if appropriate.>**

* + - 1. QUALITY ASSURANCE
         1. Regulatory Requirements: Materials and installation methods shall conform to requirements of the Bay Area Air Quality Management District Regulation 8-51.

**<Include paragraph below if applicable.>**

* + - * 1. Tile Mock-Ups: Mock-up areas indicated on Drawings shall have ceramic floor and wall tile completely installed, grouted and cleaned. These mock-up areas shall be approved by the University before proceeding with any other tile work and shall establish the standard of appearance for subsequent work.
      1. DELIVERY, Storage and handling
         1. Deliver materials in manufacturer's original sealed containers with labels legible and intact identifying brand name and contents.
         2. Tile cartons shall be grade sealed in accord with ANS A137.1.
         3. Store materials under cover in a manner to prevent damage or contamination.
      2. Environmental conditions
         1. Install tile and installation materials when ambient temperature is at least 50 deg F (10 deg C) and rising.
      3. EXTRA MATERIALS
         1. Extra Stock: In lieu of providing extra stock material, the Contractor shall provide a summary of finish products including Manufacturer Name, style number and color, local distributor's name address and phone number. This list shall be provided with close out documentation incluiding as built and warranty information.

1. PRODUCTS
   * + 1. MATERIALS
          1. A. General Requirements:

1. Tile shall be Standard Grade and comply with requirements of TCA A137.1 with modifications as specified herein.

2. Ceramic mosaic tile is required to be furnished in "factory mounted" sheets in patterns and colors selected. Unless otherwise specified, mounting is optional with tile manufacturer except that back-mounting shall comply with requirements of ANS A137.1 governing bond strength and mounting shall be recommended by tile manufacturer as suitable for the intended installation.

3. Where not otherwise noted in the Tile Schedule on the Drawings, colors and patterns will be selected by the Architect after award of contract.

* + - * 1. Tile: Ceramic tile required for the Project is scheduled on the Drawings as to manufacturer, type, size, thickness and color. Special patterns are so detailed.
        2. Tile Trim Shapes and Bases: Unless otherwise noted, trim units and shapes shall be of same type as the tile with which they are used and shall comply with TCA A 137.1. Include bases, bullnoses, caps, coves, stops, angles, returns, trimmers and other shapes indicated or required to produce a completely finished installation. Trim shapes shall match tile in color and finish unless otherwise noted. Use surface type trim for thin-set installations.
        3. Cement: ASTM C 150, Type II (no plastic cement permitted).
        4. Lime: ASTM C 207, Type "S".
        5. Sand: Sharp, clean, salt and silt free conforming to ASTM C 144.
        6. Water: Clean and potable, suitable for use with tile materials.
        7. Latex-Portland Cement Mortar: Commercially formulated, latex modified, thin-set Portland cement mortar conforming to American National Standard Specification A 118.4 for “Latex-Portland Cement Mortar”.
        8. Tile Adhesive: Organic adhesive conforming to “American National Standard for Organic Adhesives for Installation of Ceramic Tile”, ANSI A 136.1, Type II.

Primers and Sealers: Of type and consistency recommended by adhesive manufacturer.

* + - * 1. Tile Adhesive (where Used Over Membrane): Water resistant, tin-set tile adhesive especially recommended and approved by the manufacturer for setting floor tile over waterproof membrane system specified. Include primers required by Project conditions.
        2. Epoxy Adhesive: Custom Building Products “Epoxy-Crete”, Laticrete “Latipoxy 10”, or equal.
        3. Prepared Grouts: Unless otherwise noted, use products of Custom Building Products, Laticrete, L & M, Macco, Upcon, USG “Durabond”, or equal.

Commercial Sand/Cement Grout: Commercially prepared and formulated and factory mixed and colored. Grout shall be waterproof sand/cement dry type requiring addition of water only and shall be of the type recommended by the manufacturer for the installed joint widths. Grout color shall be as selected and from approved samples.

Dry-Set Grout: Commercially prepared cement grout with additives providing water retentivity, sanded or nonsanded as per installed joint widths, factory mixed and colored, requiring addition of water only. Grout color shall be as selected and approved from samples.

* + - * 1. Reinforcing Mesh: Welded fabric, 2 by 2 inches/16 by 16, or 3 inches by 3 inches/13 by 13, or 1-1/2 inches by 2inches/16 x 13, conforming to ASTM A 185.
        2. Metal Lath: 3.4# galvanized diamond mesh expanded metal lath, self-furring, conforming to ASTM C 847.
        3. Sealants (Concealed): Butyl rubber, non-drying, nonskinning, non-bleeding, gun grade; Pecora BR-96, Tremco, or approved equal. oil base compounds will not be permitted.
        4. Cleavage Membrane: No. 15 asphalt saturated felt conforming to ASTM D 226, duplex building paper conforming to Fed. Spec. UU-B-790, Type I or 4 mil polyethylene sheeting conforming to ASTM D 2103.
        5. Waterproof Membrane System: Mer-Kote Products, Inc. "MerKrete B.F.P. Waterproof Membrane", or approved equal, asphalt modified, stabilized latex elastomeric system reinforced with glass fabric, specially recommended for use with thin-set tile systems.

1. EXECUTION
   * + 1. Condition of SURFACES:
          1. Backing surfaces shall be dry, firm, plumb, level within required tolerances, clean, free of dust, oil, grease, wax and other coatings or stains which would inhibit bond of setting materials, free of loose particles and of proper thickness and grade to provide finished surfaces as indicated. Refer to "Concrete Finishes", "Concrete Block" and "Gypsum Wallboard" Sections for tolerances of backing surface. Contractor shall note that internal corners are to be coved, outside corners bullnosed and that certain areas have been dimensioned to permit the installation of tile without cutting, and he shall verify that backing surfaces will permit these types of installations.
          2. Wood surfaces to receive tile shall be well nailed with nail heads driven flush with surface of wood. Where tile is set with epoxy adhesive, joints between adjacent plywood sheets shall be at least 1/4 wide.
          3. Ascertain that plumbing work and other items concealed behind or to be mounted on or through tile are set up in place or provided for.
          4. Commencing work implies acceptance of surfaces and areas.
       2. Protection
          1. Protect adjacent finishes and surfaces from damage or stains during the installation operations.
       3. Preparation:
          1. Prepare slabs to promote positive bond with mortar. Where slabs have been steel trowelled to a smooth, glass-like finish, etch slabs with muriatic acid solution, rinse and allow surface to dry completely prior to application of topping. Protect adjacent finished surfaces from acid damage.
          2. Provide latex underlayment drainage slopes as per Drawing requirements. Comply with requirements of Latex Underlayment Section.
       4. Installation:
          1. Waterproof Membrane System (Thin-Set Tile): Mix and install waterproof membrane in strict accord with membrane manufacturer's directions. Follow manufacturer's directions for integral flashings at projecting vertical elements, drains and other penetrations. Turn up membrane at base conditions.
          2. Installation Methods: In general, Drawings indicate the setting method required.

Where noted to be set in mortar setting beds, install in accord with Reference Standard 1.02 B. Mortar setting beds shall be reinforced. Except where waterproof membranes occur, install floor setting beds over cleavage membranes. At Contractor option, tile may be installed with latex Portland cement thin-set mortar (as hereinafter specified) over cement mortar backing. Refer to following Methods included in Reference Standard 1.02 F.

Floors: F111 and F121.

Walls: W211.

Fountain Walls: W222.

Install wall tile directly on concrete or masonry and floor tile directly on concrete with latex Portland cement thin-set mortar in accord with manufacturer's directions and Reference Standards 1.02 D and 1.02 F, Methods W202 (walls) and F113 (floors). Keep mixing equipment clean and avoid contamination of mortar mixture. Deliver mortar mix to job site in branded, unopened containers. Do not extend mix or add any ingredients other than latex liquid. Prepare surfaces for proper bond with mortar. Apply mortar over properly prepared surfaces using a notched trowel to obtain a nominal 1/8~ bed thickness unless otherwise required to maintain plane surface. Mortar bed shall be applied to full coverage area of tile and shall not be spotted. Apply leveling coat if required to produce a plane surface.

Install thin-set floor tile over flexible membrane waterproofing with specified adhesive in strict accord with waterproofing and adhesive manufacturer's directions and recommendations and Reference Standard 1.02 F, Method F-122.

Mortar applied to concrete and masonry surfaces shall be applied over bonding agent when so required to obtain proper bond.

Install tile directly on wood and metal surfaces with epoxy adhesive in accord with manufacturer's directions and Reference Standard 1.02 E.

Install wall tile over gypsum wallboard with organic adhesive as per manufacturer's directions and Reference Standards 1.02 C and 1.02 F, Method W242. When required by adhesive manufacturer, wallboard backing shall be sealed by means of (1) a full 1/16" smooth skim coat of adhesive evenly applied to surfaces to receive tile and to bottom edge of wallboard -or- (2) a waterproof primer and sealer applied in accord with manufacturer's directions. Adhesive skim coat or primer-sealer shall be allowed to harden or thoroughly dry before application of adhesive bed for tile.

* + - * 1. Tolerances: Except as otherwise noted, finished tile floor and wall surfaces shall be level and plumb with no variations exceeding 1/8" in 8 feet from the required plane.
        2. Prior to setting tile, calk around pipes and conduits penetrating tile surface using specified sealant. Such calking shall be concealed.
        3. Grouting:

Comply with applicable requirements of Reference Standard 1.02 G.

Allow tile installation to thoroughly dry before commencing grouting; 24 hours minimum for thin-set installations and 72 hours minimum for mortar beds.

Wall Tile (Not otherwise Specified): "Commercial" or "dry-set" prepared grout at Subcontractor option and as per installed joint widths except use "dry-set" only for adhesive set tile.

Ceramic Mosaic and Quarry/Paver Tile: Commercial sand/cement grout.

Commercially prepared grouts shall be mixed and applied as per manufacturer's directions. Care shall be taken to use the same minimum amount of water for each uniform sized batch of grout and to do all mixing in the same way so as to provide uniform color.

Saturate joints and wet tile surface prior to placing "commercial" grout. Grout joints full using a rubber float; do not use sponges. When grout is firm enough to work, use dampened cheesecloth to clean tile surface and to wipe out grout to match contour of cushion edge tile. Compact and strike joints of square edge tile flush with surface. When haze appears, polish surface with dry cheesecloth.

* + - * 1. Use no grout or mortar once initial set has begun; do not retemper mixes.
        2. Unless otherwise noted, set tile with joints uniform, continuous and aligned in both directions.
        3. Where joint widths are not noted or specified or otherwise standard for the tile selected, secure directions from the Architect before proceeding.
        4. Adjust wainscot heights slightly as required to utilize full tile.
        5. Lay out tile with fields centered; avoid use of tile less than 1/2 size except at irregularly shaped areas. In general, toilet rooms have been dimensioned to permit installation of tile without cutting. Unless otherwise noted, align tile square with room walls, parallel and straight with joints standard and uniform including miters. When cutting is required, grind edges smooth. Make cuts on outer edge of the field. Accurately cut tile around work of other trades so that coverings will completely cover cut edges. Firmly embed tile in setting material with finished surfaces brought to true planes (corners of tile flush and level with corners of adjacent tile), sloped uniformly, where required, to drain.
        6. Thoroughly back-up trim units and molded and special shapes with mortar bed or thin-set bonding material as appropriate.
        7. Where same size and type of tile is used for walls and floor, joints in wall and floor shall align.
        8. Cove bases to floor; no "topset" bases permitted.
        9. Unless noted otherwise, make inside corners coved; outside corners bullnose (including ceramic mosaic tile bases).
        10. Sealant Expansion Joints: Clean joints out full depth of setting bed and leave free of loose mortar, dirt and debris, ready for application of sealant specified under Division 07 Section "Joint Sealants". Provide such other protection as may be required to prevent joint contamination. Ensure that no mortar or grout adheres to tile edges.
        11. Clean tile and adjacent surfaces free of setting materials and grout as work progresses.
        12. Provide proper temperature and humidity conditions for curing the work. Moist cover cure cement grouts for not less than 72 hours. Add moisture as required and cover with a nonstaining membrane.
      1. CLEANING:
         1. When work is otherwise complete, thoroughly clean entire tile installation using no acid or acid cleaners except that mild acid cleaners may be used for quarry and paver tile where specifically recommended by manufacturer. Polish glazed tile surfaces with clean, dry cloths. Cleaning agents and methods shall not damage or discolor tile or grout.
      2. Protection:
         1. Protect finished installation from damage until final acceptance of entire project.

END OF SECTION 093000