

**CONSTRUCTION STANDARD SPECIFICATION****SECTION 09300****TILE**

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## CONSTRUCTION STANDARD SPECIFICATION

### SECTION 09300

#### TILE

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Extent of Work: Tile work is indicated on Contract drawings and schedules.  
Tile includes ceramic surfacing units made from clay or other ceramic materials.
- B. Types: Tile work in this section includes the following:
  - 1. Interior glazed ceramic tile for interior walls where scheduled.
  - 2. Unglazed porcelain interior floor tile where scheduled.
  - 3. Ceramic tile trim for floors and base.
- C. Related Sections: Refer to the following sections for related work:
  - 1. Section 03300, "Cast-in-Place Concrete" for concrete surfaces.
  - 2. Section 07900 "Joint Sealants" for sealing of expansion, contraction, control and isolation joints in tile surfaces.
  - 3. Section 09250, "Gypsum Drywall" for cementitious barker units installed on substrate for ceramic tile.

##### 1.02 REFERENCES

- A. American National Standards Institute (ANSI)
  - A108.5 Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar
  - A118.1 Dry-Set Portland Cement Mortar
  - A118.4 Latex-Portland Cement Mortar

A137.1 Ceramic Tile

B. American Society for Testing and Materials (ASTM)

C171 Specification for Sheet Materials for Curing Concrete

C373 Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired White Ware Products

C482 Test Method for Bond Strength of Ceramic Tile to Portland Cement

C648 Test Method for Breaking Strength of Ceramic Tile

C650 Test Method for Resistance of Ceramic Tile to Chemical Substances

C1026 Test Method for Measuring the Resistance of Ceramic Tile to Freeze-Thaw Cycling

C. National Tile Promotion Federation

D. Ceramic Tile Institute

E. Tile Council of America (TCA)

W212 Handbook for Ceramic Tile Installation

W213 Handbook for Ceramic Tile Installation

W214 Handbook for Ceramic Tile Installation

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical information and installation instructions for materials required.

B. Asbestos Free and Lead Free Paint Certification: Submit manufacturer's written certification that all materials are free of asbestos and lead paint.

C. Samples for Initial Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures, and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection.

D. Certified Test Reports: Submit certified test reports from a qualified independent testing laboratory evidencing compliance of tile and tile setting products with requirements specified, based on comprehensive testing of current products. Include in reports testing laboratory's interpretation of test results relative to specific requirements.

E. Shop Drawings: Submit shop drawings indicating tile patterns if applicable and locations and widths of control and expansion joints in tile surfaces.

F. LEED Submittals:

1. Credit EQ 4.1: Manufacturers' product data for adhesive and sealant, including a printed statement of VOC content.

1.04 QUALITY ASSURANCE

- A. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
- B. Guarantee: All floor tile to be guaranteed by manufacturer for 15 years against undue glaze wear caused by pedestrian foot traffic.
- C. Qualifications of Installers: Ceramic tile is to be installed in a workmanlike manner by an installer with not less than three (3) years experience in similarly sized commercial work.

1.05 DELIVERY, STORAGE, AND HANDLING

Deliver and store packaged materials in manufacturer's original unopened containers with seals unbroken and labels intact until time of use. Store materials off ground and under cover to prevent damage or contamination to materials by water, freezing, foreign matter or other causes. Promptly remove from site any materials which show evidence of damage, and immediately make all replacements necessary.

1.06 PROJECT CONDITIONS

- A. Environmental: Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at 50° Fahrenheit (10° Celsius) or more in tiled areas during installation and for seven (7) days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.
- C. Tile installer must examine substrate and environmental conditions under which ceramic tile is to be installed. Notify Sandia Delegated Representative (SDR) in writing regarding any conditions which will interfere with the completion of the work.

1.07 MAINTENANCE AND EXTRA MATERIALS

Extra material will not be required upon project completion if the tile provided and installed on the project is from the manufacturer's standard product line. Extra material will be required if the tile provided and installed is of a unique or special run. Upon project completion, deliver required extra tile, trim units, composition, color, pattern, and size of each type installed to SDR. Materials should be packaged with protective covering and identified with labels. Furnish not less than 5% maintenance stock of total product installed for each type, color, pattern, and size of tile products installed.

## PART 2 - PRODUCTS

### 2.01 STANDARDS

- A. General: All tile products, grouts, trims, mortars, cleaners, thinset, etc. shall be checked for compatibility with substrate and adjacent materials by Contractor prior to purchasing material.
- B. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 “American National Standard Specifications for Ceramic Tile” for types and grades of tile indicated. Furnish tile complying with “Premium Grade” requirements unless otherwise indicated.
- C. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced for setting and grouting.
- D. Color, Textures and Patterns: As indicated on drawings and schedules; for products listed and requiring selection of colors, surface textures or other appearance characteristics, as selected at time of submittals.
- E. Accessories: Provide tile trim and accessories which match color and finish of adjoining flat tile if not as selected at time of submittals.
- F. Mounting: Where factory-mounted tile is required, provide back- or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.

### 2.02 MANUFACTURERS

Approved manufacturers include, but are not limited to, the following:

Dal-Tile Corporation  
American Olean Tile Company, Inc.  
Monarch Tile Manufacturing, Inc.  
Winburn Tile Manufacturing Company  
Summitville Tiles, Inc.

### 2.03 TILE PRODUCTS

- A. Glazed Wall Tile: Where indicated on Contract documents, provide Premium Grade tile in compliance with ANSI A137.1 and suitable for use on countertops, bathroom walls, and general commercial use and complying with the following requirements:
  - 1. Composition: Glazed wall tile
    - a. Porcelain Tile: Provide porcelain tile only when noted elsewhere in the Contract documents.
    - b. Ceramic Mosaic Tile: Provide ceramic mosaic tile only when noted elsewhere in the Contract documents.

2. Nominal Face Dimensions: If not indicated on drawings or schedules, provide manufacturer's standard size.
  3. Nominal Thickness: 5/16 inch (7.94 mm) except ceramic mosaic tile shall be 1/4 inch (6.35 mm).
  4. Grout Dimension: 1/8 inch (3.18 mm).
  5. Wearing Surface: Smooth.
  6. Back Mounting: Manufacturer's standard back-mounted sheets are allowed provided they do not interfere with any patterns indicated on Contract Documents. Contractor shall notify SDR if manufacturer's mounting prohibits installation of any patterns indicated on Contract documents at time of submittal.
  7. Trim Units: Required.
- B. Floor Tile: Where indicated on Contract documents, provide Premium Grade tile suitable for use on bathrooms, entries, and general use floor areas and complying with the following requirements:
1. Composition: Unglazed porcelain.
  2. Nominal Face Dimensions: If not indicated on drawings or schedules, provide manufacturer's standard size with square edges.
  3. Nominal Thickness: 5/16 inch (7.94 mm).
  4. Group Dimensions: 1/4 inch (6.35 mm).
  5. Wearing Surface: Slip-resistant grid or sand blasted finish.
  6. Water Absorption: Less than 1/2 percent per ASTM C373.
  7. Frost Resistance: Yes, per ASTM C1026.
  8. Chemical Resistance: Tile unaffected per ASTM C650.
  9. Break Strength: 250 pounds minimum per ASTM C648.
  10. Bond Strength: 50 psi minimum per ASTM C482.
  11. Trim Units: Required.
- C. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:
1. Size: Size shall be as coordinated with sizes and coursing of adjoining flat tile.
  2. Shapes: Shapes shall be as follows:
    - a. Base: Coved.

- b. External Corners: Surface bullnose.
- c. Internal Corners: Field-buttet square corners, except use internal cove and cap angle pieces designed to member with stretcher shapes.

#### 2.04 SETTING MATERIALS

- A. Latex-Portland Cement Mortar: Provide product complying with ANSI A118.4 and the following requirement for composition:

Prepackaged dry mortar mix incorporating dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.

- B. Thin-Set Portland Cement Mortar: Where thin-set Portland cement mortar applications are required, use the following unless otherwise indicated:

Dry-set Portland cement mortar, factory sanded and meeting the requirements of ANSI A118.1-1988 and Tile Council of America Formula 759.

#### 2.05 GROUTING MATERIALS

- A. Latex-Portland-Cement Grout: Proprietary pre-blended compound of Portland cement, selected and graded aggregates, color pigments and chemical additives gauged with latex additive to comply with manufacturer's directions.

Use latex additive in grout which is compatible with latex additive in latex-Portland cement mortar.

- B. Dry-Set Grout: Proprietary compound composed of Portland cement and additives formulated for type of tile installed.

- C. Grout Color: As selected at time of submittals.

#### 2.06 MISCELLANEOUS MATERIALS

- A. Metal Edge Strips: Zinc alloy or stainless steel, 1/8 inch (3.175 mm) at top edge with integral provision for anchorage to substrate, unless otherwise indicated.

- B. Tile Cleaner: Product specifically acceptable to manufacturer of tile and group manufacturer for application indicated and as recommended by Ceramic Tile Institute, 12061 West Jefferson Blvd. Culver City, CA 90230.

- C. Cleavage Membrane: 4 mil (0.102 mm) polyethylene film per ASTM C171 Type 1.1.2.

- D. Reinforcing: 2 inch x 2 inch (51 mm x 51 mm) x 16/16 gauge welded wire mesh or equivalent.

### PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Preparation: Examine surfaces to receive tile work and conditions under which tile will be installed. Do not proceed with tile work until unsatisfactory conditions are corrected by Contractor and comply with requirements indicated in referenced tile installation standards, manufacturer's installation instructions, and meets SDR's approval.

### 3.02 INSTALLATION

- A. ANSI Tile Installation Standard: Comply with applicable parts of ANSI A108 series of tile installation standards included under "American National Standard Institutes Specifications for the Installation of Ceramic Tile".

- B. Tile Council of America Installation Guidelines: Follow (TCA "Handbook for Ceramic Tile Installation"); comply with TCA installation methods and the following:

1. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions, obstructions, edges and corners without disrupting pattern or joint alignments.
2. 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 that plates, collars, or covers overlap tile.
3. Jointing Patterns: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.
4. Expansion Joints: Locate expansion joints and other sealant filled joints, including control, contraction isolation joints, where indicated, or if not indicated, at spacings and locations recommended in TCA "Handbook for Ceramic Tile Installation", and approved by SDR.

Prepare joints and apply sealants to comply with requirements of referenced standards and sealant manufacturer.

5. Grout tile to comply with referenced installation standards, using grout materials indicated.

Mix and install proprietary components to comply with grout manufacturer's directions.

### 3.03 FLOOR TILE INSTALLATION METHODS



- A. General: Install tile to comply with requirements indicated below for setting bed methods, TCA installation methods related to types of subfloor construction, and grout types:
  - 1. Thin-Set Portland Cement Mortar: ANSI A108.5.
  - 2. Concrete Subfloor, Interior: TCA F111 cleavage membrane (bond breaker).
  - 3. Concrete Subfloor, Interior: TCA F113 (bonded).
  - 4. Bond Coat: Portland cement paste on plastic bed or the following thin-set mortar on cured bed, ANSI A108.5, at Contractor's option: Latex-Portland cement mortar.
- B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood or other flooring which finishes flush with top of tile.

### 3.04 WALL TILE INSTALLATION METHODS

Install types of tile designated for wall application to comply with requirements indicated below for setting bed methods, TCA installation methods related to subsurface wall conditions, and grout types:

Thin-Set Portland Cement Mortar: ANSI A108.5.

- A. Masonry Interior: TCA W212 (with leveling coat).
- B. Masonry, Interior: TCA W213.
- C. Metal Studs, Interior: TCA W244.

### 3.05 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush surfaces with clean water before and after cleaning.

- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded or otherwise defective tile work.
- C. Protection: When recommended by tile manufacturer, apply a coat of neutral protective cleaner to completed tile walls and floors.
  - 1. Grout Sealer: Provide and apply manufacturer's standard [Silicone or Teflon] product for sealing grout joints that does not change color or alter appearance of the grout.

2. Protect installed tile work with Kraft paper and cardboard or other heavy covering during construction period to prevent staining, damage and wear. Prohibit foot and wheel traffic from using tiled floors for at least seven (7) days after grouting is completed.
- D. Before construction complete, remove protective coverings and rinse tile with neutral cleaner compatible for use with tile and approved by tile and grout manufacturers.

END OF SECTION