

## 712 GLAZED CERAMIC TILE

### 712.01 DESCRIPTION

This work shall consist of a mortar scratch coat applied directly to the concrete walls, ceilings and columns, a mortar float coat applied upon the mortar scratch coat and a facing of individual glazed ceramic tiles embedded in a freshly placed float coat.

### 712.02 MATERIALS

Glazed Ceramic Tile – [806.04](#)

Mortar Mixtures – [806.05\(B\)\(3\)](#)

Tile Joint Sealant – [807.07](#)

The Contractor shall provide approved equipment for checking tiles for warpage, wedging and size. The equipment shall mechanically measure compliance or non-compliance of the tiles with the specified limits of warpage and wedging and shall classify the tiles as to size group.

### 712.03 CONSTRUCTION REQUIREMENTS

**(A) GENERAL.** No mortar or tiles shall be placed until all backfilling over tunnels, behind walls, etc., has been placed, compacted and approved by the Chief Engineer. Placing of mortar or tiles shall not be permitted when the ambient temperature is less than 50°F. If the ambient temperature is expected to fall below 50°F following placement of any mortar or tiles, the Contractor shall furnish sufficient protection of the work and necessary heating devices to maintain a minimum ambient temperature of 50°F for a period of 7 days following placement of the mortar or tile.

During hot weather, the Contractor shall furnish necessary protection for all tile work against sun and wind, such as wind breaks, polyethylene cover or waterproof paper. Moistening by fog spraying or sponging may also be required.

The tile shall be delivered to the project in the original sealed containers, each container to be clearly marked as to color, finish, size, shape and quantity. Tile shall be stored on pallets.

The Contractor shall determine the actual sizes and locations of all air port openings, door openings, niches, expansion joints and similar features. These features may not be of the same size or locations shown on the plans and may be out of plumb or out of square. The Contractor shall neatly cut and fit tile bull noses of such features. No additional payment will be made because of these features varying from the plans or because they may be out of plumb or out of square.

### **(B) MORTAR.**

#### **(1) MIXING MORTAR.**

Mortar may be either machine mixed or mixed by hand. The portland cement and sand shall be thoroughly mixed dry after which sufficient water and lime shall be added to produce a stiff mix. Mortar shall be freshly mixed for prompt use and no mortar shall be used that has been mixed beyond the time limit as directed by the Chief Engineer.

Re-tempering of mortar shall not be permitted under any circumstances. The use of chemicals in the mortar to prevent freezing shall not be permitted.

The mixing machine, size of batch and mixing time will be approved by the Chief Engineer. When hand mixing is used, the mixing shall be accomplished in a clean, leak-proof mortar box constructed specifically for that purpose.

**(2) APPLYING MORTAR.**

The concrete surfaces on which the mortar scratch coat is to be placed shall be thoroughly cleaned by water at 200 psi minimum pressure or by other methods satisfactory to the Chief Engineer. After cleaning, the surfaces shall be dampened, but not saturated, with water and a neat portland cement wash applied immediately before placing the mortar scratch coat. The portland cement wash shall consist of 7 gallons of water per bag of cement and shall be used within 6 hours after mixing.

The scratch coat shall be trowelled to an even surface, parallel to and not more than 3/8 inch from the back surface of the body of the tile, exclusive of the lugs and keys. Where, due to irregularities in the concrete surfaces, the scratch coat requires a thickness of more than 1/2 inch, the scratch coat shall be built up in two or more coats; the initial coat shall have a maximum thickness of 1/2 inch and each subsequent coat shall have a maximum thickness of 3/8 inch. Wherever more than one scratch coat is necessary, the surface of each coat shall be scored before hardening and dampened immediately before application of the next coat. The surface irregularities of the final scratch coat shall not exceed 1/4 inch in a length of 10 feet. The final scratch coat, while still plastic, shall be deeply scored or scratched horizontally and diagonally with marks about 1/2 inch apart.

After the scratch coat has been completed and cured at least 24 hours, the float coat shall be applied within a period of 72 hours after curing of the scratch coat. Before the float coat is applied, the scratch coat shall be cleaned where necessary, and thoroughly moistened, but not saturated with water. Screeds or temporary guide strips shall be mortared to the scratch coat to indicate accurately the surface planes of the float coat. The thickness of the float coat shall not exceed 3/8 inch. The float coat shall be well rodded and floated to a true surface parallel to the finished surface of the wall and shall be applied only in such quantities as can be covered with tile before the initial set of the mortar as directed.

**(3) SETTING TILE.**

All tile shall be thoroughly sprayed with or immersed in clean water prior to setting. Immediately after placing the float coat, a skim coat of neat cement, not exceeding 1/8 inch thickness, shall be applied uniformly to the back of each tile so as to completely fill all spaces between lugs or keys and present an even plane surface. Each tile shall be tapped firmly into place and brought flush with adjacent units. Lines shall be kept straight and all finished surfaces shall be true. Broken, cracked, marred, or other defective tiles shall be replaced before the mortar has set.

Wherever there is a change in direction of the tile facing, all corners, coves, angles, combinations, or other trimmer tile shall be furnished and installed as required.

The tile shall fit neatly around all wall niches, openings, and horizontal and vertical expansion joints. The Contractor shall do all field cutting and drilling required for

the installation of the tile. So far as practicable, all cutting shall be done by power saws, and the cut edges shall be smooth and straight and free from chipping. Hand-cut tile shall be filed or ground smooth on the cut edges.

Each graded size or lot of tile shall be set in separate segregated groups or areas extending for the full height of the walls or columns, and for the full width of the ceilings. The size of tile in adjoining groups shall not vary by more than 1/32 inch.

Joints in the tile facing of the walls, ceiling and columns shall be constructed as specified herein and as shown on the plans, using approved spacing gauges or devices. Expansion joints shall be constructed directly over all expansion joints in the concrete masonry and where the tile abuts another material. If the joints in the concrete masonry are spaced greater than 16 feet, either vertically or horizontally, small relieving joints equal to a normal tile joint width (approximately 1/8 inch) shall be provided at intervals of 12 to 16 feet but not to exceed 16 feet, and shall be sealed with materials conforming to the requirements of [807.07](#). Joints shall be carried through all mortar coats and the tile surface, at the same width as the width of the joint in the concrete masonry.

After the mortar has hardened sufficiently to hold the tile firmly in place, loose mortar shall be raked out and the faces of the surface shall be thoroughly washed clean with water, and while still moist, the joints between the tile shall be grouted with white portland cement combined with sufficient water to obtain a consistency of thick cream. The grout shall be forced into the joints by troweling or other approved method, and finished straight and true. Special care shall be taken to prevent the scratching of the glaze on the face of the tile. Prior to hardening, any excess grouting shall be washed off with a sponge and water leaving all joints full, smooth, and flush with the cushion edge of the tile, and the face of the tile clean. Remixing or use of grout that has partially hardened will not be permitted.

As the work of setting tile progresses, the Contractor shall remove all unused material and debris and shall give the tile work a thorough cleaning with water and cloths. All traces of cement or dust accumulation shall be completely removed. No acid solution will be allowed, under any conditions, for cleaning tile surfaces. The Contractor shall take such precautions as may be necessary to prevent the soiling or injury of the tile work during the remainder of the project, and shall clean or replace any tile that may become soiled or injured. Before final payment is made, all imperfect, loose, or misplaced tile shall be removed by the Contractor at his own cost and expense, and replaced with approved units.

The Contractor shall clean and remove all stains, oil, dust, grease, and marks from the walls and repair any defective joints or fixtures prior to final acceptance of the wall tile.

#### **712.04 MEASURE AND PAYMENT**

##### **(A) MORTAR SCRATCH COAT FOR TILE.**

The measure for Mortar Scratch Coat For Tile will be the square foot. The quantity to be paid for will be the number of square feet of mortar scratch coat actually placed and

accepted by the Chief Engineer, measured on the exposed surface of the mortar with no deduction for areas one square foot or less for outlets for mechanical or other fixtures.

Payment will be made at the contract unit price per square foot bid in the Schedule of Prices, which payment shall constitute full compensation for the furnishing of all materials, labor, tools, equipment, neat coat of cement, scaffolding, and incidentals necessary to complete this item of work.

**(B) GLAZED CERAMIC TILE.**

The measure for Glazed Ceramic Tile for Walls and Glazed Ceramic Tile for Ceilings will be the square foot. The quantity to be paid for will be the number of square feet, as indicated on the plans, actually placed, and accepted by the Chief Engineer, measured on the exposed surface of the tile with no deduction for areas one square foot or less for outlets for mechanical or other fixtures.

Payment will be made at the contract unit price per square foot, which payment shall constitute full compensation for the furnishing of all materials, labor, tools, equipment, mortar float coat, neat cement skim coat, grout, elastic joint sealing materials, scaffolding, cleaning and incidentals necessary to complete this item of work.