1. **GENERAL**
	1. **SECTION INCLUDES**
		1. Ceramic tile exterior walls using setting bed application method.
		2. Substrate preparation.
	2. **REFERENCES**
		1. ANSI/TCA A108.5 - Installation of Ceramic Tile with Dry-Set Portland cement Mortar or Latex-Portland Cement Mortar.
		2. ANSI/TCA A108.10 - Installation of Grout in Tile Work.
		3. ANSI/TCA A137.1 - Ceramic Tile.
		4. ASTM C373 - Water Absorption, Bulk Density, Apparent Porosity and Apparent Specific Gravity of Fired Whiteware Products.
		5. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
		6. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation, 2021 Edition.
		7. California Building Code.
		8. ANSI/TCA A118.1 - Dry-Set Portland Cement Mortar.
		9. ANSI/TCA A118.4 - Latex-Cement Mortar.
		10. {ANSI/TCA A118.6 - Ceramic Tile Grouts.
		11. ASTM C144 - Aggregate for Masonry Mortar.
		12. ASTM C150 - Portland cement.
		13. ASTM C171 - Sheet Materials for Curing Concrete.
		14. ASTM C207 - Hydrated Lime for Masonry Purposes.
		15. ASTM C482 - Bond Strength of Ceramic Tile to Portland cement.
	3. **SUBMITTALS**
		1. Product Data: For each type of tile, mortar, grout, and other products specified.
		2. Shop Drawings: Include following:
			1. Tile patterns and locations.
			2. Widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
		3. Samples for Verification: Of each item listed below, prepared on Samples of size and construction indicated. Where products involve normal color and texture variations, include Sample sets showing full range of variations expected.
			1. Each type and composition of tile and for each color and texture required, at least 12 inches square, mounted on braced cementitious backer units, and with grouted joints using product complying with specified requirements and approved for completed work in color or colors selected by Architect.
			2. Full-size units of each type of trim and accessory for each color required.
			3. Metal edge strips in 6-inch lengths.
		4. Product Certificates: Signed by manufacturers certifying that products furnished comply with requirements.
		5. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names of architects and owners, and other information specified.
		6. Tile Test Reports: Indicate and interpret test results for compliance of special-purpose tile with specified requirements.
		7. Setting Material Test Reports: Indicate and interpret test results for compliance of tile-setting and grouting products with specified requirements.
	4. **QUALITY ASSURANCE**
		1. Installer Qualifications: Engage experienced installer who has completed tile installations similar in material, design, and extent to that indicated for this Project and with record of successful in-service performance.
		2. Source Limitations for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from one source with resources to provide products from same production run for each contiguous area of consistent quality in appearance and physical properties without delaying Work.
		3. Source Limitations for Setting and Grouting Materials: Obtain ingredients of uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from one source or producer.
		4. Mockups: Before installing tile, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with following requirements, using materials indicated for completed Work.
			1. Locate mockups in location and of size indicated or, if not indicated, as directed by Architect.
			2. Notify Architect 7 days in advance of dates and times when mockups will be constructed.
			3. Demonstrate proposed range of aesthetic effects and workmanship.
			4. Obtain Architect's approval of mockups before proceeding with final unit of Work.
			5. Maintain mockups during construction in undisturbed condition as standard for judging completed Work.

 When directed, demolish and remove mockups from Project site.

* 1. **Pre-installation Conference**: Conduct conference at Project site to comply with requirements of Section 01 30 00.
	2. **DELIVERY, STORAGE AND HANDLING**
		1. Deliver products to site only in cartons which have been grade sealed by manufacturer in accordance with ANSI A137.1 and with grade seals unbroken. Seconds grade seal quality not permitted.
		2. Tiles delivered to job or installed in Work that do not fall within specified standards of quality or accepted color range shall be removed from jobsite and replaced with acceptable material.
		3. Store and protect products in dry, secure areas.
	3. **ENVIRONMENTAL REQUIREMENTS**
		1. Maintain 50 degrees F or above during installation of bonding mortar and grout materials.
		2. Shade Work from direct sunlight during tile installation as needed to prevent rapid evaporation caused by excessive heat.
1. **PRODUCTS**
	1. **MANUFACTURERS**
		1. Tile: Products of following manufacturers form basis for design and quality intended.
			1. DAL-Tile, Corona, CA.
			2. American Olean
			3. Summitville Tiles, Summitville, OH
		2. Grout and Latex Portland Cement Adhesives: Products of following manufacturers form basis for design and quality intended.
			1. United States Gypsum Co.
			2. DAP, Inc., Chicago, IL.
		3. Or equal as approved in accordance with Section 01600 for substitutions.
	2. **TILE MATERIAL**
		1. Ceramic Porcelain Wall Tile: ANSI/TCA A-137.1, conforming to following:
			1. Moisture Absorption: As permitted by ANSI A137.1
			2. Size: To be determined by architect
			3. Edge: Semi-cushioned
			4. Surface Finish: Semi Gloss
			5. Color and Style: To be determined by architect
		2. Trim Pieces: Match wall tile for moisture absorption, surface finish, color and tile length.
	3. **BOND COAT**
		1. ANSI/TCA A118.1 - Dry-Set Portland Cement Mortar.
		2. ANSI/TCA A118.4 - Latex Portland Cement Mortar.
	4. **SETTING BED APPLICATION**
		1. Materials
			1. Portland cement: ASTM C150, Type I or II.
			2. Lime: ASTM C207, Type S.
			3. Sand: ASTM C144.
			4. Water: Potable.
			5. Walls: Ceramaseal, “Magic Seal” by Bostik, Middleton, MA.
		2. Grout and Grout Sealer
			1. Grout: Commercial Portland Cement Grout type, ANSI/TCA A118.6, color selected by Architect.
			2. Grout Sealer: Prosoco., Stand Off SLX 100.
		3. Accessories
			1. Paper Backed Lath: Expanded diamond mesh metal lath backed with waterproof paper meeting Federal Specification UU-B-790, Type I, Grade B, Style 1, with maximum flame spread of 25, galvanized, weighing 3.4 pounds per square yard, ICBO Report No. 4135. PYRO-KURE MESH P-K, manufactured by Western Metal Lath and Steel Framing Systems, or as approved in accordance with Section 01600 for substitutions.
			2. Paper Backing at Expansion Joints: Minimum 25 or 28 pounds per square, waterproof, asphalt saturated, Grade B, fire resistive.
			3. Corner Mesh: Expanded steel mesh, shaped to permit complete embedding in plaster; minimum 3 inches wide; galvanized finish.
			4. Strip Lath: Expanded steel mesh, 4 inches wide galvanized finish.
			5. Control and Expansion Joint Accessories: Formed steel; minimum 26 gauge thick; adjustable expansion joint, 2 inch metal flanges each side; galvanized finish; 1/4 to 5/8 inch adjustment.
			6. Screws: Approved self-tapping, wafer head metal screws of length to suite application, galvanized to rigidly secure lath and associated metal accessories in place; minimum penetration into steel framing supports 1/4 inch.
			7. Tie Wire: 18 gauge annealed, galvanized.
			8. Curing Paper: Kraft paper conforming to ASTM C171.
		4. Setting Bed Mix
			1. Scratch Coat: 1 part Portland Cement, 1/2 part lime, and 4 parts dry sand or 5 parts damp sand; or 1 part Portland Cement, 3 parts dry sand and 4 parts damp sand.
			2. Float or Leveling Coat: 1 part Portland Cement, 1/2 part lime and 4 parts dry sand or 6 parts damp sand; or 1 part Portland Cement, 1 part lime and 6 parts dry sand or 7 parts wet sand.
			3. Floors: 1 part Portland Cement and 5 parts dry sand or 6 parts damp sand; or 1 part Portland Cement, 1/10 part lime and 5 parts dry sand or 6 parts damp sand.
			4. California Building Code.
	5. **EXPANSION JOINT MATERIALS**
		1. Joint Sealers: ASTM C920
			1. Vertical Joints: One part silicone sealant, non-sag, elongation movements 25/25 percent, Shore A, hardness range 20 -27, 860 Glaziers and Contractor Silicone Sealant, manufactured by Pecora Corp., Harleysville, PA, or approved equal in accordance with Division 1, General Requirements for substitutions.
			2. Horizontal Joints: One part silicone, self-leveling, elongation movement 25/25 percent, Shore A, hardness 35, Urexpan NR-201, Traffic-Grade Polyurethane Sealant, manufactured by Pecora Corp., Harleysville, PA, or approved equal in accordance with Division 1, General Requirements for substitutions.
		2. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
		3. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
		4. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 25 percent larger than joint width; DENVERFOAM or GREEN-ROD.
		5. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application. Apply to bottom of joints that are too shallow to receive foam backer rod.
2. **EXECUTION**
	1. **EXAMINATION**
		1. Verify that surfaces are ready to receive work.
		2. Beginning of installation means installer accepts condition of existing substrate.
	2. **PREPARATION**
		1. Protect surrounding work from damage or disfiguration.
		2. Clean substrate and damp clean.
		3. Fill joints with specified joint filler. Apply tape centered over joints and corners but not overlapped. Force mortar completely through tape to produce smooth surface.
	3. **EXTERIOR LATH**
		1. Apply in accordance with Section 2506 California Building Code.
	4. **INSTALLATION - EXTERIOR LATH**
		1. Apply ribbed lath with self-furring ribs perpendicular to supports at soffits. Lap sides of ribbed lath minimum 1-1/2 inches. Nest outside ribs of rib lath together. Attach metal lath to steel supports using approved screws at maximum 6 inches on center.
		2. Apply self-furring paper-backed lath shingle style, with self-furring rib perpendicular to supports at vertical surfaces. Attach to supports at furring device at 6 inch center. Stagger vertical laps.
		3. Continuously reinforce internal angles with corner mesh, except where metal lath returns 3 inches from corner to form angle reinforcement. Fasten at perimeter edges only.
		4. Place beaded external angle with mesh at corners. Fasten at outer edges only.
		5. Place strip lath diagonally at corners of lathed openings. Secure rigidly in place.
		6. Place strip lath centered over junctions of dissimilar backing materials. Secure rigidly in place.
		7. Install accessories to lines and levels.
	5. **SETTING BED INSTALLATION**
		1. Mixing
			1. Apply setting bed in accordance with Sections 1403 and 2508, California Building Code.
				1. Measuring Ingredients: Proportion and measure ingredients by means of calibrated boxes or containers of such nature that quantities measured can be readily and accurately checked at any time. Proportioning by shovel measure is not acceptable.
				2. Mixing Plaster: Mix plaster by machine for a minimum of 2 minutes. Mix no more plaster than can be properly placed within 1/2 hour after mixing. Allow no material to remain overnight in mixers or mixing boxes. Thoroughly clean tools and implements used in mixing and transporting plaster.
			2. Apply scratch coat to nominal thickness of 3/8 inch, float coat to nominal thickness of 3/8 inch, total 3/4 inch.
			3. Moist cure scratch and float coats minimum 48 hours each coat. Refer to Section 2508A, California Building Code for alternate methods of application.
			4. After curing, dampen base coat prior to applying tile.
		2. Wall Installation
			1. Apply bond coat with notched trowel, minimum 1/16 inch thick.
			2. Set tile firmly on bond coat. Spacers on tile determine joint width between tile. Strings or pegs may be used to space tile that have no spacers. Bring surfaces to true plane at proper position or elevation. Thoroughly beat-in all tile while mortar is still plastic. Fill beating with minimum of 80 percent of entire back surface of tile.
			3. Lay tile to pattern indicated on Drawings, or request tile pattern from Architect. Do not interrupt tile pattern through openings.
			4. Place edge strips at exposed tile edges.
			5. Cut and fit tile tight to penetrations through tile. Form corners and bases neatly.
			6. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight without voids, cracks, excess mortar, or excess grout.
			7. Sound tile after setting. Replace hollow sounding units.
			8. Keep expansion or control joints free of mortar or grout. Apply sealant to joints.
			9. Allow tile to set for a minimum of 24 hours prior to grouting.
			10. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
	6. **GROUT INSTALLATION**
		1. Grout tile to comply with requirements of tile installation standards ANSI A108.10.
		2. Seal wall grout, 2 coats required, according to manufacturer’s recommended procedures.
	7. **EXPANSION JOINTS**
		1. Install joints minimum 12 feet on centers each direction or as indicated. Install expansion joint over any cold joint or control joint.
		2. Expansion joint shall penetrate full depth of setting bed.
		3. Do not damage waterproofing membrane.
		4. Install sealant in accordance with manufacturer's instructions, using hand pointing tools.
		5. Measure joint dimensions and size materials to achieve required width/depth ratios. Minimum width: 1/4 inch.
		6. Install joint backing to achieve a neck dimension no greater than 1/3 joint width.
		7. Install bond breaker where joint backing is not used. Install removable masking material to maintain clean lines and protect adjoining surfaces.
		8. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges. Do no install sealant on wet or damp surfaces.
		9. Install sealant free of air pockets, foreign embedded matter, ridges and sags.
		10. Tool joints concave, channel shaped or as detailed. Use slicking agent type recommended by manufacturer.
	8. **CLEANING**
		1. Clean work and adjacent surfaces.
		2. Clean tile surfaces.
	9. **PROTECTION**
		1. Protect finished installation.
		2. Do not permit traffic over finished floor surface.
	10. **REPLACEMENT OF MATERIALS**
		1. Provide two unopened boxes of additional tile and trim shape of each type, color, pattern and size used in Work for Owner's use in replacement and maintenance. Package securely to prevent damage and label clearly.

**END OF SECTION**