1. **GENERAL**
	1. **SECTION INCLUDES**
		1. Formed concrete roofing tiles.
		2. Underlayment, eave, valley and ridge protection.
		3. Associated metal flashings.
		4. Wood Batten and nailer system.
	2. **REFERENCES**
		1. ASTM A653/A653M-98 - Sheet Steel, Zinc-Coated (Galvanized) or Zinc - Iron Alloy Coated by the Hot-Dip Process.
		2. ASTM D2178 - Asphalt glass felt used in roofing and waterproofing.
		3. ASTM D2822 - Asphalt Roof Cement.
		4. ASTM D3019 - Lap cement used with asphalt roll roofing.
		5. Steep Roofing Manual, the NRCA Roofing and Waterproofing Manual – Fourth Edition.
		6. Chapter 15, California Building Code.
		7. IR M-7 - California State Structural Safety Interpretive Manual, Office of State Architect.
		8. UBC Standard 15-5.
	3. **QUALITY ASSURANCE**
		1. Manufacturer: Company specializing in forming concrete roof tiles with minimum five years experience.
		2. Fire Hazard Classification: Minimum Class B as required by Table 15-A, California Building Code.
		3. Conform to NRCA - Steep Roofing Manual.
		4. Conform to Table 15-D-2 California Building Code except where exceeded by this specification.
		5. Conform to IR M-7 DSA.
		6. Conform to UBC Standard 15-5.
		7. Mock-up
			1. Provide under provisions of Division 1.
			2. Provide mock-up test panel at least 4 feet square exactly duplicating each different job site condition including tile, attachment, underlayment, sheathing, framing and slope.
			3. Mock-up may not remain as part of completed structure.
	4. **SUBMITTALS**
		1. Product data including tile properties, configurations, jointing methods and locations, fastening methods and locations, and installation details.
		2. Three samples of tiles in size illustrating color profile and finish.
		3. Manufacturer's storage and installation instructions.
		4. ICBO approval number.
		5. Certification that minimum breaking load for tiles shall exceed 350 pounds
	5. **DELIVERY, STORAGE, AND HANDLING**
		1. Protect concrete tiles from damage in accordance with manufacturer's storage instructions.
	6. **WARRANTY**
		1. Contractor's Warranty: Warrant in writing to the Owner, all tiles, flashing, sealants, fasteners and accessories, against defective materials and workmanship and that the entire installed roof assembly will remain watertight and weatherproof with normal usage for 2 years following date of Certified Completion. Contractor shall repair or replace at his expense any leaks and resulting damage to other materials and building contents as may occur during the 2 year period.
2. **PRODUCTS**
	1. **MANUFACTURERS**
		1. Products of following manufacturers form basis for design and quality intended.
			1. Eagle Roofing Products, Rialto, CA. Product: CAPISTRANO “S” TILE
			2. MonierLifetile, Rialto, CA
		2. Or equal as approved in accordance with Division 1, General Requirements for substitutions.
	2. **ROOFING MATERIALS**
		1. Concrete “S” Tile: Portland Cement, standard weight sand, proprietary additives and mineral oxides, manufacturer's nominal size of 12-3/8 x 17 inches, special sizes to suit valley, ridge, eave and other conditions, colors and premium custom-blends as selected. Refer to Section 09 05 00.
		2. Underlayment: Type II, ASTM D4601, unperforated glass ply asphalt saturated felt.
		3. Ice Dam Protection Membrane: ASTM D1970, 40 mil, self adhesive, Vycor Ice & Water Shield as manufactured by W.R. Grace, Cambridge, MA., or equal as approved in accordance with Division 1 for substitutions.
		4. Fasteners: Copper, brass or stainless steel minimum 11 gage, with 5/16 inch heads, length to penetrate roof sheathing minimum 3/4 inch. Ring-shank type required where roof sheathing is less than 3/4 inch thick.
		5. Asbestos Free Plastic Cement: ASTM D2822; asphaltic type with mineral fiber components.
		6. Asbestos Free Lap Cement: ASTM D3019 Fibrated cutback asphaltic type, as recommended for use as an adhesive in the cold application of asphalt roofing or underlayment; free of toxic solvent.
		7. Primer: ASTM D41, Bituminous.
		8. Deck Tape: 2 inch wide aluminum coated cloth duct tape with adhesive backing.
		9. Wood Battens and Nailers: Pressure Treated No. 2 or better, Douglas Fir. Pressure treat in accordance with American Wood Preservers Association Manual of Recommended Practice, "Standard for Preservative Treatment by Pressure Process, All Timber product, C1-61". Comply with "Standard for Water-Borne Preservatives PS-60". Battens may be pressure treated with C2-C per AWPA PS-86, to a minimum retention of 0.45 pounds per cubic foot by assay, per AWPA Standards C2-84.
		10. Mortar Cement: Portland cement, sand, and water to 1 to 4 mix, pigmented with non-fading mineral oxide to match tile color.
		11. Sealant: One component polyurethane as specified in Section 07900.
		12. Wind Clips: Galvanized steel 18 gage by 1/2 inch, size to suit type of tile.
	3. **FLASHING MATERIALS**
		1. Steel Flashings: ASTM A653/A653M-98; 24 gage with 1.25 ounces per square feet galvanized coating.
		2. Bituminous Paint: Acid and alkali resistant type; black color.
	4. **FLASHING FABRICATION**
		1. Form sheet metal flashings to profiles required, and to protect roof assembly and shed water.
			1. Provide sheet metal valleys, base flashing, counter flashings, vent pipe jacks and crickets.
		2. Form sections square, true, and accurate to profile, in maximum possible lengths, free from distortion and other defects detrimental to appearance or performance.
		3. Hem exposed edges of flashings minimum 1/4 inch on underside.
		4. Apply bituminous primer on concealed surfaces of flashings.
3. **EXECUTION**
	1. **INSPECTION**
		1. Verify that roof deck surfaces are dry, sound, flat, and of sufficient thickness to accept fasteners.
		2. Beginning of installation means acceptance of substrate.
	2. **PREPARATION**
		1. Seal roof deck joints wider than 1/16 inch with deck tape.
		2. Coordinate installation of roof mounted components, or work projecting or penetrating through roof. Verify roof openings are prepared prior to installing work of this Section.
	3. **PROTECTIVE UNDERLAYMENT INSTALLATION**
		1. Apply Ice Dam Protection where recommended by NRCA’s Steep Roofing Manual.
		2. Apply 4 inch wide band of plastic cement over deck flange of eave edge flashings, and embed an 18 inch wide strip of underlayment. Place underlayment with eave edge flush with face of flashings. Secure in place. Lap ends minimum 6 inches.
		3. Apply lap cement at a rate of approximately 1-1/4 gal/square on underlayment starter strip.
		4. Starting from eave edge of starter strip, lay additional 36 inch wide strips of underlayment in lap cement, to produce a two ply membrane. Weather lap plies minimum 19 inches and nail in place. Lap ends minimum 6 inches. Stagger end joints of each consecutive ply.
		5. Extend membrane over full area of roof deck.
		6. Apply extra layer of underlayment, 36 inches wide, at valleys.
	4. **FLASHING INSTALLATION**
		1. Install flashings in accordance with NRCA requirements.
		2. Weather lap joints minimum 2 inches and seal with plastic cement. Secure in place with nails at 12 inches oc.
		3. Flash and seal work projecting through or mounted on roofing with plastic cement. Provide weathertight installation.
		4. Three-course all nail heads in nailers or underlayment with roofing fabric and plastic roofing cement.
	5. **CONCRETE TILE INSTALLATION**
		1. Install in accordance with manufacturer's instructions and NRCA Steep Roofing Manual.
		2. Place wood nailers of size and configuration to suit tile system. Set nailers in full bed of plastic cement prior to nailing.
		3. Fasten tile to battens with two nails per tile.
		4. Project tile 1-1/2 inches beyond face of fascia boards.
		5. Place tile square with building lines and parallel with roof slope.
		6. Place mortar with tile units, cut flush and tool exposed joints with tile unit.
		7. Coordinate installation of roof mounted components or work projecting through roof with weather tight placement of counter flashings.
		8. Complete installation to provide weather tight service.
		9. Install wind clips one per tile on side lap with two corrosive-resistant nails.
	6. **TESTING**
		1. Testing shall conform to Division 1, General Requirements.

**END OF SECTION**