PART 1 GENERAL

1.01 WORK SPECIFIED HEREIN
A. This Specification shall cover the furnishing of all labor, equipment, materials, accessories and services necessary to furnish and install new asphalt-fiberglass roof shingles and flashings, complete with preformed ridge caps, valley gutters and accessory trim as indicated, specified and required for a complete installation.
B. Provision of temporary roof seals as required to maintain watertight conditions and protect roofing system during installation.

1.02 REFERENCE STANDARDS
A. Reference to standards and/or specifications herein shall be interpreted to mean the latest revision unless noted otherwise. The following abbreviations appear in the specification:
   - ASTM: American Society for Testing and Materials
   - OSHA: Occupational Safety and Health Administration
   - UL: Underwriters Laboratory
B. The following standards shall be made a part of this Specification:
   - ASTM D3018: Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules
   - ASTM D3161: Wind-Resistance of Asphalt Shingles, Test Method For
   - FS SS-C-153: Plastic Cement
   - UBC: Uniform Building Code, International Conference of Building Officials
   - UL 790: Tests for Fire Resistance of Roof Covering Materials
C. Permission for deviation from these standards and/or specifications must be approved, in writing, by the Engineer in advance of Bid Proposal submittal.

1.03 QUALITY ASSURANCE
A. Manufacturer shall be an Associate Member, in good standing, of the National Roofing Contractors Association and Western States Roofing Contractors Association.
B. Manufacturer shall be nationally recognized in the roofing, waterproofing industry for fifty years.
C. Contractor shall be the roofing material manufacturer’s approved qualified applicator.
D. Upon request by the Engineer, the Contractor shall provide the names of at least ten jobs from the greater Phoenix area, available for inspection by the Engineer, that are similar or identical to the system specified in this Specification.
E. Contractor’s designated foreman shall have a minimum of five years experience in the installation of asphalt-fiberglass roof shingles similar to the system specified in this Specification.
F. The completed roofing system assembly shall meet or exceed UL 790, Class B requirements.

1.04 GUARANTEE
A. The manufacturer of the asphalt-fiberglass roof shingles shall provide a twenty-year non-prorated guarantee covering all materials and workmanship comprising the Contract Work against any leaks, defects or other deterioration of the system. Any leaks, defects or deterioration shall be repaired at no cost to Purchaser.
B. In conjunction with manufacturer’s guarantee, the Contractor shall provide a two-year guarantee covering repair/replacement of any materials and workmanship comprising the Contract Work resulting in leaks, defects or other deterioration of the system. Any leaks, defects or deterioration shall be repaired at no cost to Purchaser.
C. Unless otherwise expressly noted within this Specification, the roofing system installed shall comply with the applicable roofing material manufacturer’s written recommendations.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Materials shall be stored on pallets or equivalent wood blocking.
B. All materials shall be covered with waterproof covering top to bottom. Covering shall be secured with twine or rope.

C. Roofing materials shall be handled so as to avoid bending, tearing or other damage during transportation and installation.

D. Roofing felts, asphalt and other materials shall be stored in a place protected from water and extreme temperatures.

E. Rolls of roofing felt shall be stored on ends only. Rolls which have been flattened or otherwise damaged shall be discarded.

F. Material handling equipment shall conform to, and be operated in conformance with, OSHA and local building code requirements.

G. Material handling equipment shall be selected and operated so as not to damage newly applied roofing, the existing roof system or the building. Do not load materials or operate equipment on any roof area in a manner that could endanger or disturb occupants of the building; the Engineer will determine locations available to the Contractor at the pre-bid conference.

1.06 SITE CONDITIONS

A. Access to roof shall be from the exterior. Coordinate access and work with the Engineer.

B. Installation work shall not be performed during rainy or inclement weather. Maintain building weather tight during inclement weather. Engineer may stop project if, in his/her opinion, the work should not be continued due to adverse weather conditions.

C. Contractor shall assume that the building space directly under the roof areas included by this specification will be occupied and utilized for ongoing operations. Contractor shall not interrupt Purchaser's operations unless written approval is received from the Engineer.

1.07 SUBMITTALS

Submit manufacturer's literature at least two weeks prior to installation of asphalt-fiberglass roof shingles. Literature shall indicate materials to be provided and manufacturer's recommended installation procedures.

PART 2 PRODUCT

2.01 LUMBER
Lumber shall be Douglas fir-hemlock, construction grade with West Coast lumber inspection bureau grade stamp. Size as required to match existing or as shown on drawings.

2.02 PLYWOOD SHEATHING
Plywood sheathing shall be Structural II, A-D, exterior or standard sheathing with exterior glue, as identified by stamp of American Plywood Association, a minimum 3/4-inch thickness or match existing as appropriate for span.

2.03 NAILS
Use galvanized common nails for framing and sheathing. Size as required by UBC. For roofing, use galvanized steel 10-gauge, screw-threaded shank, 3/8 inch head, with length as required to penetrate 3/4 inch into plywood sheathing.

2.04 ROOFING FELT
Roofing felt shall be 28-pound asphalt saturated unperforated felt.

2.05 PLASTIC CEMENT
Plastic cement shall be as recommended and supplied by shingle manufacturer, complying with FS SS-C-153, Type 1.

2.06 SHINGLES
A. Shingles shall be asphalt saturated, fiberglass base, ceramic granule coated, Class A and wind resistant label shingles, in compliance with ASTM D3018, Type 1 and D3161.
B. Shingles shall be "Sentinel" grade as manufactured by GAF Building Materials Corp., and have a 20-year warranty from the manufacturer. Similar shingles as manufactured by Certainteed, Bird and Son, Flintkote, or Owens-Corning Fiberglas are also acceptable.

C. Color of Shingles shall be as selected by the Engineer from manufacturer's standard colors.

2.07 METAL Drip Edge
Metal drip edge shall be minimum 24-gauge galvanized steel with minimum three-inch nailing flange. Fascia width shall be minimum of one inch with 1/4 inch concealed hem drip edge. Maximum length for individual piece is 10 feet.

2.08 ROOF JACK
Roof jack shall be minimum 24-gauge galvanized steel with minimum three-inch wide flange around conical base. Shop fabricate vertical flashing cone and base sheet to match slope of roof deck. Where required by existing conditions at deck penetration, provide two-piece "split" jack.

PART 3 EXECUTION

3.01 INSPECTION
A. Roofing system shall not be installed until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions by Contractor.

B. Verify that any work of other trades requiring penetration of roof surface or requiring men and/or equipment to traverse roof has been completed or has been approved by the Engineer and material manufacturer's representative.

C. Check projections, curbs, walls and deck for inadequate anchorage, foreign material, moisture or unevenness preventing execution or adversely affecting quality of new roofing system. Assure that surfaces to receive shingles are uniform, smooth, sound, clean, dry, and free of Irregularities. Replace existing defective plywood roof deck surface with new similar to adjacent existing deck. Correct any deficiencies.

3.02 PROTECTION
A. Contractor shall be responsible for protection of property, including all areas around buildings, during course of work. All damage caused by this Contractor shall be repaired by this Contractor, at his expense, to its original condition to the complete satisfaction of the Engineer.

B. Roofing system and flashings shall be fully installed and sealed in a watertight manner on the day of installation and before arrival of inclement weather. Night seals shall be closely examined by job foreman after each working day to ensure watertightness. Prior to removal of temporary and daily waterstops/tie-ins, all ponded water shall be removed in such a manner as not to create any water penetration into the building. Contractor shall be responsible for any water damage to the building and/or contents.

3.03 CONSTRUCTION PREPARATION
A. Work sequence shall be scheduled to avoid use of newly constructed roofing for storage, walking surface, or equipment movement. Equipment and ground storage areas shall be moved to designated locations as work progresses.

B. Standing pipes and roof-mounted conduit shall be lifted, disconnected and saved for later reinstallation. If the Contractor is not qualified to plug plumbing or disconnect electrical connections, the Contractor will, at his expense, subcontract this work.

3.04 FELT UNDERLAYMENT
A. Roofs with 3 in 12 slope or greater: Lay one layer of felt underlayment horizontally over entire roof, lap each course over lower course. Lap two-inch minimum on horizontal joints, four-inch minimum at end joints and six inch minimum both sides over hips and ridges. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are installed.

B. Roofs with slope from 2 to 3 in 12: Apply two layers of felt underlayment parallel with eaves; lay 19-inch strip as starter course, overlap with second layer. Cover roof with 36-inch wide sheets of felt, overlap preceding layer by 19 inches, exposing 17 inches of underlying sheet.
Secure underlayment to deck with sufficient fasteners to hold in place until shingles are installed.

C. Install 36-inch wide felt underlayment centered in valley and nail in position. Horizontal underlayment courses shall overlap valley underlayment six inches minimum.

D. Eave flashings, slope 4 in 12 or greater: Apply course of smooth roll roofing to project 3/8 inch beyond felt underlayment and metal drip edge. Extend roll roofing up roof deck to a minimum of 12 inches inside perimeter wall line of building.

E. Eave flashings, slope less than 4 in 12: Apply bituminous plastic cement at rate of two gallons per 100 square feet to surface of felt underlayment. Apply second course of underlayment to extend up roof deck to a minimum of 30 inches inside perimeter wall line of building.

3.05 CLOSED VALLEY FLASHING
Center 36-inch wide smooth surface roll roofing, placed over felt underlayment, within valley.

3.06 SHINGLES
A. Starter Strip: Install row of inverted shingles along lower eave edge, with tabs facing up roof. Nail three inches in from eave edge, with nail heads not exposed to first course cutouts.

B. Random Spaced Joints: Start first course with full shingles. Start second course with full shingle with starting tab cut to three-inch minimum width. Locate cutout centerline of succeeding courses at least three inches laterally from cutout centerline of course below. Vary starting tab widths to avoid pattern cutout alignment. Install shingles with five-inch exposure.

C. Install shingles in straight horizontal single courses, following the eave and ridge lines of the building. Observe spacing and layout of shingles during installation to prevent occurrence of diagonal lines and other non-uniform appearing patterns.

3.07 HIPS AND RIDGES
Install manufacturer's standard preformed hip and ridge shingles.

3.08 CLOSED VALLEYS
Lay shingles along eaves of roof crossing valley, extending over adjoining roof deck 12 inches minimum. Lay first course along eaves of adjoining roof and extend 12 inches minimum across valley on top of previously applied shingle. Lay succeeding courses alternately. Nail no closer than five inches to valley center line and place two nails at end of each terminal strip.

3.09 ROOF JACKS
Install prefabricated sheet metal jacks at all roof deck penetrations. Base sheet of jack shall be set in plastic cement (before new shingles are installed) and nailed securely in place. Opening at top of jack cone shall be 1/2 to 3/4 inch larger than penetrating item. Seal open joint with gun-grade liquid polysulfide polymer, Thiokol, or similar as approved by Engineer. Paint (primer and finish coat) sheet metal to blend with adjacent roof shingle color.

3.10 FIELD QUALITY CONTROL
Manufacturer's representative, along with the Engineer, shall provide a final inspection of the completed work. Contractor's job foreman shall attend installation inspection and shall provide repair materials to repair areas of new roofing system found unsatisfactory by the Engineer and/or material manufacturer's representative.

3.11 ADJUSTING AND CLEANING
A. Any deficiencies found during final inspection will be corrected within five working days and will be re-inspected by the manufacturer's representative and the Engineer.

B. Remove any debris from roof.

C. Clean gutters and downspouts of all debris so they are free flowing.

D. Leave premises clean to the complete satisfaction of the Engineer.

END SECTION