

TECHNICAL SPECIFICATION

ROOF REPLACEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All work performed under this section of the specifications shall be subject to the General Conditions of the Contract, and Division 1 General Requirements.

1.2 SUMMARY

- A. Section includes granular surfaced asphalt shingle roofing, including but not limited to the following:
 1. Moisture shedding underlayment.
 2. Eave, rake and ridge protection.
 3. Ridge vents. (ADD ALTERNATE #1)
 4. Associated metal flashings and accessories.
 5. Removal of existing roofing materials.
 6. Replacement of wood fascia.
- B. It is not the intent to herein describe all of the details for asphalt roofing and flashing. Ensure that all items and details not otherwise specified, but shown on the drawings, or as otherwise required to achieve a complete watertight roofing installation, shall be provided under this Section at no additional cost to the Owner.

1.3 DEFINITION

- A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Product Data: Submit manufacturer's product data indicating material characteristics, performance criteria, and limitations.
- C. Samples: Submit two of each type shingle selected; two 12" x 12" of metal flashing indicating finish; two samples of 12" x 12" underlayment and water shield; and three samples of each type nail required for asphalt shingle and flashing.
- D. Manufacturer's Installation Instructions: Submit installation criteria and procedures.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Warranties: Special warranties specified in this Section.

1.5 SUBSTITUTIONS

- A. Substitutions shall be in accordance with Section 01630.

1.6 PERFORMANCE REQUIREMENTS

- A. Shingles shall comply with ASTM D3462 and meet the following requirements:
 - 1. ASTM E108, Class A, fire exposure-test requirements.
 - 2. Pass ASTM D3161 wind-resistance-test requirements of 60 mpg.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.
 - 1. Install self-adhering ice and water dam protection sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.
- B. Do not apply roofing membrane to damp or frozen deck surfaces.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.
- B. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

1.9 WARRANTY

- A. Shingle Material Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.
 - 1. Material Warranty Period: 25 years from date of Substantial Completion, prorated, with first 5 years nonprorated.
- B. Workmanship and Product Warranty: In addition to the manufacturer's product warranty, provide a one (1) year written guarantee commencing from date of Architect's acceptance for the replacement of all defective work related to the roofing, including but not limited to asphalt shingle installation, felts, watershield, metal work and other related installed work.
- C. Wind-Speed Warranty: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 60 mph.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bird Roofing Company.
 - b. Celotex.
 - c. Atlas Roofing Corporation.
 - d. CertainTeed Corporation.
 - e. Elk Premium Building Products, Inc.; an ElkCorp company.
 - f. Emco Building Products Corp.
 - g. GAF Materials Corporation.
 - h. Owens Corning.
 - 2. Shingle size shall be square cut, three-tab and approximately 36" x 12" with 5" exposure. Use of larger metric sizes is prohibited.
 - 3. Color: As selected by Architect.

2.2 UNDERLAYMENT

- A. Felts: ASTM D226, Type I, No. 15 (minimum) asphalt-saturated organic felts, nonperforated.
- B. Ice-and Water Dam Protection Underlayment: Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D1970, minimum of 40-mil-thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied
 - 1. "Ice and Water Shield" by W.R. Grace.
 - 2. "CCW WIP 400 Roofing Underlayment", manufactured by Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.

2.3 RIDGE VENT (ADD ALTERNATE #1)

- A. "Vent-A-Ridge", product code: VAR, aluminum .019" thick with end caps by Alcoa Building Products. Color shall be as selected by Architect.

2.4 ACCESSORIES

- A. Fasteners:
 - 1. Shingle nails shall be hot-dipped galvanized or aluminum, 11- or 12-gage, barbed shank, 5/8" head, sharp pointed roofing nails of sufficient length to penetrate at least 3/4" into plywood sheathing or wood substrate.
 - a. Staples to secure asphalt shingles will not be permitted.
 - 2. Felt underlayment nails shall be aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch minimum diameter.
 - 3. Nails used for fastening aluminum flashings shall be approved and compatible nails of the stronghold type, with large, flat heads, annular threads

and needle points. They shall not be smaller than No. 12 Stubbs gage, and of sufficient length to penetrate wood blocking not less than 1".

- B. Plastic Cement: ASTM D4586, Type II asphalt type with mineral fiber components, free of asbestos and toxic solvents, capable of setting within 24 hours at temperatures of 75 degrees F and 50 percent RH.
- C. Bituminous Paint: Acid and alkali resistant type; black color.

2.5 FLASHING, GUTTERS, LEADERS AND TRIM

- A. General: All miscellaneous formed aluminum flashings and items required for the project in various thicknesses and profiles as indicated on the drawings or required to suit conditions shall be as applicable to SMACNA details and as approved by the Architect. In absence of thicknesses shown, provide minimum .040" thick flashings and members.
- B. Gutter and Rain Leader: Gutter shall be fabricated using minimum .050" aluminum sheet stock to profiles 5" x 6" using Style B rectangular design as described in SMACNA. Gutter shall be fabricated in long lengths as practical provided with expansion joint covers and end closures, and shall include 3/32" x 1-1/4" wide aluminum gutter spacers equal to Alcoa, located 2'-6" on centers. Provide 3" diameter .050" aluminum rain leader including basket strainer and all required brackets and elbows. Provide discharge outlet and precast concrete splash block at each rain leader.
- C. Aluminum Eaves Strip: Shall be standard profile with roof flange forming projected edge with fascia and drip, as approved by the Architect. Members shall be profiles in 10'-0" lengths formed of .030" thick aluminum.

2.6 PRECAST CONCRETE SPLASH BLOCKS

- A. Precast concrete splash blocks located at roof leaders shall be 12" x 12" x 2" thick. Concrete shall have a twenty-eight day compressive strength of 2500 psi. Concrete shall be air entrained with smooth troweled surfaces and edges.

2.7 EXTERIOR TRIM

- A. Wood Trim and Fascia:
 - 1. All exterior wood trims shall be thoroughly seasoned kiln dried Northern or Western White Pine, C Select Grade, free from all knots, (except that small, sound knots that can be covered with a five-cent piece may appear on the face), pitch or pitch pockets, shakes, pitch, checks, wane and excess of sap.
 - 2. Do not use plain-sawn lumber with exposed, flat surfaces more than 3 inches wide.
 - 3. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
 - 4. Back-prime all exterior wood finish carpentry.
- B. Plastic Trimboard (Simulated Wood): (ADD ALTERNATE #2)

1. Acceptable Product: AZEK Trimboards manufactured by Vycom Corporation, Moosic, PA, (866) 549-6900.
2. Material: Free foam cellular PVC material with a small cell microstructure and density of .55 grams/cm³.
3. Sealants: Use urethane polyurethane or acrylic based sealants without silicone.

2.8 FINISH:

- A. All aluminum items specified and referred to as stated above shall have exposed surfaces finished with a factory applied fluoropolymer coating equal to "Kynar 500" meeting AAMA 2605 specifications. Coating shall consist of a pre-treatment and multi-coat thermo-cured system; primer and color coating.
Color: White

2.9 FABRICATION

- A. Form flashings to profiles indicated on Drawings, and to protect roofing materials from physical damage and shed water.
- B. Form flashing sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
- C. Hem exposed edges of flashings minimum 1/4-inch on underside.
- D. Apply bituminous paint on concealed surfaces of flashings.

PART 3 - EXECUTION

3.1 FOREIGN OBJECT DAMAGE (FOD)

- A. Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Airport Authority may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by wind, jet, or prop blasts. Remove barricade when no longer required.

3.2 REMOVAL OF EXISTING WORK

- A. Work to be removed to make ready for new asphalt shingle work include but not limited to the removal of all existing asphalt shingles and related flashings, gutters and leaders.
- B. Removal work shall include the examination of the existing wood deck, fascia and trim to determine the scope of replacement necessary to provide an acceptable

surface and trim as approved by the Architect. Replacement work shall be done under the scope of this section, and shall include removal of all unacceptable wood sheathing, fascias and wood trim, replaced with exterior grade plywood, wood strips, and boarding depending on the field conditions for roof; and No. 1 pine for fascia and trim replacement. All wood thicknesses shall match existing conditions.

- B. In addition to the work outlined above, include re-nailing all loose nails and or replacing with additional nails to make the sheathing tight and properly secured to the structural framing.
- C. All existing asphalt shingle work to be removed which is located at adjacent surface to remain shall be removed with special care to prevent damage of the remaining adjacent work.
- D. It is the responsibility of this trade to make watertight all areas and after the removal operation as specified herein. Any damage resulting from the work performed by this trade shall be paid for, without cost to the Owner.
- E. Attention is directed not to disturb or attempt removal of any discovered hazardous materials or contaminated substances. Immediately notify both the Owner and the Architect upon discovery of such conditions. Removal or containment of the hazardous materials or contaminated substances shall be performed by an abatement specialist under separate contract with the Owner.
- F. Remove any unused or abandoned vent pipes through roof. Terminate below line of roof and repair holes with sheathing to match existing.
- G. Disposal of material shall be by tripod type hoist with suitable containers and/or enclosed chutes. Material shall not be thrown off the roof. Materials to be placed in covered containers or dumpsters. Take all necessary measure to ensure materials or other debris cannot blow onto Airport secure area. Keep work area clean and clear of all debris.
- H. Dispose of all materials in accordance with State, Local and Environmental regulations.

3.3 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that substrate is sound, dry, smooth, free of ridges, warps or voids, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
- C. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.

3.4 UNDERLAYMENT INSTALLATION

- A. Ice and Water Dam Underlayment: Shall be installed continuously at eaves, rake and both sides of ridge, 36" wide in single sheet, installed in compliance with manufacturer's recommendations.
- B. Single-Layer Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches.
 - 1. Fasten with felt underlayment nails.
 - 2. Nailing pattern shall comply with shingle manufacturer's recommendation.
- C. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

3.5 METAL FLASHING AND ACCESSORIES INSTALLATION

- A. Workmanship shall be in accordance with SMACNA publication specifications. All flashing shall be done in accordance with the recommended practice and standards set forth in the industry and shall be placed without use of exposed nails on face.
- B. Provide continuous eaves flashing with fascia drip extending onto roof a minimum of 5". Include flashings at eave returns at building ends. Provide and install continuous gutters in profiles shown including straps, baskets, rain leaders with elbows and leader straps to complete the work. Include installation of all other metal trim work indicated or necessary to complete the work in accordance with project conditions as approved by the Architect.
- C. Sheet metal work shall be adequate to provide water and weathertight work. Lines, arises, and angles shall be sharp and true. Plane surfaces shall be free from waves and buckles. Seams shall overlap in the direction of the flow. Joints and seams in plane surfaces shall be avoided as far as possible. Provide all profiles and dimensions indicated or inferred on the drawings to complete the flashing work.
- D. Ample provision shall be made for expansion and contraction. All exposed surfaces shall be cleaned as each section of the work is completed. Care shall be exercised to prevent staining or discoloring exposed surrounding surfaces. Work so damaged shall be cleaned, repaired or replaced.
- E. Except as otherwise indicated or specified, gutters, fascias, trim eaves strip and simiarmembers shall be made from 10'-0" long sections. Indicate spacings and locations and detail proposed slip joints on shop drawings. Provide other expansion joints as required.
- F. Exposed edges at all condition shall be doubled back ½" in such a manner as to conceal them and to provide stiffness. Expose no nails in face of finished work; providing receiver strips, cleats and the like to secure fascias, trim, etc.

- G. Flashings shall be installed in such a manner as will prevent galvanic action with other dissimilar adjacent metals, by priming with bituminous paint or other approved methods.
- H. Install gutters along entire length of front of building. Pitch gutters at 1/8" per foot or as required by code to slope towards rain leaders located at piers between doors. Install gutters and leaders with all necessary brackets, spacers and fasteners. Seal joints with sealant. Install splash block at each rain leader location.

3.6 ASPHALT SHINGLE INSTALLATION

- A. Install starter strip along lowest roof edge, consisting of an inverted asphalt shingle strip and at least 9 inches wide with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 3/4 inch over fascia at eaves and rakes.
 - 2. Install starter strip along rake edge.
- B. Fasten asphalt shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
- C. At valleys, lay a 24" wide valley liner of Carlisle EPDM membrane conforming to roofing manufacturer's details, flashing nailed at outer edges and set in adhesive. Apply valley shingles by weaving each course in turn over the valley, extending it along the adjoining roof deck at least 12". Install shingles using the alignment notches provided (see application instructions) alternately weaving the valley shingles over each other.
- D. Ridge Vents: (ADD ALTERNATE 1) Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- E. Ridge Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
- F. Install shingles to provide uniform distribution of color blend.
- G. Coordinate installation of roof mounted components or work projecting through roof with weather tight placement of Counterflashings.
- H. Complete installation to provide weather tight service.

3.7 RIDGE VENT INSTALLATION (ADD ALTERNATE 1)

- A. Remove existing ridge cap shingles
- B. Snap chalk lines on boths sides of the ridgeline to allow 1 1/2" horizontal dimension between.
- C. Cut out ventilation opening along the ridge at the chalk lines stopping 12" short of outside walls.

- D. Remove cut out portion of sheathing and shingles leaving a clean open slot. .
- E. Install vent on ridge starting ½” from the gable end. Align center of vent with center of ridge.
- F. Attach vent to roof every 8” on center. Slide lock next piece into first piece, align and attach to roof. Continue to end. Cut last piece to suit. Install end caps.

3.8 FASCIA INSTALLATION (BASE BID)

- A. Remove existing wood fascia at rear of building.
- B. Install new wood fascia board to match existing. Fascia shall be back primed.
- C. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8'-0” for plumb and level (including countertops); and with 1/16-inch maximum offset in flush adjoining surface, 1/8-inch maximum offsets in revealed adjoining surfaces.
- D. Scribe and cut work to fit adjoining work, refinish cut surfaces and repair damaged finish at cuts.
- E. Anchor woodwork to anchor or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Fasteners to be punched or countersunk and filled flush with woodwork.
- F. Miter inside and outside corners. Scarf joints.
- G. Install continuous pieces in longest possible lengths.
- H. Carefully scribe work that is against other building materials, leaving gaps of 1/16-inch maximum.
- I. Prime paint new fascia board and bare patches on existing trim boards. Thoroughly prep and paint fascia and rake boards on entire building with two coats exterior grade semi-gloss paint compatible with existing finish.

3.9 FASCIA INSTALLATION (ADD ALTERNATE #2)

- A. Remove existing wood fascia and rake boards on entire building.
- B. Install new plastic wood (simulated wood) trim boards to match existing sizes and in accordance with manufacturer’s recommendations.
- C. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8'-0” for plumb and level (including countertops); and with 1/16-inch maximum offset in flush adjoining surface, 1/8-inch maximum offsets in revealed adjoining surfaces.

- D. Scribe and cut work to fit adjoining work, refinish cut surfaces and repair damaged finish at cuts.
- E. Anchor woodwork to anchor or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Fasteners to be punched or countersunk and filled flush with woodwork.
- F. Miter inside and outside corners. Scarf joints.
- G. Install continuous pieces in longest possible lengths. Glue joints with manufacturer's adhesive and clamp pieces until set. Allow for expansion of 1/8" per 18 linear feet of continuous run and seal gaps with compatible sealant.
- H. Carefully scribe work that is against other building materials, leaving gaps of 1/16-inch maximum.
- I. Paint fascia with two coats 100% exterior grade semi-gloss acrylic latex paint in accordance with manufacturer's recommendations.

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit traffic over finished roof surface.

END OF SECTION