

WISCONSIN HOUSING AND ECONOMIC DEVELOPMENT AUTHORITY

SHINGLE ROOFING MAINTENANCE AND REPLACEMENT SPECIFICATION Section 07310 - April 98

TO: Owners/Project Managers/Contractors

RE: All WHEDA_{SM} Projects
Repair / Reroofing of Steep Roof (Shingle) Surfaces

I. INFORMATION TO BE SUBMITTED AS A PART OF THE BID

- A. To facilitate a prompt review of all bid proposals by the WHEDA Asset Management Group, a standard bidding format has been developed to ensure competitive, all inclusive, bids. This format attempts to cover the majority of shingle roofing surface conditions. Three (3) competitive proposals for each site will be solicited by the Owner.
- B. For each site (building at separate locations which are non-contiguous) bidder is instructed to fully complete, and submit as his/her proposal, the attached "Shingle Roofing Bid Form." Failure to provide all information required by the bid form will be the sole cause for rejection of the bid.
- C. All bids shall conform to the specifications. Each bidder shall list on the bid form, the specific number of shingle squares, the estimated number of deck replacement sheets, etc. required by and included in the bid. List name of shingle manufacturer as well as the shingle style, type, and weight.

II. GENERAL REQUIREMENTS

- A. Contractor shall purchase and maintain liability insurance to protect from claims under work's or workmen's compensation acts and other employee benefits acts, claims for damages because of bodily injury, including death, and for claims for damages to property which may arise out of results from the contractor's operation or any subcontractor or anyone directly or indirectly employed by any of them. Minimum limits shall be as are acceptable to the Owner. Certificates of such insurance shall be filed with the owner prior to the commencement of any work.
- B. Contractor shall pay unemployment and social security taxes or other taxes imposed by local, state, or federal government and certify to Owner that this has been done before payment is made to contractor.
- C. Contractor shall comply with all applicable state, federal and local codes, and pay all permits, licenses and certificates, and other fees as required by the work.
- D. Contractor should prepare and submit to the Owner, for approval, a schedule fixing dates for the work to begin and end.

Contractor is advised that the building(s) is occupied, and the contractor is cautioned to make every effort to protect and maintain it in a weathertight manner while executing the roofing

work. The contractor will be held liable for any damage caused to the building(s) and ancillary structures, and/or injury to the occupants resulting from the execution of the work or from not exercising proper precautionary protective measures. Any cost of repair/replacement resulting from damages shall be at the contractor's expense.

II. GENERAL REQUIREMENTS (cont.)

- E. Contractor shall furnish all labor and all materials as specified herein and/or required to complete the work. All materials shall be new unless otherwise noted. All labor shall be performed by persons qualified with at least 5 years of experience in the shingle roofing trade. (See Bid Form attachment for requirement to provide references.)
- F. Submit to Owner all specified certificate of warranty and guarantee of work as part at the final request for payment. All materials and workmanship shall be guaranteed to be free from defect for not less than two (2) years unless otherwise specified for a longer period within the terms of the material manufacturer's warranty for said specified material.
- G. Conditioned upon the owners acceptance of the completed work; i.e., without defects or deficiencies, final payment in an amount equal to ten (10) percent of the contract amount will be made within thirty days of final payment request. Contractor shall submit to Owner waivers of lien for all materials and labor prior to release of the final payment.
- H. The contract may be changed only by written authorization, approved by Owner and WHEDA. Contractor shall submit any written Change Order to Owner and WHEDA, for approvals, before commencing the work.
- I. An inspection of the work will be made after completion of the contract. A representative from WHEDA may review the work upon completion and prior to disbursing funds for final payment. Notify Owner's representative ten (10) days prior to the anticipated date of completion for the required inspection.

III. SCOPE OF WORK

A. GENERAL:

- 1. The installation of the roofing system shall be in accordance with this specification and the installation instructions printed by the manufacturer, as written on the back of each shingle bundle. Should the requirements of this specification conflict with those of the shingle manufacturer, the contractor is to notify WHEDA, but follow the shingle manufacturer instructions to ensure the availability of the required warranty coverage. However, where the shingle manufacturer's printed instructions offer options; e.g., the permitted use of nails or staples in the application of shingles, the contractor shall follow the requirements of this specification; i.e., the use of nails is mandatory.
- 2. The contract shall include all labor, materials and incidentals necessary to complete the work in a neat and acceptable manner--weathertight in every respect--including, but not limited to, the following:
 - a. Repairs to and/or replacement of deteriorated roof decking;
 - b. Repairs to and/or replacement of damaged and deficient flashings; i.e., wall and valley flashings;

- c. Reset, repair and/or replacement of all associated roof flashings, including those located at roof curbs, masonry walls, parapets, plumbing vents, etc.

III. SCOPE OF WORK (cont.)

- d. Tear-off existing roofing materials, site cleanup and hauling away, including all dump fees;
- e. Removal and replacement of all continuous ridge ventilators, where existent, with new prefinished aluminum, or shingle covered, continuous ridge ventilators;
- f. Installation of polystyrene attic rafter air vents (baffles), one between each truss/rafter space along eaves where none currently exist;
- g. Removal and replacement of deteriorated sections of gutters and downspouts, including replacement of missing components. **Note:** See *Separate Bid SB-5 for major replacement requirements*.
- h. Furnishing certificates of shingle manufacturer's warranty, and workmanship guarantee; and
- i. Other specific work as described herewith or required to complete the contract.

Note: The following descriptions of work (Repair/Reroofing/Total Tear-off and Replacement) are not intended to indicate the specific locations or the extent of roofing work to be performed, but to identify those conditions where roofing work is required. Refer to the applicable sections of these specifications for determining the roofing materials and procedures to be used.

B. REPAIR:

1. The term "repair" means the partial removal and replacement of a roofing system, or a section of roofing, or its components, as necessary: a) to eliminate or prevent roof leakage resulting from deteriorated, defective, missing, or improperly installed shingles, flashings, and/or roof accessories; or b) to remediate conditions of delamination and/or excessive warpage of the wood deck.
2. Also included is the partial replacement necessitated by an act of God, such as wind and/or hail damage, where the scope of replacement is determined in conjunction with the property owner's insurance carrier.

C. REROOFING:

1. The term "reroofing" means the application of new shingles over existing shingles.
2. Existing shingles in their present "as is" condition may be reroofed only if none of the conditions cited in para.D.2.b. below are determined by the contractor to exist. If one

or more of the conditions cited in par. D.2.b. exist, appropriate repairs must be made before the reroofing work is to commence.

D. TOTAL TEAR-OFF AND REPLACEMENT:

1. The term "total tear-off" means the complete removal of 100% of the shingles and underlayment so as to fully expose 100% of the existing roof deck.

III. SCOPE OF WORK (cont.)

2. Total tear-off and replacement is required, if:
 - a. The roof has been previously reroofed, i.e., two (2) layers of shingles already been applied; or
 - b. One or more of the following conditions exist over at least 25% of the roof's total surface or if, in the contractor's judgment, a total tear-off and replacement is less costly than the partial removal and repair:
 - 1) Delamination, buckling and/or curling of the shingles;
 - 2) Misalignment horizontally a differential of shingle placement in excess of 10 inches between roof eaves and ridge;
 - 3) Delamination of the roof deck panels; and/or
 - 4) Excessive buckling and/or warping of the plywood or pressed board roof deck--measuring 1/4 inch or more out of flatness in 4 feet--and unable to be secured flat and uniform relative to adjacent sheets using nominal 2" wood blocking placed within attic space and/or metal H-clips.

IV. PRODUCTS

A. ROOF SHINGLES:

1. Mandatory performance requirements:

Class A fiber glass shingles shall be at least 235 lb. per square with self-sealing tabs coated with a modified bitumen type sealing compound capable of initial tab sealing at 60 to 70°F. **Note:** Roofs having a pitch of 12" or greater will require shingles be of at least 300 lbs. per square. Fiber glass shingles shall comply with U.L. Class A fire resistance, and ASTM: D3018 Type I (self-sealing); D3161 (wind resistance); D3462 (tear strength); and E108 (Class A fire resistance).

Class C organic felt shingles shall be at least 250 lb. per square with self-sealing tabs coated with a modified bitumen type sealing compound capable of initial tab sealing at 60 to 70°F. **Note:** Roofs having a pitch of 12" or greater shall require shingles be of at least 300 lbs. per square. Organic felt shingles shall comply with

U.L. Class C fire resistance; U.L. 997 (wind resistance); ASTM D3161 (self-sealing); and CSA Standard A123.1-M1979.

2. Shingles shall be tested by U.L. and carry the specified fire and wind resistance labels as required by state and local codes--contractor is responsible for determining the minimum required shingle fire classification that is to be met, but which may be exceeded.
3. Shingles shall be three-tab square-butt type. Organic felt shingles and fiber glass shingles impregnated with asphalt shall be coated on the top surface only with ceramic granules for a 5" exposure--color selected to match original shingles.

IV. PRODUCTS (cont.)

4. Shingles shall be warranted by the roofing manufacturer for a minimum of 25 years (2 years full coverage with the remainder pro-rated).

B. ROOF DECK:

1. Replacement panels shall be Structural 1, C-D Interior APA plywood with exterior glue of thickness to match existing. Partial replacement panels shall span over a **minimum** of 3 rafters or truss chords.
2. The substitution of OSB or other wafer type sheathing is prohibited, except where an OSB type roof sheathing exists.

C. ROOFING FELT AND WATERPROOFING UNDERLAYMENTS:

1. Roofing felt Underlayment: 15 lbs. per square non-perforated asphalt-saturated roofing felt--apply as the general underlayment conforming to ASTM D 226.
2. Waterproofing Underlayment: 40 mil thick, cold applied, self-adhering membrane composed of high strength polyethylene film coated on one side with a thick layer of adhesive consistency rubberized asphalt covered with release paper. Celotex "WinterGuard" or W.R. Grace "Ice and Water Shield", apply as the eaves protection and in the valleys. Apply membrane in strict accordance with the membrane manufacturer's printed instructions. **Do not apply asphalt felts over this waterproofing membrane.**

D. METAL FLASHINGS:

1. General flashing: 26 gauge prefinished galvanized or aluminized steel.
2. Open valley flashing: 26 gauge - 32" wide (center inverted "V" or "W" break where metal flashing is exposed) prefinished galvanized or aluminized steel--lengths no less than 8 feet.
3. Step flashing: 26 gauge prefinished galvanized or aluminized steel 10" by 7" (or 2" wider than shingle exposure) bent for equal 5" vertical and horizontal legs. Step flashing at roof penetrations shall have 8" vertical leg and 4" horizontal leg.
4. Metal drip edge: Style "D" - 24 gauge, 1 1/8" roof edging and drip fabricated from bent prefinished aluminum. **Note:** *Install metal drip over underlayments at rakes, and under waterproofing membrane at eaves.*
5. Miscellaneous flashing: preformed and special, as required to flash to and/or around other roof penetrations and/or walls, shall be of 26 gauge prefinished galvanized or aluminized steel. Soil stack flashings of 2 1/2 lb. sheet lead or preformed polyvinyl shall be provided to replace defective flashings.

IV. PRODUCTS (cont.)E. CEMENTS AND SEALANTS:

1. Asphalt plastic roofing cement as recommended by roofing material manufacturer. Asphalt primer (cleaner/bonding agent) required at all masonry prior to applying cement. **Note:** *Do not place asphalt roofing cement in contact with waterproofing membrane underlayment at eaves or in valleys.*
2. Shingle tab cement as recommended by shingle manufacturer for additional shingle securement on steeper sloped roofs.
3. Sealant: Tremco "Dymonic" urethane caulk.

F. FASTENERS:

1. Nails shall be used in all cases for shingle application, or any substitution and use of staples thereof will constitute sufficient reason for rejection of the total installation. Nails, hot dipped galvanized or aluminum of 11 or 12 gauge, barbed or deformed shank with 3/8" to 7/16" diameter heads. Nails shall be 1 1/4" to 1 3/4" long to fully penetrate through a plywood deck, at least 1/8" (rehab roofs with 1x, or greater thickness, wood decks--use nails of sufficient length for full 3/4" penetration into wood).
2. Use of staples for shingle application is not permitted. Staples using a pneumatic or hammer gun is permitted in applying. Only the stapling of underlayment felts, the building-up of repair areas and the flattening of existing curled/warped shingles, when either or both of which precede reroofing work.

Use four (4) fasteners (nails) per shingle with the following exceptions: roofs which experience high winds or are considered to be a steep slope roofs will require six (6) fasteners per shingle placed in accord with NRCA and the shingle manufacturer's installation guidelines, or as otherwise recommended by the shingle manufacturer to maintain product warranty.

G. RIDGE VENTILATORS:

1. "Multi-pitch Filtervent" manufactured by Air Vent, Inc. (or equal), roll formed .032" prefinished aluminum or of durable molded high-impact co-polymer plastic (color fast) flexible but resists denting or cracking, net air flow 12 sq. inches (min.) per lineal foot, with weather filter to protect against infiltration of moisture, dust and insects. Provide as required manufactured components for ventilation at roof/wall junction, and shed roof peak conditions, etc. Factory finished in dark brown or black to blend with the roof shingle color.

H. RAFTER VENTS:

1. "Propervent/2", manufactured by Construction Products Division (or equal), semi-rigid polystyrene attic rafter vents. Staple to underside of roof sheathing at every truss space. Replacement of existing rafter vents is not required.

V. APPLICATION PROCEDURES

A. PREPARATION:

1. Inspect all existing roof surfaces for conditions of loose, curled, lifted, buckled (warped) or broken shingles; loose, damaged or missing flashing; loose or protruding nails and/or staples. Based on the intended scope of work, make all repairs necessary to correct conditions in a manner acceptable to the roofing materials manufacturer and good roofing practices.
2. Inspect all existing roof trim boards and roof deck for loose or split members, or members that show signs of delamination, deterioration, rotting, or excessive warpage or splitting. Re-nail loose trim boards and decking, and repair or replace same where any condition of splitting, delamination, rotting, or warpage is excessive.
3. Inspect all masonry, at its juncture with the roof, for required flashing or counterflashing replacement. Furnish and install as required and specified herewith.
4. Inspect all gutters and downspouts. Clean and/or replace, and realign as required for proper draining. Replace all missing gutter and downspout accessory components.
5. Inspect attic framing members, soffit and roof vents for abnormal or failing conditions. Identify and correct all noted deficiencies. Where replacement of existing ridge ventilators is required, inspect deck openings at ridge to ensure that the required 1 1/2" minimum clear opening is provided -- saw cut roof deck where required to provide the optimum clear opening.
6. Inspect attic for signs and location(s) of roof leakage to determine scope of required shingle, flashing, etc. replacement. Make all needed repairs.
7. Inspect attic for presence/absence of a rafter vent within every rafter/truss space and the lack of light along soffit length indicating clogged (closed) air passages. Clear passages and install a polystyrene rafter vent within every space where none exists.
8. Inspect operation of mechanical roof ventilators. Verify both the presence and proper operation of high temperature and humidistatic controls. Inform owner of any inoperative ventilator conditions and/or of the absence of controls. **Note:** *In some earlier constructed WHEDA financed projects humidistatic controls were not provided. Submit as a part of the bid, in the space provided, the cost for the correction of those conditions found and/or for the addition of humidistatic controls.*
9. During cold weather application of shingles, allow for expansion of shingles during warm temperatures to prevent buckling (appearance of fish-mouth). Conversely warm weather application of shingles require full contact at shingles butt ends.
10. General shingle installation requirements:

- a. Head lap to be no less than 6", exposure 5" minimum.
- b. Double shingles at eaves and cornices. Provide specified heal lap and lay shingles to an even line with joints breaking.

V. APPLICATION PROCEDURES (cont.)

- c. Full shingle to receive at least four (4) nails; 1" from each end and one (1) nail about 5" on each side of center cut-out.
- d. Extend shingle beyond metal drip edge 1/4" to 3/8" along eaves and 1/2" beyond metal edging at the rake. Cutting off excess shingle material flush with metal edging is not permitted and will be just cause for rejection at work.

B. REPAIR APPLICATION PROCEDURES:

1. Where partial removal of existing roofing is required to accommodate limited shingle replacement, remove all shingles within the affected area(s). If leaking has occurred within the affected area(s), overlay new 15 lb. felts over existing felts--cement all laps, edges, and ends. Install new shingles matching the composition, color and tab alignment of the existing shingles.
2. Where excessive deterioration of eaves construction, caused by ice dams, is found, and/or where reported leaks have been occurring along interior surfaces at exterior walls, the following method of eaves flashing shall be provided:
 - a. Remove existing shingles starting at the eaves edge then proceed upward to a line parallel to and at least 24" past the inside face of the exterior wall. Cut the existing felt underlayment along a line 18" past the inside face of the exterior wall--this will provide a minimum 6" wide strip (flap) of existing felt underlayment exposed below the remaining shingles. Remove the felt underlayment starting from the cut line down to eaves to expose wood deck. Temporarily fold back the 6" flap of exposed felt underlayment over the remaining shingles directly above.
 - b. Apply the self-adhering waterproofing membrane directly to the bare (exposed) wood deck. Apply the membrane parallel to the eaves starting from the bottom edge of the deck--overlapping the metal drip edge installed along the eaves--then continuing upward to a line parallel to and at least 24" past the inside face of the exterior wall. Lower the previously folded back 6" flap of existing felt underlayment, overlapping the newly applied membrane approximately 6". Using a non-solvent based cement, continuously cement along the resultant overlap and all end laps to ensure a waterproof installation. Apply metal drip edges over the underlayments along each rake.
 - c. Apply new shingles matching the composition, color, and tab alignment of the existing shingles.

C. REROOFING APPLICATION PROCEDURES:

1. Where total removal of old shingles is not required, apply new shingles directly over existing shingles. Where partial removal of old roofing is required to make deck or flashing repairs, apply asphalt underlayment felt over roof deck adequately lapping all edges of the underlayment. Fill-in area with reclaimed or new shingles to raise repaired area up to level of adjoining roof surfaces. Broom roof surfaces and valleys to remove all debris before commencing reroofing.

V. APPLICATION PROCEDURES (cont.)

2. Underlayment felt shall be applied only over existing shingles at areas known to have leaked. Verify location(s) of leakage during inspection of attic.
3. The application of new shingles over existing shingles shall commence after required deck repairs, underlayment work and shingle patching have been completed. Based on the use of three-tab, square-butt shingles applied so that all cutouts are centered over the tabs in the course below, the following application guideline is provided:
[Contractor is to make required lateral adjustments to avoid alignment of nailing points and ends of shingles between the new and the existing.]
 - a. Starter Course: After removing 3" from the end of the first shingle, cut off tabs and upper portion of the shingle so that the remainder is slightly greater in width than the exposure at the first row of existing shingles at the eaves. Starter course shall abut upper course shingle and extend 1/4 to 3/8 inch beyond the metal drip edge at both eaves and rake. Set starter course (strip shingle) in full bed of asphalt plastic cement along eaves.
 - b. First Course: Cut off head of a full shingle as required (normally 2" when the existing shingle exposure is 5") so shingle fits tight to the butts of existing third course while extending 1/4 to 3/8 inch beyond the metal drip edge at the eaves and rake (the same as was required for the starter course). Start at rake with full-width shingle.
 - c. Second through Fourth Courses:
 - The SECOND course should be started with a shingle from which 6" have been cut.
 - The THIRD course should be started with a shingle from which the entire first tab has been cut.
 - The FOURTH course should be started with a one-half shingle.
 - d. Repeat application cycle every fifth course starting with a full-width shingle. Always place top edge of new shingle against butt end of existing shingles in course above.
 - e. **SPECIAL REQUIREMENT:** For steep slope roofs; i.e., where the roof pitch exceeds 45° or 12" per foot, secure each shingle with six (6) fasteners and apply a dab of shingle tab cement under each shingle tab at the time each shingle is installed. Upon installing each shingle, press down each shingle tab to disburse cement to secure to underlying shingle.

D. TOTAL TEAR-OFF AND REPLACEMENT APPLICATION PROCEDURES:

1. Remove all existing roofing (shingles and underlayment felts).
 - a. Expose only that portion of the roof deck that is able to be repaired and recovered with 15 lb. asphalt felt underlayment before leaving the project at the end of the

work day. Remove shingles starting at ridge working downward towards eaves taking care not to damage old metal flashings that may need to be used as patterns for the fabrication of replacement flashings.

V. APPLICATION PROCEDURES (cont.)

- b. Broom roof surfaces and valleys to remove all debris before commencing underlayment application.
2. Apply new underlayment felt/waterproofing membrane over exposed decking. Based on the use of a waterproofing membrane at eaves and valleys, and 15lbs. asphalt-saturated felts as general underlayment.
 - a. Eaves Protection: Remove all dirt and dust from the deck. After applying a new metal drip edge along the eaves, apply the self-adhering waterproofing membrane underlayment directly to the bare wood deck. Apply the membrane parallel with the eaves starting from the lower edge of the deck (overlapping the metal drip edge) then extend membrane up the deck to a line parallel with, and at least 24" past, the inside face of the exterior wall. Overlap sheets in a manner so as to shed water. All end laps to be a minimum of 6". Press all lap joints firmly with a roller to insure a waterproof installation. Stagger the end laps a minimum of 2 feet apart from course to course.
 - b. Valley Underlayment: Remove all dirt and dust from the deck surface at the valley. Apply the self-adhering waterproofing membrane underlayment to the bare wood deck. Starting at the bottom of the valley, apply the 36" wide (full-width) membrane up the center of the valley. Refer to par. E.2.b. below for the lapping and application requirements for the underlayment asphalt felts which intersect the valley.
 - c. General Underlayment: Apply over the remainder of the exposed roof deck a double layer of 15lb. asphalt-saturated (non-perforated) felt. Overlapping the eaves protection membrane 6", start with a 19" wide starter sheet applied parallel with the eaves. Then apply a full-width sheet over the starter sheet, again overlapping the eaves protection membrane 6". Succeeding sheets should be lapped 19" over the preceding sheet leaving a 17" exposure. Lay all felts parallel to eaves overlapping in a manner so as to shed water. End laps are to be a minimum of 6" and are to be staggered 6 feet apart from course to course. Felts are to be backnailed under the laps only as necessary to hold the felts in place until the shingle roofing material is applied. Laps (felt to felt) may be sealed with plastic asphalt cement as required. **Note:** *The lap where the felt overlaps the eaves waterproofing membrane is to be continuously sealed with a non-solvent based cement such as a silicone or acrylic sealant.*
 3. New shingle application. Based on the use of three-tab, square-butt shingles, applied so that all cutouts are centered over the tabs in the course below, the following guideline is provided:

- a. Starter Course: Apply a row of either shingles or a 9-inch (or wider) starter strip of 90# mineral surfaced roll roofing along eaves extending 1/4 to 3/8 inch beyond the metal drip edge at both the eaves and rake. If self-sealing shingles are used for the started course, the exposed (tab) portion of the shingle and 3" off the end of the shingle should be removed. Set starter course in full bed of asphalt cement.

V. APPLICATION PROCEDURES (cont.)

- b. First Course: Should be started with a full-width shingle over the starter course so it extends (the same as the starter course below) beyond the metal drip edge at both the eaves and the rake 1/4 to 3/8 inch.
 - c. Second through Fourth Courses:
 - The SECOND course should be started with a shingle from which 6" have been cut.
 - The THIRD course should be started with a shingle from which the entire first tab has been cut.
 - The FOURTH course should be started with a one-half shingle.
 - d. Repeat application cycle every fifth course starting with a full-width shingle.
 - e. **SPECIAL REQUIREMENT:** For steep slope roofs; i.e., where the roof pitch exceeds 45° or 12" per foot, secure each shingle with six (6) fasteners and apply a dab of shingle tab cement under each shingle tab at the time each shingle is installed. Upon installing each shingle, press down each shingle tab to disburse cement to secure to underlying shingle.
 - f. Apply shingles along ridge straight and uniform in "Boston Ridge" fashion, in accordance with shingle manufacturer's instructions where power ventilators exist. Cement ridge shingles to underlying shingles.
 - g. Install new replacement ridge ventilators, in lieu of a Boston Ridge, wherever ridge ventilators were previously installed. Recut wood deck at ridge ventilator locations wherever inadequate clear air passage space exists.
4. Place nails in strict accordance with shingle manufacturer's written instructions. Do not readjust shingle after placement of 2 nails--remove all nails, patch holes and reinstall shingle placing nail near, but not in, old nail holes.

E. VALLEY FLASHING:

1. Replacement of valley flashings is mandatory for "Tear-off and Replacement", but is only required for "Repair" and "Reroofing" where leakage occurs within a valley and/or in the judgment of the contractor replacement is warranted to extend the life of the total roofing system equal to the warranty life of the shingles (remaining warranty life in the case of repairs).

2. Where the previously applied valley underlayment is a self-adhering waterproofing membrane, substitute mineral-surfaced roll roofing in lieu of felts.
3. Valley Re-flashing Preparation: Valleys shall match type existing (open or closed) unless otherwise specified herewith. Roof valleys shall be prepared as follows:
 - a. If reroofing is required and the existing roof has an open valley, build up the depressed valley area with 90# mineral surfaced roll roofing flush with adjoining roofing before installing new valley materials.

V. APPLICATION PROCEDURES (cont.)

- b. If total removal of existing roofing is required, remove existing valley flashing and underlayment to expose wood deck. Repair and/or replace any failed decking, then apply a 36" wide (full-width) self-adhering waterproofing membrane up the center of valley. Start membrane application at the bottom of valley and work upwards, overlapping membrane sheets 6" at lap joints. Trim horizontal courses of felt to overlap valley strip 6"--cement lapping felts entire length of valley using the non-solvent non-asphaltic cement. Complete open, woven or closed cut valleys as specified herein.

4. Open Valley Installations: Open valleys may be of either exposed mineral-surfaced roll roofing or sheet metal. Refer to par. 3. Valley Re-flashing Preparation: above.

- a. Mineral-Surfaced Roll Roofing Valley: Apply 18" wide 90# mineral surfaced roll roofing (face side down) centered in valley and trimmed flush with eaves drip edge. Using only enough nails to hold the sheet smoothly in place, apply second layer of 90# mineral surfaced roll roofing 36" wide,(face side up) centered in valley over first strip and trimmed at the eaves. Starting at eaves, lap each successive sheet 12" over so as to shed water; embed each lap in asphalt plastic cement.
- b. Sheet Metal Valley: Using only enough nails to hold the sheet smoothly in place, apply a 36" wide layer of 15lb asphalt-saturated (non-perforated) felt over the previously applied underlayment; center on valley and trim at eaves. Starting at eaves, lap each successive sheet 12" over so as to shed water; embed each lap in asphalt plastic cement.

Then install the 32" wide metal valley flashing by securing both sides to decking with metal receiver cleats placed 8" to 12" o.c.--do not nail directly into metal valley flashing. Starting at eaves, lap each successive piece 6" over so as to shed water. Trim at eaves.

- c. Snap two chalk lines, for shingle termination, starting at the ridge 3" out from each side of valley center and diverging outward 1/8" per foot down valley to metal drip edge, then:
 - 1) Measure and cut shingles to a chalk line. To prevent damage to the valley flashing, do not cut shingles after they are installed.
 - 2) At each cut edge in the valley, trim an inch off upper corner of each shingle on a 45° angle to direct water into valley.
 - 3) Spot cement each shingle to the valley flashing and to shingle below in a 4" bed of asphalt plastic roofing cement. Do not nail into metal valley flashing.

5. Closed Cut Valley Installations: Refer to par. 3. Valley Re-flashing Preparation: above.

- a. Using only enough nails to hold the sheet smoothly in place, apply a 36" wide layer of 15 lb. asphalt-saturated (non-perforated) felt over the previously applied

V. APPLICATION PROCEDURES (cont.)

underlayment; center on valley and trim at eaves. Refer to par. 4.b. Open Valley Installations: for lap joint requirements.

b. Apply shingles for closed cut valley as follows:

- 1) Apply first course along eaves of one intersecting roof plane and across valley extending up adjoining roof for a distance of no less than 12".
- 2) Apply succeeding courses in same manner as first course.
- 3) Pressing shingles firmly into valley, nail using normal shingle fastening methods, except that 1) no fasteners shall be placed within 6" of valley's center line, and 2) two fasteners shall be placed at the end of each shingle crossing the valley.
- 4) Apply shingles on adjoining roof plane (opposite side of valley) starting along eaves and crossing the valley onto the previously applied shingles. Snap chalk line no less than 2" back from valley center line and trim shingles to the line to ensure a neat installation.
- 5) Trim one inch on a 45° angle from upper corner of each shingle to direct water into valley.
- 6) Finally, embed each trimmed shingle end in a 4 inch wide strip of asphalt plastic cement.

6. Woven Valley Installations: Refer to par. 3. Valley Re-flashing Preparation: above.

a. Using only enough nails to hold the sheet smoothly in place, apply a 36" wide layer of 15 lb. asphalt-saturated (non-perforated) felt over the previously applied underlayment; center on valley and trim at eaves. Refer to par. 4.b. Open Valley Installations: for lap joint requirements.

b. Apply shingles for woven valley as follows:

- 1) Apply first course along eaves of roof area at the right-hand side up to and across valley extending up adjoining roof for a distance no less than 12".
- 2) Then from the left-hand side apply first course along eaves of intersecting roof plane up to and across valley over top of shingles already crossing valley. Extend onto roof plane no less than 12" beyond the valley center.
- 3) Apply successive shingle courses alternately as described above, weaving the shingles into the valley and over the preceding shingle.

Pressing shingles firmly into valley, nail using normal shingle fastening methods except, that: 1) no fasteners shall be placed within 6" of the valley center line, and 2) two fasteners shall be placed at the end of each shingle crossing the valley.

V. APPLICATION PROCEDURES (cont.)F. MISCELLANEOUS FLASHINGS:

1. Flashing against vertical sidewall:
 - a. Step flashings shall remain--repair and replace as required to maintain flashing protection.
 - b. Align top edge of new shingle against butt edge of existing.
 - c. Trim new shingles to within 3/8 inch of the vertical face of any existing step flashing. Embed the last 4 inches of the end shingle of each course in asphalt plastic cement.
 - d. Run a continuous caulk bead of cement between new shingle and sidewall flashing.
2. Install new preformed or reclaimed soil stack and vent pipe flashings when opening falls within new shingle. Set flashing in mastic and resume shingling. Cut shingles in successive courses to fit around pipe allowing 3/8 inch clearance between shingle cut and flashing. Embed shingles in asphalt plastic roofing cement. Lower flange of flashing shall overlap lower shingles. Seal flashing to stack or vent with urethane caulk.
3. Flashings around chimney and roof curbs:
 - a. Where not already provided, construct new cricket (wood saddle) at high side (rear) of items projecting through roofs that are 20" or wider.
 - b. Apply underlayment felt and shingles up to front edge before flashing.
 - c. Where masonry is to be flashed apply a coat of asphalt primer to seal surfaces to provide adhesion of asphalt plastic cement.
 - d. Install metal base flashing around all sides. Lower section to be embedded in cement, and to extend at least 4 inches horizontally over shingles and 12 inches vertically up surface.
 - e. Install metal step flashing at sides. Secure to deck with nails and vertically with cement to masonry.
 - f. Cut and bend flashing over cricket and to back of chimney/curb extending onto roof surface and up vertical faces at least 8 inches in both directions.
- g. Rake out mortar joints 1 1/2 inches, to receive metal cap flashing. Refill joint with portland cement mortar. Bend flashing down over base flashing and make weathertight within urethane sealant.

VI. FINAL REQUIREMENTS

- A. Protect all surfaces against damage. Upon completion, clean all adjacent surfaces soiled by the roofing work.
- B. These are occupied buildings--exercise extreme care. Provide all barricades necessary to protect the residents during the construction activities.
- C. At the end of each working day, remove all portable tools, etc., which may constitute a potential hazard to the tenants, or an attractive nuisance. Upon completion of the work, remove all remaining debris, barricades, tools, and equipment from the site.
- D. Make all repairs to landscaping and building components damaged in the performance of the reroofing work, including but not limited to: repairs or replacement of sod, trees, concrete, paving, building surfaces, incidentals or equipment attached to or detached from project. Use of plywood sheets and wood planking to prevent rutting of lawn is highly recommended.

VII. SEPARATE BIDS**SB-1. POWER ATTIC VENTILATORS:**

- a. Provide attic ventilation fan(s) within each smoke compartment of each attic space. Fans shall be equipped with Hi-Low temperature thermostats, including humidistat controls. The ventilators shall be properly sized to exhaust at least 1.5 cfm of air per each square foot of floor area within each respective compartmentalized attic space. Controllers shall incorporate reverse-acting thermostat and thermal protection.
- b. The bid shall reflect the total cost of removing defective units and providing new power ventilator units sized to the capacity required in par. a. above, and electrically energized, controlled by a high temperature controller and a variable setting humidistat controller, to properly ventilate each attic compartment.

SB-2. POWER ATTIC VENTILATOR CONTROLLERS:

- a. Furnish and install a variable setting humidistat controller at each of the existing power ventilators that are functional and equipped only a thermostatic controller.

SB-3. RIDGE VENTILATOR REPLACEMENT:(For "Repair" work bids only. The cost of replacement shall be included in the base bid for all "Reroofing" and "Total Tear-off and Replacement" bids.)

- a. Where existing ridge ventilators appear to be heavily damaged or otherwise ineffective, the ridge ventilators shall be removed and replaced. See par. IV. PRODUCTS, G. Ridge Ventilators: for specifications.

VII. SEPARATE BIDS (cont.)

SB-4. SUPPLEMENTAL ROOF VENTS:(Bid only where roof vents already are installed, but not in sufficient numbers.)

- a. Provide a sufficient number of new roof vents to equal one (1) square foot of free air venting for every 300 square feet of attic floor surface within each given area and between fire walls. Install vents in upper third (1/3) of roof on same roof plane as other miscellaneous roof caps. Install vents in roof away from view from street or interior courts. Match existing in style.
- b. Spinner roof ventilators are not permitted for this use.

SB-5. GUTTER/DOWNSPOUT REPLACEMENT:

- a. Where existing gutters or downspouts are deficient; i.e., require more than minor repair or are missing altogether, replacement shall be provided as specified below.
- b. Gutters/downspouts shall match existing color and style where practical. Gutters shall be seamless, and minimally must be 5" type prefinished aluminum, 0.032" thickness. Provide all hangers, straps, elbows, and apron. All joints shall be caulked and riveted. Provide additional downspouts, where required, to ensure positive gutter drainage.
- c. Provide a precast or preformed spill block at every new downspout installation.

End of Section 07310

Shingle Roofing Maintenance and Replacement Specification

SHINGLE ROOFING BID FORM

(All work in accordance with WHEDA Shingle Roofing Maintenance and Replacement Specification 07310/SRMRS/04/98)

This form must be fully completed and attached to all roofing and ventilation proposals submitted for WHEDA-financed projects, even though the information required herewith may be a part of the contractor's standard bid form. Failure to provide the required information will be sole cause for bid rejection.

Project Name _____ WHEDA No. _____

Location(s) _____

Building Address(s) _____

Owner/Contact _____ Tel. No. (____) _____

Roofing Contractor's Name _____

Address _____ Zip Code _____

Contact Person _____ Tel. No. (____) _____

TYPE OF SHINGLE ROOFING BID: (Complete all required bid information below; if none, write "NONE".)

REPAIR

REROOFING

TEAR OFF

A. Shingle Manufacture: _____

Type	Weight	Style	Fire -rated(Class)
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Note: Contractor assumes full responsibility for replacing existing shingles with shingles of equal fire-resistance (class) rating.

B. Type of valley flashing:

Existing	Valley Type in Bid	Lineal Feet
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C. Steep Slope Roofs: Do conditions exist which require inclusion in Bid of special material or applications for steep slope roofs? NO YES

D. Other Existing Roofing Systems: Does Bid include the repair or replacement of another type of roofing system: i.e., built-up asphalt, modified bitumen, or applied single-ply membrane, please identify type:

NOT IN BID YES _____
Other Type of Roofing System Present

E. Bid Components and Estimated Quantities included in the Base Bid are:

1. Total surface area of all shingled roofs: _____ Sq. Ft.
2. Total roof surface area to be replaced: _____ Sq. Ft.
3. Continuous Ridge Vent to be installed: _____ Ln. Ft.
4. Prefinished metal drip edge to be replaced: _____ Ln. Ft.
5. Number of roof sheathing panels (4' x 8') to be replaced: _____ Panels
6. Polystyrene vent baffles between rafter to be installed: _____ Pieces
7. Minor replacement of: Gutters _____ Ln. Ft.; Downspouts _____ Ln. Ft.

TOTAL BASE BID AMOUNT \$ _____

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Authorized Contractor's Signature, Title

Date

(Contractor must complete BF 2 of 2: UNIT PRICES, SEPARATE BID AND REFERENCES)

ADDING ALTERNATES TO SHINGLE ROOFING BASE BID

I. UNIT PRICES: (Mandatory contractor complete the following for work not included in the base bid.)

A. Removal and replacement of wood roof sheathing: \$_____/Sq. Ft. (Minimum replacement section for plywood, 4'x 4' where trusses @ 24" o.c. and 4'x 2'-8" rafters @ 16" o.c.)

B. Remove and replace existing defective shingles: \$_____/Sq. Ft.

II. SEPARATE BIDS: (Contractor shall complete for work specified under paragraph VII., which at the option of the owner, may be added to the scope of the contract work.)

SB-1. POWER ATTIC VENTILATORS

Add \$_____ to provide _____ new power ventilators, as manufactured by _____, model no. _____, rated _____ cfm each.

SB-2. POWER ATTIC VENTILATOR CONTROLLERS: (To supplement existing thermostat.)

Add \$_____ to provide _____ new humidistats, as manufactured by _____, model no. _____.

SB-3. RIDGE VENT REPLACEMENT: Separate bid for Repair Work only.

Add \$_____ to provide _____ lin. ft. of new ridge ventilators, as manufactured by _____, model no. _____.

SB-4. SUPPLEMENTAL ROOF VENTS: (To provide the minimum required attic ventilation.)

Add \$_____ to provide _____ new matching attic vents, as manufactured by _____, model no. _____.

SB-5. GUTTER/DOWNSPOUT REPLACEMENT: (For major replacement/new installations.)

Add \$_____ to provide _____ lin. ft. of gutters and _____ lin. ft. of downspouts, as manufactured by _____.

III. REFERENCES LISTING:

List three references for work completed at least eighteen (18) months to five (5) years prior to date for this bid for owner's review. Failure to provide the following information will be sole cause for rejection of bid.

A. Project Name: _____ Location: _____

Contact Person: _____ Tel. No. (____) _____

B. Project Name: _____ Location: _____

Contact Person: _____ Tel. No. (____) _____

C. Project Name: _____ Location: _____

Contact Person: _____ Tel. No. (____) _____