

SECTION 07 31 13

ASPHALT SHINGLE ROOFING

PART 1 – GENERAL

1.1 PURPOSE

- A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

- A. **Class 4 System – At least 4 components must be Class 4.**
- B. **Air-driven fastener’s pressure must be regulated to not go through shingles, just driven home instead.**

1.3 SECTION INCLUDES

- A. Asphalt shingles
- B. Asphalt shingle underlayment and accessories

1.4 RELATED WORK

- A. Section 06 10 00 – Rough Carpentry
- B. Section 07 62 00 – Sheet Metal Flashing and Trim

1.5 REFERENCE STANDARDS

- A. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual; current edition.
- B. Underwriters Laboratories (UL)
 - 1. Roofing Materials and Systems Directory; current edition.
 - 2. Fire Resistance Directory; current edition.
 - 3. UL 2218 -Impact Resistance of Prepared Roof Covering Material; current edition.
- C. ASTM D1970 - Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; current edition.
- D. ASTM D3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method); current edition.
- E. ASTM D3462 - Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules; current edition.
- F. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos Free; current edition.
- G. ASTM D4869 - Standard Specification for Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing; current edition.
- H. ASTM D6757 - Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products; current edition.

1.6 SUBMITTALS

- A. See Division 01 for submittal procedures.
- B. Prior to pre-roofing meeting, submit the following:
 - 1. Manufacturer's Certification: Letter from manufacturer, on letterhead, and signed by authorized representative, stating:
 - a) Materials and components conform with ASTM D3462 and that materials furnished are compatible.
 - b) Asphalt shingles with underlayment over roof deck meet UL Class A Fire Resistance.
 - c) Asphalt shingles attached according to this Section meet ASTM D3161 Class F wind resistance.
 - d) Asphalt shingles and underlayment over roof deck qualifies for specified warranty.
 - e) Installer is authorized to install manufacturer's warranty roof systems minimum five (5) years prior to the Project NTP.
 - 2. Sample manufacturer, and installer, warranties meeting Specification requirements.
 - 3. Product Literature: Submit product literature on roof system and accessory components.
 - 4. Shop drawings.
- C. Roof Protection Plan: Submit written roof protection plan for A/E and Owner approval that describes type and layout of roof protection during construction activities on or above roof area.
- D. Pre-Roofing Meeting Notes: Submit Pre-Roofing Meeting Notes within 5 business days of meeting date.

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- E. Manufacturer's Field Reports: Submit copies of manufacturer's field reports to A/E during the Work, and at final completion.
 - F. Shop drawings: Submit shop drawings for approval prior to Pre-roofing Conference and start of Work. Include the following Drawings:
 - 1. Roof Plan(s): Prepare scaled roof plan locating roof details and penetrations.
 - 2. Location and type of penetrations. Illustrate edge, wall, vent curb and penetrations flashing. Scale details at 1½" or larger. Manufacturer's standard pre-printed details are not acceptable for shop drawings.
 - 3. Indicate deck type on each drawing.
 - 4. Indicate location of proposed staging areas and material storage on site plan.
 - G. Product data:
 - 1. Submit manufacturer's data sheets for each product being installed. Include manufacturer's installation instructions.
 - 2. Material Safety Data Sheets: Provide manufacturer's MSDS information for all materials proposed for use.
 - 3. ASTM Compliance Sheet: Submit product material list with corresponding ASTM standard(s) each product complies with. Include Specification paragraph reference number that relates to each product.
 - 4. Asphalt shingle color sample board. Provide to A/E for color selection prior to ordering asphalt shingles.
 - 5. Board Insulation products: Submit manufacturer's data sheets for each component required including venting method, insulation board, fasteners and accessories. Provide roofing system manufacturer's written acceptance of proposed venting method, insulation, fasteners, and procedures for installation. Coordinate with Section 07 22 16.
- 1.7 QUALITY ASSURANCE
- A. Installer: Company specializing in performing the work of this Section and approved by roof manufacturer for installation of specified roof system.
 - B. Minimum 5 years documented successful experience with asphalt shingle roofing.
- 1.8 REGULATORY REQUIREMENTS
- A. Fire Resistance:
 - 1. UL Class A Fire Hazard Classification
 - 2. UL Roof Ceiling Assembly Rating
 - B. Wind Uplift Resistance: design and certify that asphalt shingle roofing meets wind uplift loads as shown on Design Documents.
 - C. Hail Resistance – UL 2218, Class 4 (2 inch diameter hail test)
- 1.9 TOLERANCES
- A. Comply with tolerances listed in this Section.
 - B. Where tolerances are not expressly stated in these Specifications, or by the manufacturer, perform Work within tolerances specified in the NRCA Roofing and Waterproofing Manual.
- 1.10 PRE-ROOFING CONFERENCE
- A. Schedule meeting to discuss roof Work before start of work onsite. Notify attending parties prior to commencing work of this Section.
 - B. Pre-roofing conference attendees shall include Owner, A/E, A/E's roofing consultant, General Contractor representatives, roofing subcontractor project manager and superintendent/foreman, related subcontractors and roof manufacturer's technical representative.
 - C. Review Specifications, Submittals, installation procedures and coordination required with related Work. Agenda shall include:
 - 1. Schedule of daily roofing operations and daily production anticipated.
 - 2. Designation of key personnel and their respective responsibilities.
 - 3. Review of staging and material storage locations.
 - 4. Coordination of work with other trades.
 - 5. Emergency rain protection procedures.
 - 6. Protection of completed roofing and Roof Protection Plan.
 - 7. Manufacturer's scheduled inspections and acceptance procedures.
 - 8. Warranty period process for leak repairs and inspections.
- 1.11 DELIVERY, STORAGE AND HANDLING
- A. Deliver, store, and handle products according to manufacturer's recommendations.

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- B. Deliver products in original containers, dry, undamaged, with seals and labels intact.
- C. Storage:
 - 1. Roof-top storage of weather-sensitive material is not permitted. Material stored overnight on roof-top will be considered defective.
 - 2. Store weather-sensitive products in enclosed storage trailers. Or if site conditions do not allow storage trailers,
 - a) Store weather-sensitive products on pallets, clear of ground, and cover with secure breathable canvas tarps. Or if site conditions do not allow site storage,
 - b) Store weather-sensitive products in an enclosed warehouse, or in storage trailers off-site. Deliver products in quantity that can be used each day, without roof-top storage. Products must be returned to warehouse, or storage trailer, each day.
 - 3. Store roll goods on end. Do not use rolls with damaged ends. Cut and remove portion of roll damaged, and use undamaged portion.
- D. Store related materials, within temperature ranges, recommended by the manufacturer(s) of each product.

1.12 ENVIRONMENTAL REQUIREMENTS

- A. Comply with manufacturer's environmental requirements for storage and application of products.
- B. Verify existing and forecasted weather conditions and determine when conditions are acceptable for roof Work within the guidelines as follows:
 - 1. Do not proceed with work when ambient air temperature falls below 40 ° F.
 - 2. Do not proceed with roof application when excessive moisture is present.
- C. Do not expose materials sensitive to water, or sunlight, damage in quantities greater than can be weatherproofed during each day.

1.13 COORDINATION

- A. Coordinate Work with installation of associated metal flashings as the Work of this Section proceeds.

1.14 INSPECTION BY MANUFACTURER

- A. Coordinate inspection of the Work, by an authorized technical representative of the asphalt shingle manufacturer.
 - 1. Manufacturer is required to inspect work a minimum of three (3) visits per Project.
 - 2. Manufacturer's visits to consist of:
 - a) Attendance at Pre-Roofing Meeting
 - b) One visit at Project commencement
 - c) Interim visits for each 10 work days of roof work, and one visit at Project completion
- B. Provide manufacturer's field inspection reports within five days of each site visit.

1.15 ASPHALT SHINGLE MANUFACTURER WARRANTY

- A. Provide manufacturer's ten (10) year asphalt shingle material and workmanship warranty. Warranty shall include material, labor, disposal and other associated costs to repair or replace asphalt shingles due to workmanship or material deficiencies.
- B. Provide manufacturer's thirty (30) year asphalt shingle material warranty. Warranty shall include manufacturer providing replacement shingles for defective materials, including shipping and delivery costs.
- C. Warranty shall be issued on the manufacturer's form as submitted by Contractor and reviewed by A/E.
- D. If special maintenance of the roof is required by the manufacturer during the Warranty term(s), such requirements shall be provided to the Owner with the Warranty.

1.16 INSTALLER WARRANTY

- A. Roof Installer Warranty: provide two (2) year installer warranty under provisions of Division 01.
- B. Provide on Midwest Roofing Contractors Association Form 2002B - Roofing Contractor Workmanship Warranty. Warranty shall be issued on form submitted, and reviewed, prior to Work commencement.
- C. Installer Warranty to be co-signed by General Contractor.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Roof System: plywood roof deck, board insulation as specified in Section 07 22 16, one ply underlayment and asphalt shingles.
- B. Obtain written approval from asphalt shingle manufacturer for use of products incorporated into roof

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system, which are not supplied by asphalt shingle manufacturer.

C. Substitutions:

1. Where specific products are listed in this Specification, the referenced roofing manufacturer's systems are to establish a level of quality.
2. Requests for substitutions to listed products shall be submitted during the bidding phase per requirements of Division 01.
3. Consideration of requests for substitution is at the sole discretion of the A/E and Owner, and approvals shall be issued in writing by the A/E with Owner concurrence.

2.2 MATERIALS

- A. Field Shingles: ASTM D3462, UL Class A, minimum 300 pounds per 100 square feet, fiberglass reinforced, laminated, algae and fungus resistant coating. Color chosen by A/E.
- B. Starter Shingles: as supplied by, or specially recommended by asphalt shingle manufacture, meeting warranty requirements.
- C. Ridge and Hip Shingles: match color of field shingles, heavyweight, as supplied by, or specially recommended by asphalt shingle manufacture, meeting warranty requirements.
- D. Underlayment: ASTM D4869, Type II, No. 15, non-perforated, asphalt-saturated organic felt. Verify underlayment necessary for shingle roof warranty and Project requirements. Revise this underlayment reference if ASTM D6757, or ASTM D1970, or other type of underlayment is utilized – coordinate with self-adhering underlayment requirements (see below).
- E. Self-Adhering Underlayment: ASTM D1970, self-adhering rubberized asphalt membrane, as provided by, or specifically approved by asphalt shingle manufacture, meeting warranty requirements. Verify use – this product might be required in areas of slight slope, or other special areas. Consult with asphalt shingle manufacture to determine acceptable products and use(s). Delete this reference if not applicable. Part 1 & 3 of this Section includes product. Revise these paragraphs to indicate actual Project requirements.
- F. Shingle Nails: Hot-dipped galvanized, barbed roofing nails, minimum 3/8 inch head, of sufficient length to penetrate 1 inch into, or 1/4 inch through roof deck. Staples are not acceptable.
- G. Underlayment Fasteners: 1 inch roofing nails, as described above, through minimum 32 gage, 1 5/8 inch diameter tin tabs.
- H. Plastic Cement: ASTM D4586, non-asbestos reinforced, as supplied and recommended by asphalt shingle manufacturer.
- I. Sheet metal flashings: according to provisions of Section 07 62 00.
- J. Ridge Vent: as supplied by, or specifically approved by, asphalt shingle manufacturer, meeting warranty requirements.
- K. Board Insulation: Comply with requirements of Section 07 22 16.

PART 3 – EXECUTION

3.1 GENERAL

- A. Work of this Section shall be performed in accordance with quality workmanship standards as defined by NRCA. Detailing shall be performed in accordance with standards as defined by NRCA and SMACNA.
- B. Asphalt shingle manufacturer's technical specifications shall be considered a part of this specification and shall be used as a minimum standard in conjunction with this specification. If this Specification conflicts with, or exceeds manufacturer's minimum requirements the more rigid standard shall apply and be enforced.

3.2 COORDINATION

- A. Ensure proper sequencing of roofing and to allow installation of roof and flashings as detailed, without damage.
- B. Coordinate activities to prevent damage to roof assemblies.

3.3 EXAMINATION & PREPARATION

- A. Do not store, stage activities, or allow construction traffic over roof areas, unless protection plan is approved in advance by A/E.
- B. Contractor is responsible for maintaining roof in good condition and shall restore to manufacturer's warrantable state upon completion of activities.
- C. Verify that surfaces and site conditions are ready to receive Work. Verify that debris has been completely removed from roof area and broom clean the deck immediately prior to roofing application.
- D. Verify deck is sound, smooth, and dry enough for covering with roofing. Report decking not serviceable for covering with roof system.
- E. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, and wood components are in place.
- F. Construct and install decking, nailers and blocking under provisions of Section 06 10 00.

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3.4 TEMPORARY WATERPROOFING

- A. Provide water stops and temporary tie-ins daily to prevent moisture penetration into building interior or installed assemblies.
- B. Seal roofing temporarily to the deck where leakage could penetrate installed assemblies. Remove upon resumption of Work.
- C. Provide permanent, or temporary, counter flashing daily.
- D. Provide temporary seals which do not soil finished work surfaces or contaminate surfaces intended to receive sealants.
- E. Remove temporary seals from completed Work.

3.5 EXAMINATION OF SITE

- A. Inspect and verify pre-existing conditions and appearance of building surfaces, components and grounds. Submit findings prior to starting Work.
- B. Verify deck is clean, dry, smooth and ready to receive roofing.
- C. Verify sheet metal flashings are complete and installed in accordance with Sheet Metal Flashings 07 62 00.

3.6 BOARD INSULATION APPLICATION

- A. Comply with requirements of Section 07 22 16.
- B. Only install insulation that can be covered with watertight underlayment the same day.
- C. Protect installed insulation from damage, and moisture.
- D. Comply with asphalt shingle manufacturer's ventilation requirements above at areas to receive board insulation.

3.7 UNDERLAYMENT INSTALLATION

- A. Comply with shingle manufacturer's application instructions.
- B. Install one ply, shingle fashion, with minimum 12 inch endlaps.
- C. Fasten underlayment felt using asphalt shingle manufacturer-approved fasteners driven through metal discs.
- D. Fastening Pattern:
 - 1. Field: 18 inches on center staggered pattern
 - 2. Laps: 9 inches on center

3.8 SELF-ADHERED UNDERLAYMENT APPLICATION

- A. Install one ply of self-adhered underlayment at areas indicated on Drawings.
- B. Install self-adhered underlayment in areas required by asphalt shingle manufacturer for specified Warranty.
- C. Lap shingle-fashion with standard underlayment. Install underlayment according to manufacturer's recommendations.
- D. Do not allow excessive exposure before covering with asphalt shingles. Comply with manufacturer's exposure limits.

3.9 SHINGLE INSTALLATION

- A. Starter Shingles:
 - 1. Standard three tab starter: Neatly trim tabs from shingle, to allow self-sealing strip to be positioned at lower edge of roof. Trimming tabs is not necessary if manufacturer's provided starter strip has adhesive at bottom-edge.
 - 2. Fasten maximum 12 inches on center, in row 4 inches above bottom edge. Ensure minimum 5 inch staggering of laps and fasteners from joints in first course shingles above.
- B. Offset each shingle course, minimum 5 inches, in pattern recommended by shingle manufacturer to obtain desired aesthetic appearance. Ensure joints are staggered from previous course's fasteners.
- C. Neatly trim shingles at rakes. Do not use less than a 12 inch long shingle at rakes.
- D. Fasten shingles with 4 fasteners per shingle, evenly spaced, placement of fasteners recommended by the manufacturer. Do not fasten into, or above, factory-applied sealant strip. Remove and replace shingles with fasteners improperly placed.
- E. Drive fasteners flush, but do not cut into shingles. Remove and replace shingles damaged by improperly driven fasteners.
- F. Shingle exposure: 5 inches.
- G. Install shingles straight, with uniform exposure. Utilize chalk lines as necessary to maintain alignment. Remove and replace shingles improperly installed.

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- H. Prepare and fasten ridge shingles according to manufacturer's recommendations. Utilize chalk lines to provide straight application.
 - I. Prepare deck and install ridge vent according to manufacturer's instructions at locations indicated on Contract Documents. Verify ridge vent use.
 - J. Install vent and pipe flashings laced into shingles shingle fashion. Bed concealed flanges in bed of plastic cement. Fasten bottom edge with wood screws minimum 6 inches on center, and at each corner.
- 3.10 PROTECTION
- A. Remove debris, trash, and extra materials from grounds and roof areas daily.
 - B. Comply with submitted Roof Protection Plan. Certain projects may require a more detailed approach to roof protection, including consideration of a temporary roof to allow construction to proceed without damaging final roof
 - C. Protect roof system from damage. Repair or remove and replace damaged asphalt shingles according to methods approved by roof manufacturer and A/E. A/E and Owner's decision on corrective procedure will be final.
 - D. Repair minor scars, cuts, scraps, tears, using methods approved by manufacturer. Severe roof damage to be corrected by removal and replacement with new asphalt shingles.
 - E. Ensure roof warranty is not voided due to membrane damage.

END OF SECTION