

SECTION 07 32 13

CLAY ROOF TILES

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. **Design professional to coordinate with UTA representative if this section is used.**
- B. **Domestically sourced manufacturer is preferred.**

1.3 SECTION INCLUDES

- A. Clay roof tiles
- B. Clay roof tile 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. Tile Roofing Institute - Concrete and Clay Roof Tile Installation Manual for Moderate Climate Regions; current edition.
- C. Underwriters Laboratories (UL)
 - 1. Roofing Materials and Systems Directory; current edition.
 - 2. Fire Resistance Directory; current edition.
- D. ASTM C270 - Specification for Mortar for Unit Masonry; current edition.
- E. ASTM C1167 - Clay Roof Tiles; current edition.
- F. ASTM D1970 - Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; current edition. Verify use – this product might be required in areas of slight slope, or other special areas. Consult with clay roof tile manufacture to determine acceptable products and use(s). Delete this reference if not applicable. Part 2 & 3 of this Section includes product listing for self-adhering underlayment. Revise these paragraphs to indicate actual Project requirements.
- G. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos Free; current edition.
- H. ASTM D 2626 - Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing; current edition.
- I. ASTM D4869 - Standard Specification for Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing; current edition.
- J. ASTM D6164 - Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements; current edition.
- K. ASTM D6757 – Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products; current edition.

1.6 SUBMITTALS

- A. Prior to pre-roofing meeting, submit the following:
 - 1. Manufacturer's Certification: Letter from manufacturer, on letterhead, and signed by authorized representative, stating:
 - a) Clay roof tile comply with ASTM C1167 Grade 1 and that materials furnished are compatible. Verify ASTM clay tile reference standard.
 - b) Clay roof tile, fasteners and accessories attached according to this Section meet Project-specific wind resistance requirements. Verify special wind zone requirements, such as coastal. Certain wind zones may require additional fasteners, hold-down clips, or special adhesive.
 - c) Clay roof tile, tile accessories and underlayment over roof deck qualifies for specified warranty.
 - d) 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 sheet metal and accessory components.
 - 4. Approved tile blend color selection criteria. Coordinate with construction of Mockup a subsequent

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- approval of A/E and Owner.
5. Shop drawings.
- B. 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. 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. Pre-Roofing Meeting Notes: Submit Pre-Roofing Meeting Notes within 5 business days of meeting date.
 - D. Manufacturer's Field Reports: Submit copies of manufacturer's field reports to A/E during the Work, and at final completion.
 - E. 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.
 5. Roof Plan indicating clay roof tile fastening types and zones. Depict attachment types(s) and areas on roof plan for each attachment type.
 - F. 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. Tile samples exhibiting available tile colors. Coordinate with Mockup construction.
 5. Board Insulation products: Submit manufacturer's data sheets for each component required including insulation board, fasteners and accessories. Provide roofing system manufacturer's written acceptance of proposed, insulation, fasteners, and procedures for installation. Coordinate with 07 22 16.
 - G. Clay Tile Roof System Mockup: Construct tile blend mockup and have blend approved prior to ordering tile. Construct tile mockup to allow adequate lead time in ordering roof tile.
 1. Construct 10 foot by 10 foot, ¾ inch thick plywood deck, at ground level, sloped to match predominate Project roof deck slope. Install nailer at mockup ridge. Adequately support and anchor Mockup structure to prevent collapse and wind damage.
 2. Install complete clay tile roof system components above Mockup roof deck.
 3. Install 4 foot long samples of eave flashings, gutter, closures, ridge tile, pigmented mortar, wind clips and tile fasteners to demonstrate installation and materials.
 4. Provide 6 different field tile colors blend chosen by A/E from clay roof tile manufacturer's color selections. Coordinate installation of mockup tiles with A/E and Owner's Representative. Consult Owner's Representative for tile blend review and approval preferences. Include language here to define sample colors.
 5. Obtain tile color blend approval of A/E and Owner prior to ordering clay roof tiles.
- 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 clay tile 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 clay roof tiles meet wind uplift loads as shown on Design Documents.
- 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

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- A. Schedule meeting to discuss roof Work before start of work onsite.
 - 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.
 - D. Keep meeting notes and provide copies to those in attendance according to Submittal requirements.
- 1.11 DELIVERY, STORAGE AND HANDLING
- A. Deliver, store, and handle products according to manufacturer's recommendations.
 - B. Deliver products in original containers, dry, undamaged, with seals and labels intact.
 - C. Storage: Verify particular jobsite conditions as related to material storage.
 - 1. Roof-top storage of weather-sensitive material is not permitted. Material stored overnight on roof-top will be considered defective.
 - 2. Note – Select ONE of the following statements:
 - a). If site conditions allow storage trailers onsite use the following,
 - 1). Store weather-sensitive products in enclosed storage trailers.
 - b). Or, if site conditions do not allow storage trailers,
 - 1). Store weather-sensitive products on pallets, clear of ground, and cover with secure breathable canvas tarps.
 - c). Or, if site conditions do not allow site storage,
 - 1). 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 rolls 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 manufacturer's recommended 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 other 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 clay roof tile 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 to 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.

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1.15 MANUFACTURER WARRANTY

- A. Provide manufacturer's fifty (50) year clay roof tile material warranty. Warranty shall include manufacturer providing replacement tiles for defective materials, including shipping and delivery costs.
- B. Warranty shall be issued on the manufacturer's form as submitted by Contractor and reviewed by A/E.
- C. 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: ¾ inch thick plywood roof deck, board insulation as specified in Section 07 22 16, one shingled ply of underlayment and clay roof tiles. Verify roof system components. Delete references to board insulation if not part of roof system.
- B. Obtain written approval from clay roof tile manufacturer for use of products incorporated into roof system, which are not supplied by clay roof tile 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 Tile: ASTM C1167, Grade 1, Spanish Tile, color blend chosen by A/E.
- B. Tile Closures: eave and headwall closures, clay tile matching color of field tile, as supplied by clay roof tile manufacture.
- C. Ridge and Hip Tiles: match color of field tiles, as supplied by clay roof tile manufacture. Provide clay roof tile manufacture-produced ridge and hip terminations and transitions.
- D. Tile Nails: Copper or stainless-steel, ring-shank roofing nails, minimum 3/8 inch head, of sufficient length to penetrate 1 inch into, or 1/4 inch through roof deck.
- E. Tile Wind Clips: brass or stainless steel, as supplied by, or recommended by clay roof tile manufacturer for use with specified tile profile.
- F. Underlayment: ASTM D1970, modified bituminous waterproofing sheet, self-adhering, high temperature resistant, Vycor Ultra by W.R. Grace, or approved substitute.
- G. Mortar: ASTM C270, Type M, color pigmented as approved by A/E.
- H. Plastic Cement: ASTM D4586, non-asbestos reinforced, as supplied and recommended by clay roof tile manufacturer.
- I. Sheet metal flashings: according to provisions of Section 07 62 00.
- J. 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. Clay roof tile 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

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- 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.
- G. Install sheet metal components, according to provisions of Section 07 62 00.

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 Section 07 62 00.

3.6 BOARD INSULATION APPLICATION

- A. Comply with requirements of Section 07 22 16. Verify Section number.
- B. Only install insulation that can be covered with watertight underlayment the same day.
- C. Protect installed insulation from damage, and moisture.

3.7 UNDERLAYMENT INSTALLATION

- A. Comply with tile manufacturer's application instructions.
- B. Install one ply, shingle fashion, with minimum 4 inch laps.
- C. Install strip-in ply at ridges, hips, valleys, transitions, eaves and rise walls.
- D. Lap shingle-fashion with field underlayment.
- E. Do not allow excessive exposure before covering with clay roof tiles. Comply with manufacturer's exposure limits. Remove and replace underlayment that is over-exposed.

3.8 TILE INSTALLATION

- A. Apply in accordance with tile manufacturer's recommendations.
- B. Match approved Mockup blend pattern and layout.
- C. Ensure tile courses are straight and uniform distribution. Use string lines to ensure straight courses.

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- D. Fasten each tile to roof deck with 2 fasteners per tile. Drive fasteners flush without damaging tile. Verify number of fasteners per tile to meet wind zone requirements.
 - E. Install tile wind clips at first course of roof tile at eave. Verify special attachment of clay roof tiles in coastal, or high-rise and other high risk areas. Roof slope can affect attachment method. Ensure roof slope(s) are evaluated for tile attachment design. Consult OFPC Manager for information
 - F. Replace broken tiles. Remove tile in its entirety, seal nail holes in underlayment with sealant or plastic cement. Install replacement tile.
 - G. Install flashings to provide watertight construction.
- 3.9 HIP & RIDGE TILE INSTALLATION
- A. Cover wood nailer with self-adhering strip-in ply. Lap over underlayment minimum 6 inches. Ensure shingle-fashion application.
 - B. Install field tile and apply mortar to head of wetted field tile.
 - C. Moisten ridge tile and set in mortar bed. Ensure positive embedment.
 - D. Fasten hip tile to nailer. Apply plastic cement at overlap with adjacent hip tile.
- 3.10 CLEANING & PROTECTION
- A. Clean roof surfaces, metal flashings, walls, windows, walks, and other surfaces, which become soiled or discolored due to the work of this Section.
 - B. Utilize cleaning agents which are approved by the applicable manufacturer.
 - C. Protect completed Work during construction activities.
 - D. Remove debris, trash, and extra materials from grounds and roof areas daily.
 - E. 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
 - F. Protect roof system from damage. Repair or remove and replace damaged clay roof tiles according to methods approved by roof manufacturer and A/E. A/E and Owner's decision on corrective procedure will be final.

END OF SECTION