

DIVISION 7 THERMAL & MOISTURE PROTECTION

07 32 00 Clay Roof Tile

PART 1: GENERAL

1.01 Scope of Standard

- A. This standard provides general guidance concerning the specific preferences of Texas State University-San Marcos for Clay Roof Tile.
- B. Texas State University-San Marcos recognizes that project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification, it is expected that these guidelines will govern the design and specifications for Texas State University-San Marcos projects.
- C. Roof systems shall be designed by, and with plans and specifications, sealed by a licensed architect or engineer, in accordance with ASCE 7-98, the IBC, and the International Plumbing Code.

1.02 Design Guidelines

- A. Pitched Roofs:
 - 1. Clay Tile Systems shall match the random blended terra cotta color and style on existing buildings on the Campus, such as Brogdon Hall, Brazos Hall, and Speck Street Parking Garage.
 - 2. When a flat or low slope roof building is approved by the Project Representative, the perimeter of building roof shall have a pitch mansard type clay tile roof system.
 - 3. Avoid the use of skylights, unless approved by Project Representative.
 - 4. Include fall protection and roof anchors for safe roof access after construction.

1.03 Related Documents

- A. Drawings and general provisions of the Construction Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.04 Reference Standards

- A. All roofing systems shall be in accordance with Factory Mutual I-90 requirements.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM B134 – Brass Wire
 - 2. ASTM B159 – Phosphor Bronze Wire
 - 3. ASTM B206 – Copper-Nickel-Zinc Alloy (Nickel Silver) Wire and Copper-Nickel Alloy Wire.

4. ASTM C270 – Mortar for Unit Masonry.
5. ASTM D226 – Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
6. ASTM D1002 – Test Method for Strength Properties of Adhesion in Shear by Tension Loading (Metal-to-Metal).
7. ASTM D4586 – Asphalt Roof Cement, Asbestos Free.
8. ATSM C1167-94, Grade 1 – Standard Specification for Clay Roof Tile.

C. NRCA, National Roofing Contractors Association

D. UL, Underwriters Laboratories

1.05 Quality Assurance

- A. The work of this section shall be performed by a company which specializes in the type of clay tile roofing work required for this project, with a minimum of 5 years of documented successful experience and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.
- B. Manufacturer shall specialize in manufacturing the type of clay tile roofing system specified in this section, with a minimum of 5 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty.
 1. Provide secondary products only as recommended by manufacturer of products for use with tiles specified.

1.06 Submittals

- A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.
- B. Product Data: Shall be clearly marked to indicate all technical information which specifies full compliance with requirements of this Section and Contract Documents, including manufacturers published installation recommendations.
- C. Samples, but not limited to the following:

Item No.	Quantity	Size	Description
S1	5	Typical tile	Each tile and accessory tiles
S2	5	6" long	Each mortar color

- D. Complete shop drawings showing roof plans and 3" scale details of all project specific detail conditions, including, but not limited to: rake, ridge, valley, eave, gutter, parapet, and all penetrations, including lightning terminal penetrations.

- E. Roof Mock-Up: Provide a 96" x 96" on-site mock-up, showing clay tile installed with eave and rake.
- F. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB)

1.07 Delivery, Handling, and Storage

- A. Comply with General Conditions and including the following:
 - 1. Protect all work of this Section against breakage, chipping, staining, and other damage.
 - 2. Should such damage occur prior to Texas State University acceptance of the Work, it shall be replaced with new material under this section and the entire work left in first class condition.
 - 3. All such replacement costs and expenses shall be borne by the contractor at no additional expense to Owner.

1.08 Warranty

- A. Comply with General Conditions and Section 01 78 36, agreeing to repair or replace specified materials or Work that has failed within the warranty period. Failures include but are not limited to the following:
 - 1. Failure to perform as protective roofing.
 - 2. Roof leaks which are detected during the Warranty Period.
 - 3. Broken or discolored roof tiles attributable to product manufacturing defects.
- B. Contractor to provide the Warranty Forms included in this section, to Owner's Project Representative upon substantial completion of the Project.
 - 1. Roofing Contractor and the General Contractor must notify the owner, prior to submitting their bid, if any warranty item cannot be provided as written.

PART 2 PRODUCTS

2.01 Unauthorized Materials

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.02 Acceptable Manufacturers

- A. General: For the purpose of establishing the minimum functional, aesthetic and quality standards required for the work of this section, products of the following manufacture's are specified:

B. Basis of Design Product: The design for clay roofing tile is based on U.S. Tile.; 18 inch Spanish Tile. Subject to compliance with requirements and approval of the Owner’s Representative, provide the named product or a comparable product by one of the following:

1. U.S. Tile

C. Final Clay Tile must be approved by Texas State University-San Marcos’, Project Representative.

2.03 Clay Tiles

A. Clay Tile: ASTM C 1167, Grade 1, molded-or extruded-clay roof tile units; kiln fired to vitrification, and free of surface imperfections. Provide with fastening holes prepunched at factory before firing.

1. Acceptable product: 18 inch Spanish Tile.

2. Campus Standard Profile: One-piece “S” type tile.

3. Color: Smooth “Terra-Cotta”, with random blended colors.

Colors based on U.S. Tile:

a. Smooth “Tuscani”: 30% of Color

b. Smooth “Red”: 70% of Color

B. Special Shapes and Fittings: Supply special shapes and fittings of the same material and finish as adjacent tile, factory-formed before firing, as indicated on drawings, or specified in manufacturer’s instructions for project conditions including, but not limited to, the following:

1. Hip caps.

2. Ridge caps.

3. Rake edges.

4. Detached gable rake edges.

5. Eave edges.

6. Valley edges.

7. Termination caps.

8. Half tile.

9. End Bands.

10. Bird Stops

2.04 Materials

- A. Membrane Underlayment:
 - 1. Base Sheet: 45mil, W.R. Grace, Ultra, barrier membrane.
 - 2. Top sheet: 30 lb. Organic felt, complying with ASTM D226, Type II.
- B. Mortar: ASTM C270, Type M, and shall be an approved premixed, high strength, water-resistant mortar mixed with a suitable pigment (high-fired, non-leading mineral colorant type) to produce a color matching the color of the approved clay tile roofing, to be used under hip, ridge and coping tile.
- C. For repairs on existing buildings with Mission “Pan and Cover” style Clay Tile provided. Treated Wood Support Battens, Blocking and Stringers: Refer to Section 06 10 00/Rough Carpentry.
 - 1. Battens: 2 x 4 treated yellow pine, spaced under each barrel of Mission “Pan and Cover” clay tile, approximately 12” on center. Not required with “S” Type Clay Tile.
 - a. Reference Exhibit 1.
 - 2. Exposed Gable Eave Strips: 2x4 treated yellow pine, clad with dark bronze anodize aluminum or painted with Kynar finish.
 - a. Reference Exhibit 2.
- D. Plastic Cement: Non-running, heavy-body flashing cement composed of mineral ingredients conforming to ASTM D4586.
- E. Metal Flashing: Copper, 16oz., width as required, with ¼” edge turned over and fastened with cleats.
 - 1. Lap joints 4” minimum but do not solder.
- F. Roofing Tiles and Accessories: All roof tiles and accessory tiles shall interlock and provide a complete approved weather tight roof.
- G. Tile Fastening System:
 - 1. Nails for securing the felt shall have large flat heads and shall be hot-dipped galvanized.
 - 2. Nails for securing the tile shall be solid copper not smaller than 11 gauge, 5/16” head minimum.
 - 3. Nails shall be long enough to penetrate the wood nailers 1” when the tiles are in their final position.
 - 4. Tile wires for tile-tie system shall be brass-14 gauge, copper alloy No. 260, annealed, conforming to ASTM B134, ASTM B159 and ASTM B206.
- H. Sealant: Silicone in compliance with ASTM D1002.
- I. Gabled Roof Eave Closure Tile
 - 1. Refer to Exhibit 1 for Eave Detail.

PART 3 EXECUTION

3.01 Surface Conditions

- A. Inspection: Prior to installation of tile roofing work, carefully inspect the installed work of other trades and verify that all such work is complete to the point where tile roofing installation may properly be commenced.
 - 1. Full acceptance of supporting surfaces as satisfactory to receive work of this Section shall be evidenced by start of installation of tiles.
 - 2. Verify that clay tile roofing can be installed in complete accordance with tile manufacture's current recommendations.
 - 3. Immediately notify the Architect of all such areas of defective construction revealed by inspections and work under this Section.
 - 4. Do not proceed with installation in any areas containing defective construction until all such defects have been fully resolved and corrected
- B. Contractor shall provide a letter of acceptance from the Clay Tile manufacturer and roofing subcontractor, stating that the substrate is acceptable, to the University's Project Representative.

3.02 Installation of Underlayment and Flashing

- A. Secure base membrane to substrate and secure overlaps per manufacturers instructions.
 - 1. Lay with minimum 4" head lap and a 6" side lap.
 - 2. Membrane and felt shall extend over hips and ridges and the surfaces left unbroken, applying double membranes.
 - 3. Install flashing at valleys, projections and adjacent surfaces as recommended by manufacturer, applying double membranes.

3.03 Tile Installation

- A. Provide wood stringers at hips and ridges of proper height.
- B. All hip, ridge and coping tile shall be set in cement mortar and fastened by non-corrosive nails.
 - 1. All tiles in contact with cement mortar shall be immersed in water for at least 2 minutes before laying.
- C. All tiles shall be laid in regular courses parallel with the eaves and no attempt shall be made to stretch the courses.
 - 1. The courses shall be accurately spaced so as to finish even and parallel at the top of all level terminations
 - 2. Valleys shall be open with copper flashing (with an opening of 6" minimum) and close tile gap edges with copper flashing.

3. Tiles shall be laid in random pattern so that similar colors are not grouped together.
- D. Secure every piece of tile by at least one nail or screw, and two nails or screws where practicable.
 1. All nails or screws shall be covered in finished work.
 - E. Lay all tiles with an end lap of at least 3" properly fitted together.
 1. Install short course covers over regular pans at eave and regular covers over short course pans at ridge.
 2. Top edge of cover shall not abut bottom edge of pan in the succeeding course throughout the roof so all covers lay tight to the pans.
 3. Fasten small pieces with copper tie wire and elastic cement.
 - F. A limited amount of elastic cement may be used for leveling tile, for pointing around the edges of top fixtures and eave enclosures, and between the joints of hip and ridge rolls.
 1. Spaces between field tile and the hip stringers shall be filled with elastic cement to make waterproof joint.
 2. Where tile joins stringer, install plastic cement.
 - G. Starter tiles shall be of required lengths and where cutting is required against abutting work it shall be neatly done.
 - H. Tiles that verge along the hips shall be cut close against the hip board and a watertight joint made by cementing cut hip joint to the hip board.
 - I. Provide clay roof tiles as a completely weatherproof and waterproof system requiring no further maintenance.
 - J. All sequences of work shall be inspected by the Owner's and manufacturer's representatives prior to being covered up by subsequent work.
 - K. Roofing contractor shall not proceed with subsequent work until inspection and approval by Owner's and Manufacturer's representative.
- 3.04 Cleaning
- A. Promptly upon completion of this portion of the work, legally remove from the Project site all tools, equipment and surplus materials of the Section, including tile-ends, and debris resulting from the clay tile roofing installation.

WARRANTIES**MANUFACTURER'S CERTIFICATION OF MATERIALS
(ON ROOFING MATERIAL MANUFACTURER'S LETTERHEAD)**

Date

<<OWNERREP>>

<<OWNERTITLE>>

<<OWNERCOMPANY>>

<<OWNERADDRESS>>

<<OWNERCITY>> <<OWNERZIP>>

Project:

Dear <<OWNERREP>>,

We are pleased to offer to supply the clay tile roofing materials for the roofing project named above. We hereby certify that (NAME OF CONTRACTOR) is an approved roofing contractor/applicator with our firm for the term or type of warranty stipulated below.

The conditions stipulated and representations in this letter are made by us as an inducement to you to use our materials on your roofing job. We propose to furnish the clay tile roofing materials necessary to provide a watertight roofing assembly on the above project. We hereby represent to you that our materials comply with our standard specifications, and upon specific further request, we will issue a fifty (50) year, "No Dollar Limit" Clay Tile Roof Guarantee on the form required in these specifications.

In addition, we will provide such inspections as we deem necessary. By means of this letter, we also certify that the contractor listed above has applied for the required warranty and made the necessary payment to cause issuance of the warranty. In the event that anything arises during the course of this transaction, including, but not limited to, failure by the contractor to make full payment for the warranty; or quality assurance issues which might jeopardize issuance of this warranty, we will notify you, the owner, immediately, in writing, to give you the chance to rectify such problems and cause issuance of the warranty as stipulated above.

Yours very truly,

COMPANY NAME

Signature by Authorized Representative

WARRANTIES

ROOFING UNDERLAYMENT’S CERTIFICATION

Re: Roof Replacement of Designated Areas at Texas State University

_____, certifies that
Roofing Underlayment Manufacturer

_____ is currently approved by
Roofing Contractor

the roofing system manufacturer to install the specified roofing system for the referenced project and that the above named Roofing Underlayment Manufacturer is ISO 9000 certified, has reviewed bidding documents in their entirety, and has approved them as they are written and drawn. The above named Roofing Underlayment Manufacturer will provide field inspection services by a full time employee of the manufacturer, no less than three times per week, during and until all roof construction work is completed and accepted by the Owner.

The above named Roofing Underlayment Manufacturer will provide the manufacturer’s guarantee as stipulated in the contract documents upon completion of the project.

By: _____
Name

Signed

Title

Date: _____ (Affix Corporate Seal)

CONTRACTOR'S WARRANTY

Project Warranty for _____

Whereas _____ (Contractor),

Address _____

Telephone (____) _____ - _____ has performed _____ (Work)

on the following Project: _____

Address: _____

WHEREAS, the Contractor has agreed to Warrant said Work _____

NOW, THEREFORE, the Contractor hereby Warrants said Work in accordance with the terms hereof, complying with the terms of the Contract with the Owner dated _____.

that _____ WARRANTY PERIOD Two (2) years, STARTING _____,

TERMINATING _____ IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20__, for the Contractor _____

as its _____ (position).

Name of firm: _____

Address: _____

And has been countersigned in accordance with the terms and conditions, for the Manufacturer _____ as its _____ (position).

Name of firm: _____

Address: _____

Signed: _____

Date: _____

CLAY TILE MANUFACTURER’S WARRANTY

Project Warranty for _____

Whereas _____ (Manufacturer),

Address _____

Telephone (____) _____ - _____ has furnished/provided _____ (product)

on the following Project: _____

Address _____

Constructed by _____ (Contractor),

Address _____

For _____ (Owner),

Address _____

WHEREAS, the Manufacturer, through the Contractor, has agreed to Warrant said product

NOW, THEREFORE, the Manufacturer hereby Warrants said Product in accordance with the terms hereof, complying with the terms of the Contract with the Owner dated _____,

that _____ WARRANTY PERIOD Fifty (50) years, STARTING _____,

TERMINATING _____ IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20____, for the Manufacturer _____

as its _____ (position).

And has been countersigned in accordance with the terms and conditions, for the Contractor

_____ as its _____ (position).

Signed: _____

Date: _____

INSTALLATION SYSTEM AND FLASHING

Project Warranty for _____

Whereas _____ (Contractor),

Address _____

Telephone (____) _____ - _____ has performed _____ (Work)

on the following Project: _____

Address: _____

WHEREAS, the Contractor has agreed to Warrant said Work _____

NOW, THEREFORE, the Contractor hereby Warrants said Work in accordance with the terms hereof, complying with the terms of the Contract with the Owner dated _____,

that _____ WARRANTY PERIOD Twenty (20) years, STARTING _____,

TERMINATING _____ IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20____, for the Contractor _____

as its _____ (position).

Name of firm: _____

Address: _____

And has been countersigned in accordance with the terms and conditions, for the Manufacturer _____ as its _____ (position).

Name of firm: _____

Address: _____

Signed: _____

Date: _____

BASE SHEET MEMBRANE UNDERLAYMENT

Project Warranty for _____

Whereas _____ (Contractor),

Address _____

Telephone (____) _____ - _____ has performed _____ (Work)

on the following Project: _____

Address: _____

WHEREAS, the Contractor has agreed to Warrant said Work _____

NOW, THEREFORE, the Contractor hereby Warrants said Work in accordance with the terms hereof, complying with the terms of the Contract with the Owner dated _____,

that _____ WARRANTY PERIOD Twenty (20) years, STARTING _____,

TERMINATING _____ IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20__, for the Contractor _____

as its _____ (position).

Name of firm: _____

Address: _____

And has been countersigned in accordance with the terms and conditions, for the Manufacturer _____ as its _____ (position).

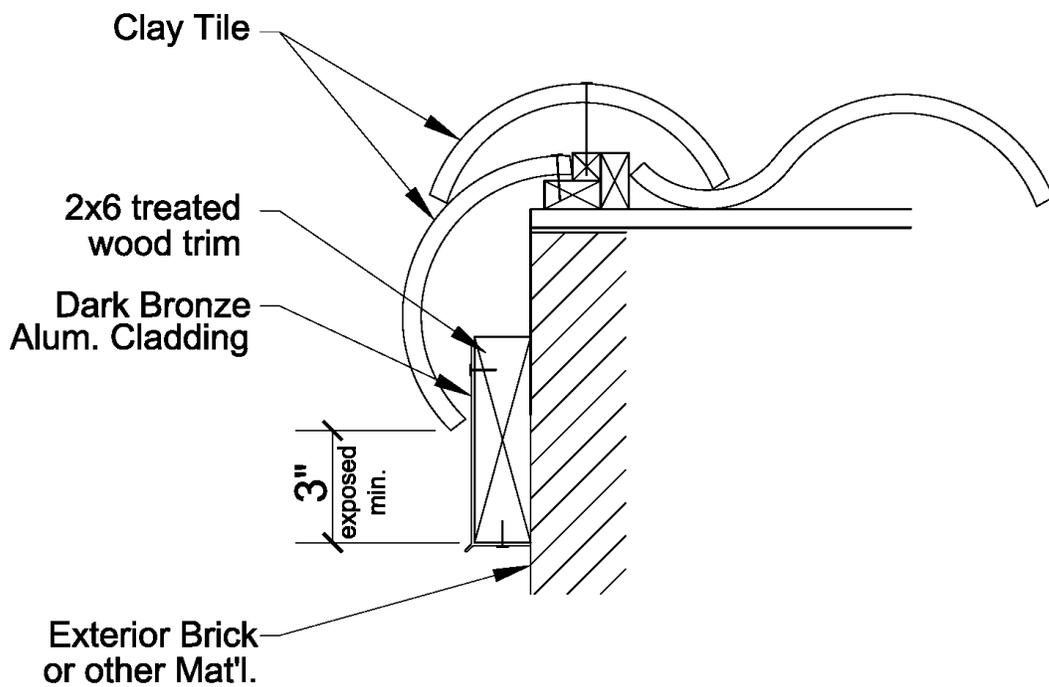
Name of firm: _____

Address: _____

Signed: _____

Date: _____

Exhibit 1:

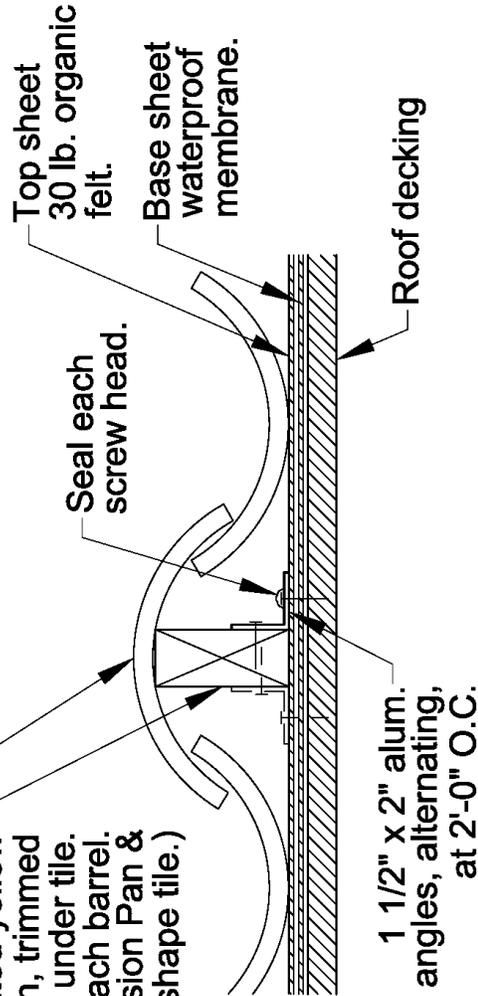


TEXAS STATE 801 University Drive San Marcos, Texas 78666-4616 Phone: (512)245-2202 Fax (512)245-8839	Title: Clay Tile Eave Edge Detail	Sheet No.:
	File updated: 6/6/2013 Plot Date: 6/6/2013	1 of 1
	File name: Clay Tile Roof Standard	

General Note:
 1. Use only for existing campus buildings with "Pan & Cover" mission style clay tile roofs.

Exhibit 1:

Mission Tile ("Pan & cover")
 2" x 4" treated yellow pine batten, trimmed to fit under tile.
 Provide under each barrel. (Only use on "Mission Pan & cover shape tile.)



 601 University Drive San Marcos, Texas 78666-4616 Phone: (512)245-2202 Fax: (512)245-8839	Title: Batten detail at "Pan & Cover" mission clay tile	Sheet No.:
	File updated: 6/6/2013 Plot Date: 6/6/2013	1 of 1
	File name: Clay Tile Roof Standard 1	

END OF SECTION 07 32 00