SECTION 07320
ROOFING TILE

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:
   1. Vitrified clay roofing tile.

B. Related Sections:
   1. Section 06100 - Rough Carpentry: Wood, plywood or nailable substrate.
   2. Section 07600 - Flashings and Sheet Metal.

1.2 SUBMITTALS:

A. Product Data: Submit specifications and installation instructions from the manufacturer for roofing system required. Include data substantiating compliance with the requirements.

B. Samples for New Construction and Major Additions: Submit 2 sets of samples not less than 4 units each, of roofing tile showing color and maximum color range. Supply material within approved color range.

C. Samples for Repair of Existing Roofs and Nearby Adjacent Additions: Submit samples of each custom color and size of roofing tile. Include samples showing range of color to be expected for each color required.

1.3 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Furnish products manufactured by a firm having not less than 5 years successful experience in the production of the type of roofing tiles required.

B. Installer Qualifications:
   1. Installer: Company specializing in tile roofs with five years continuous experience.
   2. Pre-Bid approval shall be obtained from the Owner prior to bidding tile roof installation.
   3. Submit a minimum of two similar jobs successfully completed within the last four years.

C. Conform to details and installation requirements of NRCA Roofing and Waterproofing Manual, Steep Roofing, Tile Roofing sections except as otherwise indicated.

D. All installation procedures must be approved by the Owner prior to commencing work.

E. Mock-Ups:
1. Prior to ordering tile, install a 4’ x 8’ mock-up at ground level at location directed by Architect for verification, showing full range of color, color distribution and trim pieces. Modify blends and colors as required. Order tile based on approved mock-up.

2. Install 16’ x 16’ mock-up in-place on roof structure, showing full range of color, color distribution and trim pieces. Obtain Architect’s acceptance before proceeding with remainder of roof installation and revise mock-up until accepted. All or part of mock-up which is acceptable may be retained as part of permanent installation.

1.4 PROJECT/SITE CONDITIONS:

A. Proceed with roofing work only after substrate construction and penetration work have been completed.

B. Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with requirements and the manufacturer's recommendations.

1.5 MAINTENANCE:

A. Extra Materials: Provide 2% extra stock, in new condition, for each color, texture and shape of tile installed.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

A. Ludowici-Celadon.

2.2 MATERIAL:

A. Clay Tile:

   1. Fired vitrified clay roofing tile, ASTM C56, manufacturer's standard unglazed units, as manufactured by LudowiciCeladon.

   a. Furnish Straight Barrel Mission Tile design units with matching ridge, edge, eave and other fittings, 14.25" length starters with 2 holes.

      1) New Construction and Major Additions: 16" length tile.
      2) Repair of Existing Roofs and Nearby Adjacent Additions: 18" length tile (custom size to match existing).

   b. Tile at hips, ridges, starter course and where wind uplift is a problem shall be 18" tile with 2 holes. Caulk all exposed nail heads with roof tile caulking or polyurethane caulk.

   c. Provide eave and end enclosures for all open tile ends at hips, ridges and
eaves. Provide rake tile accessories at roof rakes.

d. Furnish clay tile color for new construction and major addition projects as follows:

<table>
<thead>
<tr>
<th>Pans:</th>
<th>100%</th>
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<tbody>
<tr>
<td>Red Range</td>
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</table>

<table>
<thead>
<tr>
<th>Covers:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Red Range</td>
<td>60%</td>
</tr>
<tr>
<td>Burgundy</td>
<td>15%</td>
</tr>
<tr>
<td>Red</td>
<td>18%</td>
</tr>
<tr>
<td>Black Slip</td>
<td>7%</td>
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<tr>
<td>Total Covers</td>
<td>100%</td>
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NOTE: BLACK AND YELLOW/BUFF PERCENTAGES ARE SMALL AND CAN BE VARIED OR DELETED WITH CAMPUS ARCHITECT'S PERMISSION - ARCHITECT OF RECORD TO RECOMMEND BLEND. *BLACK DELETED ON GEOLOGY AND 2% YELLOW/BUFF ADDED.

e. For repair of existing roofs and nearby adjacent additions, match existing colors and blends. Match the actual color of the tile, not the name as named colors have changed but the names have remained the same. Remove existing tiles and reblend with new as required to achieve a uniform appearance. Furnish clay tile matching the following existing colors:

<table>
<thead>
<tr>
<th>Pans:</th>
<th>100%</th>
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<tbody>
<tr>
<td>FMS Red Range</td>
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<table>
<thead>
<tr>
<th>Covers:</th>
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<tbody>
<tr>
<td>Weathered red dark</td>
<td>20%</td>
</tr>
<tr>
<td>Weathered red medium</td>
<td>20%</td>
</tr>
<tr>
<td>Weathered brown dark</td>
<td>20%</td>
</tr>
<tr>
<td>Weathered X61 light brown</td>
<td>40%</td>
</tr>
<tr>
<td>Total Covers</td>
<td>100%</td>
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NOTE: CAMPUS ROOFER AND SHOPS TO DEVELOP SURVEY AND CATALOG OF EXISTING STYLE AND APPROXIMATE BLEND ON ALL BUILDINGS.

2. Other Materials:

a. Fasteners (Nails): Non-corrosive smooth copper shank type, size recommended by tile manufacturer.

b. Sealant: One part polyurethane conforming to ASTM C920, Grade NS, Type S.

d. Wood Strips: Fire retardant treated wood strips as specified in Section 06100.

WOOD STRIPS CAN BE PRESERVATIVE TREATED IF ROOF ASSEMBLY IS NOT FIRE-RATED.

e. Snow Guards:

1) Stainless steel. Indicate size, type and location on the drawings.

SUPPLIED BY CU SHOP. PROVIDE PATTERN AND QUANTITY REQUIRED ON ROOF DRAWING.

f. Ice Dam Material: Rubberized asphalt and polyethylene laminated self-adhesive sheet, 40 mils thick. Provide one of the following:

1) "Bituthene Ice and Water Shield" by W.R. Grace.
2) "Polyguard Deck Guard" by Polyguard Products, Inc.
3) "Polyken 640 Underlayment Membrane" by Polyken Technologies. Melt point not to be less than 210°.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Verify that valley and other metal flashings required under tile have been properly installed to provide watertight installation.

B. Care of workman not to damage other work - re-cover any areas where felts or ice and water shield damaged prior to installing batts.

3.2 PREPARATION OF SUBSTRATE:

A. Clean the substrate of projections and substances detrimental to the work.

B. Felt Underlayment:

1. Nail two plies of felt underlayment to wood deck, shingle fashion, using galvanized roofing nails.
2. Lap felts 6" at ends and 18" at edges.

C. Ice Dam Material:

1. Apply minimum 6'-0 - (2) - 3'-0 Pass and 24" inside wall line wide layer of ice
dam material at entire perimeter of surface to receive roofing, including eaves, ridges, hips, valleys, skylights, vertical wall penetrations, dormers, and edges. Extend ice dam material at edges a minimum of 24” inside exterior wall line and 36” at eaves. Apply ice dam sheets horizontally using maximum available width to eliminate or minimize horizontal joints.

2. Apply plasticized asphalt by removing separating membrane and pressing to adhere to substrate. Lap and self-seal joints with 4” minimum lap. Apply roofing immediately. Cover ice and water shield with felt within 30 days of applying ice and water shield.

D. Wood Strips: Apply wood strips at cover tile and ridges of proper height to support tile. Place across roof slope and space to support each row of cover tile. At the eave, notch 2” x 4” batten 1” x 4” to receive eave enclosure -- (Avoid short nailers). Toe-nail wood strips to substrate with 16d nails staggered pattern 18” o.c.

3.3 INSTALLATION:

A. Installation of Roofing Tile:

1. Except as otherwise indicated, install tiles to match Owner's existing roofs, accepted mock-up, and as recommended by the manufacturer.

2. Take special care in handling and working over installed tile to avoid cracking, chipping or breaking of the tiles. Replace any broken or chipped tile found during installation.

3. Provide accessory items as shown and as required to make a complete installation of roofing, including flashing integrated with the tile work.

B. Secure with nails with side and head lap as recommended by manufacturer for required exposure, climate, wind and conditions, and roof slope. Include closers, ridge, edge and hip units as indicated or required. Caulk all nail heads by setting them in roof tile sealant. Ensure nails penetrate wood (batten) substrate 3/4" minimum.

C. Provide bird stops at all open tile ends to match existing roofs.

D. Seal rakes and ridges to field tile with polyurethane or roof tile sealant.

E. Install roof tile using "tight" method.

F. Install at least 3 or more staggered rows, as size of roof requires, of snow guards at all sloped roofs where indicated on the roof plan.

G. All tile shall be nailed including pan and cover tile. No exceptions.

H. Valleys shall have 6” wide opening to allow water to drain. Concrete mortar will be used to cover end of cut tile in valley.

I. Tile shall be installed to withstand 100 mph winds.
J. All curbs heights shall be 12” above finished roof.

K. Install permanent tie-off anchors on all new roofs for access to all areas of tile roofs.

END OF SECTION 07320