SECTION 04 01 20

MASONRY RESTORATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. Work of this Section includes all labor, materials, equipment and services necessary to complete the masonry restoration and cleaning as shown on the drawings and/or specified herein, including but not limited to, the following:

1. Re-pointing existing face brick walls.

1.3 QUALITY ASSURANCE

A. Field-Constructed Mock-Ups: Prior to start of general masonry restoration, prepare the following sample panels on the building where directed by Architect. Obtain Architect's acceptance of visual qualities before proceeding with the work. Retain acceptable panels in undisturbed condition, suitably marked, during construction as a standard for judging completed work.

1. Repointing: Prepare two (2) separate sample areas of approximately 3' high by 6' wide for each type of repointing required, one for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating quality of materials and workmanship expected in pointing mortar joints.

1.4 SUBMITTALS

A. Product Data: Submit manufacturers' technical data for each product indicated including recommendations for their application and use and VOC compliance. Include test reports and certifications substantiating that products comply with requirements.

B. Restoration Program: Submit written program for each phase of restoration process including protection of surrounding materials on building and site during operations. Describe in detail materials, methods and equipment to be used for each phase of restoration work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.

B. Deliver other materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

C. Protect masonry restoration materials during storage and construction from wetting by rain,

snow or ground water, and from staining or intermixture with earth or other types of materials.

D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.6 PROJECT CONDITIONS

A. Do not repoint mortar joints or repair masonry unless air temperatures are between 40 deg. F. and 80 deg. F. and will remain so for at least forty-eight (48) hours after completion of work.

B. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces.

C. Protect sills, ledges and projections from mortar droppings.

1.7 SEQUENCING/SCHEDULING

A. Perform masonry restoration work in the following sequence:

1. Repair existing masonry including replacing existing masonry with new masonry materials.

2. Rake-out existing mortar from joints indicated to be repointed.

3. Repoint existing mortar joints of masonry indicated to be restored.

4. Clean existing masonry surfaces.

PART 2 PRODUCTS

2.1 MASONRY MATERIALS

A. For mortar materials, conform to the requirements of Section 042000.

2.2 MORTAR MIXES

A. Measuring and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its
2. Rake out mortar from joints to depths equal to 2-1/2 times their widths but not less than 1/2" nor less than that required to expose sound, unweathered mortar.

3. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.

4. Do not spall edges of masonry units or widen joints. Replace any masonry units which become damaged.

    a. Cut out old mortar by hand with chisel and mallet.
    b. Power operated rotary hand saws and grinders will be permitted but only on specific written approval of Architect based on submission by Contractor of a satisfactory quality control program and demonstrated ability of operators to use tools without damage to masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

B. Joint Pointing

1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.

2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8" until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.

3. After joints have been filled to a uniform depth, place remaining pointing mortar in three (3) layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing bricks have rounded edges recess final layer slightly from face. Take care not to spread mortar over edges onto exposed masonry surfaces, or to featheredge mortar.
4. When mortar is thumbprint hard, tool joints to match original appearance of joints, unless otherwise indicated. Remove excess mortar from edge of joint by brushing.

5. Cure mortar by maintaining in a damp condition for not less than seventy- two (72) hours.

6. Where repointing work precedes cleaning of existing masonry allow mortar to harden not less than thirty (30) days before beginning cleaning work.

END OF SECTION

SECTION 04 01 60

TERRA COTTA RESTORATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the terra cotta restoration and cleaning as shown on the drawings and/or specified herein, including, but not limited to, the following:

1. Repointing existing terra cotta surfaces.

2. Patch and repair of existing damaged terra cotta.

1.3 QUALITY ASSURANCE

A. Field-Constructed Mock-Ups: Prior to start of general terra cotta, prepare the following sample panels on the building where directed by Architect. Obtain Architect's acceptance of visual qualities before proceeding with the work. Retain acceptable panels in undisturbed condition, suitably marked, during construction as a standard for judging completed work.

1. Repointing: Prepare two (2) separate sample areas of approximately 3'-0" high by 6'-0" wide for each type of repointing required, one for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating quality of materials and workmanship expected in pointing mortar joints.

B. Preconstruction Testing of Existing Mortar: Test according to ASTM C 295, modified as agreed by testing service and Architect for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength.

1.4 SUBMITTALS

A. Preconstruction test reports for existing mortar.

B. Product Data: Submit manufacturers' technical data for each product indicated including recommendations for their application and use and VOC compliance. Include test reports and certifications substantiating that products comply with requirements.

C. Restoration Program: Submit written program for each phase of restoration process, including protection of surrounding materials on building and site during operations. Describe in detail materials, methods and equipment to be used for each phase of restoration work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.

B. Deliver other materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

C. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.6 PROJECT CONDITIONS

A. Do not repoint mortar joints or repair masonry or stone unless air temperatures are between 40 deg. F. and 80 deg. F. and will remain so for at least forty-eight (48) hours after completion of work.

B. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Immediately remove grout and mortar in contact with exposed masonry and other surfaces.

C. Protect sills, ledges and projections from mortar droppings.

1.7 SEQUENCING/SCHEDULING

A. Perform terra cotta work in the following sequence:

1. Repair existing terra cotta, including replacing existing terra cotta with new materials.

2. Rake out existing mortar from joints indicated to be repointed.

3. Repoint existing mortar joints of masonry indicated to be restored.

PART 2 PRODUCTS

2.1 MASONRY MATERIALS

A. Provide new terra cotta units to match existing units by Boston Valley in body composition, physical properties, colors, gloss, surface texture, thickness, profiles, dimensions, and composition of surface glaze. Provide units with tested physical properties within 10 percent of those determined from preconstruction testing of selected existing units.

B. For mortar materials, conform to the following requirements:

1. Portland Cement: ASTM C 150, Type 1, standard color, one source.

2. Hydrated Lime: ASTM C 207, Type S.

3. Sand: Clean, washed, buff colored sand, graded per ASTM C 144.

4. Water: Clean, fresh and suitable for drinking.

2.2 PATCHING MATERIALS

A. Stone Patching Mortar: Single-component, cementitious, mineral based mortar equal to M70 Jahn Restoration Mortars made by Cathedral Stone Products Inc., or approved equal.

B. Formulate patching compound for terra cotta in colors and textures to match each unit being patched.

2.3 MORTAR MIXES

A. Measuring and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1-to-2 hours. Add remaining water in small portions until mortar of desired consistency is reached. Use mortar within thirty (30) minutes of final mixing; do not retemper or use partially hardened material.

B. Colored Mortar: Produce mortar of color required by use of selected coloring agent. Mortar to match existing.

C. Do not use admixtures of any kind in mortar, other than colorant.

D. Mortar Proportions

1. Match the sand of the original grain size aggregate proportion and color to minimize fading color unevenly.
2. Pointing Mortar for Brick: One part white Portland cement, 2 parts lime and 6 parts colored mortar aggregate. To product mortar colors required to match.

3. Rebuilding Mortar: Comply with ASTM C 270, Proportion Specification, Type to match existing mortar, with cementitious material content limited to Portland cement-lime and coloring agent.

a. Contractor shall perform test to establish type of existing mortar.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions where masonry restoration and cleaning are to be performed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by

the Contractor in a manner acceptable to the Architect.

3.2 REPOINTING EXISTING TERRA COTTA

A. Joint Raking

1. Rake out mortar from joints to depths equal to 2-1/2 times their widths but not less than 1/2" nor less than that required to expose sound, unweathered mortar.

2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.

3. Do not spall edges of masonry units or widen joints. Replace any masonry units which become damaged.

   a. Cut out old mortar by hand with chisel and mallet.
   b. Use Dremel kind tools will be permitted but only on specific written approval of Architect based on submission by Contractor of a satisfactory quality control program and demonstrated ability of operators to use tools without damage to masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

B. Tuck Joint Pointing

1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8" until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.

3. After joints have been filled to a uniform depth, place remaining pointing mortar in three (3) layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing bricks have rounded edges recess final layer slightly from face. Take care not to spread mortar over edges onto exposed masonry surfaces, or to featheredge mortar.

4. When mortar is thumbprint hard, tool joints to match original appearance of joints, unless otherwise indicated. Remove excess mortar from edge of joint by brushing.

5. Cure mortar by maintaining in a damp condition for not less than seventy- two (72) hours.

6. Where repointing work precedes cleaning of existing masonry allow mortar to harden not less than thirty (30) days before beginning cleaning work.

3.3 PATCHING AND TERRA COTTA

A. Remove deteriorated material as determined by sounding gently with a small hammer. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least ¼" thick, but not less

than recommended by patching compound manufacturer.

B. Where mortar joints adjacent to patch are open, fill back of joints with pointing mortar and allow to cure before patching terra cotta. Leave space for pointing joints according to “Repointing Masonry” Article.

C. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of unit.

D. Rinse surface to be patched and leave damp, but without standing water.

E. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.

F. Place patching compound in layers as recommended by patching compound manufacturer, but not less than ¼" or more than 2" thick. Roughen surface of each layer to provide a key for next layer.

G. Do not apply patching compound over mortar joints. If patching compound bridges mortar joints, cut out joints after patching compound hardens.

H. Trowel, scrape, or carve surface of patch to match texture, details, and surrounding surface plane or contour of terra cotta. Shape and finish surface before or after curing, as determined by testing to best match existing terra cotta.

I. Keep each layer damp for 72 hours or until patching compound has set.

J. After final layer of patching compound has cured, apply glaze replacement according to manufacturer's written instructions. Apply two or more coats, as needed, to match glaze of adjacent terra cotta units

END OF SECTION

SECTION 42 00 00

UNIT MASONRY

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the unit masonry work as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:

1. Protection, pointing and cleaning of masonry.

1.3 SUBMITTALS

A. Samples (Submit the following):

1. Mortar color, 12" long cured sample.

B. Manufacturer's Literature: Submit technical and installation information for:

1. Mortar materials, each material and mortar type.

2. Certification of mortar mix.

C. Cleaning Procedures: Submit proposed procedures and materials for cleaning masonry work; including certification that cleaner will not adversely affect stone, gaskets, sealants, etc.

1.4 QUALITY ASSURANCE

A. Job Mock-Up: Prior to installation of masonry work, erect sample wall panel mock-up using materials, bonding patterns and joint tooling required for final work. Provide special features as directed by the Architect for caulking and contiguous work. Build mock-up at the site, 4' x 4' size as directed by the Architect, indicating the workmanship to be expected in the completed work. Reconstruct mock-up if directed by the Architect until it meets with Architect's approval. Obtain Architect's acceptance of visual qualities of the mock-up before start of masonry work. Retain mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until work is completed and accepted by the Architect. Use sample panels to test proposed cleaning procedures after sample panel meets with Architect's approval.

1.5 PRODUCT HANDLING

A. General: Deliver, store, handle and protect all materials from damage, moisture, dirt and intrusion of foreign matter. Store all masonry units and mortar materials on raised

platforms and under ventilated and waterproof cover. Store packaged materials in manufacturer's unopened containers, marked with manufacturer's name and product brand name. Immediately reseal containers after partial use. Remove and replace damaged materials.

B. Aggregate: Store with provisions for good drainage.

1.6 CODE REQUIREMENTS

A. Work of this Section shall conform to all applicable requirements of the Philadelphia Building Code.

1.7 JOB CONDITIONS

A. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

PART 2 PRODUCTS

2.1 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type 1, standard color, one source.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: Clean, washed, buff colored sand, graded per ASTM C 144.

D. Aggregate for Grout: ASTM C 404.

E. Water: Clean, fresh and suitable for drinking.

2.2 MORTAR MIX

A. Mortar for Cement Cants: One (1) part Portland cement and four (4) parts sand, by volume.

B. Grout for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of unit masonry. Use grout of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Grout shall have a minimum compressive strength of 3000 psi when tested in accordance with ASTM C 1019.

C. Mixing

1. General: Add cement just before mixing and mix dry. Use sufficient amount of water as necessary to produce workable mix. Mix in small batches to make plastic mass.

2. Mixing: Machine mix all mortars in approved type mixer with device to accurately and uniformly control water. Add hydrated lime dry. Mix dry materials not less than two (2) minutes. Add water, then mix not less than three (3) minutes, not to exceed five (5) minutes. Mix only amount of mortar that can be used before initial set. Do not use mortar which has reached its initial set or two (2) hours after initial

mixing, whichever comes earlier. Mortar may not be re-tempered. Clean mixer for each batch, whenever mortar type is changed, and at end of each day's work.

3. Acceleration or other admixtures not permitted.

4. Mortar shall have a flow after suction of not less than seventy-five (75) percent of that immediately after mixing as determined by ASTM C 91.

D. Admixtures

1. No air-entraining admixtures or cementitious materials containing air-entraining admixtures shall be used in the mortar.

2. No anti-freeze compounds or other substances shall be used in the mortar to lower the freezing point.

3. Calcium chloride or admixtures containing calcium chloride shall not be used in mortar.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that masonry may be completed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.

B. Discrepancies: In the event of discrepancy, immediately notify the Architect in writing. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved. Starting of work by the Contractor means acceptance by the Contractor of the substrate.

3.2 COORDINATION

A. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

3.3 INSTALLATION

A. Mortar Bedding and Jointing

1. Tool exposed joints slightly concave. Concealed joints shall be struck flush.

3.4 CLEANING, PROTECTION, ADJUSTMENT

A. Protection: The Contractor shall take adequate precautions for the protection of all surfaces against mortar spatter and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.

1. The Contractor shall take adequate precautions for the protection of all surfaces against mortar spatter and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.

2. Excess mortar shall be wiped off the masonry surfaces as the work progresses.

3. Wood coverings shall be placed over all such masonry surfaces as are likely to be damaged during the progress of the entire project.

4. Protective measures shall be performed in a manner satisfactory to the Architect.

5. Damaged masonry units shall be replaced to satisfaction of the Architect.

B. Cleaning of Masonry: Upon completion, all exposed masonry shall be thoroughly cleaned following recommendations of the BIA Technical Note No. 20. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately 4' x 4' in a location approved by the Architect. No further cleaning work may proceed until the sample area has been approved by the Architect, after which time the same cleaning materials and method shall be used on the remaining wall area. If stiff brushes and water do not suffice, the surface shall be thoroughly saturated with clear water and then scrubbed with a solution of an approved detergent masonry cleaner, equal to "Vana Trol" made by ProSoCo Inc. or equal made by Diedrich or approved equal, mixed as per manufacturer's directions, followed immediately by a thorough rinsing with clear water. All lintels and other corrodible parts shall be thoroughly protected during cleaning.

1. Unless otherwise required by cleaning agent manufacturer use only low-pressure device (30 to 50 psi) for application of cleaning agent and water rinsing.

C. Pointing: Point any defective joint with mortar identical with that specified for that joint.

END OF SECTION

SECTION 07 32 00

CLAY ROOF TILE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Clay roof tile.
B. Fasteners.
C. Underlayment.
D. Flashings and Counter flashings.

1.2 RELATED SECTIONS

A. Section 07 53 00 – EPDM Thermoset Single-Ply Roofing

B. Section 07 62 00 – Sheet Metal Flashing and Trim

1.3 REFERENCES

A. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
B. ASTM B 749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
C. ASTM C 67 - Standard Test Methods of Sampling and Testing Brick and Structural Clay Tile.
D. ASTM C 387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
E. ASTM C 887 - Standard Specification for Packaged, Dry, Combined Materials for Surface Bonding Mortar.
F. ASTM C 1167 - Standard Specification for Clay Roof Tiles.
G. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
H. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
I. ASTM D 2626 - Standard Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing.
J. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
K. SMACNA Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association, Inc.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00.
B. Product Data: Manufacturer's descriptive literature for products specified in this section.
C. Shop Drawings: Indicate the following:

1. Roof tile:

a. Exposure pattern.

b. Locations and configurations of special shapes.
c. Locations and configuration of each type roof flashing.

2. Fabricated sheet metal items:

a. Dimensioned profiles.
b. Locations and extent of each item; include joint locations.
c. Jointing methods and materials.
d. Provisions for prevention of electrolytic action between dissimilar materials.
e. Interface with adjacent construction.

D. Selection Samples: Two sets of color charts or samples representing manufacturer's full range of available colors.
E. Verification Samples: Three full-size tile samples of each type tile specified, representing actual color and finish of products to be installed.
F. Manufacturer's printed installation instructions for each product, including product storage requirements.
G. Closeout Submittals: Warranty documents, issued and executed by tile manufacturer, countersigned by Contractor.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing roofing of the type specified in this section, with no fewer than three years of documented experience.
B. Roof tile manufacturer shall have current ISO 9000 certification..
C. Mock-Up:

1. Construct mock-up using materials specified in this section.
2. Construct mock-up as directed, at location indicated or directed.
3. Construct mock-up at location indicated or directed, size 10 feet by 10 feet
4. Obtain Architect's acceptance of mock-up before beginning construction activities of this section; accepted mock-up will be standard by which completed work of this section is judged.
5. All colors selected are to be blended 25% of each. Mock-up should avoid hot spots of one color.
6. Mock-up may not remain as part of Work.
7. Accepted mock-up may remain as part of Work.

D. Pre-Installation Meeting:

1. Convene at job site seven (7) calendar days prior to scheduled beginning of construction activities of this section to review requirements of this section.
2. Require attendance by representatives of the following:

a. Installer of this section.
b. Other entities directly affecting, or affected by, construction activities of this section.

3. Notify Architect four (4) calendar days in advance of scheduled meeting date.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products of this section in manufacturer's unopened packaging until installation.
B. Maintain storage area conditions for products of this section in accordance with manufacturer's instructions until installation.

1.7 WARRANTY

A. Product Warranty:
    1. The clay roof tile manufacturer shall provide a 75-year warranty guaranteeing material integrity and color fastness for roof tile.
B. Special Warranties:

    1. Roofing Contractor Warranty: The Contractor warrants products of this section, as installed, to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship for a period of 3 years.

1.8 EXTRA MATERIALS

A. Provide an additional quantity of roof tile matching tile installed, in the amount of 3 percent of the total installed, but not less than one full carton, for Owner's use in roof maintenance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

B. Manufacturing facility shall be located in the United States.
C. Manufacture shall have been in continuous operation for over 100 years.
D. Manufacturer shall be ISO 9000 certified and meet Cradle to Cradle specifications
E. Basis-of-Design Tile Manufacturer: Ludowici Roof Tile; P.O. Box 69, 4757 Tile Plant Road, New Lexington, OH 43764. Tel: (800) 945-8453. Email: info@ludowici.com. www.ludowici.com.
F. Or equal to the Basis-of-Design Manufacturer.

2.2 CLAY ROOF TILE

A. Roof Tile - General: Incombustible, vitrified tile manufactured from shale and fire clays, having less than 2.0 percent moisture absorption when tested in accordance with ASTM C 67, and meeting Grade 1 freeze/thaw resistance requirements when tested in accordance with ASTM C 1167.

    1. Color: Standard color - Slate Red
    2. Color: Standard color - Summer Rose
    3. Color: Standard color - Burgundy
    4. Color: Standard color - Historic Red
    5. All colors selected above are to blended 25% of each color. Contractor to construct mock-up to avoid hot spots.

B. Clay Roof Tile Type:

    1. Acceptable product: 13.25” Spanish.

        a. Profile: High.

b. Nominal size: 9.75 inches (247.6 mm) wide by 13.25 inches (336.6 mm) long.
c. Average exposure: 8.25 inches (209.6 mm) center to center by 10.25 inches (260.4 mm) long.

2. Accessory tile pieces required:
   a. 206 Ridge tile
   b. 206 Type II Vented Ridge tile one every 5 feet in lieu of Standard Ridge 206 tile.
   c. Beveled Eve tile
   d. Top Fixture tile
   e. End Band tile

2.3 ACCESSORY MATERIALS

A. Underlayment: 2 layers of 30 lbs/sq ASTM D 226, Type II asphalt-saturated organic felt.
B. Waterproofing Membrane: underlayment meeting ASTM D1970
C. Wood Stringers: S4S, maximum 19 percent moisture content, nominal 1.5 inch (38.1 mm) thick, of height required to support tile.
D. Flashing: 16oz/sq ft, 0.56mm thick ASTM B 370 cold rolled copper.
E. Tile Fasteners: Corrosion-resistant; types and sizes specified in manufacturer's instructions for indicated uses and conditions.
F. Copper Wire: 16 gauge (1.3 mm) minimum.
G. Grout for Finishing Rake and Eave Edges:

   1. Mix the following materials in equal parts:

      a. Factory-mixed mortar meeting requirements of ASTM C 387, Type M.
      b. Factory-mixed surface bonding mortar meeting requirements of ASTM C 887.

   3. Add mineral oxide pigment to match color of roof tile.
   4. Add water and acrylic additive in accordance with mortar materials manufacturers' instructions to obtain correct mix for workability.

H. Roof Cement: Asphalt roof cement conforming to ASTM D 4586, Type I or II.
I. Sealant Used in Lieu of Flashing Cement: ASTM C 920 silicone; provide one of the following:

   1. Dow Corning 790 Silicone Building Sealant.
   2. GE SilProof.

J. Screws: No. 8 or No. 9 brass or stainless steel, flathead Phillips or square drive, not less than 1-3/4 inches (45 mm) long.
K. Nails for Solid Wood Deck: Corrosion resistant copper, brass, or stainless steel; minimum 3/8 inch (9.5 mm) head diameter; shank of minimum 11 gage (3 mm) diameter and length sufficient to penetrate 3/4 inch (19 mm) into deck but not through the underside.
L. Nails for Plywood Sheathing: Slater's copper ring shank nail, 11 gage (3 mm), not less than 1-3/4 inches (45 mm) long with 3/8 inch (9.5 mm) head; point must penetrate through underside of deck.
M. Wood Nailers and Cant Strips: Preservative-treated wood, as specified in Section 06 10 00.
N. Adhesive: NP1 Roof Tile Adhesive.

   1. Do not expose to ultraviolet rays.

2. Do not allow direct contact with waterproofing shingle underlayment.

2.4 FLASHING FABRICATION

A. Form flashing to profiles indicated on drawings and as required to protect roofing materials from physical damage and shed water and in accordance with manufacturer's instructions for indicated project conditions.
B. Form sections square and accurate in profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
C. Fabrication of other indicated sheet metal items is specified in Section 07 60 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that roofing penetrations and plumbing stacks are in place and properly flashed to deck surface.
B. Verify that roof openings are correctly framed.
C. Verify that deck surfaces are dry and free of ridges, warps, and voids.

3.2 PREPARATION

A. Comply with tile manufacturer's recommendations on preparation of acceptable roof deck.
B. Broom clean deck surfaces prior to installation of underlayment.

3.3 UNDERLAYMENT AND ACCESSORY INSTALLATION

A. Underlayment:

1. Beginning at eave edge, install perpendicular to roof slope; extend minimum of 4 inches (100 mm) over gutters and valley flashing, and minimum 6 inches (150 mm) up abutting vertical surfaces.
2. Overlap side joints minimum 2-1/2 inches (64 mm); overlap end joints minimum 6 inches (150 mm).

B. Valley Flashings:

1. Install minimum 24 inch (610 mm) wide flashing over full-width waterproofing membrane material; fasten metal to deck with cleats.
2. Overlap end joints minimum 8 inches (203.2 mm); do not solder joints.
3. Lap waterproofing membrane material over edges of flashing 4 inches (100 mm).

C. Intersections of Roof Surfaces and Abutting Vertical Surfaces:

1. Install continuous 12 inch (304 mm) wide strips of waterproof membrane material to extend 9 inches (228 mm) across roof deck and 3 inches (76 mm) up vertical surface.
2. Install continuous metal flashing to extend 3 inches (76 mm) up vertical surface.
3. At locations where vertical surface will abut top edge of tile, install metal flashing to extend 3 inches (76 mm) up vertical surface, form metal flashing to extend

minimum 3 inches (76 mm) over tile, and form 1/2 inch (12 mm) return hem at edge of metal.
4. Form saddle flashings for protrusions through roof in accordance with manufacturer's instructions.

D. Fabricated Sheet Metal Items: Install in accordance with shop drawings and SMACNA ASMM.
E. Fabricated Sheet Metal Items: Installation is specified in Section 07 60 00.
F. Nailers: Install nominal 2 inch by appropriate height by 48 inches (50.8 mm by appropriate height by 1220 mm) pressure-treated wood nailers as detailed at ridge, hips and cover tiles, directly over underlayment. Protect with layer of waterproofing membrane material before installing hip and ridge accessory.

3.4 TILE INSTALLATION

A. Install tile roofing in strict conformance with manufacturer's instructions.
B. Install first course over eave closure, with overhang.

1. Do not drive fasteners tightly against tiles, to reduce risk of breakage and to allow natural deck movement.
2. Allow tile to "hang" on its fasteners.
3. Provide 0.75 inch (19 mm) to 2 inches (51 mm) overhang, permitting proper flow into gutters.

C. Install each subsequent course with maximum exposure in each course of 10.25 inches (260.4 mm). Wet cut tile at hips and valleys, using masonry saw with diamond blade.
D. At hip and ridge, install bead of adhesive at butt end of each tile, located so it is completely concealed. Install sealant as required at hip and ridge accessories to achieve watertight installation.

3.5 PROTECTION

A. Do not permit traffic over finished roof surface unless absolutely necessary.
B. Minimize traffic over finished roof surface. If necessary, wear soft-soled shoes and walk on the "butt" of the tile in order to avoid breakage.
C. Replace tile broken due to improper protection or traffic control.

END OF SECTION

SECTION 07 53 00

EPDM THERMOSET SINGLE-PLY ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. EPDM thermoset single-ply roofing.

B. Membrane flashings.

C. Metal flashings.

D. Roof insulation.

1.2 RELATED SECTIONS

A. Section 07 32 00 – Clay Roof Tile

B. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

A. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.

B. ANSI/SPRI RP-4 "Wind Design Standard For Ballasted Single-ply Roofing Systems".

C. ANSI/SPRI WD-1 "Wind Design Standard for Roofing Assemblies".

D. ASTM International (ASTM):
1. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
2. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
3. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
4. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
5. ASTM D 816 - Standard Test Methods for Rubber Cements.
6. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
7. ASTM D 4637 - Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
8. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.

E. Factory Mutual (FM Global):
1. Approval Guide.
   a. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
   b. Loss Prevention Data Sheets 1-28, 1-29.

F. International Code Council (ICC):
   1. International Building Code (IBC).

G. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.

H. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

I. Underwriters Laboratories (UL):
   1. TGFU R1306 - "Roofing Systems and Materials Guide".
   2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.

J. ANSI/ASHRAE/IESNA Standard 90.1 (2007): Energy Standard for Buildings Except Low-Rise Residential Buildings

1.4 DESIGN CRITERIA

A. Wind Uplift Performance:
   1. Roof system is designed to withstand wind uplift forces as calculated using the current revision of ASCE-7.
   2. Roof system is designed to achieve a FM 1-90 wind uplift rating.
   3. Roof System is designed to achieve 105-psf of uplift testing.
   4. Carlisle offers a standard 55 MPH wind speed warranty. Please contact Carlisle if a higher wind speed warranty is desired.

B. Fire Resistance Performance:
   1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.

C. Thermal Performance: Roof system will achieve a minimum R value not less than 2.5.

D. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.

E. Building Codes:
   1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Detail Drawings:
   1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
   2. Coordinate approved drawings with locations found on the Contract Drawings.

D. Selection Samples: For each finish product specified, two complete sets of chips representing manufacturer's full range of available colors, membranes, and thicknesses.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: All products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years experience.

B. Installer Qualifications:
1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
2. Installer must be capable of extending the Manufacturer's Labor and Materials guarantee.
3. Installer must be capable of extending the Manufacturer's No Dollar Limit guarantee.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Refer to Carlisle's Roofing System specification, Part II - Application, for General Job Site Considerations.

C. Safety Data Sheets (SDS) must be on location at all times during the transportation, storage and application of materials.

D. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.

E. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.

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

G. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.

H. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.

I. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.

J. New roofing shall be complete and weathertight at the end of the work day.

K. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.9 WARRANTY

A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total-System warranty, outlining its terms, conditions, and exclusions from coverage.
   1. 20 years.
   2. Coverage to be extended to include accidental punctures in accordance with terms stated in the Warranty document.
   3. Coverage to be extended to include roof edge metal water tightness in accordance with terms stated in the Warranty document.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis if Design Manufacturer: Carlisle SynTec Systems, which is located at: P. O. Box 7000; Carlisle, PA 17013; ASD Toll Free Tel: ; 800-4-SYNTEC; Tel: ; 717-245-7000; Fax: ; 717-245-7053; Email:info@carlislesyntec.com; Web:https://www.carlislesyntec.com.

B. Manufacturer:
   1. Carlisle Syntec System (Basis-of-Design)
   2. Firestone Building Products Company
   3. Johns Manville International, Inc.

2.2 SCOPE / APPLICATION

A. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in Design Criteria.

B. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.

C. Insulation: Provide a roof insulation system beneath the finish membrane.

2.3 INSULATION

A. SecurShield HD Plus Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1. Designed for higher uplift with fewer fasteners per board.
   1. Compressive Strength: 80 psi min. (751 kPa).
   2. Board Thickness: 1/2 inch (13 mm).

2.4 INSULATION ADHESIVE

A. Flexible FAST Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.

B. Flexible FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

C. Flexible FAST Dual Tank Adhesive: A two-component, polyurethane construction grade,

low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

D. Flexible FAST 5 gallon Jug Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with spray application rigs.

2.5 ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE

A. Sure-Tough Membrane: Cured, polyester fabric reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type II.
   1. Attachment Method: Fully adhered.
   2. Color: Black.
   3. Membrane Thickness: 60 mil nominal / 0.020 inches (0.5 mm) over scrim.
   4. Sheet Dimensions:
      a. Width: 4.5 feet, 8 feet or 10 feet.
      b. Length: 100 feet (30.5 m) maximum.
   5. Performance:
      a. Breaking Strength: 180 lbf (800 N) minimum.
      b. Tear Strength: 30 lbf (132 N) minimum.
      c. Elongation: 480 percent.

2.6 FLASHING ACCESSORIES

A. Sure-Seal (black) Pressure-Sensitive Pipe Seals with Factory-Applied TAPE on the deck flange are available for use with Sure-Seal Roofing systems.

B. Sure-Seal Pressure-Sensitive Pourable Sealer Pocket: Pre-fabricated Pourable Sealer Pocket consisting of a 2 inch (51 mm) wide plastic support strip with Pressure-Sensitive, Factory-Applied, adhesive backed uncured Elastoform Flashing.

C. Sure-Seal Pressure-Sensitive (PS) Inside/Outside Corner: A 7 inch by 9 inch precut 60-mil thick Elastoform Flashing with a 30-mil Factory-Applied TAPE.

D. Sure-Seal Pressure-Sensitive (PS) Curb Flashing - A 60-mil thick, 20 inch (508 mm) wide cured EPDM membrane with 5 inch (126 mm) wide Factory-Applied Pressure-Sensitive TAPE along one edge to be used to flash curbs/skylights, etc.

E. Sure-Seal 20" pressure-Sensitive Cured Flashing - A 20" wide (508 mm) cured EPDM membrane with Pressure-Sensitive TAPE the full width, factory applied, used to flash curbs/skylights, etc.

F. Sure-Seal Pressure-Sensitive Cured Cover Strip: Sure-Seal 60-mil cured EPDM membrane laminated to a nominal 35-mil cured Factory-Applied TAPE.

G. Sure-Seal Pressure-Sensitive "T" Joint Covers: A factory cut uncured 60-mil thick EPDM flashing laminated to a nominal 35-mil Factory-Applied TAPE, used to overlay field splice intersections and to cover field splices at angle changes. Available in 6 inch by 6 inch and 12 inch by 12 inch for Sure-Seal applications.

H. Sure-Seal Pressure-Sensitive Elastoform Flashing: 60-mil thick uncured EPDM Flashing laminated to a 30-mil Factory-Applied Pressure-Sensitive TAPE used in conjunction with Sure-Seal Primer.

2.7 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

A. Carlisle Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and

remove contaminants from the surface of exposed EPDM membrane prior to applying EPDM Primer.

B. Sure-Seal SecurTAPE: 3 inch (76 mm) or 6 inch (152 mm) wide by 100 foot (30.5 M) long splice tape used for splicing adjoining sections of EPDM membrane.

C. Low VOC EPDM and TPO Primer - A low VOC (volatile organic compound) primer (less than 250 grams/liter) for use with SecurTAPE or Pressure-Sensitive products.

D. Sure-Seal Lap Sealant: A heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice.
1. Sure-Seal Lap Sealant: Black sealant for use with Sure-Seal (black) Roofing Systems.

E. EPDM x-23 Low-VOC Bonding Adhesive: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

F. Low-VOC Bonding Adhesive: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

G. Water Cut-Off Mastic: A one-component, low viscosity, self wetting, Butyl blend mastic used as a compression sealing agent between EPDM membranes and applicable substrates.

H. Sure-Seal One-Part Pourable Sealer: A one-component, moisture curing, elastomeric polyether sealant used as a sealant around hard-to-flash penetrations such as clusters of pipes, and is available in white or black.

I. Universal Single-Ply Sealant: A 100 percent solids, solvent free, one-part, polyether sealant that provides a weather tight sealant to a variety of building substrates; used as a termination bar sealant. Available in white only.

J. CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer: a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: Priming unexposed asphalt prior to applying Flexible FAST Adhesive, adhering Sure-Seal EPDM, horizontally, for the field of the roof, and for adhering Sure-Seal FleeceBACK and Sure-Seal EPDM membrane to vertical walls. Coverage rate is approximately 2,000-2,500 sq. ft. per 40 lb cylinder and 4,000-5,000 sq. ft. per 85 lb cylinder as a primer, in a single-sided application and 750 sq. ft. per 40 lb cylinder and 1,500 sq. ft. per 85 lb cylinder as an adhesive for vertical walls, in a double-sided application; 1,000 sq. ft. per 40 lb cylinder and 2,000 sq. ft. per 85 lb cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided application.

2.8 FASTENING COMPONENTS

A. HP Fastener: Threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with steel, wood plank or oriented strand board (OSB).

B. InsulFast Fasteners: Threaded, #12 fastener with #3 Phillips head used with 3 inch (76 mm) diameter Insulation Plates. For insulation attachment into steel or wood decks.

C. Pre-Assembled ASAP Fasteners: InsulFast Fastener and pre-assembled 3 inch (76 mm) diameter Plastic Insulation Plate for insulation attachment on adhered and mechanically-fastened roofing systems.

D. HP Term Bar Nail-In: A 1 1/4 inch (32 mm) long expansion anchor with threaded drive pin used for fastening Sure-Seal Termination Bar or Seam Fastening Plates to concrete, brick or

block walls.

E. HP Polymer Seam Plate: A 2 inch (51 mm) diameter plastic barbed fastening plate used for membrane and Pressure-Sensitive RUSS securement for Mechanically Fastened Roofing Systems over steel roof decks.

F. Seam Fastening Plate: 2 inch (51 mm) diameter metal plate for insulation, membrane and RUSS attachment.

G. Insulation Fastening Plate: Nominal 3 inch (76 mm) diameter FM approved metal plate used for insulation attachment.

2.9 EDGINGS AND TERMINATIONS

A. Sure-Seal Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5 mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.

B. SecurEdge Term Bar Fascia: A 1.75" wide formed aluminum termination bar with pre-slotted fastening holes for ease of locating and installing. The decorative cover is available in 0.040" aluminum or 24-gauge galvanized steel. SecurEdge Term Bar Fascia is manufactured in 12' lengths for fewer joints/seams, fewer sections to handle and faster installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.

D. A vapor retarder / temporary roof (Carlisle VapAir Seal 725TR Air & Vapor Barrier/Temporary Roof or Carlisle VapAir Seal MD Air & Vapor Barrier) may be applied to protect the inside of the structure prior to the roof system installation.

3.3 MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)

A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.

B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.

C. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down

the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.

D. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.

E. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

3.4 MEMBRANE SPLICING (Tape Splice)

A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.

B. Fold the top sheet back and clean the dry splice area (minimum 2 1/2 inches (64 mm wide) of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.

C. Where Splice Tape is not Factory-Applied, apply Splice Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch (13 mm).

D. Remove the release film and press the top sheet onto the tape using hand pressure.

E. Roll the seam toward the splice edge with a 2 inch (51 mm) wide steel roller.

F. Install Pressure-Sensitive "T" Joint Cover, a 6 inch wide (152 mm) section of Pressure-Sensitive Elastoform Flashing over all field splice intersections.

G. When using non-Pressure-Sensitive Elastoform Flashing or Elastoform Flashing, seal edges of flashing with Lap Sealant.

H. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.

3.5 FLASHING

A. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.

B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.6 WALKWAYS

A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.

B. Adhere walkways pads to the EPDM membrane in accordance with the manufacturer's current application guidelines.

3.7 DAILY SEALS

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.8 CLEAN UP

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

3.9 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

1.6 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

D. Recycled Content of Copper-Sheet Flashing and Trim: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 40 percent.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Hussey Copper Ltd.
b. Revere Copper Products, Inc.

2. Nonpatinated Exposed Finish: Mill.
3. Prepatinated Copper-Sheet Finish: to match existing and submit samples for architect’s approval.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.

C. Solder:

1. For Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

2. Use lapped expansion joints only where indicated on Drawings.

C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

H. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer**.**

2.5 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:

1. Copper: 16 oz./sq. ft.

B. Valley Flashing: Fabricate from the following materials:

1. Copper: 16 oz./sq. ft.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.

4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder metallic-coated steel and aluminum sheet.
2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
5. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.

3.2 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).

3.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 07 62 00