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

SECTION 31 13 13 - SELECTIVE LANDSCAPE PRESERVATION & PLANT REMOVAL

PART 1 GENERAL

1.01 STIPULATIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division I Specifications Sections, apply to this Section.

1.02 GENERAL REQUIREMENTS

A. This Section includes the protection and stress reduction of existing trees and vegetation that interfere with, or are affected by, execution of the Work, whether temporary or permanent. Work is to be coordinated with the Project Plans.

B. Coordinate Work with that of other trades affecting or affected by Work of this Section and cooperate to assure the steady progress of Work.

1.03 SECTION SUMMARY

Work Included: Provide labor and materials as indicated on drawings and specified to implement basic arboriculture activities for existing plants, as well as construction observation of activities within the Tree Protection Areas. Scope to include but not limited to:

A. Temporary Site and Tree protection Fencing and Temporary Sign Installation

B. Selective Crown and Root Pruning and Tree Removals

C. Coordination of Temporary Tree and Plant Protection

D. Diagnosis and Treatment Recommendations

E. Temporary Limb Guying or Clearance Pruning for construction access

F. Supplemental Watering

G. Monitor Excavation & Construction within Tree Preservation Area.

H. Disposal and Cleanup

1.05 REFERENCE STANDARDS

A. ASTM A 300 – Tree Care Operations

B. National Arborist Association (N.A.A.) Standards

C. American Society of Consulting Arborists

D. American National Standard for Tree Care Operations
   1. ANSI Z133.1—1994
   2. ANSI A300—1995

E. American Nurseryman Association Standards

F. Pennsylvania Seed Act of 1965(Act No. 187) as amended

G. Pennsylvania Agricultural Liming Materials Act of 1978 (P.L.15,No.9, as amended)

H. Pennsylvania Soil Conditioner and Plant Growth Substance Law, Act of December 1, 1977, P.L. 258, No.86 (3P.S.68.2) as amended

I. Regulations of the Pennsylvania Department of Agriculture Bureau of Plant Industry

1.06 QUALITY ASSURANCE

A. Arboriculture: comply with all applicable standards of the National Arborist Association (NAA) for pruning, guying, fertilizing and installation of lightning protection systems. Arborist shall have current certification by the International Society of Arboriculture (ISA).

   1. All arboricultural work under this section shall be performed by personnel totally familiar with arboricultural work and under the supervision of an experienced foreman and ISA certified arborist.

   2. Pruning shall be performed by tree workers who, through a minimum of five years related training and on-the-job experience, are familiar with the techniques and hazards of this work.

B. Analysis and testing of materials required under these specifications shall be in accordance with the current methods of the Association of Official Agricultural Chemists (AOCA) and ASTM.

C. Equipment and Safety

   1. Equipment shall be modern and well maintained. Adhere to all applicable state and federal regulations. Contractor shall be responsible for damage to property resulting from equipment, including fluid leakage or damage resulting from equipment failure. Report incidents of this type immediately to Department of General Services' representative.

   2. Safety shall be a primary concern while working on the Site. Contractor shall have an established safety program and adhere to NAA, OSHA and ANSI standards applicable to the tree care industry, including electrical and utility requirements as well as personal equipment and safe work procedures.

D. Pesticide Applications

1. Certified Pesticide Applicator shall be responsible for supervision of all applications of fertilizer or pesticides on the site.

2. Pesticides shall be applied in strict compliance with label instructions and all applicable federal, state and local requirements. Material Safety Data sheets shall be available for pesticides in the Contractor's possession while on the site.

E. Arrange a pre-construction meeting between the Landscape Architect, General Contractor and Arboriculture Subcontractor. Such meeting shall seek to review the proposed arboriculture procedures, schedule, consideration of substitutions, and general review of specifications. Note that pruning, fertilization, vertical mulching and mulching activities should be performed prior to the start of construction activities, to improve the vigor of the existing trees to be preserved and to help mitigate the effects of construction stress.

1.07 DEFINITIONS

A. Diameter shall be defined as diameter at breast height (dbh) which is the average tree diameter at 4.5 feet from the ground on the uphill side of the tree.

B. Caliper shall be defined as the diameter of the trunk at 6" above the soil for trees up to 4" in caliper and as the diameter of the trunk at 12" above the soil for trees up to 12" caliper.

C. Root zone shall be defined as 1 (one) foot of radius around trunk for every inch of trunk diameter (at 4.5 feet above the ground level on the uphill side of the tree).

D. Root zone shall be defined as 1 (one) foot of radius around trunk for every inch of trunk diameter (at 4.5 feet above the ground level on the uphill side of the tree).

1.08 SUBMITTALS

A. General: Make submittals in accordance with the general contract provisions and procedures of Divison 1, Submittals Specification. Render submittals and receive approval prior to delivery or installation.

1. Approval by the Landscape Architect of submitted product data, samples, test reports, and certificates, or material inspected at source of supply, does not constitute final acceptance.

B. Product Data: Submit producers/manufacturers specifications, quality control, product data, and test reports for the following: Include instructions for handling, storage, installation and protection.

1. All Pesticides, Insecticides, Herbicides, and other chemicals

C. Arboricultural Program: Submit detailed program of Arboriculture work and proposed schedule at the pre-construction meeting.

D. Arborist Qualifications

1. Include evidence of experience, including project list.

2. Verification of membership in the National Arborist Association (NAA).

1.09 COORDINATION

A. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work, as necessary to assure the steady progress of all work of the Contract.

1.10 PERMITS AND CODES

A. All work shall comply with applicable codes, ordinances, rules, regulations, and laws of all local, municipal, and state authorities having jurisdiction. All work necessary to make site preparation comply with such requirements shall be provided without additional cost to Department of General Services.

1.11 REGULATORY REQUIREMENTS

A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor materials, equipment and services necessary to make Work comply with such requirements without additional cost to Department of General Services.

B. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to and ingress and egress at the site. Conform to all governmental regulations regarding the transportation of materials and secure, in advance, any necessary permits.

C. Procure and pay for permits and licenses required for Work.

1.12 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in clearly marked containers showing net weight, guaranteed analysis and name of manufacturer. Specified requirements for packaged materials apply to bulk shipments. Protect materials from deterioration during delivery and during storage at site.

1.13 PROJECT CONDITIONS

A. Existing Conditions

1. Carefully examine the site before submitting a bid. Be informed as to the nature and location of the Work, general and local conditions including climate, adjacent properties and utilities, conformation of the ground, the nature of subsurface conditions, the character of equipment and facilities needed prior to and during execution of the Work. Be aware of and comply with restrictions regarding subsurface utilities and subterranean structures, including excavation and loading parameters.

2. Should the Contractor, in the course of Work, find any discrepancies between Drawings and physical conditions or any omissions or errors in Drawings, or in

layout as furnished by the Landscape Architect, it will be his duty to inform the Landscape Architect immediately in writing for clarification. Work done after such discovery unless authorized by the Landscape Architect, shall be done at the Contractor's risk.

B. Environmental Conditions—Arboriculture

1. Pruning: Pruning is preferred, between October 1 and April 1st, prior to the leafing out of the trees. Pruning shall only occur when weather conditions are favorable; pruning shall not occur when branches are wet with snow or rain or when covered by ice.

2. Fertilization: Spring fertilization shall occur in early spring, before bud break. When leaves have fully expanded, fertilizing can continue until early July Fall fertilization shall occur after October 1st or after the first hard freeze, whichever comes first, when all possibility of top growth in past and before the moisture in the soil freezes casing root activity. Avoid fertilizing between July and September 1.

3. Pest control: Avoid use of herbicides within planting bed. Avoid use of fertilizer/herbicide combinations within the dripline of trees in plant beds.

PART 2 PRODUCTS

2.01 SOIL AMENDMENT MATERIAL

A. Sand: Natural, medium to coarse grained in texture, free from decomposed organic matter like roots, sticks, leaves, paper and of any other undesirable trash-like glass, plastic or metal fragments that could interfere with soil drainage and planting operations. Sand shall be salt-free.

B. Ground Limestone: Natural dolomitic limestone containing a minimum of 88% of calcium and magnesium carbonates. Total of 100% passing the 10 mesh sieve; minimum of 90% passing the 20 mesh sieve; minimum of 60% passing the 100 mesh sieve.

C. Water: Potable, clean, fresh and free from harmful materials. Water shall be furnished by the Contractor. All hoses and other irrigation equipment required for the Work shall be furnished by the Contractor.

2.02 FERTILIZERS

A. General: As specified below, all fertilizer shall conform to applicable state fertilizer laws. It shall be uniform in composition, free-flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which is unsuitable for use will be rejected.

B. Fertilizer: To be determined based on testing.

2.03 MULCH

A. Mulch shall be double shredded hardwood bark.

PART 3 EXECUTION

3.01 GENERAL

A. Basic arboriculture shall include all activities as noted in drawings, and shall include other arboriculture activities as described herein. Note that pruning and mulching activities should be performed prior to the start of construction activities, to improve the vigor of the existing trees to be preserved and to help mitigate the effects of construction stress.

B. The Arborist shall monitor excavations and construction within the Tree Preservation Area, including: being on site during all excavations within the Tree Preservation Area to ensure that hand or approved mechanical excavations does not damage existing root systems, and to perform compensatory pruning. The construction that would occur within the Tree Preservation Area would include but not be limited to removal of existing pavements, pavements, and utility trenching.

3.02 PRUNING

A. Pruning – General: Pruning shall conform to ANSI A300 – 1995 standards as specified. Stripping of interior growth on trees is not acceptable. Interior growth may be selectively thinned when appropriate to type of prune. Thinning in general shall be accomplished from the tips of branches by removing diseased, crossing, and/or conflicting branch structure. Target pruning shall be the preferred method of branch removal. Equipment shall be sharp and well maintained. Proper equipment shall be used for all pruning procedures (i.e., handsaw, chainsaw, polesaw, or pole pruner). Employees pruning trees shall have adequate training as to the proper methods and procedures for tree pruning. Refer to ANSI A300 standards for other pruning requirements.

1. On trees known or suspected of being diseased, tools are to be disinfected with methyl alcohol at 70% (denatured wood alcohol diluted appropriately with water) or Clorox solution after each cut and between trees where there is known to be a danger of transmitting the diseased on tools.

2. The presence of any structural weakness, disease conditions, decayed trunk or branches, split crotches or branches, should be reported in writing to the Professional and PPR, and corrective measures recommended.

B. All Trees shall receive a crown cleaning to remove all dead, weak, and conflicting branches 1 (one) inch and larger at the point of attachment. Trees with root zone affected by construction shall receive a slight reduction in the meristematic regions at the branch tips in the crown.

3.03 ROOT PRUNING

A. Root pruning shall be performed in conjunction with Tree Preservation Fencing. Root pruning shall be performed as indicated on Drawings or as required, including: trenching for utilities, excavations for foundations, or wherever grades will be changed within the root zone of the tree to be preserved. Root pruning shall be to the depth of excavation or 24 inches, whichever is less. A trencher or vibratory plow shall be used to prune roots. Roots over 2" in diameter shall have a clean cut made on the surface of the root which is still attached to the tree. This cut shall be made with a hand saw or chain saw as soon as larger root is severed. Where fill is to be placed, root pruning shall be to the depth of top soil.

B. The Arborist must verify exact layout with General Contractor, to ensure root pruning in appropriate location.

C. When root pruning in conjunction with excavation and installation of utilities, the Arborist shall endeavor to work around and preserve the existing tree roots. Make all effort to preserve roots greater than 2" in diameter.

3.04 FERTILIZATION

A. Trees shall receive a liquid fertilization within three months prior to construction activities. Fertilizer shall be applied at a rate of 1.5 pounds of nitrogen per 1,000 square feet of root zone treated. A root stimulant shall be added for trees with root loss or disturbance or otherwise affected by construction. Fertilizer shall be injected using a soil probe at a depth of six inches. Fertilizer shall be applied in three foot grid pattern evenly distributed throughout the root zone.

3.05 TREE WOUND CARE

A. Tree wounds shall be treated according to standard practices, by a professional arborist. Wounds shall not be covered with dressings.

3.06 DISPOSAL AND CLEAN UP

A. All refuse and debris from these operations shall be legally disposed of off-site. Material shall be removed or neatly stored at the end of each day's work. Dumping on the site shall not be permitted. Burning of material on the site shall not be permitted.

B. All diseased, infected or infested vegetation that has been pruned/cut shall be removed immediately (at end of day pruning operations are performed) from the site.

C. Maintain the site in an orderly condition during the progress of Work. Continuously and promptly remove excess and waste materials; keep lawn areas, walks and roads clear. Store materials and equipment where directed. Immediately remove rejected materials from the property. Promptly remove equipment, surplus material, and debris and trash resulting from operations under this Contract upon completion and prior to initial acceptance of Work. Lave the site in a neat, orderly condition, "broom clean".

D. Maintain the site in an orderly condition during the progress of Work. Continuously and promptly remove excess and waste materials; keep lawn areas, walks and roads clear. Store materials and equipment where directed. Immediately remove rejected materials

from the property. Promptly remove equipment, surplus material, and debris and trash resulting from operations under this Contract upon completion and prior to initial acceptance of Work. Lave the site in a neat, orderly condition, "broom clean".

END OF SECTION 31 13 13

SECTION 32 92 10 - TURF GRASS SEEDING

PART 1 GENERAL

1.01 SECTION SUMMARY

A. Provide seed, sod and related items. Seeding shall be where indicated and at a time allowed by environmental conditions, by adjacent construction operations, and as specified.

B. Review of conditions and materials affecting seed installations.

C. Maintenance of seeded or sodded areas.

1.02 RELATED SECTIONS

A. Applicable Sections: Division 1

1.03 SUBMITTALS

A. Notices and Scheduling

1. Submit a schedule itemizing lawn and meadow work to be performed. This schedule shall be in addition to Project Contract Schedule(s) required by General Conditions and shall be submitted within 45 calendar days after Contract Notice to Proceed.

a. Include in this schedule anticipated dates for commencement and sequencing of lawn and meadow seeding, including but not limited to seed bed fertilizer and water applications, seeding, sodding and commencement of maintenance period.

b. Schedule shall also include, and relate to, work specified in other sections, such as subgrade preparations; landscape soil placements and grading; utility installations paving and site wall installations; and other elements of site. Obtain related scheduling information from General Contractor.

2. Prior to seed and sod installation, submit confirmation of understanding that the following elements of work have been inspected and approved prior to start of any work of this Section:

a. Complete placement of planting soil mix including verification of acceptability of grades, quality of soil mixes, and quality of material placement.

b. Confirm, also, that no construction access will be required across lawn or meadow areas.

B. Product Data:

1. Submit manufacturers or supplier's literature or tear sheets giving name of product, manufacturers or supplier's name and evidence of compliance with Contract Documents.

2. Commercial fertilizer

3. Herbicides, pesticides and fungicides

4. Mulch(s)

C. Certificates:

1. Submit certified analysis for each treatment, amendment, and fertilizer material specified and as used. Include guaranteed analysis and weight for packaged material.

2. Prior to the use on site of any chemical weed control materials, submit a list of the weed control materials and quantities per acre intended for use in controlling the weed types expected on the site. Submittal shall include data demonstrating the compatibility of the weed control materials and methods of installation or application with the intended planting and seed or sod varieties.

D. Test Reports: Submit written reports of each grass and meadow seed mixture or sod composition. Each report shall include the following as a minimum and such other information required specific to material tested:

1. Date issued;

2. Project Title and names of Contractor and supplier;

3. Testing laboratory name, address and telephone number, and name(s), as applicable, of each field and laboratory inspector;

4. Date, place, and time of sampling and test;

5. Location of material source;

6. Type of test;

7. Recommendations for soil additives, mix proportions, and methods of preparation, as applicable, for optimum lawn and meadow conditions;

8. Test for purity, proportion by weight, weed seed content and germination percentage of seed mixtures proposed for use.

9. No seed shall be delivered until the test reports are approved. Seed shall be tested within six months immediately proceeding date of sowing. Owner reserves the right to have seed tested independently.

E. Samples:

1. Mulch: Two-pound bag of each type, with manufacture's recommendations on application rate for Hydro mulch.

F. Statement(s) of Qualifications: Submit to confirm qualifications as specified in Article 1.4, herein.

G. Maintenance Program: Submit a program for continued maintenance of lawn and meadow areas after Substantial Completion. Program shall include a report of conditions unique to site that has been identified during Contractor's maintenance of lawn and meadow work (Article 3.6, herein). Refer also to Article 1.4, herein.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Installation and maintenance foreman on the job shall be competent English-speaking supervisor(s), experienced in landscape installation and maintenance. Perform work with personnel totally familiar with lawn and meadow preparations and installations under the supervision of an experienced landscape foreman.

2. Exhibit and identify a record of at least three (3) lawn and meadow installations of similar scope or size to this Project.

B. Pre-lnstallation Review of Related Work: Within 45 calendar days after Contract Notice to Proceed for seeding work or such later date as approved by Owner's Representative, but prior to first Pre-lnstallation Conference, obtain data as necessary and review plant mix materials and soil amendments to be used for lawn and meadow areas of this Project. Become familiar with proposed plant mixes and on-site grading conditions. Reference design drawings.

1. Submit a report of acceptance of soil mixes as being appropriate for seed and sod installation and, if deemed necessary, recommendations for possible SOC adjustment of amendments.

2. Review conditions and coordinate findings of report at Pre-lnstallation Conference.

C. Pre-Installation Conference: Prior to commencement of any of the work of this section, Contractor shall arrange a conference at the site of this Project with the Owner's Representative, Construction Manager, and Landscape Architect. At least five-(5) working days notice shall be given prior to the conference.

1. Conference attendance will include the Contractor, the foreman appointed to oversee the work of this Section, the foreman responsible for soil preparation and mixes and soil placement (reference design drawings), other representatives of Owner, and other persons as deemed appropriate for coordination of work and quality control.

2. At the conference, review lawn and meadow installation and sequence schedules, specification criteria and installation, procedures, outstanding submittals and approvals, and such other subjects necessary for coordination of Work.

3. Establish follow up meeting(s) as necessary including but not limited to a final pre-installation review of lawn and meadow area plant mix soil placement.

D. Inspection for Substantial Completion

1. Maintain all lawn and meadow areas until Substantial Completion. Maintenance will be in accordance with requirements specified in Article 3.6 of this Section.

2. The Owner or Architect will make an inspection for Substantial Completion of the work of this Section at the time of Substantial Completion of the entire Contract. The Contractor shall submit a full and complete written program for maintenance of the lawns and meadows for review by the Landscape Architect and Owner's Representative at the time of the request for substantial completion.

   a. Submit a written request for inspection at least 14 calendar days prior to the day on which the inspection is requested.

   b. Contractor shall prepare a list with status of items to be completed or corrected for review by the Owner or Landscape Architect, prior to inspection.

   c. At time of the Owner or Landscape Architect's inspection, all lawns and meadows shall show a uniform, thick, well-developed stand of plants. If the stand is unsatisfactory, as determined by the Landscape Architect, the Contractor's maintenance responsibility shall continue until an acceptable stand of plants is achieved.

   d. Upon completion of the inspection, the Owner or Landscape Architect will amend Contractor's list of items to be completed or corrected as determined necessary and will indicate the anticipated time period for their completion or correction.

3. Lawns and meadows will not be accepted until all items of lawn and meadow work have been completed or corrected. The Owner or Landscape Architect, after Contractor's completion of outstanding work, will recommend to the Owner, in writing, the Substantial Completion of the lawn and grasses work of this Section.

   a. The Contractor's responsibility for maintenance, however, shall terminate only upon issuance of acceptance by Owner for Substantial Completion.

1.05 REFERENCES

A. SPN: "Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.

B. Association of Official Agricultural Chemists.

C. ASTM: American Society for Testing and Materials using test criteria as specified or required by other references.

D. AASHTO: American Association of State Highway and Transportation Officials.

1.06 REGULATORY REQUIREMENTS

A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary to make Work comply with such requirements without additional cost to Owner.

B. Procure and pay for permits and licenses required for work of this section.

1.07 PROJECT/SITE CONDITIONS

A. Acquaintance With Existing Site Conditions:

1. Through study of all Contract Documents, and by careful examination of the site, become informed as to the nature and location of the Work, the nature of surface and subsurface soil conditions, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work.

2. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of this work site. Conform to all governmental regulations in regard to the transportation of materials to, from, and at the job site, and secure in advance such permits as may be necessary.

B. Should the Contractor, in the course of Work, find any discrepancies between Contract Drawings and physical conditions or any omissions or errors in Drawings, or in layout as furnished by the Owner, it will be Contractors duty to inform the Landscape Architect (Design Consultant) immediately in writing for clarification. Work done after such discovery, unless authorized by the Owner or Landscape Architect, shall be done at the Contractor's risk.

C. Sequencing and Scheduling:

1. Adjust, relate together, and otherwise coordinate work of this Section with Work of Project and all other Sections of Specification.

2. Seed installations shall not begin until all other constructions, including installation of all utilities and placement of planting soil mixes, are complete and possibility from damage caused by operations does not exist.

D. Environmental Requirements:

1. Perform soil work only during suitable weather conditions. Do not disc, rototill, or work soil when frozen, excessively wet, or in otherwise unsatisfactory condition.

2. Place grass seed or sod only at seasonal times within appropriate temperature range and wind conditions for plant development as approved by Landscape Architect:

a. Acceptable Seeding Seasons/Times:

1) Spring: April 1st - June 15th

2) Fall: September 1st - October 15th

b. Seeding or sodding at any time other than within the above seasons shall be allowed only when the Contractor submits a written request for permission to do so and permission is granted in writing by the Owner. Newly seeded or sodded areas, if installed out of season, must be continuously watered according to best recommended and Landscape Architect approved practice. Contractor shall be responsible for providing an acceptable stand of grass as specified.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in unopened bags or containers, each clearly bearing the name, guarantee, and trademark of the producer, material composition, manufacturers' certified analysis, and the weight of the material.

B. Bulk Materials

1. Deliver bulk materials with each individual shipment accompanied by an affidavit from the vendor (supplier), countersigned by the Contractor upon receipt, identifying the material type, composition, analysis, and weight and certifying that the material furnished complies with specification requirements of this Project.

2. Affidavits shall be furnished in duplicate with one copy submitted to Construction Manager at the end of day of shipment receipt at the Project site and the second copy retained with material or on file with Contractor.

C. Mulch, amendment materials, or soil stored on site temporarily in stockpiles prior to placement shall be protected from intrusion of contaminants, erosion and from mechanical or environmental damage.

PART 2 PRODUCTS

2.01 TEMPORARY TURF

A. Temporary turf seed mix shall be as specified on the Erosion Control Plans, Notes, and Details.

2.02 PERMANENT TURF

A. Permanent turf seed mix shall be the following:

Seed Type	Proportion by Weight	Minimum Purity	Minimum Germination
1. Turf-Type Tall Fescue	60%	95%	80%
2. Perennial Rye Grass	30%	95%	85%
3. Kentucky Blue Grass	10%	90%	80%

2.04 TOPSOIL

A. Existing topsoil stripped from the project site, disturbed areas only, may be used for lawns, planting and transplanting work. Contractor shall verify if available project site topsoil is sufficient in quantity to perform the required work. If project site topsoil is insufficient the contractor shall provide topsoil from an approved off project site source(s) as required to complete work.

B. Topsoil to be imported to the project site shall be a sandy loam topsoil (as defined in USDA Soil Texture Classification) and be fertile, friable, well-drained, pH range of 6.0 to 6.5, free of subsoil, toxic substances harmful to plant growth, without clay lumps, stones, roots or debris. The imported topsoil shall have a mechanical analysis as follows:

1. Sand: 35 percent to 40 percent.

2. Clay: 15 percent to 20 percent.

3. Organic Matter: 2.5 percent.

4. Silt: Balance

2.05 FERTILIZER

A. Conforming to standards of Association of Official Analytical Chemists, delivered to Project Site in sealed and labeled bags, or in bulk with certification as to quality and analysis. Nitrogen source shall be at least 33 percent water insoluble. Fertilizer shall have the following formulations:

1. Basic Fertilizer: 10-10-10 or 10-6- 4 analysis.

2. Starter Fertilizer: 5-10-10 or 10-20-20 analysis.

A. Fertilizer shall be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear the manufacturer's guaranteed statement of analysis or a manufacturer's certificate of compliance covering analysis shall be furnished to the Landscape Architect. Store fertilizer in a weatherproof place and in such a manner that it shall be kept dry and its effectiveness shall not be impaired.

2.06 LIMESTONE

A. Ground agricultural dolomitic limestone, 90 percent calcium carbonate equivalent, conforming to standards of Association of Official Analytical Chemists and applicable State and Federal Regulations. Material shall have a total of 100% passing the 10 mesh sieve, minimum of 90% passing the 20 mesh sieve, and a minimum of 60% passing the 100 mesh sieve.

2.07 SOIL-STABILIZING AGENT

A. For use in hydroseed mix only. Material shall be one (1) of the following:

1. "Verdyol Complex": Weyerhaeuser Company,

2. "Curasol": Wolbert Master Associates,

3. "Terra-Tack": Grass Growers, Inc,

4. "J-Tac": Reclamare Company,

5. Approved Equal.

2.08 MULCH MATERIALS

A. General Use: Straw, salt marsh hay, or a combination of both. Material shall be:

1. Reasonably weed free, not brittle or overly decomposed.

2. Cured to less than 20% moisture content by weight.

3. Contain no stems of tobacco, soybeans, or other coarse or woody material.

2.09 HYDROSEEDING MATERIALS

A. Fiber mulch shall be biodegradable, non-toxic green dyed-wood cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum mixture content of 15 percent and a pH range of 4.5 to 6.5.

B. Nonasphaltic tactifier shall be a colloidal tactifier recommended by the fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors. Material shall be one (1) of the following:

1. "Verdyol Complex": Weyerhaeuser Company,

2. "Curasol": Wolbert Master Associates,

3. "Terra-Tack": Grass Growers, Inc,

4. "J-Tac": Reclamare Company,

5. Approved Equal.

2.10 EROSION CONTROL BLANKET/FABRIC NETTING

A. Contractor shall provide and install where indicated on civil drawings “Curlex” blankets: by American Excelsior Company; “Polyjute” Style465 CT: by Synthetic Industries or approved equal.

B. The area to be covered shall be properly prepared, fertilized, and seeded before blanket is applied. When blanket is unrolled, the netting shall be on top and the fibers in contact with the soil over the entire area. In ditches, the blanket shall be applied in the direction of the flow of water, butted snugly at ends and side and stapled. On slopes, the blankets shall be applied either horizontally or vertically to the slope. Ends and sides shall be butted snugly and stapled. Staple to manufacturer’s recommendations.

2.11 WATER

A. Potable, clean, fresh and free from harmful material. Water shall be furnished by Owner as necessary for lawn installation and maintenance. Include all hoses and other irrigation equipment required for correct use of water without waste.

2.12 ACCESSORY MATERIALS

A. Herbicides: For possible use if there is seed germination in lawn areas after plant soil mix placement and prior to seed installation. Herbicides shall be approved before use for type and rate of application by the Landscape Architect and by local and state agencies with jurisdiction.

1. Post-emergent shall be Roundup, as manufactured by Monsanto Agricultural Products Company, C3NJ, St. Louis, MO 63166, or an approved equal.

B. Sod Stables: 11 Gauge steel wire staples, one (1) inch wide and six (6) inches long for securing sod to slopes 4:1 (25%) or greater.

C. Lawn areas shall have fertilizer applied in two (2) applications with a thorough watering immediately following application. The first application shall be one (1) week before the seeding at the rate of 35 pounds per 1,000 square feet harrowed into the top two inches (2") of seedbed. The second application shall be done at the rate of 25 pounds per 1,000 square feet, immediately following the second mowing.

D. Commercial fertilizer for temporary turf seed areas shall be a 10-10-10-grade fertilizer (600lbs/acre).

PART 3 EXECUTION

3.01 VERIFICATIONS

A. Prior to construction of lawn and meadow areas, ascertain the location of all electric cables, conduits, underdrainage systems and utility lines. Take proper precautions so as not to disturb or damage sub-surface elements. Contractor failing to take these precautions shall be responsible for making requisite repairs to damaged utilities at Contractors own expense.

B. Verify that required underground utilities are available, in proper location and ready for use. Coordinate with other trades.

C. Verify that all final grades blend with adjacent grades and that area(s) to be seeded is free from depressions and abrupt changes in slope and that all grades as placed have been approved by, and remain satisfactory to Owner & Architect.

D. Verify that all tree planting in lawn areas and all shrub beds adjacent to lawn areas have been installed, will remain as approved, and no further construction work will occur which will or may require access through lawns and meadows.

3.02 SUBSOIL PREPARATION

A. Inspect rough grade subsoil. Eliminate uneven areas and low spots. Remove, for example, debris, roots, branches and stones in excess of 2 inches in size. Remove subsoil which has

been contaminated with petroleum, concrete spills, and toxic substances.

B. Bring subsoil to required levels, profiles and contours. Cut out areas to receive topsoil specified in this Section, and otherwise to subgrade elevations as specified in Section 31 20 00 – Earth Moving.

C. Cultivate subgrade to a depth of 6 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

D. Maintain during grading operations the specified compaction, restore previously compacted areas and test soil compaction according to Section 02200 - Earthwork.

3.03 TOPSOIL PLACEMENT AND LAWN BED PREPARATION

A. Inspect subsoil prior to placing topsoil to confirm subsoil conditions meet the requirements of this specification. If subsoil conditions do not meet the requirements repeat subsoil preparation work as specified under this Section.

B. Place topsoil in areas where seeding, sodding and planting are to be performed. Place to the following minimum depths, up to finished grade elevations: Six (6) Inches for seeded and sodded areas.

C. Incorporate the following materials uniformly throughout entire depth of topsoil:

1. Limestone: 100 pounds per 1,000 square feet or as determined by agricultural soil test reports.

2. Basic Fertilizer: 3 pounds per 1,000 square feet or as determined by agricultural soil test reports.

D. Use topsoil in relatively dry state. Place during dry weather. Do not spread wet or clumpy topsoil.

E. Fine grade topsoil to the required levels, profiles and contours. Eliminate rough and low areas to ensure positive drainage. Establish proper flowline gradients and profiles for swales and other storm management features. Drag smooth and hand rake topsoil to final grade elevations. Roll if necessary to stabilize in order to commence seeding. Remove all ruts, mounds, and ridges on surface of topsoil. Remove all stones greater than 1 inch, roots, weeds, or other debris visible on soil surface. Resulting holes shall be filled with specified topsoil, leaving a uniform planar surface. Grade uniformly so soil surface does not have low spots which may collect water. Finish grades shall be within ¼ inch +/- tolerance of finish grades indicated on the plans.

F. Manually spread topsoil around trees, plants, and other construction to prevent possible damage by grading equipment.

G. Blend topsoil smoothly into undisturbed areas. Do not place topsoil on existing vegetation in undisturbed areas. Maintain required depth of topsoil at limit of grading line.

H. Lightly compact and roll placed topsoil.

I. Clean all paved and building surfaces and remove soil to maintain quality of finished surface.

J. Allow for and verify that planting soils of lawn and meadow areas, completed in placement with deficiencies corrected as necessary, to settle for a minimum fourteen (14) days prior to beginning of lawn and meadow installation.

K. Coordinated sequencing of work shall allow immediate seed and sod installation after completion of verifications and preparations. \

3.04 ADDITIONAL SEED AND SOIL AMENDMENTS

A. Starter fertilizer: Add starter fertilizer at the following rates to surface of seed bed or include as an ingredient in hydroseed mix: 40 pounds per 1,000 square feet.

3.05 SEEDING

A. Seeding shall be done between the following dates:

1. Permanent Seeding:

a. Spring Seeding: April 1 to June 15.

b. Fall Seeding: August 15 to November 1.

2. Temporary (Non-Permanent) Seeding:

a. January 1 to December 31.

B. Prior to seeding contractor shall inspect surface soil bed conditions to assure they meet the requirements for receiveing seed. At minimum the soil bed surface shall be roughened to break-up large clods and surface crust, to scarify and fine rake to remove irregularities that will hold water.

C. Manual or mechanical sowing of seed may be by the following optional methods:

1. Mechanical Power-Drawn Seeder: Combination grass planter and land packer or pulverizer. Plant seed not deeper than [1/4 inch] {6 mm}. Keep seeding operation as close as possible to contours and not up and down slopes. After seeding, compact with land roller, such as a cultipacker. With proper equipment, sowing seed and cultipacking in one (1) operation is satisfactory.

2. Hopper Type Spreader: Manually-propelled or power-drawn hopper devices. Uniformly distribute seed by sowing half seed in one (1) direction and remainder at right angles to direction of first sowing. Cover seed an average depth of [1/4 inch] {6 mm} by means of chain harrow, cultipacker, or other approved method.

D. Hydroseeding: Mix specified seed, fertilizer and fiber mulch in water using clean, washed equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into a homogenous slurry suitable for hydraulic application. Hydraulic broadcasting of prepared material.

1. Hydroseed at the following rates per acre:

a. Water: As specified.

b. 1,500 pounds of wood cellulose, plus 15 percent for slopes 5 percent and steeper.

c. Fertilizer: As specified for starter fertilizer. Starter fertilizer may be added to surface of seed bed.

d. Soil stabilizer of type and at rate recommended in writing by manufacturer.

e. Seed Mix: As specified.

f. For a 3,000 gallon tank, multiply specified quantities by 0.75. Mix and agitate all materials, except wood cellulose, in 2,200 gallons of water; then add wood cellulose, fill tank with water and continue agitation. Seed promptly, under constant agitation of mix, beginning when complete mix is a uniform slurry. Limit coverage for 3,000 gallon tank to 0.75 acre.

g. Take precautions against overspray onto roads, curbs, sidewalks, building walls, and other surfaces except ground areas. Contractor shall promptly clean all areas of overspray to satisfaction of Owner's Representative and Landscape Architect.

3.07 MULCHING

A. Except hydroseeded areas, seeded areas sloped four (4) horizontal to one (1) vertical or greater, and areas where lawn would be difficult to establish, shall be mulched at rate of 1.5 tons per acre.

B. Use wood fiber mulch or soil stabilizing agents, hydraulically applied in water at rate of 1,500 pounds of wood fiber per acre, plus l5 percent on slopes greater than four (4) to one (1).

C. For dry-mulched areas, spray with soil-stabilizing agent/tackifier material immediately after spreading straw or salt marsh hay or both, at rate of 200 gallons of asphalt per acre, in a method to bind mulch to soil and inhibit wind loss of mulch. Do not apply soil-stabilizing agent/tackifier material within when ambient temperature is below 55 degrees F. Clean off misplaced spray from building walks, paving, light standards and bases, and other surfaces to satisfaction of Owner's Representative or Landscape Architect.

3.08 WATERING

A. Keep newly sodded areas moistened until grass becomes well established and have shown signs of knitting with topsoil.

B. In event of insufficient rainfall, moisten areas every two (2) or three (3) days until sod becomes established. Thereafter, water in absence of rain every seven (7) to ten (10) days. When watering sod, make sure that water soaks through sod into topsoil bed below.

3.09 PROTECTIVE WORK

A. Provide materials and Work necessary to protect Work from damage. Prevent damage to Owner's property and Work specified in other Sections during these operations.

B. Protective Work shall include wire line and stakes along walkways with cloth strips at 4 feet intervals as evidence of wire and also "KEEP OFF" signs.

C. Defer Work when continuation of construction Work must occur over certain lawn areas.

3.10 MAINTENANCE PRIOR TO ACCEPTANCE

A. Maintain all sodded areas by properly mowing, watering, weeding, and similar care to keep Work in a clean and neat condition at all times. Advise Owner's Representative, in writing, when Work is in condition to meet acceptance.

3.11 CONDITIONS OF ACCEPTANCE

A. Fine Lawns shall be approved to begin one (1) year Maintenance and Guarantee Period based on the following requirements:

1. Bare spots, not greater than 1 square foot, shall be permitted up to a maximum of 3 percent of Fine Lawn Area.

B. During one(1) year Maintenance and Guarantee Period, Owner shall do no Maintenance Work, watering or cutting of lawns provided under this Contract.

C. Contractor may use existing underground irrigation systems if available.

D. When Work meets conditions specified above, Date of Acceptance shall be Date that Guarantee Period commences. Design Professional shall notify Contractor in writing of said Date.

3.12 MAINTENANCE AND GUARANTEE OF LAWN AREAS AND SODDED AREAS

A. Provide all Maintenance Work throughout Guarantee Period, which shall be one (1) year from Date of Acceptance.

B. Guarantee Work to be in vigorous and thriving condition by end of Guarantee Period, free of objectionable quantities of weeds and other undesirable growth. Maximum percentage allowed for scattered bare spots shall not exceed 3 percent of fine lawn area. Each bare spot shall not be larger than 1 square foot.

C. Maintenance Work shall include watering, remedial Work such as repair of eroded areas, and resodding if required. Provide general cleanup of stakes, strings, temporary signs, and sweeping of paving and sidewalks. Cut grass a minimum of 26 cuttings a year. Include other Work as maintenance as necessary, for example, lawn feeding, grub control and weeding, broadleaf weed control as deemed required by Contractor in support of Guarantee, or as may be brought to his/her attention during Guarantee Period.

D. Additional fertilization and limestone shall be required. Spread one (1) additional application of 10-6-4 fertilizer evenly over fine lawn area at rate of 25 pounds per 1,000 square feet and spread one (1) additional application of limestone at rate of 100 pounds per

1,000 square feet. Complete applications in fall season of year approaching termination of Maintenance and Guarantee Period.

E. Cutting of fine lawn areas shall occur when grass is dry and to maintain a height of about 2 inches. Cut grass a maximum of 1/3 of total grass blade height. Maintain a neatly-trimmed edge condition throughout at all times.

F. During one (1) year Maintenance and Guarantee Period, Owner shall do no Maintenance Work, watering or cutting of lawns provided under this Contract.

3.13 FINAL INSPECTION AND ACCEPTANCE

A. Toward end of Maintenance and Guarantee Period, give notice in writing to Owner's Representative stating desired Date for Final Inspection.

B. At time of Final Inspection, lawn Work shall be in condition required by Maintenance and Guarantee Work indicated.

C. If Work is accepted at time of Final Inspection, Guarantee shall be considered fulfilled and terminated. Should any Work need replacement at time of Final Inspection, continue Guarantee Period until such replacements are made and deemed acceptable.

D. Design Professional shall notify Contractor in writing of Date of Final Acceptance.

END OF SECTION 32 92 10

SECTION 33 01 10 - PROTECTION OF EXISTING UTILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Identification and field mark out of all on-site utility lines to remain in operation during construction.

B. Submission of procedures to be used to ensure the safety of the utility.

C. Repair of any damage during construction operations.

1.02 RELATED SECTIONS AND DOCUMENTS

A. Contract Drawings

1.03 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of capped utilities and utility lines encountered during construction.

1.04 REGULATORY REQUIREMENTS

A. Contractor shall notify all affected utility companies, agencies, authorities, owners, etc. at least 48 hours prior to the commencement of work and shall comply with their requirements.

B. Contractor shall contact the PA ONE-CALL service for an official utility mark out.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

3.01 IDENTIFICATION

A. Locate all existing utilities which are to remain in service during construction as shown on the Construction Drawings.

3.02 PROTECTION

A. Flag, barricade or suitably protect existing utilities during construction operations and equipment movement.

B. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction.

3.03 LATERAL DISCONNECTION

A. Where a utility line is to be disconnected from portions to remain, the lateral pipes shall be cut and suitably plugged/capped in accordance with the Contract Drawings and applicable utility or agency requirements.

3.04 REPAIRS

A. Any damage to existing, operational utilities by the Contractor or his subcontractors during the on-going construction operation shall be immediately repaired to operational standards at the Contractor's expense. If the repairs are not immediately addressed by the Contractor, the utility owner and/or the Owner shall contract for the repair at the Contractor's expense.

END OF SECTION 33 01 10

City of Philadelphia - Department of Public Health
Air Management Services, 2nd Fl. Asbestos Control Unit
321 University Ave. Philadelphia, PA 19104

Asbestos Inspection Report

Office Use Only	Date Received L&I:	Date Received AMS:
	Date Inspected	Inspector No.

1. Name of Building / Property: Richmond Library
Address: 2987 Almond Street Philadelphia, PA 19134

2. Name of Building / Property Owner: Free Library of Philadelphia
Address:
Phone No.: 215-686-5322

3. Name of Philadelphia Certified Investigator: Bernard J. Bryson
Certification No.: 0437
Contact Information / Email / Phone No.: 215-755-2305

L&I Commercial Activity No. (Former Business Privilege License No.): H-31804
Business Tax ID No.: 559-2027

4. Name of Philadelphia Licensed Laboratory: EMSL
License No.: 137
Phone No.: (856) 858-4800

5. Scope of Work: (Insert or attach a complete description of the portion of the subject property inspected and the anticipated work that will result in the disturbance of the identified Asbestos Containing Materials (ACMs) (e.g. demolition, asbestos abatement, and / or renovation activities.)

6. ☐ Property has been declared to be in imminent danger (ID) of failure or collapse by the City of Philadelphia Department of Licenses & Inspections. Attached is a copy of the L&I Notice of Violation declaring the property I.D. **Note: INVESTIGATOR MUST BE ON SITE DURING DEMOLITION!

7. (ACMs) identified? ☑ Yes (List Below) ☐ No (explain)

Project No. 632-267

8. Suspected ACM's sampled? ☑ Yes (attached are copies of the laboratory chain of custody and bulk sample results.) ☐ No (Why?)

9. List all identified ACM's located in the planned renovation/demolition areas. Damaged ACM must be listed and then repaired or removed prior to renovation. You (Investigator) must label all ACM that may be left in the work area. (Attached are add'tl sheets)

Location	Description	Type (Code 1)	Amount Square	Amount Linear	Condition (Code 2)	Action (Code 3)
Section 9 begins of Page 2						

Code 1
FRI - Friable
NF1 - Non-Friable, Cat. 1
NF2 - Non-Friable, Cat. 2

Code 2
DD - Deteriorated or Delaminated
ND - Non-Damaged

Code 3
REM - Removal necessary prior to Demo/Reno
NRN - No removal necessary, label ACM
REP - Repair & Label ACM, removal not necessary

10. I hereby certify that the foregoing statements are true and the information contained in this report is true. This certification is made subject to the penalties set forth in 18 PA. C.S. S4904 relating to unsworn falsification to authorities. Furthermore I certify that the inspection, sampling, and labeling requirements of section X of the Asbestos Control Regulation (ACR) have been met. The building owner has been notified of the ACR requirements and given a copy of this report. If the inspection has revealed ACM which will be disturbed by the proposed work or if it has revealed ACM in bad condition, the building owner has been notified to remove or repair the ACM in accordance with the ACR prior to renovation or demolition activity.

11. Signature of Certified Asbestos Investigator:	Date:	Signature of Building Owner:	Date:
Bernard J Bryson	7/31/2020		

Asbestos Inspection Report

9.
List Asbestos Containing Material (ACM) located in the planned renovation/demolition area(s). Damaged ACM must be listed and then repaired or removed prior to renovation.

Q/U = Quantity Undetermined

Location	Description	Type (Code 1)	Amount Square	Amount Linear	Condition (Code 2)	Action (Code 3)
Basement	Plaster Wall Grey Undercoat (assumed ACM) * isolated locations of damage	FRI	4,000 square feet		*	TBD
Basement	Plaster Ceiling Grey Undercoat (assumed ACM) * isolated locations of damage	FRI	3,500 square feet		*	TBD
First Floor and Front Loft	Plaster Wall Grey Undercoat (confirmed ACM) * isolated locations of damage	FRI	10,000 square feet		*	TBD
First Floor and Front Loft	Plaster Ceiling Grey Undercoat (confirmed ACM) * isolated locations of damage	FRI	7,500 square feet		*	TBD
Throughout the Building	Wood and Metal Fire Doors (assumed asbestos-containing interiors)	NF2	Approximately 25 doors		ND	TBD
Electric Panels	Wire Insulation inside Electric Panels (assumed present; assumed asbestos-containing)	NF2	Q/U		ND	TBD
1st Floor Closet in Stairwell along Mercer Street	9” x 9” Grey Floor Tile (mastic non-asbestos)	NF1	30 square feet		ND	TBD
Throughout the 1st Floor Computer Section, Children’s Section, Adult Section, Office and Front Desk	Brown Floor Tile below Carpeting (** ***carpet removal could render the floor tile friable***)	NF1 **	6,600 square feet		ND	TBD
Throughout – Concealed within Wall Cavities and above Rigid Ceilings (assumed present)	Thermal System Insulation (pipe, duct, radiator, etc.)	FRI	Q/U	Q/U	unknown	TBD
Attic Crawlspace	Thermal System Insulation (pipe, duct, radiator, etc.)	FRI	Q/U	Q/U	unknown	TBD
Rooftops	Roof field and flashing (assumed asbestos-containing)	NF1	7,000 square feet		unknown	TBD

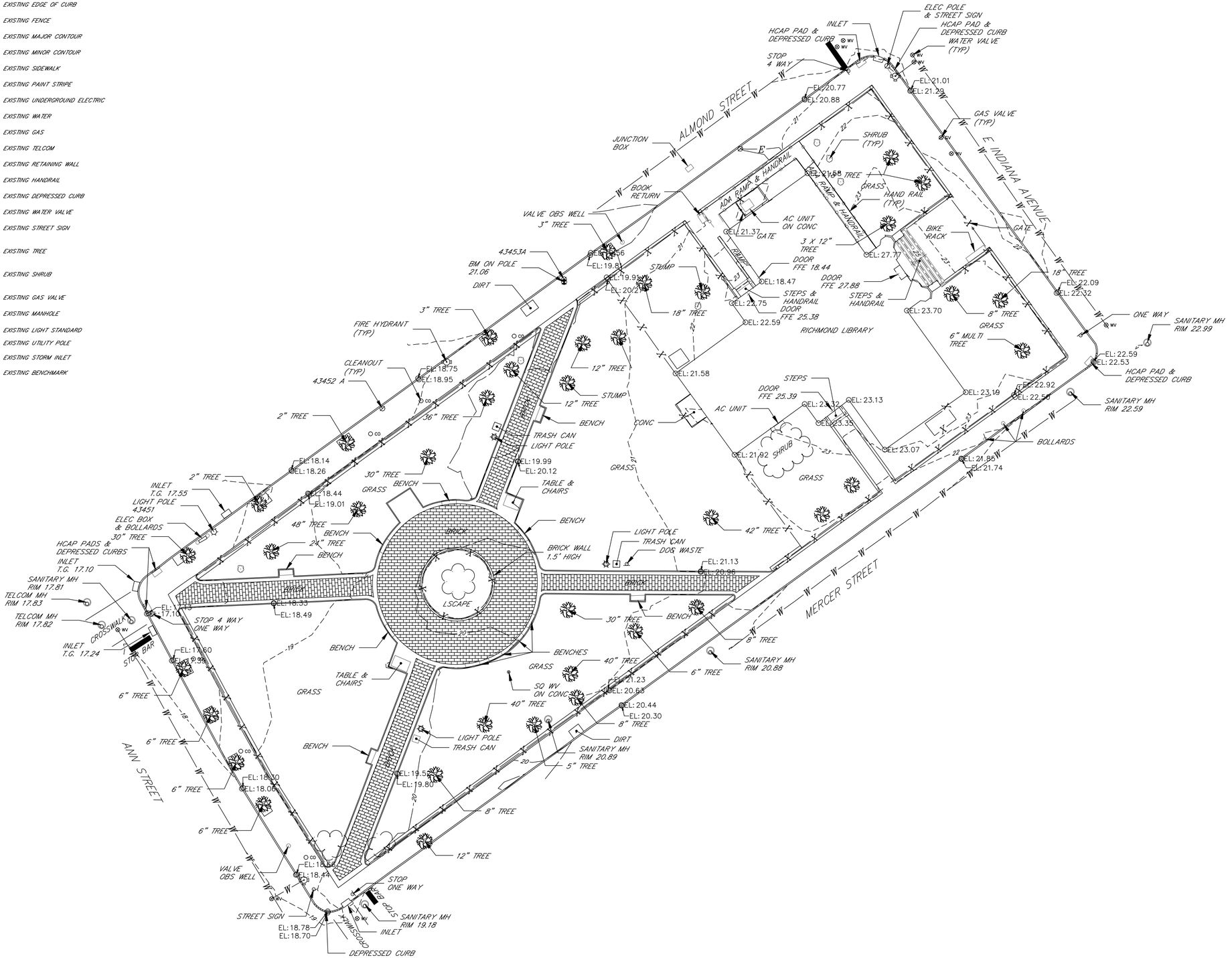
Signature of Certified Asbestos Investigator: Date:

7/31/2020

Signature of Building Owner: Date:

LEGEND

- EXISTING EDGE OF CURB
- EXISTING FENCE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING SIDEWALK
- EXISTING PAINT STRIPE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER
- EXISTING GAS
- EXISTING TELCOM
- EXISTING RETAINING WALL
- EXISTING HANDRAIL
- EXISTING DEPRESSED CURB
- EXISTING WATER VALVE
- EXISTING STREET SIGN
- EXISTING TREE
- EXISTING SHRUB
- EXISTING GAS VALVE
- EXISTING MANHOLE
- EXISTING LIGHT STANDARD
- EXISTING UTILITY POLE
- EXISTING STORM INLET
- EXISTING BENCHMARK



PENNSYLVANIA STATE PLANE: SOUTH ZONE
HORIZONTAL DATUM: NAD 83
VERTICAL DATUM: CITY OF PHILADELPHIA DATUM

graphic scale
0 20 40 60
SCALE IN FEET

REV.	DESCRIPTION	BY	DATE

JOB NUMBER: 18093.06
FILE NAME: 18093.06 Richmond.dwg
DRAWN BY: TMG
CHECKED BY: JMW
DATE: 9-1-2021
REVISED:

441 FRIENDSHIP ROAD
HARRISBURG, PA. 17111
1-800-733-1102
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