Construction Specifications

ATW Terminal Expansion Project
ALTERNATE BID #1: AW South Building Roof Replacement

ATW Airport
Appleton, WI

May 4, 2020

A1536A18

OMNI
ASSOCIATES
a **Westwood** company

SECTION 06 10 53
MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Roofing nailers, blocking and plywood panels.

1.02 RELATED REQUIREMENTS

A. Section 07 54 23 - Thermoplastic Polyolefin (TPO) Roofing.

B. Section 07 62 00 - Sheet Metal Flashing and Trim; Finish architectural flashings.

1.03 REFERENCE STANDARDS

A. Board of Review, American Lumber Standard Committee (ALSC); alsc.org.

B. ASTM International Standards, latest editions unless otherwise stated:

1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware;
2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process;

C. National Institute of Standards and Technology, Department of Commerce, latest editions:

1. Voluntary Product Standard PS 1 - Structural Plywood.
2. Voluntary Product Standard PS 20 - American Softwood Lumber Standard.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Cover wood products to protect against moisture.

B. Support stacked products to prevent deformation and to allow air circulation.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: PS 20 and requirements of specified grading agencies.

1. Provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
2. Grading Agency: Any grading agency whose rules are approved by the ALSC, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on Contract Drawings.

B. Moisture Content: S-dry or MC19;

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.
2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Other Applications:

1. Plywood Concealed from View but Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View but Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

2.04 FASTENERS AND ANCHORS

A. Carpentry/plywood to wood substrate:
   1. Common wire nails with hot-dipped galvanized coating.
   2. #8, coarse galvanized, sharp point, dual-torque deck screw with bugle head.
   3. Length as necessary to penetrate substrate by a minimum of 1-1/2-inches.

B. Carpentry to steel roof decking:
   1. #14 steel roofing screw with corrosion-protective coating.
      a. Roofgrip screw with Climaseal coating, by Buildex Division of ITW, Inc.; itwbuildex.com.
      b. Heavy Duty Roofing Fastener with CR-10 coating, by OMG, Inc.; olyfast.com.
      c. #14 Dekfast with gray e-coat coating, by SFS intec, Inc.; sfsintecusa.com.
      d. Trufast #14 HD Roofing Fastener with black e-coat coating, by Altenloh, Brinck & Co. U.S., Inc.; trufast.com.
      e. Or Approved equal.
   2. Length shall be sufficient to penetrate steel decking (top pan only) by 1/2-inch.

C. Carpentry to concrete or solid masonry substrate:
   1. 1/4-inch diameter, Phillips-head masonry screw.
      a. Tapcon, 1/4-inch diameter, Phillips-head screw, by Buildex Division of ITW, Inc.; itwbuildex.com.
      b. Tapper, 1/4-inch diameter, Phillips-head screw, by Powers Fastening, Inc.; powers.com.
      c. Titen, 1/4-inch diameter, Phillips-head screw, by Simpson Strong-Tie; strongtie.com.
      d. Or Approved equal.
   2. Zinc Alloy nail-drive expansion anchor, 1/4-inch diameter, with stainless-steel pin.
   3. Length as necessary to provide a minimum of 1-inch embedment.

D. Carpentry to hollow masonry substrate:
   1. 1/4-inch diameter sleeve anchor; length as necessary to penetrate a minimum of 1-inch into interior of the hollow masonry units.
      a. Sleeve Anchor, by Hilti Fastening Systems; hilti.com.
      b. Or Approved equal.
   2. 1/4-inch diameter, Phillips-head masonry screw; length as necessary to provide a minimum of 1-inch embedment.
      a. Tapcon, 1/4-inch diameter, Phillips-head screw, by Buildex Division of ITW; itwbuildex.com.
      b. Tapper, 1/4-inch diameter, Phillips-head screw, by Powers Fastening, Inc.; powers.com.
      c. Titen, 1/4-inch diameter, Phillips-head screw, by Simpson Strong-Tie; strongtie.com.
      d. Or Approved equal.

E. Carpentry to sheet metal substrate:
   1. Self-drilling sheet metal screws, cadmium plated.
      a. 10-24 wafer-head Plymetal TEKS/3 with wings, by Buildex Division of ITW, Inc.; itwbuildex.com.
      b. Or Approved equal.
   2. Length shall penetrate the substrate by a minimum of 1-inch.

F. Carpentry to structural steel:
   1. Self-drilling sheet metal screws, cadmium plated.
      a. 12-24 flat-head TEKS/4, by Buildex Division of ITW, Inc.; itwbuildex.com.
      b. Or Approved equal.

2. Length shall penetrate the substrate by a minimum of 1-inch.

2.05 STRUCTURAL GRADE PLASTIC LUMBER

A. Mineral-added HDPE plastic wood blocking, nominal thickness as indicated on Contract Drawings:

1. Lumber shall be manufactured with recycled HDPE and consist of no less than 50 percent recycled material, both post-industrial and post-consumer mixed with minerals to add strength.
2. Lumber shall be molded in one piece per specified size. Materials will have UV additives to prevent deterioration of the plastic lumber from exposure to UV light.
3. Finished plastic lumber will not rot, crack or splinter for a minimum of 50-years and shall be resistant to termites, marine borers, salt spray, oil, and fungus.
4. Approved Manufacturers:
   a. BearBoard by Engineered Plastic Systems, LLC; bearboardlumber.com.
   b. Fiberforce by Bedford Technology, LLC.; plasticboards.com.
   c. PolyForce by Tangent Technologies, LLC.; tangentusa.com.

PART 3 - EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members with Work specified in other sections.

B. Examine existing nailers and blocking which conforms to Contract Drawings at walls, edges, expansion joints, hatches, pipes or curbs:

1. Replace deteriorated sections with new dimensional lumber of same size.
2. Verify existing fastening to comply with specified requirements for new Work; enhance to secure as required.

3.02 INSTALLATION – GENERAL

A. Do not use lumber or materials which are unsound, warped, bowed, twisted, inadequately seasoned, or too small to fabricate Work with a minimum of joints.

B. Fit carpentry Work to other Work. Produce joints which are tight, true and well fastened.

C. Set carpentry accurately to required levels and lines with members plumb and true.

D. Attach carpentry to substrates in accordance with recognized standards.

E. Countersink new fastener heads flush with top of wood members. Hollow out bottom of new wood members, if necessary, to fit over existing exposed bolt heads that are not countersunk.

3.03 ROOF-RELATED CARPENTRY

A. Provide wood blocking and nailers as indicated on Contract Drawings.

B. Coordinate installation of roofing carpentry with other construction, framing of roof openings, and roofing assembly installation.

C. Provide wood curbs at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.

D. Provide wood curb extensions at all existing curbs, except where specifically indicated otherwise, to achieve a minimum of 8-inch flashing height above finished roof surface. Form corners with alternating, lapping side members.

E. When using multiple nailer courses, weave corners and stagger end joints a minimum of 3-feet from underlying course.

3.04 PLYWOOD PANELS

A. Provide plywood panels as indicated on Contract Drawings.

B. Space panels with 1/8-inch joints at butt joints. Provide back-splice support of lumber or sheet metal behind unsupported panel joints greater than 12-inches in length, and at corners.

C. Bevel-cut edges at 45-degree angle, where required for smooth transition of roof flashings.

3.05 ATTACHMENT

A. Fasten 2-by material to decking at a maximum of 16-inches on center, staggered, and 1 by material at a maximum of 12-inches on center, staggered.

B. Fasten 2 by material to concrete or masonry at a maximum of 24-inches on center, staggered, and 1 by material at a maximum of 16-inches on center, staggered.

C. Fasten 2 by material together with 3-inch long screws at 16-inches on center, staggered.

D. Within 8-feet of building corners, increase fastening rate to at a maximum of 8-inches on center, staggered.

E. Provide additional fasteners, as required, to counteract minor warpage or variances in substrate, and to hold tight and true to lines.

F. Plywood panel attachment:

1. Fasten panels at edges; spacing shall be no greater than 12-inches on center and staggered from adjacent rows.
2. Fasteners shall be placed no closer than 1-inch from panel edges.
3. Where applicable (at large panels), fasten center in horizontal rows on 24-inch maximum centers. Fastener spacing shall be no greater than 12-inches on center and staggered from adjacent rows or edges.
4. Within 8-feet of building corners, increase fastening rate to at a maximum of 6-inches on center, staggered.

3.06 TOLERANCES

A. Framing Members:1/4-inch from true position, maximum.

B. Variation from Plane:1/4-inch in 10-feet, maximum, and 1/4-inch in 30 feet, maximum.

END OF SECTION

SECTION 07 01 50.19
PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparation of existing building components in preparation for a new roof system.

B. Repairs/adjustments to existing building components to remain, in preparation for a new roof system.

1.02 RELATED REQUIREMENTS

A. Section 06 10 53 - Miscellaneous Rough Carpentry; Replacement or addition of perimeter blocking.

B. Section 07 54 23 - Thermoplastic Polyolefin (TPO) Roofing.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with affected mechanical and electrical Work associated with roof penetrations.

B. Coordinate with affected plumbing Work associated with storm drainage system.

C. Schedule work to coincide with commencement of installation of new roofing system.

1.04 SUBMITTALS

A. See *Section 01 30 00 - "Administrative Requirements"*, for submittal procedures.

B. Copy of pull test results: Provide ANSI/SPRI 1A-1 form, indicating completed field testing.

1.05 FIELD CONDITIONS

A. Reroofing Work, once begun, will leave building subject to leakage and therefore must be considered in state of emergency when weather threatens.

B. Do not remove existing roofing membrane when weather conditions threaten integrity of building contents or intended continued occupancy.

C. Existing building shall be protected from water infiltration through any roof, parapet, or wall area under repair for the life of Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface is clear and ready for Work of this section.

B. Verify that existing wood nailers and blocking to remain is properly anchored.

C. Contractor is responsible for confirming presence of hazardous materials with Owner per OSHA requirements prior to removal.

3.02 PREPARATION

A. Provide exterior access to roof areas.

B. Prior to removal of existing roofing:

1. Perform mechanical, electrical and plumbing Work as required.

C. Perform fastener pull tests on Roof Areas X and X, per ANSI/SPRI FX-1.

3.03 MATERIAL REMOVAL

A. Verify, prior to start of decking removal, existence and location of deck-supported utilities and accessories including, but not limited to:

1. Water or gas lines;
2. Fire-sprinkler systems;
3. Above- and below-deck conduit and tubing, and;
4. Ceiling suspension systems.

B. Refer to Contract Drawings for removals of existing, abandoned curbs and infill as follows:
   1. Verify presence of underdeck supports at existing openings.
   2. Nest replacement deck panels in beads of butyl sealant over resultant opening, spanning a minimum of two supports.
   3. Fasten panels in replacement area to supports on 8-inch centers and stitch panels to existing roof panels on 6-inch centers.
   4. Seal all edges of patch area with polyurethane or silicone sealant.

3.04 ADJUSTMENTS

A. Refer to Contract Drawings for additions and/or changes to perimeter blocking configuration.
   1. Provide wood nailers at perimeters and other locations, to height matching total thickness of insulation being used., as indicated on Contract Drawings.

B. Projections and penetrations within roof area that are less than 8-inches in height shall be modified and raised to provide a flashing height of 8-inches, minimum, above finished surface of new roof system.
   1. Plumbing vent piping shall be raised using no-hub connectors and Schedule 40 plastic piping to a height of not less than 8-inches nor more than 12-inches above finished surface of new roof system.

3.05 FIELD QUALITY CONTROL

A. Verify that:
   1. Substrate is smooth, dry, and properly installed and ready to accept new roof system.
   2. Items not specified to be removed and replaced, but necessary for proper installation of Work, have been properly coordinated for removal and replacement.

B. Do not proceed until unsatisfactory conditions have been corrected.

END OF SECTION

SECTION 07 54 23
THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. TPO single-ply membrane roofing; Induction-Welded system, including components specified.
   1. Insulation: Flat-stock and Tapered;
   2. Cover Board;
   3. Field-fabricated Flexible Flashings;
   4. Preformed Components; Roofing Stack Boots and Walkway Pads.

B. Disposal of construction waste is the responsibility of Contractor. Perform disposal in manner complying with applicable Federal, state, and local regulations.

C. Commencement of Work by Contractor shall constitute acknowledgement by Contractor that this specification can be satisfactorily executed, under Project conditions and with necessary prerequisites for warranty acceptance by roofing membrane manufacturer.
   1. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

1.02 RELATED REQUIREMENTS

A. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood nailers associated with roofing and roof insulation.

B. Section 07 01 50.19 - Preparation for Reroofing.

C. Section 07 62 00 - Sheet Metal Flashing and Trim: Formed metal flashing and trim items associated with roofing.

1.03 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.

B. LTTR: Long Term Thermal Resistance, as defined by CAN-ULC S770.

1.04 REFERENCE STANDARDS

A. ASTM International Standards, latest editions unless otherwise stated:
   1. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board;
   2. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer;
   3. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing;
   4. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C.

B. CAN-ULC-S770 - Standard Test Method Determination of L-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams;

C. FM DS 1-28 - Wind Design; Factory Mutual System;

D. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

E. Underwriters Laboratories Inc. (UL):
   1. UL (RMSD) - Roofing Materials and Systems Directory; current edition.
   2. UL (FRD) - Fire Resistance Directory; current edition.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.

1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing Work.

1.06 SUBMITTALS

A. See Section 01 30 00 - “Administrative Requirements”, for submittal procedures.

B. Product Data:

1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
2. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.

C. Shop Drawings: Provide:

1. Provide manufacturer’s insulation fastening pattern for requirements specified or required.

D. Specimen Warranty: Submit prior to starting work.

E. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.

F. Pre-Installation Notice: Copy to show that manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the manufacturer.

G. Executed Warranty at Project Closeout.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: Roofing installer shall have the following:

1. Current approval, license, or authorization as applicator by the manufacturer.
2. At least 5-years’ experience in installing specified system.
3. Capability to provide payment and performance bond to building Owner.

B. Comply with the published recommendations and instructions of the roofing membrane manufacturer.

C. Perform Work in a sequential manner to avoid construction traffic over completed areas as installation progresses.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.

B. Store materials clear of ground and moisture with weather protective covering.

1. Protect foam insulation from direct exposure to sunlight.
2. Provide ventilation to prevent condensation and degradation of insulation products.

C. Keep combustible materials away from ignition sources.

1.09 WARRANTY

A. Comply with warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

B. Manufacturer’s Warranty: After Project completion and acceptance, provide a roof system warranty covering membrane, insulation, and accessory components supplied by roof system manufacturer, for a term of 10-years from date of Substantial Completion.

C. Limit of Liability: No dollar limitation.

D. Scope of Coverage: Repair leaks in the roofing system caused by:

1. Ordinary wear and tear of the elements.
2. Unintentional damage due to normal rooftop inspections, maintenance, or service.
3. Manufacturing defects in materials supplied by Warrantor.
4. Defective workmanship used to install these materials.
5. Damage due to winds up to 55 mph.

E. Contractor's Warranty: After project completion and acceptance, provide the installing Contractor's 2-year limited labor and material guarantee covering Work completed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Roof System:

1. Carlisle Syntec Systems: carlislesyntec.com.
2. Firestone Building Products LLC: firestonebpco.com.
3. Versico Roofing Systems: versico.com.
4. Substitutions: *See Section 01 60 00 - "Product Requirements".*

2.02 ROOFING SYSTEM DESCRIPTION

A. Roofing System: Thermoplastic-polyolefin (TPO) single-ply membrane.

1. Membrane Attachment: Induction welded mechanically fastened.
2. Comply with applicable local building code requirements.
3. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.

2.03 MEMBRANE MATERIALS

A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement and the following additional characteristics:

1. Thickness: 0.060 inch plus/minus 10 percent, with coating thickness over reinforcement of 0.024 inch plus/minus 10 percent.
2. Puncture Resistance: 300-lbf, minimum, when tested in accordance FTM 101C Method 2031.
3. Solar Reflectance: 0.79 initial, and 0.70 after 3-years (uncleaned), in accordance with ASTM C1549, and as certified by Cool Roof Rating Council (CRRC).
4. Color: White.
5. Acceptable Products:
   a. UltraPly TPO, by Firestone.
   b. Sure-Weld TPO, by Carlisle.

B. Membrane Fasteners and Plates: Coated heavy-duty type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

1. Membrane-Coated Plates: 3-inch round, specially coated galvalume: Invisiweld Plates.

C. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18-inches wide.

D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.

1. Thickness: 0.060 inch plus/minus 10 percent.
2. Tensile Strength: 1550 psi, minimum, when tested in accordance with ASTM D638 after heat aging.
3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
4. Tearing Strength: 12 lbf, minimum, when tested in accordance with ASTM D1004 after heat aging.
5. Color: White.
6. Acceptable Product: As furnished by roof membrane manufacturer.

E. Tape Flashing: 5-1/2-inch nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065-inch nominal, as furnished by roof membrane manufacturer.

F. Bonding Adhesive: Neoprene and SBR rubber blend, formulated for compatibility with the membrane other substrate materials, including masonry, wood, and insulation facings; as furnished by roof membrane manufacturer.

G. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer as furnished by roof membrane manufacturer.

H. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches wide by 0.10-inch-thick as furnished by roof membrane manufacturer.

I. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed, as furnished by roof membrane manufacturer.

J. General Purpose Sealant: EPDM-based, one-part, white general-purpose sealant, as furnished by roof membrane manufacturer.

K. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; Small and Large Pipe Flashing, as furnished by roof membrane manufacturer

L. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal, as furnished by roof membrane manufacturer.

2.04 ROOF INSULATION

A. Molded Polystyrene Board Insulation: Expanded polystyrene board, ASTM C 578; with the following characteristics:

1. Compressive Strength: 10 psi.
2. Board Edges: Square.
3. Board Density: 0.9 lb/cu ft.
4. Flat-Stock Thicknesses: As indicated on Contract Drawings.
5. Tapered Insulation Configuration:
   a. Starting Thickness: As indicated on Contract Drawings.
   b. Rate of Taper: As indicated on Contract Drawings.
6. Manufacturers:
   a. ACH Foam, Fond du Lac, WI.
   b. Plymouth Foam, Plymouth, WI.

B. Insulation Fasteners: Heavy Duty Type; use only fasteners furnished by roof membrane manufacturer.

C. Miscellaneous:

1. Tapered Edge Strips: High-density wood fiberboard, thickness and width as needed to comply with Contract Drawings, conforming to ASTM C208.

2. Spray Filler Foam: “Roof-Pak” by Dow Chemical Company.
3. Substitutions: *See Section 01 60 00 – "Product Requirements".*

2.05 COVER BOARD

A. High Density Polyisocyanurate Cover Board: Non-combustible, water resistant, high density closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM C1289, Type II, Class 4, Grade 1, with the following characteristics:
   1. Board Size: 48-inches by 96-inches, nominal.
   2. Board Thickness: As indicated on Contract Drawings.
   3. Thermal Value: R-value of 2.5, tested in accordance with ASTM C518 and ASTM C177.
   4. Surface Water Absorption: <3 percent, when tested in accordance with ASTM C209.
   5. Compressive Strength: 80 psi when tested in accordance with ASTM D1621.
   6. Dimensional stability: <0.5% linear change, when tested in accordance with ASTM D2126.
   7. Factory Mutual approved for use with FM 1-90 rated roofing assemblies.
   8. Mold Growth Resistance: Passing ASTM D3273.
   9. Acceptable Product: Same manufacturer as roof system manufacturer.
B. Insulation Fasteners: Heavy Duty Type; use only fasteners furnished by roof membrane manufacturer.
C. Miscellaneous:
   1. Tapered Edge Strips: High-density wood fiberboard, thickness and width as needed to comply with Contract Drawings, conforming to ASTM C208(82).
   2. Spray Filler Foam:
      a. “Roof-Pak”, by The Dow Chemical Company; building.dow.com.
      b. Substitutions: See Section 01 60 00 - “Product Requirements”.

2.06 ACCESSORY MATERIALS

A. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch by 30 inches by 40-feet long with patterned traffic bearing surface; as furnished by roof membrane manufacturer.

PART 3 - INSTALLATION

3.01 GENERAL

A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
   1. Obtain all relevant instructions and maintain copies at Project site for duration of installation period.
B. Do not start Work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
C. Perform Work using competent and properly equipped personnel.
D. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
E. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F.

F. Protect adjacent construction, property, vehicles, and persons from damage related to roofing Work; repair or restore damage caused by roofing Work.
   1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
   2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
   3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

G. Until ready for use, keep materials in their original containers as labeled by the manufacturer.

H. Consult membrane manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.

B. Verify that surfaces and site conditions are ready to receive Work. Correct defects in substrate before commencing with roofing Work.

C. Examine roof substrate to verify that it is properly sloped to drains.

D. Verify that specifications and Contract Drawings are workable and not in conflict with roofing manufacturer's recommendations and instructions; start of Work constitutes acceptable of Project conditions and requirements.

E. Verify that wood nailers have been properly installed.

3.03 PREPARATION

A. Perform the tool calibration with the induction welding tool.
   1. For OMG RhinoBond Tool: make test welds with TPO membrane and InvisiWeld plate. Weld some spare membrane to the plates at various energy settings. Then set the device at the lowest energy setting that creates a bond that covers 100-percent of the bonding area of the InvisiWeld plate.
   2. NOTE: The tools should be calibrated
      a. Every morning before starting Work
      b. Change of generator
      c. 15 +/- degree in temperature change
   3. Equipment and Test Splice Requirements
      a. When weather conditions vary, adjustments to the welding machine must be made. It is recommended that this be done using spare or test material before starting welding of the finished roofing material. In addition, there shall be destructive tests performed daily and at the beginning of welding and after interruptions in the welding process (such as power failure, welder shut down, job site condition change, after break or lunch). Periodically check and correct the welder settings, including at the start of each work day welding will occur.
   4. Contractor to wipe clean the magnets after every use.
   5. Contractor to date, stamp and label tests welds of laps and induction welding and save until Project is complete.

B. Refer to Section 07 01 50.19 - “Preparation for Re-Roofing”.

3.04 INSULATION INSTALLATION

A. Install insulation in accordance with Contract Drawings.

B. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.

C. Lay roof insulation in courses perpendicular to existing roof edges panels.

D. Tapered insulation layout: Refer to Contract Drawings.

1. At projections greater than 12-inches in width, provide tapered insulation crickets on upslope side.

a. Lay out boards with leading edges of cricket a minimum of 6-inches out from curb corners to extend beyond edges of roof flashings.

E. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4-inch. Fill gaps greater than 1/4-inch with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4-inch.

F. Mechanical preliminary attachment for insulation.

1. Roof Areas 1 & 2:

a. Preliminary attachment spacing: 8 fasteners per 48-inch by 96-inch board. **A minimum of two (2) fasteners per insulation board shall be fastened to structural purlins.**

3.05 SINGLE-PLY MEMBRANE INSTALLATION

A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.

B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.

C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.

D. Mechanical Attachment: In the field of the roof, install fasteners with coated plates, covered by membrane.

1. Lay out plates and fasteners as recommended by membrane manufacturer and as indicated, whichever is most stringent.

a. Install fasteners and coated plates on 12-inch centers into every other row of purlins (approx. 10’ centers).

b. Along the eaves, install fasteners and coated plates on 6-inch centers into every row of purlins (approx. 5’ centers, for 10 feet).

c. Along the rakes, install fasteners and coated plates on 6-inch centers, extending 8-feet in from the rake edge along each row.

d. At corners (8’ x 8’), install fasteners and coated plates on 4-inch centers into every row of purlins.

2. Properly engage fasteners into the purlins with head flush with the countersunk portion of plate.

3. Induction weld membrane to plates. Test attachment after membrane has cooled.

E. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.

1. Exceptions: Round pipe penetrations less than 18-inches in diameter and square penetrations less than 4-inches square.

2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

3.06 FLASHING AND ACCESSORIES INSTALLATION

A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.

B. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8-inches high above membrane surface.

1. Use the longest practical flashing pieces.
2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
4. Provide termination directly to the vertical substrate as shown on Contract Drawings.

C. Flashing at Penetrations: Flash penetrations passing through the membrane; make flashing seals directly to the penetration.

1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2-inches deep, with at least 1-inch clearance from penetration, sloped to shed water.
3. Structural Steel Tubing: If corner radii are greater than 1/4-inch and longest side of tube does not exceed 12-inches, flash as for pipes; otherwise, provide a standard curb with flashing.
4. Flexible and Moving Penetrations: Provide weather tight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.
5. High Temperature Surfaces: Where the in-service temperature is, or is expected to be, in excess of 180 degrees F., protect the elastomeric components from direct contact with the hot surfaces using an intermediate insulated sleeve as flashing substrate as recommended by membrane manufacturer.

3.07 FINISHING AND WALKWAY INSTALLATION

A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.

1. Use specified walkway pads unless otherwise indicated.

B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1-inch and maximum of 3-inches from each other to allow for drainage.

1. If installation of walkway pads over field fabricated splices or within 6 inches of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6-inches on either side.
2. Clean the membrane and weld the walkway pads.

3.08 FIELD QUALITY CONTROL

A. See *Section 01 40 00 - "Quality Requirements",* for additional requirements.

B. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).

1. Inspect all field seams and flashing seams; make appropriate repairs.

C. Perform all corrections necessary for issuance of warranty.

3.09 PROTECTION

A. Protect installed roofing and flashings from subsequent construction operations and inclement weather.

B. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

3.10 CLEANING

A. Clean contaminants generated by roofing Work from roof surface, building and surrounding areas, including dirt, bitumen, adhesives, sealants, and coatings.

1. Utilize cleaning equipment and detergents approved for use by roof system manufacturer.

B. Repair or replace building components and finished surfaces damaged or defaced due to Work of this section; comply with recommendations of manufacturers of components and surfaces.

C. Remove leftover materials, trash, debris, equipment from Project site and surrounding areas

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including: Metal downspouts.

1.02 REFERENCE STANDARDS

A. ASTM International Standards, latest editions unless otherwise stated:
   1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware;
   2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process;

B. National Roofing Contractors Association (NRCA) – The NRCA Roofing and Waterproofing Manual, ML104; Fifth Edition, with interim updates.

C. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting: Convene one week before starting Work of this section.

1.04 SUBMITTALS

A. See *Section 01 30 00 - "Administrative Requirements",* for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations and installation details.

C. Mock-Ups: Provide 10-foot sections of finished product, including continuous cleats.

D. Submit manufacturer's standard color chart for Owner's selection.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.

B. Coordinate and be responsible for removal and reinstallation of items not specified to be removed and replaced as may be necessary for proper installation of its Work.

C. Utilize good weather to utmost.
   1. Plan and schedule Work to occur during least threatening weather.

D. Work, once begun, will leave building subject to leakage and therefore must be considered in state of emergency when weather threatens.
   1. Existing building shall be protected from water entering through any roof, parapet or wall area under repair for the life of Project.

E. Remove only as much flashing as can be made watertight each day.
   1. Make an effective watertight seal between existing and new at the end of each day's Work.
   2. Remove seal prior to continuing.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 - PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Steel: ASTM A653/A653M, with G90/Z275 zinc coating; factory pre-coated with PVDF coating.

1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
2. Color: As selected by Owner from manufacturer's standard colors.
3. Color: To match approved sample.
4. Color: As selected by Consultant from manufacturer's standard colors.

2.02 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.

B. Sealant: Polyurethane watertight sealants specified in *Section 07 90 05 - "Joint Sealers".*

C. Fasteners and Anchors: Where not specified, size fasteners to suit conditions and materials.

1. Metal Jointing with Pop Rivets:
   a. Rivets shall be a minimum 1/8-inch diameter, of length required to properly engage both pieces of sheet metal.
   b. Rivets shall match the type and finish of sheet metal being joined.
2. Metal to Wood Concealed Fasteners:
   a. Ring shank nails: Hot-dipped galvanized steel per ASTM A153/A153M.
3. Metal to Wood Exposed Fasteners:
   a. Number 10 nonmagnetic stainless-steel screws with EPDM bonded washer.
4. Metal to Metal Concealed Fasteners:
   a. Cadmium-plated, bugle-head sheet metal screws.
5. Metal to Metal Exposed Fasteners:
   a. Screw anchors:
      1) Nonmagnetic stainless-steel; pop rivets; same finish as sheet metal.
      2) Number 8 nonmagnetic stainless-steel pan head screws; counter flashing to reglet/receiver.
      3) Number 10 nonmagnetic stainless-steel screws with EPDM bonded washer.
6. Metal to Concrete and Masonry Concealed Fasteners:
   a. Nail-drive expansion anchor.
      1) Zinc alloy (nylon not allowed) with stainless-steel pin.
   b. Screw anchors.
      1) Zinc-plated carbon steel.
7. Metal to Concrete and Masonry Exposed Fasteners:
   a. 1/4-inch nonmagnetic stainless-steel screw anchors with bonded EPDM washer.

2.03 FABRICATION

A. Sheet metal flashings and trim shall be fabricated in accordance with dimensions indicated on Contract Drawings, and/or as field-measured and verified by Contractor prior to fabrication.

B. Deliver shop fabricated and manufactured products to site ready for designed installation. Field fabricate to fit applications indicated and perform optimally with respect to weather resistance, water-tightness, durability, strength and uniform appearance.

C. Fabricate to allow controlled expansion in running lengths not only for movement of metal components in relationship to one another, but also to adjoining dissimilar materials in a manner sufficient to prevent water infiltration, deformation, or damage.

D. Fabricate items in maximum lengths and hold joints to a minimum. At no time shall any piece be shorter than 3-feet in length unless piece makes up an entire run.

E. Unless otherwise noted, drip edges, where shown, shall be 3/4-inches with exposed edges hemmed 1/2-inch. Hem exposed edges on underside 1/2-inch; miter and seam corners.

F. Do not "punch" brake points. Finish all joints neatly with lines trimmed true and sharp.

G. Form sections true to shape, accurate in size, square, and free from distortion or defects.

H. Form pieces in longest possible lengths.

I. Face dimensions greater than 8-inches shall be fabricated with 1/2-inch stiffening ‘V’-groove in center.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions under which Work of this section will be installed.

1. Bring to Consultant's attention any conditions detrimental to the proper and timely completion of Work.
2. Do not proceed until satisfactory conditions have been corrected.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

C. Counterflash, with architectural sheet metal, vertical surfaces base flashed with roof system membrane.

3.02 PREPARATION

A. See *Section 07 01 50.19 - “Preparation for Re-Roofing”.*

B. Remove and dispose of existing architectural sheet metal flashing from areas to receive new.

C. Verify that wood blocking and nailers are securely anchored and that roof projections and penetrations are in place and set and braced.

D. Install starter and edge strips, and cleats before starting installation.

3.03 SHEET METAL JOINTING

A. Solid joints for prefinished steel and aluminum sheet metal:

1. Lap sheet metal sections 2-inches, minimum.
2. Install specified sealant between sections.
3. Fasten with pop-rivets on 2-inch maximum centers.

B. Solid (i.e., soldered) joints for stainless-steel sheet metal:

1. Prior to riveting, pre-tin all surfaces to be joined on both sides at least 2-1/2 inches. Install rivets in 2 rows, not more than 2-inches apart, staggered.
    a. Clean surface of all foreign materials and contaminants and apply flux prior to soldering.
    b. Solder from “wet” side (i.e., inside gutter) allowing solder to flow into joint and rivets. Solder over the heads of all rivets.
    c. Solder flat, or down-hand, whenever possible.
    d. Keep container of water handy to cool the joint as solder is applied; stainless holds heat for a long time.
    e. Rinse copiously with water after it reaches ambient temperatures.

C. Lapped joints:

1. Install running sections in maximum of 10-foot lengths.
2. Lap sheet metal sections 2-inches, minimum.
3. At lap, notch the bottom hem of one section 2-inches back from the end, to accommodate the adjacent section.
4. Hook the overlying sheet metal flashing onto the adjacent sheet metal flashing section; creating a 2-inch minimum lap.

3.04 INSTALLATION

A. Coordinate with installation of roof system and substrates to receive Work of this section which are required to assure each element of the Work performs properly and combines elements in waterproof and watertight system.

B. General installation procedures:

1. Install and attach as shown on Contract Drawings.

2. Finish flashings, where applicable, must be fully engaged and continuously crimped onto the underlying cleat.
3. Anchor substrates to withstand lateral and thermal stresses and loading pressures.
    a. Conceal fasteners where possible and as indicated on Contract Drawings.
    b. Use exposed fasteners only where permitted.
4. Secure flashings in place using concealed fasteners whenever possible. Use exposed fasteners only where permitted.
5. Fit flashings tight in place.
    a. Field bends on pieces greater than 6-inches in length shall utilize a portable break to produce sharp, straight lines.
    b. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Hand-bent or “wrapped” pieces shall be cause for rejection of the component.
6. All points where the sheet metal flashing end or transitions into a different flashing detail shall be flashed with a field-formed sheet metal closure. The use of mastic or excessive caulking shall not be acceptable.

C. Drip Edge:
1. Provide new architectural sheet metal, as shown on Contract Drawings.
2. Fabricate using 8'-0" or 10’-0" flat stock sheets.
3. Secure exterior leg to continuous cleat; hand tool (crimp) to fully engage; where indicated.
4. Lap sections a minimum of 2-inches, by removing hem and taper cutting drip from underlying section, and seal.
5. Apply strip flashing over secured flange.

D. Fascia Flashing:
1. Provide new architectural sheet metal fascia cover as shown on Contract Drawings.
2. Fabricate using 8'-0" or 10’-0" flat stock sheets.
3. Provide lapped joints (lap with direction of prevailing winds).
4. Where shown on Contract Drawings, secure to continuous cleats; hand tool (crimp) to fully engage.

E. Concealed Continuous Cleats:
1. Provide new architectural sheet metal concealed cleats as shown on Contract Drawings.
2. Fabricate using 8'-0" or 10’-0" flat stock sheets.
3. Provide 1/4-inch space between sections.
4. Secure to substrate at 8-inches on center, maximum.

F. Perimeter Roof Edge / Gravel Stop:
1. Provide new architectural sheet metal roof edge (gravel stop) as shown on Contract Drawings.
2. Fabricate roof edge from 8'-0” or 10'-0” long sheets with a 4-inch roof flange.
3. Notch and lap pieces 3-inches; solid-joint laps, as described above.
4. Secure outside edges with a continuous cleat. Hand tool (crimp) to fully engage.
5. Install over nailers and completed membrane; secure to blocking at 4-inches on center, maximum, in staggered rows.
6. Apply strip-in flashing over secured flange, as indicated on Contract Drawings.

G. Surface-Mounted Counter Flashing:
1. Provide new architectural sheet metal counter flashing as shown on Contract Drawings.
2. Fabricate using 8'-0" or 10’-0" flat stock sheets.
3. Unless otherwise noted, counter flashing shall run in a straight line and shall lap top of roof flashings a minimum of 3-inches.

4. Brake counter flashing longitudinally to provide spring action; holding bottom firmly against roof flashing.
5. Provide 2-inch laps at joints by removing hem and taper cutting drip from adjacent section.
    a. Inside corners: Notched and lapped 1-1/2-inches through corner.
    b. Outside corners: Notched, mitered, lapped and seamed.
6. Apply butyl tape caulk to back surface of counter flashing fastening leg prior to installing.
7. Provide termination bar over counter flashing fastening leg when installing.
8. Fasten through termination bar and counter flashing with concrete or masonry screw type fasteners, as required, a maximum of 18-inches on center.
    a. Provide additional fasteners a maximum of 2-inches from each end of termination bar.
    b. Do not fasten through counter flashing joints.
9. Fill and seal sealant lip; force sealant into all voids and tool joint to provide water-shed surface.

H. General Counter Flashings:
1. Provide new architectural sheet metal counter flashing as shown on Contract Drawings.
2. Fabricate using 8'-0" or 10'-0" flat stock sheets.
3. Unless otherwise noted, counter flashing shall run in a straight line and shall lap top of roof flashings a minimum of 3-inches.
4. Brake counter flashing longitudinally to provide spring action; holding bottom firmly against roof flashing.
5. Provide 2-inch laps at joints by removing hem and taper cutting drip from underlying section.
    a. Inside corners: Notched and lapped 1-1/2-inches through corner.
    b. Outside corners: Notched, mitered, lapped and seamed.
6. Insert counter flashing behind existing unit flange, fasten as indicated on Contract Drawings.
7. Fasten counter flashing to curb with stainless-steel sheet metal screws through pre-punched holes; minimum 2 per side.

I. Shop-Fabricated Gutter System:
1. Provide new architectural sheet metal gutter system where shown on Contract Drawings and as required.
2. Fabricate using 8'-0" or 10'-0" flat stock sheets.
3. Lap joints 2-inches in direction of flow, rivet 3-inches on center, staggered, and seal.
4. Provide fabricated brackets 20-inches on center; secure to substrate with exposed fasteners and to gutter with Number 10 by 3/4-inch stainless-steel nuts, bolts and washers.
5. Provide field-fabricated expansion joints, as shown on Contract Drawings; position in accordance with SMACNA recommendations.
6. Provide fabricated end caps and outlet tubes, where shown on Roof Plan.

J. Downspouts:
1. Provide new architectural sheet metal downspouts where shown on Contract Drawings.
    a. Fabricate using 8'-0" or 10'-0" flat stock sheets as shown on Contract Drawings.
    b. Longitudinal seam: Mechanically seamed and sealed.
    c. Lap joints 2-inches, in direction of flow, and rivet.
    d. Provide fabricated brackets and install 10-feet on center; with additional bracket(s) located within 12-inches of the top, bottom and elbows.
    e. Provide downspout adapter/connection to underground drainage system after testing of drainage, otherwise provide elbow, downspout extension and splash block at bottom.

K. Tall Cone Base Flashing Flanges and Sleeves:

1. Provide new architectural sheet metal sleeves where shown on Contract Drawings and as required.
2. Fabricate sleeves lapping, riveting and fully soldering.
3. Fabricate sleeves to provide minimum 8-inches height above finished roof system.
4. Fasten sleeves to substrate 8-inches on center.

L. Storm Collars/Umbrellas:

1. Provide new architectural sheet metal sleeves where shown on Contract Drawings and as required.
2. Fabricate storm collars lapping, riveting and soldering solid.
3. Secure to vent pipe with stainless-steel gear drive clamp.
4. Seal with sealant and tool complete.

M. Penetration Pans:

1. Provide new architectural sheet metal penetration pans where shown on Contract Drawings and as required.
2. Fabricate penetration pans lapping, riveting and fully soldering.
3. Fabricate penetration pans to provide minimum 3-inch height above finished roof system.

3.05 FIELD QUALITY CONTROL

A. Inspection will involve surveillance of Work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 07 90 05
JOINT SEALERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

1.02 REFERENCE STANDARDS

A. ASTM International Standards, latest editions unless otherwise stated:
   1. ASTM C920 - Standard Specification for Elastomeric Joint Sealants;
   2. ASTM C1193 - Standard Guide for Use of Joint Sealants;
   3. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate Work with other sections referencing this section.

1.04 SUBMITTALS

A. See *Section 01 30 00 - "Administrative Requirements",* for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Samples: Submit one sample, 6-inches in length, or manufacturer's standard color chart, illustrating sealant color(s) for selection by Owner.

1.05 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.06 WARRANTY

A. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
   1. Correct defective Work within a 2-year period after Date of Substantial Completion.

B. See *Section 01 70 00 - "Execution and Closeout Requirements",* for additional warranty requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Polyurethane Sealants:
   1. BASF Corp. Building Systems; buildingsystems.basf.com.
   2. Bostik; bostik-us.com.
   3. Pecora Corporation; pecora.com.
   4. Sika Corporation; usa.sika.com.
   5. Tremco Commercial Sealants & Waterproofing; tremcosealants.com.

B. Butyl Sealant:
   1. C.R. Laurence Co., Inc.; crlaurence.com.
   2. Pecora Corporation; pecora.com.
   3. Sika Corporation; usa.sika.com.
   4. Tremco Commercial Sealants & Waterproofing; tremcosealants.com.

2.02 SEALANTS

A. Non-sag Polyurethane Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses NT, I, M, G, O and A; single-component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion.
   1. Movement Capability: Plus, or minus twenty-five percent.
   2. Service Temperature Range: -40 to 180 degrees F.
   3. Color: To be selected by Consultant from manufacturer's standard range.
   4. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
      b. Joints between concrete and other materials.
      c. Joints between metal and other materials.
      d. Other exterior joints for which no other sealant is indicated.
   5. Polyurethane Products:
      a. MasterSeal NP 1, by BASF.
      b. Chem-Calk 915, by Bostik.
      c. Dynatrol I-XL, by Pecora.
      d. Sikaflex 1a, by Sika.
      e. Dymonic, by Tremco.
   6. Substitutions: See *Section 01 60 00 - "Product Requirements".*

B. Butyl Sealant: ASTM C920, Grade NS, Class 12-1/2, Uses NT, M, A, G, O, single component, solvent release, non-skinning, non-sagging.
   1. Color: To be selected by Consultant from manufacturer's standard range.
   2. Movement Capability: Plus, or minus 12-1/2 percent.
   3. Service Temperature Range: minus13 to 180 degrees F (minus 25 to 82 degrees C).
   4. Shore A Hardness Range: 10 to 30.
   5. Applications: Use for:
      a. Concealed sealant bead in sheet metal work.
   6. Products:
      a. PTI 707 Architectural Butyl Sealant, by C.R. Laurence.
      b. Pecora BA-98, by Pecora.
      c. Sikalastomer-511, by Sika.
      d. Trempro JS 773, by Tremco.
   7. Substitutions: See *Section 01 60 00 - "Product Requirements".*

C. Silicone Sealant: ASTM C920, Grade NS, Class 25, Uses NT, A, G, M, O, single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
   1. Color: To be selected by Consultant from manufacturer's standard range.
   2. Movement Capability: Plus, or minus 25 percent.
   3. Service Temperature Range:
      a. Architectural applications: -65 to 180 degrees F (-54 to 82 degrees C).
      b. High-temperature applications: Up to 500 degrees F (260 degrees C) continuous, and 600 degrees F (315 degrees C) intermittent.
   4. Shore A Hardness Range: 15 to 35.
   5. Applications: Use for:

a. Joints between aluminum components.
b. Joints between aluminum components and glazing.
c. High-service temperature joints adjacent to sheet metal.

6. Products (Architectural Applications):
   a. Chem-Calk 1200, by Bostik.
   b. Dow Corning 799, by Dow Corning.
   c. Silglaze N, by GE Silicones.
   d. 864NST Low Modulus Architectural Silicone Sealant - Class 50, by Pecora.
   e. Proglaze, by Tremco.
7. Products (High-Temperature Applications):
   a. Red RTV, 736H Heat Resistant Silicone Sealant, by Dow Corning.
   b. Red Devil; 100% Silicone Heat Resistant RTV Sealant, by Red Devil.
8. Substitutions: See *Section 01 60 00 - "Product Requirements".*

2.03 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
C. Joint Backing: Round foam rod compatible with sealant; closed cell polyethylene; oversized 30 to 50 percent larger than joint width.
D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive Work.
B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Plan Work and take whatever action is necessary to prevent dirt and debris from contaminating or preventing proper applications. It is the responsibility of this applicator to verify conditions exist in accordance with manufacturer's requirements for proper installation and performance.
B. Remove loose materials and foreign matter that could impair adhesion of sealant.
C. Clean and prime joints in accordance with manufacturer's instructions.
D. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
E. Protect elements surrounding Work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform Work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Perform installation in accordance with ASTM C1193.
C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
D. Install bond breaker where joint backing is not used.
E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Dry-tool joints concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

B. Remove debris from Project site.

3.05 PROTECTION

A. Protect elements surrounding Work of this section from damage or disfigurement.

B. Repair or replace defaced and/or disfigured finishes caused by Work of this section.

C. Protect sealants until cured.

END OF SECTION