SECTION 024116 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of roofing.
2. Disconnecting, capping or sealing, and removing site utilities.

B. Related Documents and Sections:

1. General Conditions, Supplementary Conditions, and Division 1 - General Requirements sections apply to work of this Section.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit informational report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.

B. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services.
3. Shutoff and capping or re-routing of utility services.

C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

C. Pre-demolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.

1.7 PROJECT CONDITIONS

A. Building will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

1. Provide not less than 72 hours' notice of activities that will affect operations of building.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of building and adjacent buildings.

    a. Do not close or obstruct walkways, exits, or other facilities used by occupants of building or adjacent buildings without written permission from authorities having jurisdiction.

B. Owner assumes no responsibility for buildings and structures to be demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Hazardous Materials: Asbestos materials will be encountered in the removal of the existing roofing materials based on asbestos report.

1. Hazardous materials will be removed by Contractor and properly disposed of based on City, State and Federal requirements.

D. On-site storage or sale of removed items or materials is not permitted.

1.8 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.

1.9 WORK – GENERAL

A. The contractor will utilize means and methods to minimize noise, dust and disruption of ongoing activities to the surrounding adjacent properties.

B. The contractor will provide a scope of work that will describe in detail how their proposed means and methods will achieve the goals of minimizing noise, dust and disruption of ongoing activities to the surrounding adjacent properties.

C. Limits of removal include all resulting debris as well as footers and foundation unless otherwise directed by the property owner or its representative.

D. The contractor will adhere to all local, municipal, state and federal regulations.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.2 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

3.3 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.

    a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015000 "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION, GENERAL

A. General: Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain adequate ventilation when using cutting torches.
3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Engineering Surveys: During demolition, perform surveys to detect hazards that may result from building demolition activities.

C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.5 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

3.6 REPAIRS

A. Promptly repair damage to building caused by demolition operations.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION 024116

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SECTION 030230 – CONCRETE REPAIR

PART 1 - GENERAL

1.01 DESCRIPTION

Provide labor, materials, equipment, and supervision necessary to complete the application of repair mortar to existing concrete.

1.02 QUALITY ASSURANCE

Products shall be installed by a trained applicator with a minimum of five years of experience and meet the requirements of the Manufacturer.

1.03 SUBMITTALS

A. Manufacturer's current product data bulletins.

B. The trained applicator shall prepare a test panel of the repair installed on the actual building as a submittal for approval of proper application and adhesion.

C. The trained applicator shall submit a list of five projects completed within the last five years, exhibiting the applicator's skills. The list shall include project name, location, and description of work and completion date.

1.04 PRODUCT DELIVERY, STORAGE & HANDLING

A. Deliver all products and accessories in original labeled, sealed, and undamaged containers or bundles.

B. Store all products in accordance with manufacturer's printed instructions.

C. Handle all products in accordance with manufacturer's printed instructions.

1.05 JOB CONDITIONS

All products shall be applied at substrate and ambient temperatures of 40°F and above. A minimum temperature of 40°F shall be maintained 24 hours after completion of work. Protect products from weather and other damage for a period of 24 hours after installation. Do not apply products to frozen surfaces.

1.06 COORDINATION & SCHEDULING

The work requires close coordination with related sections and trades.

PART 2 - PRODUCTS

2.01 BASIS-OF-DESIGN - MANUFACTURER

The following manufacturer is approved for the project:

Conproco Corporation, 17 Production Drive, Dover NH 03820. (800) 258-3500.

Or approved equal

2.02 BASIS OF DESIGN – MATERIALS

A. Conpro Primer: A long open time, water-based, single component bonding primer for concrete and repair mortars.

B.

C. Conpro Set: Trowel applied, single component, polymer modified cementitious repair mortar with integral corrosion protection.

D. Forment: A two component, shrinkage compensated, cement based, pourable and pumpable repair mortar with integral corrosion protection.

E. ECB: A single component anti-corrosion coating for reinforcing steel.

2.03 Other manufacturers/materials may be submitted for review. It is the contractor's sole responsibility to provide all applicable data to clearly indicate that the submitted products are equivalent to the specified Basis of Design information.

PART 3 - EXECUTION

3.01 GENERAL

A. Installation shall be performed strictly in accordance with manufacturer's current product data bulletins.

B. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.

C. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas and landscaping from contact due to mixing, handling, and application of materials.

3.02 SURFACE PREPARATION

A. Remove loose and deteriorated material, laitance, dirt, dust, oil, and any surface contaminants that will inhibit proper bond.
B. Saw cut edges with a diamond blade at a 90° angle to eliminate feather edging. Avoid polishing the edges as this will inhibit bond.

C. Avoid bruising or micro cracking during surface preparation. Refer to ICRI Surface Preparation Guide 03732.

D. Repair zone must be a minimum of 1/4 inch deep, of simple geometry, with no complex edge conditions.

E. If possible, avoid long narrow repairs; these have a greater tendency to crack.

F. Apply Conpro Primer in accordance with the manufacturer's instructions.

G. Apply Conpro Start where a consolidant is of benefit (soft, powdery surfaces). Allow to react a minimum of 12 hours before proceeding with repairs.

H. Saturate substrate with clean water, (saturated surface dry/SSD), with no standing water during Priming or Application.

I. Remove concrete from corroded steel and several inches beyond to expose non-corroded steel.

J. Provide a 3/4-inch clearance between the concrete and steel.

K. Damaged reinforcing steel should be inspected by the consulting engineer and appropriate action taken.

3.03 PRIMING

A. Hand-applied concrete repair material:

1. Prime the prepared substrate including all edges with a slurry coat of the repair mortar. Work the slurry into the substrate to ensure intimate contact and establish bond. The repair material must be applied while slurry is wet. If the slurry dries, remove and recoat.
2. Alternatively, use Conpro Primer or ECB as a bonding primer. Refer to the individual product technical data bulletin for information.

B. Form-and-pour concrete repair material:

1. Several hours prior to placing the form-and-pour repair material, fill the formwork with clean water.
2. Immediately prior to placement, completely drain the water and seal the ports.

C. Reinforcing Steel:

1. Remove all scaling rust from reinforcing steel.

2. Apply ECB anti-corrosion coating.

3.04 MIXING

A. Mechanically mix using a low-speed drill (400 - 600 rpm) and mixing paddle or mortar mixer.

B. For Conpro Set:

1. Pour 3-1/2 quarts of potable water into a clean mixing vessel and slowly add all 50 lbs. of material.
2. Maintain the same water to Conpro Set ratio when mixing less than full 50 lbs. units.
3. Mix continuously for 3 minutes to a uniform, lump-free, stiff mortar consistency.
4. Add up to 1 pint of additional water if needed.
5. Allow to “breathe” for 1 minute and remix for 1 minute. This will improve workability and open time.

C. For Forment:

1. Mixing Proportions- one 50 lb. bag of Forment to one container of Forment Admix.
2. Do not add any additional water or chemicals.
3. Mix for 2 minutes until a smooth, lump free consistency is achieved.
4. Continuous mixing should be maintained until material is placed.

3.05 APPLICATION - HAND-APPLIED REPAIRS

A. At the time of application, surfaces should be saturated surface dry (SSD) but hold no standing water.

B. Follow instructions for Priming.

C. Force the material against the edges of the repair, working toward the center.

D. Material may be applied in multiple lifts of not less than 3/8 inch and no greater than 2 inches.

E. Consolidate each lift and allow to stiffen to thumbprint hard before continuing.

F. Scratch (crosshatch) each lift to prepare surface for subsequent lift.

G. Over-build final lift by 1/4 inch and allow to take initial set.

H. Shave to final form with trowel edge up to 2 hours after application.

I. Finish with a sponge float or trowel.

J. Do not overwork the finish.

K. For applications over 2 inches add a maximum of 30 lbs. of 3/8 inch aggregate per 50

lbs. bag. Aggregate must be non-reactive, low absorption, graded and high density.

3.06 APPLICATION - FORM-AND-POUR REPAIRS

A. Fill forms with clean water several hours prior to placement.

B. Locate drainage outlets at the bottom of the forms to allow the water from presoaking to drain.

C. Pour or pump Forment into the forms.

D. Refer to ACI 304R-85 (Placing Concrete by Pumping Methods) for details on pumping procedures.

E. Do not allow Forment to sit unagitated in the mixer or lines for longer than 5 minutes, as the material could begin to set up. Recycle material if necessary.

F. Forment should be placed within 30 minutes of mixing when surrounding conditions are 70ºF, 50% humidity. Higher temperatures will reduce open time. Under continuous mixing conditions, Forment will be pumpable for approximately 30 minutes.

G. Care should be taken to completely fill the forms and properly consolidate the material.

H. Cap the vents when a steady flow is evident.

I. Prevent loss of material when removing the line and placing the plugs, as this will result in lack of bond with the substrate.

J. Remove the forms after 24 hours. The outside edges of the repair and the anchor holes may need to be cleaned and/or repaired with Conpro Set.

3.07 CURING

A. Dampen the repair with a fine mist of water for 24 hours or moist cure with wet burlap and polyethylene. Alternatively, apply Conpro C309 Cure & Seal.

B. Protect repair from direct sunlight, wind, rain and frost during curing period.

4 DECK REPAIR/UNIT COST

A. At areas of metal decking it is recommended to carry an allowance and/or unit cost related to removal/replacement of metal decking as a result of corrosion, deterioration, and section loss from saturated substrates. This allowance and/or unit cost should include removal of deteriorated lightweight concrete, installation of roof assemblies with tapered polyisocyanurate insulation w/ ¼”/ft slope, engage structural engineer licensed in the State of PA to design roof infill repairs, engage a licensed/certified/insured special inspector related to observe and metal deck fasteners as required by IBC 2018. The allowance and/or unit cost should be at least 20% of the total area of roof where metal decking occurs (2,411 X 20% = 483 SF).

B. At areas of roofing where deterioration of lightweight concrete may occur as a result of saturation & freeze/thaw cycles over 2” pre-cast concrete roof planks, it is recommended to carry an allowance and/or unit cost. This allowance and/or unit cost should include removal of deteriorated lightweight concrete, installation of roof assemblies with tapered polyisocyanurate insulation w/ ¼”/ft slope. The allowance/unit cost should be at least 20% of the total area of the roof (8,422 X 20% = 1, 684 SF).

4.01 JOB SITE CLEANUP

A. Material left over at the job site by the approved applicator shall be removed.

B. Clean tools and equipment with water immediately after use.

C. Cured material must be removed mechanically.

END OF SECTION 030230

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SECTION 05310 - METAL ROOF DECK

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes galvanized steel roof deck intended as support for insulation and roofing membrane.

1.2 SUBMITTALS

A. Product Data: For each type of deck, accessory and product indicated.

B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, deck openings, special jointing, accessories, and attachments to other construction.

C. Product Certificates: Signed by steel deck manufacturers certifying that products furnished comply with requirements.

D. Welding Certificates: Copies of certificates for welding procedures and personnel.

E. Product Test Reports: From a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:

F. Mechanical fasteners.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

C. AISC Specifications: Calculate structural characteristics of steel deck according to AISC's "Specification for the Design of Cold-Formed Steel Structural Members."

D. FM Listing: Provide galvanized steel roof deck evaluated by FM and listed in FM's "Approval Guide, Building Materials" for Class I fire rating and windstorm ratings. See drawings and manufacturer's calculations for specific windstorm rating requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to Compliance with requirements, provide products by one of the following: Vulcan, D-Mac, ASC, DACS, or equal.

2.2 STEEL ROOF DECK

A. Galvanized Steel Roof Deck: Fabricate panels without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 29, and the following:

B. Galvanized Steel Sheet: ASTM A 653 G-90 with minimum yield strength of 33,000 psi.

C. Profile: 1 ½" depth, 'B'-deck.

D. Galvanized Steel Thickness: 22 gauge or as required for span load tables.

E. Span condition: As indicated.

F. Side Laps: Overlapped and fastened.

2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Low-velocity, self-drilling galvanized-steel Tek fasteners.

C. Side-Lap Fasteners: Self-drilling, galvanized-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 22 gauge design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Galvanized Steel Sheet Accessories: Galvanized Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

G. Vinyl Tape; "3M 472 or equal".

2.4 GALVANIZING REPAIR PAINT

A. High-zinc-dust content paint for re-galvanizing welds and repair painting galvanized steel, with dry film containing not less than 93% zinc dust by weight, and complying with ASTM A 780.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions and requirements in this Section.

B. Locate decking bundles to prevent overloading of supporting members.

C. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

D. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

E. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking.

F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.

G. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

H. Fasten roof deck panels to steel supporting members with mechanical fasteners as indicated on the drawings.

I. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on the drawings, but with intervals not exceeding 18".

J. Mechanically fasten with self-drilling No. 10 diameter or larger galvanized steel self-drilling screws.

K. End bearing: Install deck ends over supporting frame with minimum end bearing of 1-1/2", with end joints as follows:

L. End Joints: Lapped 2" minimum.

M. Miscellaneous Roof Deck Accessories: Install ridge and valley plates, finish strips, cover plates, end closures, and reinforcing channels according to deck manufacturer's written instructions. Fasten to substrate to provide a complete deck installation.

N. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

O. Span: Individual units of decking shall span minimum 2 spans.

3.3 FIELD QUALITY CONTROL

A. Remove and replace work that does not comply with specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.4 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on surfaces of deck with galvanizing repair paint according to ASTM A 780 and manufacturers written instructions.
   a. Rusted Deck: Remove rust using mechanical means, remove dust and prime with Rust-Go Primer at a rate of .5 gal per 100 square feet.

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05310 - METAL ROOF DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking and nailers.
4. Wood furring.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.4 SUBMITTALS

A. All action and informational submittals are to be submitted in a single package with provided submittal form according to submittal schedule. Submittals package must be complete for this division, incomplete packages will be rejected

1.5 ACTION SUBMITTALS

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1.6 ACTION SUBMITTALS

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1.7 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.8 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: **15 percent** unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2].

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Application: Treat **items indicated on Drawings, and the following:**

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, **furring,** and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664, and design value adjustment factors shall be calculated according to ASTM D6841.[**For enclosed roof framing, framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.**]

C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

D. Application: Treat **items indicated on Drawings**

2.4 DIMENSION LUMBER FRAMING

A. Other Framing: **Construction or No. 2** grade of **the following** species:

1. Hem-fir (north); NLGA.
2. Douglas fir-larch; WCLIB or WWPA.
3. Southern pine or mixed southern pine; SPIB.
4. Spruce-pine-fir; NLGA.
5. Douglas fir-south; WWPA.
6. Hem-fir; WCLIB or WWPA.
7. Douglas fir-larch (north); NLGA.
8. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

B. Dimension Lumber Items: **Construction or No. 2** grade lumber of **any of the following species:**

1. Hem-fir (north); NLGA.
2. Mixed southern pine or southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. Concealed Boards: **15**percent maximum moisture content of **any of the following** species and grades:

1. Mixed southern pine or southern pine, **No. 3** grade; SPIB.
2. Hem-fir or hem-fir (north), **Construction or No. 2 Common** grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir, **Construction or No. 2 Common** grade; NeLMA, NLGA, WCLIB, or WWPA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners[**with hot-dip zinc coating complying with ASTM A153/A153M**] [**of Type 304 stainless steel**].

B. Nails, Brads, and Staples: ASTM F1667.

C. Screws for Fastening to Metal Framing: [**ASTM C1002**] [**ASTM C954**], length as recommended by screw manufacturer for material being fastened.

D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate **furring,** nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. **Install fire-retardant-treated plywood panels with classification marking of testing agency exposed to view.**

D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.

H. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

J. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

K. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILER

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 INSTALLATION OF WOOD FURRING

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal size furring as shown on Drawings.

C. Furring to Receive **Gypsum Board**: Install 1-by-2-inch nominal- as shown on Drawings.

3.4 PROTECTION

A. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 070150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Full tear-off of roof system at areas indicated on Drawings.
2. Removal of flashings and counter-flashings.
3. Temporary roofing.

B. Related Requirements:

1. Section 011000 "Summary" for use of premises and for phasing requirements.
2. Section 015000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.3 DEFINITIONS

A. EPS: Molded (expanded) polystyrene.

B. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.

C. OSB: Oriented strand board.

D. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.

1. Meet with Owner, Construction Manager, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:

a. Reroofing preparation, including roofing system manufacturer's written instructions.
b. Temporary protection requirements for existing roofing system components that are to remain.
c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
e. Existing roof deck conditions requiring Architect notification.
f. Existing roof deck removal procedures and Owner notifications.
g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
h. Structural loading limitations of roof deck during reroofing.
i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
j. HVAC shutdown and sealing of air intakes.
k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
l. Asbestos removal and discovery of asbestos-containing materials.
m. Governing regulations and requirements for insurance and certificates if applicable.
n. Existing conditions that may require Architect notification before proceeding.

1.5 SUBMITTALS

A. All action and informational submittals are to be submitted in a single package with provided submittal form according to submittal schedule. Submittals package must be complete for this division, incomplete packages will be rejected

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1. Include certificate that Installer is approved by warrantor of existing roofing system.
2. Include certificate that Installer is licensed to perform asbestos abatement.

B. Field Test Reports:

1. Fastener pull-out test report.

C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.

1. Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.8 CLOSEOUT SUBMITTALS

A. Certified statement from manufacturer for existing warranted roof system stating that existing roof warranty has not been affected by Work performed under this Section.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

B. Regulatory Requirements:

1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.10 FIELD CONDITIONS

A. Owner will occupy portions of building immediately below reroofing area.

1. Conduct reroofing so Owner's operations are not disrupted.
2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.

B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

E. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to 1,500 LBS for rooftop equipment wheel loads and 40 PSF for uniformly distributed loads.

F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

G. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.

1. Existing roof will be left no less watertight than before removal.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

a. Hazardous materials will be removed by Contractor under a separate contract.

H. Hazardous Materials: A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials may be present.

1. Do not disturb hazardous materials or items suspected of containing hazardous materials.
2. Coordinate reroofing preparation with hazardous material remediation, if required to prevent water from entering existing roofing system or building.

1.11 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty issued by manufacturer for existing warranted roof system.

1. Notify warrantor before proceeding with the Work.
2. Notify warrantor of existing roofing system on completion of reroofing, and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect.

a. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

A. EPS Insulation: ASTM C578.

B. Plywood: DOC PS 1, Grade CD, Exposure 1.

C. OSB: DOC PS 2, Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are Contractor's responsibilities.

2.3 INFILL AND REPLACEMENT MATERIALS

A. Use infill materials matching existing roofing system materials unless otherwise indicated.

B. Steel deck is specified in Section 053100 "Steel Decking."

C. Wood blocking, curbs, and nailers are specified in Section 061053 Miscellaneous Rough Carpentry."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Limit traffic and material storage to areas of existing roofing that have been protected.
2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.

B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.

C. Shut off rooftop utilities and service piping before beginning the Work.

D. Test existing roof drains to verify that they are not blocked or restricted.

1. Immediately notify Architect of any blockages or restrictions.

E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.

1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.

1. Prevent debris from entering or blocking roof drains and conductors.

a. Use roof-drain plugs specifically designed for this purpose.
b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.

    a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

A. Notify Owner each day of extent of roof tear-off proposed for that day.

B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.

C. Roof Tear-off: Where indicated on Drawings, remove existing roofing and other roofing system components

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.

1. Do not proceed with installation until directed by Architect.

C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.

1. Do not proceed with installation until directed by Architect.

D. Provide additional deck securement as indicated on Drawings.

E. Replace steel deck as indicated on Drawings.

F. Replace steel deck as directed by Architect.

1. Deck replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

G. Prepare and paint steel deck surface.

1. Painting and preparation for painting is specified in Section 099113 "Exterior Painting."

3.4 INFILL MATERIALS INSTALLATION

A. Immediately after roof tear-off, and inspection and repair, if needed, of deck, fill in tear-off areas to match existing roofing system construction.

1. Installation of wood blocking, curbs, and nailers is specified in Section 061053 Miscellaneous Rough Carpentry."

B. Install new roofing patch over roof infill area.

1. If new roofing is installed the same day tear-off is made, roofing patch is not required.

3.5 TEMPORARY ROOFING

A. Install approved temporary roofing over area to be reroofed.

B. Remove temporary roofing before installing new roofing.

3.6 BASE FLASHING REMOVAL

A. Remove existing base flashings.

1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain.

1. Replace metal counterflashings damaged during removal with counterflashings specified.

C. Inspect parapet, wood blocking, curbs, and nailers for deterioration and damage.

1. If parapet, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

D. When directed by Architect, replace parapet framing, wood blocking, curbs, and nailers to comply with Section 061053 Miscellaneous Rough Carpentry."

3.7 DISPOSAL

A. Collect demolished materials and place in containers.

1. Promptly dispose of demolished materials.
2. Do not allow demolished materials to accumulate on-site.
3. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150.19

SECTION 07 71 00

MANUFACTURED ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes manufactured roof-edge flashings.

B. Related Work
1. Division 6 Section “Rough Carpentry”
2. Division 7 Section “Roof Insulation”
3. Division 7 Section “Modified Bituminous Membrane Roofing – Hot/Cold Applied”
4. Division 7 Section “Standing Seam Metal Roof Panels”
5. Division 7 Section “Sheet Metal Flashing 7 Trim”
6. Division 7 Section “Manufactured Roof Accessories”

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.

C. Samples for Verification: For each type of exposed finish required, prepared on specified metal substrate.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: When requested by Architect

B. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof specialties installation.

1.7 WARRANTY

A. Refer to warranty requirements of Division 07 Section 07521 SBS Modified Bituminous Roofing, Cold Applied for terms and conditions of warranties covering work of this Section.

B. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design - Manufacturers/Products: Subject to compliance with requirements, provide products by one of the following manufacturers comparable to the Basis of Design product specified:

1. The Garland Company Inc.

2. Or Approved Equal

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction, and will not allow water infiltration into building assemblies or the building interior.

B. SPRI Wind Design Standard: Manufacture and install roof-edge flashings tested according to SPRI ES-1.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 40 mils hick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer. Approved manufactures and materials listed below. Basis-of-Design

1.) The Garland Company Inc., Hydroshell SA 60

2.) Grace: Ice and Water Shield

3.) Or approved equal

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

C. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment:

1. Install wrinkle free. Apply primer if required by underlayment manufacturer.

2. Install self-adhering sheet underlayment over all wood blocking prior to installation of metal edge systems, gutters, copings and any other edge accessory item.

3.3 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties 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 roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise shown on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints with elastomeric sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F .

3.4 ROOF-EDGE FLASHING INSTALLATION

A. At no time during the project shall the wood blocking be left exposed to the elements. Waterproof the wood blocking by installing the self-adhering sheeting to cover the wood blocking on a daily basis.

B. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

C. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.5 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder and sealants.

B. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 71 00

SECTION 079200

JOINT SEALANTS

PART 1 – GENERAL

1.1 SUMMARY

A. This document describes the sealing of vertical joints/cracks using a one-component elastomeric joint sealant.

B. Related Sections:
1. Section 033000 – Cast in Place Concrete
2. Section 042100 – Masonry Assemblies Unit Masonry
3. Section 076200 – Sheet Metal Flashing and Trim
4. Section 084113 – Aluminum Entrances and Storefronts
5. Section 088100 – Glass Glazing

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to project joint substrates as follows:
1. Locate test joints indicated on project or, if not indicated, as directed by architect.
2. Perform field tests for each application indicated below.
3. Notify Architect and Owner's Representative a minimum of () days in advance of dates and times when test joints will be performed.
4. Each test patch will need a minimum of 5 full days to cure.
5. Arrange for tests to take place with joint-sealant manufacturer's representative present.
   a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in ASTM C 1193.
6. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
7. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
8. Evaluation of Preconstruction Field-Adhesion-Test Results.
9. Do not use sealants that fail to adhere to joint substrates during testing.

1.3 SYSTEM DESCRIPTION

A. Design Requirements:
1. Design number of joints and joint widths for maximum of ± 25% movement.
2. Design depth of sealant to be ½ width of joint.
   a. Maximum Depth: ½ in.
   b. Minimum Depth: ¼ in.
   c. Maximum Recommended Width: 1 in.

B. Performance Requirements: ASTM C 920, Type S, Grade NS, Use T2, NT, M, A, G and O, Federal Specification TT-C-0230C, ASTM C 1382 for use with EIFS

1.4 DELIVERY, STORAGE AND HANDLING

A. All materials must be delivered in original packaging.

B. Materials must be kept off the ground and protected from inclement weather conditions including but not limited to rain, snow, ice, frost, and high temperatures.

1.5 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: Manufacturer must provide a sample of each sealant to be applied.

C. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretations of test results written recommendations for substrate preparation as needed to obtain proper adhesion.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of the material for this project.

B. Source Limitations: Obtain each kind of joint sealant from single source and single manufacturer.

C. Product Testing: Field Test to ensure adhesion.

D. Pre-installation Conference: Conduct conference at project site.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
   2. When joint substrates surfaces are damp or wet.
   3. Where joint widths are outside of the joint width parameters set by the joint sealant manufacturers recommendations.
   4. Where contaminants capable of interfering with adhesion have not yet been properly removed from joint substrates.
   5. Where joint movement will occur exceeding the sealants capabilities.

1.8 WARRANTY

A. Upon completion of installation, and acceptance by the owner and architect, the manufacturer will supply to the owner the appropriate warranty.

B. Installer will submit a two (2) year labor warranty to the sealant manufacturer directly and provide a copy directly to owner (5 Year Material warranty)

PART 2 – PRODUCTS

2.1 GENERAL MATERIALS

A. Compatibility: Provide joint sealants, approved backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Backing Material: Provide backing material or bond breaker tape compatible with joint sealant based on manufacturers recommendations.

2.2 SILICONE JOINT SEALANT PRODUCTS (ALL-SIL)

A. Silicone Sealant: One part, medium, modulus, non-corrosive high performance silicone sealant as recommended and furnished by the membrane manufacturer.
   1. Tensile Strength (ASTM D412): 230 psi
   2. Elongation (ASTM D412): 360%
   3. Hardness, Shore A (ASTM C920): 24

2.3 MS JOINT SEALANTS (TUFF-STUFF MS)

A. Sealant: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
   1. Elongation (ASTM D412): 450 - 550%
   2. Hardness, Shore A (ASTM C920): 25 - 35
   3. Shear Strength (ASTM D1002): 275 psi

2.4 POLYETHER JOINT SEALANTS (GREEN-LOCK SEALANT XL)

A. Sealant: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
   1. Elongation at Break: 750%
   2. Hardness, Shore A (ASTM D-2240) at 21 days: 24 ± 3

*Note: All product testing above was performed in ideal laboratory temperature and conditions.

PART 3 – SCOPE OF WORK

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants. With installer present, ensure joint sealant manufacturer’s requirements for joint configuration, installation tolerances, and other conditions proven to affect joint sealants performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer’s written instructions and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant including; dust, old joint sealant, oil, grease, frost, moisture, and any other foreign contaminants that could interfere with proper adhesion.

2. Prepare and clean porous joint substrate surfaces by mechanical abrading, grinding, brushing, or a combination of these methods to produce a virgin, sound substrate capable of developing a tenacious bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
3. Once joint is prepared adequately wipe surface with denatured alcohol prior to sealant application.

3.2 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install approved sealant backings of kind indicated on sealant manufacturers data sheet to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Ensure sealant backing material is continuous and free of any gaps between each section.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry approved material.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
1. Ensure proper backing material is used.
2. Ensure backing material is installed at proper depth.
3. Ensure proper size backing material is used.

E. Install masking tape to protect surfaces adjacent to recessed tooled joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Install sealant into prepared joints when joint is at the midpoint of its contraction and expansion cycle.
2. Install sealants so they directly contact and fully wet the joint substrates.
3. Completely fill the recesses in each joint configuration.
4. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow sealants to utilize maximum movement capabilities.

END OF SECTION

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. Section 02 41 16 - Site and Structure Demolition

B. Section 31 20 00 – Earth Moving

C. Section 31 23 10 – Excavation, Backfill & Subgrade Preparation for Pavement

D. 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

GARLAND PROJECT MANUAL

FOR THE

ROOF REPLACEMENT

AND

ASSOCIATED WORK

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TABLE OF CONTENTS

SECTION 075650

PREPARATION FOR REROOFING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the Conditions of the Contract apply to this section.

1.2 SUMMARY

A. Membrane re-roofing preparation for roof tear-off and removal of base flashings.

B. Related Sections:
   1. Division 07 Section Modified Bituminous Membrane Roofing.
   2. Division 07 Section Roof Insulation

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, demolished materials become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

A. Product Data: Provide manufacturer s technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with not less than 12 years documented experience.

C. Installer Qualifications: Company specializing in modified bituminous roofing installation with not less than 5 years experience and authorized by roofing system manufacturer as qualified to install manufacturer's roofing materials.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress. Maintain proper supervision of workmen.

E. Maintain a copy of the Contract Documents in the possession of the Supervisor/Foreman and on the roof at all times.

1.6 PRE-INSTALLATION CONFERENCE

A. Preliminary Re-roofing Conference: Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of reroofing installation and associated work.

B. Require attendance of installer of each component of associated work, Owner, roofing system manufacturer s representative, and other representatives directly concerned with performance of the Work. Objectives of conference include:
   1. Review foreseeable methods and procedures related to re-roofing work.
   2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.
   3. Review re-roofing system requirements (drawings, specifications and other contract documents).
   4. Review and finalize construction schedule related to re-roofing work and verify availability of materials, installer s personnel, equipment and facilities needed to make progress and avoid delays.
   5. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).
   6. Review notification procedures for weather or non-working days.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately below re-roofing area. Conduct re-roofing so Owner’s operations will not be disrupted. Provide Owner with not less than 24 hours’ notice of activities that may affect Owner’s operations.

B. Coordinate work activities daily with Owner so Owner can implement protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or-detection equipment if needed, and evacuate occupants from below the work area.

C. Protect building to be re-roofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from re-roofing operations.

D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

E. Owner assumes no responsibility for condition of areas to be re-roofed. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

F. Weather Condition Limitations: Do not apply roofing membrane during inclement weather or when inclement weather is expected.

G. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer s recommendations and warranty requirements.

1.8 WARRANTY

A. Upon completion of installation, and acceptance by the Owner, the manufacturer will supply to the Owner a thirty (30) year warranty.

B. Installer will submit a five (5) year warranty to the membrane manufacturer with a copy directly to Owner.

PART 2 – PRODUCTS

2.1 BASE SHEET MATERIALS:

A. Base Sheet: ASTM D4601, Type II, nonperforated, asphalt-coated, glass-fiber sheet: HPR Premium Glasbase

B. Asphalt Primer: ASTM D41.

2.2 RE-ROOFING MATERIALS

A. Refer to Division 07 Section Modified Bituminous Membrane Roofing.

2.3 AUXILIARY RE-ROOFING MATERIALS

A. General: Auxiliary re-roofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of [existing and] new membrane roofing system.

B. Base Sheet Fasteners: Cap nails as manufactured by ES Products and distributed by Fastener Systems, Inc. (800)232-5060.

C. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section Sheet Metal Flashing and Trim.

PART 3 – EXECUTION

3.1 PREPARATION

A. Coordinate with Owner to shut down air intake equipment in the vicinity of the Work. Cover air intake louvers before proceeding with re-roofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

B. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

C. Verify that openings, curbs, pipes, conduit, sleeves, ducts, and other items which penetrate the roof are set solidly, and that cant strips, nailing strips, and reglets are set in place.

3.2 ROOFING DEMOLITION

A. General: Notify Owner each day of extent of roof tear-off proposed.

B. Remove all obsolete penetrations from the roof area..

C. Roof Tear-Off: Remove existing roofing membrane and other roofing system components down to the light weight fill substrate.

D. Remove nails and fasteners from the deck.

3.3 DECK PREPARATION

A. Inspect deck/substrate after tear-off of built-up/modified bitumen roofing system.
1. Verify that substrate is visibly dry and free of moisture.

B. If deck surface is not suitable for receiving new roofing, or if structural integrity of deck is suspect, immediately notify Owner. Do not proceed with installation until directed by Owner.

3.4 BASE SHEET INSTALLATION

A. Penetrations through the deck or joints in the deck construction will be sealed to prevent materials penetrating the interior.

B. One ply of the base sheet shall be applied with side laps of 4'' and end laps of 6''.

C. Using an approved fastener, nail each sheet every 9'' through the laps and stagger nail the remainder of the sheet on 9'' centers.

3.5 FIELD QUALITY CONTROL

A. Perform field inspections a minimum of three (3) days a week.

B. Correct defects or irregularities discovered during field inspection.

C. Require attendance of roofing materials manufacturer representatives at site during installation of the roofing system.

3.6 CLEANING

A. Remove bitumen adhesive drippings from all walls, windows and finished surfaces.

B. In areas where finished surfaces are soiled by work of this Section, comply with the cleaning instructions of the manufacturer of surfaces.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

1.7 CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during reroofing procedures. Comply with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 072200

ROOF DECK AND INSULATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the Conditions of the Contract apply to this section.

1.2 SUMMARY

A. Section includes roof insulation over the properly prepared deck substrate.

1.3 REFERENCES

A. American Society for Testing and materials (ASTM):
   1. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board.
   2. ASTM C209 Standard Test Method for Cellulosic Fiber Insulating Board.
   3. ASTM C1396 Standard Specification for Gypsum Wallboard.
   4. ASTM C518 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

B. Factory Mutual Research (FM):
   1. Roof Assembly Classifications.

C. National Roofing Contractors Association (NRCA):
   1. Roofing and Waterproofing Manual.

D. Underwriters Laboratories, Inc. (UL):
   1. Fire Hazard Classifications.

E. Warnock Hersey (WH):
   1. Fire Hazard Classifications.

F. Insulation Board, Thermal (Fiberboard) (FS LLL-1-535B)

1.4 SUBMITTALS

A. Product Data: Provide manufacturer’s specification data sheets for each product.

B. Provide a sample of each insulation type.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer’s original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 – PRODUCTS

1.1 INSULATION MATERIALS

1. Polyisocyanurate Roof Insulation; ASTM C1289:
    a. Qualities: Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
    b. Thickness: Minimum 3.5”
    c. Average R-Value: 20
    d. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1
    e. Acceptable Products:
        1) ENRGY 3; Johns Manville
        2) EnergyGuard; GAF
        3) Approved Equivalent

2. Securerock Roof Board:
    a. Qualities: Nonstructural, noncombustible, homogenous composition panel.
    b. Board Size: Four by four feet (4’x4’).
    c. Thickness: One half (1/2) inch.
    d. R-Value: .5
    e. Compliances: UL. WH or FM listed under Roofing Systems.
    f. Manufacturer: USG

1.2 RELATED MATERIALS

A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite as per the approved manufacturer.
    1. Acceptable Manufacturers:
        a. Celotex
        b. Johns Manville
        c. GAF
        d. Approved Equivalent

B. Roof Deck Insulation Adhesive: Dual-component, high rise foam adhesive with 45% rapidly renewable material content as recommended by insulation manufacturer and approved by manufacturer.
    1. Tensile Strength (ASTM D412)……250 psi
    2. Density (ASTM D1875)……..8.5 lbs./gal.
    3. Viscosity (ASTM D2556)……22,000 to 60,000 cP.
    4. 2 `Peel Strength (ASTM D903)…..17 lb/in.
    5. 3 `Flexibility (ASTM D816)……Pass @ -70°F

PART 3 – EXECUTION

3.1 EXECUTION, GENERAL

A. Comply with requirements of Division 01 Section “Common Execution Requirements.”

3.2 INSPECTION OF SURFACES

A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
   1. Verify that work which penetrates roof deck has been completed.
   2. Verify that wood nailers are properly and securely installed.
   3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
   4. Do not proceed until defects are corrected.
   5. Do not apply insulation until substrate is sufficiently dry.
   6. Broom clean substrate immediately prior to application.
   7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.

3.3 INSTALLATION

A. Attachment with Insulation Adhesive
   1. Ensure all surfaces are clean, dry, free of dirt, debris and other contaminants that may inhibit adhesion.
   2. Apply insulation adhesive directly to the substrate using a ribbon pattern with one quarter to one half (1/4-1/2) inch wide beads 6” at the perimeters and corners and 12 inches in the field of the roof o.c., using either the manual applicator or an automatic applicator, at a rate of one (1) gallon per one hundred (150) square feet per cartridge.
   3. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.
   4. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular surfaces may prevent the insulation board from making positive contact with the adhesive. Relief cuts or temporary weights may be required to ensure proper contact.
   5. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.

3.4 CLEANING

A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

3.5 CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 075500

MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Torch Applied 2-Ply Modified Bitumen Membrane Roofing

B. Edge Treatment and Roof Penetration Flashings

1.2 RELATED SECTIONS

A. Section 07565 - Roof Deck Substrate Preparation.

B. Section 07220 - Insulation Board: Insulation and fastening.

C. Section 07710 - Manufactured Roof Specialties: Counter flashing and fascia.

1.3 REFERENCES

A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 2822 Standard Specification for Asphalt Roof Cement.

G. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

H. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

I. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

J. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

K. Factory Mutual Research (FM): Roof Assembly Classifications.

L. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

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

N. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

O. Warnock Hersey (WH): Fire Hazard Classifications.

P. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

Q. ASCE 7-05, Minimum Design Loads for Buildings and Other Structures

R. UL - Fire Resistance Directory.

S. FM Approvals - Roof Coverings and/or RoofNav assembly database.

1.4 SUBMITTALS

A. 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 instructions.

B. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
   1. Record minutes of the conference and provide copies to all parties present.
   2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
   3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Owner.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Owner.

F. Adhesive storage shall be between the range of above 40 degree F and below 80 degree F. Area of storage shall be constructed for flammable storage.

1.8 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.9 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: The Garland Company, Inc.

B. Approved Equal

2.2 TORCH APPLIED 2-PLY MODIFIED BITUMEN MEMBRANE ROOFING

A. Base (Ply) Sheet:
   1. HPR Torch Base:

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with interplay adhesive.
   1. StressPly IV Plus Mineral:

C. Flashing Base Ply:
   1. HPR Torch Base:

D. Flashing Cap (Ply) Sheet
   1. StressPly IV Plus Mineral:

E. Surfacing:
   1. Surface Coatings
      a. Pyramic: white ‘Energy Star’ acrylic coating
      b. Applied in 2 coats to all roof and flashing surfaces.

2.3 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Perimeter Fascia: R-Mer Force - .050 aluminum. Color to be selected by Owner.

B. HVAC curbs and roof hatch counter flashings:.032 aluminum.

C. Drain Flashings should be 4lb sheet lead formed and rolled.

D. Plumbing stacks should be 4lb sheet lead formed and rolled.

E. Liquid Flashing: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
   1. Tensile Strength, ASTM D 412: 400 psi
   2. Elongation, ASTM D 412: 300%
   3. Density @77 deg. F 8.5 lb/gal typical

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Owner of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
   1. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
   2. Prime surfaces, where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Insulation: Roof insulation is specified in Section 072200
   1. All joints between layers should be staggered when multiple layers of insulation are installed.
   2. Insulation shall be kept dry at all times. Install only as much insulation as can be covered with completed roofing membrane before the end of the day's work or prior to onset of inclement weather.
   3. Edges shall butt tightly and all cuts shall fit neatly against adjoining surfaces to provide a smooth overall surface. Gaps of greater than 1/4 inch width shall be filled with insulation.
   4. Install tapered insulation, where required, to provide adequate slope for proper drainage at roof drains.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual and applicable codes.

B. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

3.4 INSTALLATION TORCH APPLIED 2-PLY MODIFIED BITUMEN MEMBRANE ROOFING

A. Base Ply: Install torch base sheet to the properly installed gypsum roof board. Shingle in proper direction to shed water on each area of roofing.

1. Lay out the roll in the course to be followed and unroll 6 feet.
2. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
3. After the major portion of the roll is bonded, re-roll the first 6 feet and bond it in a similar fashion.
4. Repeat this operation with subsequent rolls with side laps of 4 inches and end laps of 8 inches.
5. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.
6. Extend underlayment 2 inches beyond top edges of cants at
7. projection bases.
8. Install base flashing ply to all perimeter and projections details.

B. Modified Cap (Ply) Sheet: Over torch base sheet underlayment, lay out the roll in the course to be followed and unroll 6 feet. Stagger seams over the torch base sheet seams.
1. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
2. After the major portion of the roll is bonded, re-roll the first 6 feet and bond it in a similar fashion.
3. Repeat this operation with subsequent rolls with side laps of 4 inches and end laps of 8 inches.
4. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives.

D. Metal Work: Provide metal fascia, counter flashings, etc., as specified in Section 007600. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

E. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

F. Flashing Base Ply: Seal all curb flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
1. Prepare all penetrations and other surfaces to be flashed with asphalt primer at the rate of 100 square feet per ½ gallon. Allow primer to dry tack free.
2. All wood surfaces, nailers, etc. will be covered with a self-adhering fire retardant membrane prior to flashing installation.
3. Solidly adhere the entire sheet of flashing membrane to the substrate. Tops of all flashings that are not run up and over curb shall be secured and sealed at top

G. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the base ply.
1. Adhere to the underlying base flashing ply. Nail off at a minimum of 8 inches o.c. from the finished roof at all vertical surfaces.
2. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
3. Coordinate roof accessories, miscellaneous sheet metal accessory items with the

roofing system work.

4. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and fiberglass mesh.
5. All stripping shall be installed prior to flashing cap sheet installation.
6. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Roof and Base Flashing Surface Coating: Apply the base coat of roof coating at the rate of 1.5 gallons per 100 square feet and 1.5 gallons per 100 square feet for the top coat.

I. Roof Walkways: Install pads leading from the roof hatch to and around all serviceable HVAC units. The pads will be set in an approved adhesive.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Counterflashing at Roof Hatch and HVAC curbs:
1. Minimum flashing height is 8 inches above finished roof height. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches.
3. Install base flashing ply covering wall with 6 inches on to field of the roof.
4. Install a second ply of modified flashing ply over the base flashing ply, 9 inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams.
5. Secure termination bar through flashing and into wall.
6. Secure counterflashing under over the termination bar.

B. Pre-Manufactured Flash-less Snap-On Metal Edge System around Perimeter:
1. Position base ply of the modified roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations. Cap sheet shall stop at the edge of the roof and shall not turn over the edge of the nailer.
2. Prior to installing the base anchor, assure a level plane is present. If not, shim the roof edge surface as required.
3. Extruded base anchor: Apply two 1/4" beads of Green-Lock Sealant XL or equal on the bottom surface of the top flange of the extruded anchor.
4. Set the extruded anchor on the edge and face fasten through pre-punched slots every 18 inches o.c. Begin fastening 6 inches from ends.
5. Install Green-Lock Sealant XL or equal at the ends of the base frame to prevent water from running between base anchor joints.
6. Install compression seals every 40 inches on center in the slots located at the top of the extruded anchor.
7. Install fascia cover setting the top flange over the top flange and compression seals of the base anchor. Assure compression seals are in place during this process. Beginning on one end and working towards the opposite end, press downward firmly (do not rotate) until "snap" occurs and cover is engaged along entire length of miter.
8. Install splice plate at each end of the base anchor and fascia cover prior to the installation of the next adjacent ten foot piece.
9. Fabricate and install a.050 aluminum extender under new metal fascia system. Use stock metal from edge metal manufacturer and match color. At Glass Block/Aluminum Store front, extender to return into building.

C. Exhaust Fan:
1. Minimum curb height is 8 inches above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.

2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches.
3. Install base flashing ply covering curb with 6 inches on to field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches o.c. Apply a three-course application of mastic and mesh at all vertical seams.
5. Install metal exhaust fan over the wood nailers and flashing to act as counter flashing. Fasten per manufacturer's recommendation.

D. Roof Drain:
1. Remove the existing roof drain bowel and install a new Smith drain bowel.
2. Plug drain to prevent debris from entering plumbing.
3. Taper insulation to drain minimum of 24 inches from center of drain.
4. Run roof system plies over drain. Cut out plies inside drain bowl.
5. Set lead flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead into drain a minimum of 2 inches. Prime lead at a rate of 100 square feet per gallon and allow to dry.
6. Install base flashing ply : 40 inch square minimum torch applied.
7. Install modified membrane: 48 inch square minimum torch applied.
8. Install clamping ring and ensure that all plies are under the clamping ring.
9. Remove drain plug and install strainer.

E. Plumbing Stack:
1. Minimum stack height is 12 inches.
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch bed of roof cement.
4. Torch apply the base flashing ply.
5. Torch apply the top membrane over the base flashing ply.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of 1 inch down inside of stack.

3.6 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately three (3) days per week. Provide a final inspection upon completion of the Work.
1. Warranty shall be issued upon manufacturer's acceptance of the installation.
2. Field observations shall be performed by a Technical Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.

END OF SECTION

SECTION 076200

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SCOPE OF WORK:

A. Provide all labor, equipment, and materials to fabricate and install the following.

1. Metal fascia around the perimeter.
2. Counterflashings at HVAC curbs and roof hatch.
3. Lead flashing for vents and roof drains.

1.2 RELATED SECTIONS

A. Drawing and general provisions of the Contract, including General Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.3 REFERENCES

ASTM B-209	Specification for aluminum sheet
FS QQ-L-201	Specification for Lead Sheet
ASTM A792	Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process
ASTM B32	Solder Metal
ASTM B209	Aluminum and Alloy Sheet and Plate
ASTM B486	Paste Solder
ASTM D486	Asphalt Roof Cement, Asbestos-free
FS O-F-506	Flux, Soldering, Paste and Liquid
WH	Warnock Hersey International, Inc. Middleton, WI.
FM	Loss Prevention Data Sheet
NRCA	National Roofing Contractors Association - Roofing Manual
SMACNA	Architectural Sheet Metal Manual

1.4 SUBMITTALS

A. Shop Drawings

1. For shop fabricated coping and all other sheet metal fabrications.

2. Shop drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.

3. Indicate type, gauge and finish of metal.

1.5 QUALITY CONTROL

A. Reference Standards

1. Comply with details and recommendations of SMACNA Manual for workmanship, methods of joining, anchorage, provisions for expansion, etc.

2. Factory Mutual Loss Prevention Data Sheet 1-49 windstorm resistance 1-90.

B. Contractor's Warranty

1. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of five (5) years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

1.6 QUALIFICATIONS

A. Fabricator and Installer: Company specializing in sheet metal flashing work with 5 years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials which may cause discoloration or staining.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metal fascia will be Aluminum, ASTM B20, in thickness of .050” x 10.25”.

a. R-Mer Force Edge Metal

B. Miscellaneous Metals and Flashings:

a. Fascia Extender: .050 and color to match edge metal.
b. Lead: Meets Federal Specification QQ-L-201, Grade B, four pounds per square foot: Drains and Vent Pipes.

b. Aluminum sheet in thickness of .032”: counterflashings at roof hatch and HVAC curbs.

2.2 RELATED MATERIALS

A. Metal Primer: Zinc chromate type.

B. Plastic Cement: ASTM D 4586

C. Sealant: Specified on drawings.

D. Fasteners:

1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.

2. Fastening shall conform to Factory Mutual 1-120 requirements or as stated on section details, whichever is more stringent.

E. Termination Bars:

1. Shall be aluminum unless otherwise recommended by membrane manufacturers.

1. Material shall be .125” x 1” (minimum) aluminum conforming to ASTM B-221, mill finish. Bar shall have caulk cup as required.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect contact areas of dissimilar metals with heavy asphalt or other approved coating, specifically made to stop electrolytic action.

3.2 GENERAL

A. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction.

B. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual I-90 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.

C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.

3.3 INSPECTION

A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.

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

C. Beginning of installation means acceptance of existing conditions.

D. Field measure site conditions prior to fabricating work.

3.4 MANUFACTURED SHEET METAL SYSTEMS

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.

B. Furnish and install manufactured sheet metal systems in strict accordance with manufacturer's printed instructions.

C. Provide all factory-fabricated accessories including, but not limited to, fascia extenders, miters, joint covers, etc.

3.5 SHOP FABRICATED SHEET METAL

A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.

B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

C. Hem exposed edges.

D. Angle bottom edges of exposed vertical surfaces to form drip.

E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.

F. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

3.6 METAL FLASHING INSTALLATION

A. FLASH-LESS SNAP-ON FASCIA DETAIL WITH EXTRUDED ALUMINUM BASE ANCHOR

1. Position base ply of the modified bitumen roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer’s recommendations. Cap sheet shall stop at the edge of the roof and shall not turn over the edge of the nailer.

2. Prior to installing the base anchor, assure a level plane is present. If not, shim the roof edge surface as required.

3. Extruded base anchor: Apply two 1/4" beads of Green-Lock Sealant XL or equal on the bottom surface of the top flange of the extruded anchor.

4. Set the extruded anchor on the edge and face fasten through pre-punched slots every 18 inches o.c. for 5.75 inch face fascia. Begin fastening 6 inches from ends.

5. Install Green-Lock Sealant XL or equal at the ends of the base frame to prevent water from running between base anchor joints.

6. Install compression seals every 40 inches on center in the slots located at the top of the extruded anchor.

7. Install fascia cover setting the top flange over the top flange and compression seals of the base anchor. Assure compression seals are in place during this process.

8. Beginning on one end and working towards the opposite end, press downward firmly (do not rotate) until “snap” occurs and cover is engaged along entire length of miter.

9. Install splice plate at each end of the base anchor and fascia cover prior to the installation of the next adjacent ten foot piece.

B. ROOF DRAIN

1. Prime lead at a rate of 100 square feet per gallon and allow to dry.

2. Set lead flashing (30" square minimum) in a 1/4" bed of mastic.

3. Install clamping ring and strainer assure all plies are under the clamping ring.

C. PLUMBING STACK

1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.

2. Install properly sized sleeves in a 1/4" bed of elastomeric sealant.

3. Turn sleeve a minimum of 1" down inside of stack.

4. Caulk intersection of the membrane and flange with elastomeric sealant.

D. STACK

1. Prime flange and sleeve at a rate of 100 square feet per gallon and allow to dry.

2. Install properly sized sleeves in a 1/4" bed of elastomeric sealant.

2. Install new collar over cape. Weld collar or install stainless steel draw band.

3. Caulk intersection of the membrane and flange with elastomeric sealant.

END OF SECTION