SECTION 07115 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes cold-applied asphalt dampproofing.

1.3 FIELD CONDITIONS

A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.

B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.1 BITUMINOUS DAMPPROOFING

A. Odor Elimination: For interior and concealed-in-wall uses, provide dampproofing material warranted by manufacturer to be substantially odor free after drying for 24 hours under normal conditions.

B. Cold-Applied, Emulsified-Asphalt Dampproofing:

1. Trowel Coats: ASTM D 1227, Type II, Class 1.
2. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.
3. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. BASF Construction Chemicals – Building Systems; Chemrex Brand Products.
    b. Karnack Corporation.
    c. Meadows, W. R., Inc.

2.2 MISCELLANEOUS MATERIALS

A. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.

B. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.

C. Protection Course, Asphalt-Board Type: Premolded, 1/8-inch- thick, multi-ply, semirigid board consisting of a mineral-stabilized asphalt core sandwiched between layers of asphalt-saturated felt, and faced on 1 side with polyethylene film.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. BASF Construction Chemicals – Building Systems; Chemrex Brand Products.
   b. Grace, W. R. & Co.; Construction Products Div.
   c. Meadows, W. R., Inc.

PART 3 - EXECUTION

3.1 APPLICATION, GENERAL

A. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

B. Apply dampproofing to footings and foundation walls from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches over outside face of footing.

1. Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat required for embedding fabric is in addition to other coats required.

C. Apply dampproofing to provide continuous plane of protection on exterior face of inner wythe of exterior masonry cavity and barrier walls.

D. Apply dampproofing to provide continuous plane of protection on interior face of above grade, exterior single-wythe masonry walls unless walls are indicated to receive direct application of paint.

3.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. On Concrete Foundations: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat, one fibered brush or spray coat at not less than 3 gal./100 sq. ft., or one trowel coat at not less than 4 gal./100 sq. ft.

B. On Unparged Masonry Foundation Walls: Apply primer and one trowel coat at not less than 5 gal./100 sq. ft.

C. On Backs of Concrete Retaining Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft.

D. On Exterior Face of Inner Wythe of Cavity Walls: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft.

E. On Interior Face of Exterior Concrete Walls: Where above grade and indicated to be furred and finished, apply one brush or spray coat at not less than 1 gal./100 sq. ft.

F. On Interior Face of Single-Wythe Exterior Masonry Walls: Where above grade and indicated to be furred and finished, apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft.

3.3 INSTALLATION OF PROTECTION COURSE

A. Where indicated, install protection course over completed-and-cured dampproofing. Comply with dampproofing material manufacturer's written recommendations for attaching protection course. Support protection course with spot application of trowel-grade mastic where not otherwise indicated.

END OF SECTION 07115

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SECTION 07131 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Modified bituminous sheet waterproofing.
2. Molded-sheet drainage panels.

B. Related Requirements:

1. Division 2 Section “Subdrainage” for subsurface drainage pipe.

1.3 SUBMITTALS

A. Product Data: For each type of product, include construction details, material descriptions, and tested physical and performance properties of waterproofing.

B. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

C. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for waterproofing.

E. Special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

B. Preinstallation Conference: Conduct conference at Project site.

1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

1. Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Modified Bituminous Sheet: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil- thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.

1. Products: Subject to compliance with requirements, provide the following:
   a. Grace, W. R. & Co.; Bituthene 3000.
2. Physical Properties:
   a. Tensile Strength: 250 psi minimum; ASTM D 412, Die C, modified.
   b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
   c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970.
   d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836.
   e. Puncture Resistance: 50 lbf minimum; ASTM E 154.
   f. Hydrostatic-Head Resistance: 200 feet minimum; ASTM D 5385.
   g. Water Absorption: 0.1 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
   h. Vapor Permeance: 0.05 perms; ASTM E 96, Water Method.

2.2 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

B. Primer: Liquid primer recommended for substrate by sheet-waterproofing material manufacturer.

C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.

D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch thick, predrilled at 9-inch centers.

G. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

H. Mastic, Adhesives, and Tape: Liquid mastic and adhesives, and adhesive tapes recommended by waterproofing manufacturer.

2.3 MOLDED-SHEET DRAINAGE PANELS

A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 15 gpm per ft..

1. Product: Subject to compliance with requirements, provide the following:
   a. Grace, W. R., & Co. - Conn.; Hydroduct 220.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.

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

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.

E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

F. Bridge and cover isolation joints discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths according to manufacturer's written instructions.

1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.

G. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.

H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.

E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

F. Seal edges of sheet-waterproofing terminations with mastic.

G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.

H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.

I. Immediately install protection course with butted joints over waterproofing membrane.

3.4 MOLDED-SHEET DRAINAGE-PANEL INSTALLATION

A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesives or other methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

3.5 PROTECTION, REPAIR, AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07131

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SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Perimeter insulation under slabs-on-grade.
2. Perimeter wall insulation (supporting backfill).
3. Insulation under slabs-on-grade
4. Concealed building insulation.
5. Exposed building insulation.
6. Sound attenuation insulation.

B. Related Requirements:

1. Division 4 Section “Unit Masonry Assemblies” for two-piece wall ties designed to supplement insulation attachment of board insulation.

1.3 PERFORMANCE REQUIREMENTS

A. Plenum Rating: Provide slag-wool-fiber/rock-wool-fiber insulation where indicated in ceiling plenums whose test performance is rated as follows for use in plenums as determined by testing identical products per "Erosion Test" and "Mold Growth and Humidity Test" described in UL 181, or on comparable tests from another standard acceptable to authorities having jurisdiction.

1. Erosion Test Results: Insulation shows no visible evidence of cracking, flaking, peeling, or delamination of interior surface of duct assembly, after testing for 4 hours at 2500-fpm air velocity.
2. Mold Growth and Humidity Test Results: Insulation shows no evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosium on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products per ASTM E 84 and other methods indicated with product by UL or another testing and inspecting agency

acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, 1.60 lb/cu. ft., with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:

2.2 GLASS-FIBER BLANKET INSULATION

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

1. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Knauf Insulation.
5. Owens Corning.

B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

C. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft, foil-scrim, or foil-scrim-polyethylene vapor-retarder membrane on 1 face.

D. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:

1. 3-5/8 inches thick with a thermal resistance of 11 deg F x h x sq. ft./Btu at 75 deg F.
2. 5-1/2 inches thick with a thermal resistance of 21 deg F x h x sq. ft./Btu at 75 deg F.
3. 6-1/2 inches thick with a thermal resistance of 19 deg F x h x sq. ft./Btu at 75 deg F.

2.3 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

2.4 INSULATION FASTENERS

A. Fastening devices: 18-guage galvanized steel wire.

B. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 2 inches between face of insulation and substrate to which anchor is attached.

C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

E. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF PERIMETER AND UNDER-SLAB INSULATION

A. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.

1. If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.

B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

C. Protect below-grade insulation on vertical surfaces from damage during backfilling by applying protection course with joints butted. Set in adhesive according to insulation manufacturer's written instructions.

D. Protect top surface of horizontal insulation from damage during concrete work by applying protection course with joints butted.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. On units of foam-plastic board insulation, install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates indicated.

1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Division 4 Section "Unit Masonry Assemblies."

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

C. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated.

1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

D. Install mineral-fiber insulation in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures.
4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

E. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
2. Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.

3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

F. Apply self-supported, spray-applied cellulosic insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make it flush with face of studs by using method recommended by insulation manufacturer.

G. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.5 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

A. Install 3-inch- thick, unfaced glass-fiber blanket insulation over suspended ceilings at partitions in a width that extends insulation 48 inches on either side of partition.

END OF SECTION 07210

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SECTION 07241 – WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes Class PB exterior insulation and finish system (EIFS) **with drainage** applied over brick veneer.

1.3 PERFORMANCE REQUIREMENTS

A. Class PB EIFS: Comply with performance characteristics in EIMA's "EIMA Guideline Specification for Exterior Insulation and Finish Systems, Class PB."

1. Impact Resistance: **Medium.**
2. Positive and Negative Wind-Load Performance: Capability to withstand wind loads indicated when tested per ASTM E 330.

B. Drainage: Three samples capable of draining water, and having an average minimum true drainage efficiency of 90 percent when tested per EIMA 200.2.

C. Water-/Weather-Resistive-Barrier Coating: Comply with ICBO-ES AC24.

1.4 SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, penetrations, terminations, fasteners, and attachments to other work.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Certified in writing by EIFS manufacturer to install manufacturer's system using trained workers.

B. Source Limitations: Obtain EIFS through one source from a single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.

C. Fire-Test-Response Characteristics: Where indicated, provide EIFS and system components identical to those of EIFS and system components tested per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting agency.

1. Fire-Resistance Characteristics: ASTM E 119.
2. Full-Scale Fire Test: Tested mockup per ASTM E 108.
3. Radiant Heat Exposure: No ignition of EIFS when tested according to NFPA 268.
4. Surface-Burning Characteristics: Insulation board, adhesives, base coats, and finish coats with flame-spread index of 25 or less and smoke-developed index of 450 or less, per ASTM E 84.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockups at location as directed by Architect.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Preinstallation Conference: Conduct conference at Project Site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Subject to compliance with requirements, provide StoTherm ci Lotusan by Sto Corporation or comparable products by one of the following:

1. BASF Construction Chemicals – Building Systems.
   a. System: Synergy, Finestone, SonoWall or Acrocrete with Synerflex Tersus Finish.
2. Dryvit Systems, Inc.
   a. System: Outsulation Plus MD with Dirt Pick-Up Resistant Chemistry

B. Finish:

1. Reseal all cracks using NP1 sealer prior to recoating EIFS.
2. Recoat using StoCoat Lotusan Finish or approved equal.]
3. Match texture of existing adjacent EIFS material.

2.2 MATERIALS

A. Compatibility: Provide substrates, adhesive, fasteners, board insulation, reinforcing meshes, base- and finish-coat systems, sealants, and accessories that are compatible with one another and approved for use by EIFS manufacturer for Project.

B. Water-/Weather-Resistive-Barrier Coating: Formulation and accessories designed for indicated use.

C. Primer: Substrate conditioner as recommended by EIFS manufacturer designed to seal substrates from moisture penetration and to improve the bond between substrate type indicated and adhesive used for application of insulation.

D. Drainage Mat: Designed to drain incidental moisture by gravity; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer with manufacturer's standard corrosion-resistant mechanical fasteners suitable for intended substrate.

E. Adhesive for Application of Insulation: Factory-blended adhesive recommended by manufacturer's written instructions for intended use and compatible with substrate. Notch to create drainage per manufacturer's recommendation.

F. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with EIFS manufacturer's requirements, ASTM C 578 for Type I, and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board."

G. Reinforcing Mesh: Balanced, alkali-resistant, open-weave glass-fiber mesh treated for compatibility with other EIFS materials and complying with EIMA 105.01 and ASTM D 578.

1. Standard-Impact Reinforcing Mesh: Not less than 4.0 oz. /sq. yd.
2. Heavy-Duty Reinforcing Mesh: Not less than 20 oz. /sq. yd. from FFE to 8 feet AFF.
3. Strip Reinforcing Mesh: Not less than 3.75 oz. /sq. yd.
4. Detail Reinforcing Mesh: Not less than 4.0 oz. /sq. yd.
5. Corner Reinforcing Mesh: Not less than 7.2 oz. /sq. yd.

H. Base-Coat Materials: Factory-blended polymer-emulsion adhesive and inert fillers.

I. Primer: Factory-mixed elastomeric-polymer primer for preparing base-coat surface for application of finish coat per manufacturer's recommendation.

J. Finish-Coat Materials: Standard acrylic-based coating with enhanced mildew resistance by one of the manufacturers specified above.

1. Colors, Textures, and Patterns: As indicated on Finish Schedule or as selected by Architect.

K. Trim Accessories: Drip screed, case beads, and accessories as indicated, manufactured from UV-stabilized PVC and complying with ASTM D 1784 and ASTM C 1063.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with ASTM C 1397 and EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.

B. Insulation: Adhesively attach to substrate.

C. Expansion Joints: Install at locations indicated; where required by EIFS manufacturer; where expansion joints are indicated in substrates behind EIFS; where EIFS adjoin dissimilar substrates, materials, and construction; at floor lines in multilevel wood-framed construction; and where wall height changes.

D. Base Coat: Apply to exposed surfaces of insulation in minimum thickness recommended in writing by EIFS manufacturer, but not less than 1/16 - inch dry-coat thickness.

E. Reinforcing Mesh: Completely embed mesh in wet base coat, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.

F. Double-Layer Reinforcing Mesh Application: Where indicated, apply second base coat and second layer of standard-impact reinforcing mesh.

G. Double Base-Coat Application: Where indicated, apply in same manner and thickness as first application except without reinforcing mesh.

H. Finish Coat: Apply over dry base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION 07241

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SECTION 07540 - THERMOPLASTIC MEMBRANE ROOFING - INLAND

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Mechanically fastened membrane roofing systems
2. Roof insulation and sheathing.
3. Fascia.
4. Reglets and counterflashing.

B. Related Sections include the following:

1. Division 9 Section “Gypsum Board Assemblies” for gypsum sheathing requirements at roof parapet.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

C. Samples: For each product included in membrane roofing system.

D. Research/evaluation reports.

E. Maintenance data.

1.4 QUALITY ASSURANCE

A. The TPO membrane roofing system must achieve a UL Class (A) and FM (1A-90) rating. In addition, roof system shall meet or exceed wind uplift in accordance with ASCE 7 as per the International Building Code as adopted by the governing municipality.

B. Installer Qualifications: A qualified installer, approved by manufacturer to install manufacturer's products.

C. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

D. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 and UL 790, for application and roof slopes indicated.

E. Preinstallation Conference: Conduct conference at Project site.

1.5 WARRANTY

A. Provide manufacturer's 15 Year Total System Warranty covering both labor and material with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 72 MPH measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.

B. Pro-rated System Warranties shall not be accepted. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

1.5 SITE CONDITIONS, CAUTIONS AND WARNINGS

Refer to Carlisle's Sure-Weld Mechanically-Fastened Roofing System specification, Part II - Application, for General Job Site Considerations.

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

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

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

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

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

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

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

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

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

PART 2 - PRODUCTS

2.1 GENERAL

A. All components of the specified roofing system shall be products of Carlisle Syntec Incorporated or accepted by Carlisle as compatible.

1. Refer to Harris Teeter National Account Contact List.

B. All products (including insulation, fasteners, fastening plates and edgings) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty.

2.2 THERMOPLASTIC POLYOLEFIN ROOFING MEMBRANE (TPO)

A. TPO Membrane Roofing Membrane: Carlisle Syntec Sure-Weld, .060” (60 mils) thick, white, reinforced TPO membrane. Membrane thickness over reinforcing scrim (top-ply thickness) shall be nominal .024” (24 mils) thick.

1. Colors: Provide horizontal roofing membrane in manufacturer’s standard white color. Vertical surfaces (minus the RTU curbs) in manufacturer’s standard tan color.

2.3 INSULATION/UNDERLAYMENT/SHEATHING

A. Polyisocyanurate Board Insulation: ASTM 1298 Grade 3, Type II, 25 psi minimum compressive strength. The insulation must meet UL1256 or equivalent test for insulated metal deck assembly.

1. Provide Carlisle Syntec; HP-H Polyisocyanurate Board Insulation.

B. Provide a minimum insulation thermal resistance (R-Value) of R30, unless otherwise indicated on Drawings. See “Envelope Compliance Certificate on Drawings for actual R value required.

C. Polyisocyanurate Tapered Insulation: Provide Carlisle Syntec HP-H polyisocyanurate, factory-tapered insulation boards fabricated to slope of ½-inch per 12 inches. Use at all cricket locations shown on Drawings and upslope of all curbed penetrations. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain.

2.4 ADHESIVES AND CLEANERS

A. Adhesives and Cleaners, General: All products shall be furnished by Carlisle and specifically formulated for the intended purpose.

1. Bonding Adhesive: Sure-Weld.
2. Edge Sealant: Cut Edge Sealant.
3. Sealer: Water Cut-Off Mastic and Universal Single-Ply Sealant.
4. Pocket Sealant: TPO Molded Pocket Sealant.
5. Cleaner: Carlisle Weathered Membrane Cleaner.

2.5 FASTENERS AND PLATES

A. HP-X Fasteners: A heavy duty #15 threaded fastener with a phillips head used for membrane securement into steel, wood plank or minimum 15/32 inch thick plywood.

B. HP Fasteners: A threaded, black epoxy electro-deposition coated fastener used with steel and wood roof decks for insulation attachment only.

C. HP Term Bar Nail-Ins: A 1-1/4” long expansion anchor with a zinc plated steel drive pin used for fastening the Carlisle Termination Bar or Seam Fastening Plates to concrete, brick, or block walls.

D. Piranha Plates: A 2-3/8 inch diameter metal barbed fastening plate used with Carlisle Fasteners for membrane securement. This plate can be used for insulation securement.

E. Insulation Fastening Plates: A nominal 3 inch diameter metal plate used for insulation attachment with the appropriate Carlisle Fastener.

2.6 METAL EDGING AND MEMBRANE TERMINATIONS

A. Carlisle Drip Edge: Metal fascia/edge system with a 22 or 24 gauge continuous anchor cleat and 24 gauge steel fascia. Metal fascia color shall be as designated by the Owner's Representative. For use at drainage or gutter eaves only.

B. Carlisle Termination Bar: 1-inch wide and .098 inch thick extruded aluminum bar pre-punched 6 inches on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.7 MISCELLANEOUS MATERIALS

A. Carlisle Yellow Pressure-Sensitive (PS) Coverstrip: Nominal 30-mil-thick non-reinforced TPO flashing laminated to a nominal 30-mil-thick fully cured synthetic rubber PS adhesive to provide a visual warning of an impending hazard (i.e., roof edge, deep drain sump, skylight), as recommended by Carlisle Syntec Systems.

2.8 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16-inch (5 mm) thick, and acceptable to membrane roofing system manufacturer.

PART 3 - EXECUTION

3.1 INSULATION INSTALLATION

A. Overlay metal deck with two layers polyisocyanurate insulation, loose laid in place. Install tapered insulation under area of roofing to conform to slopes indicated. Stagger all joints between layers per membrane roofing systems requirements. Within each layer offset joints in boards approximate one-half the length of the board.

B. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

C. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.

D. Secure completed insulation/sheathing system to the substrate with 5 HP fasteners and insulation plates in accordance with manufacturer’s specifications. All fasteners shall engage the tope flute of the metal deck.

3.2 MECHANICALLY FASTENED ROOFING MEMBRANE INSTALLATION

A. Unroll and position membrane without stretching. Provide and secure both field, perimeter and corner membrane sheets in accordance with the manufacturer's most current specifications and details.

B. Utilize 10’ sheets secured in the laps at 6” on center maximum spacing in the field. Fasteners and plates shall be Carlisle HP-Xtra and Piranha.

1. Perimeters: Spacing of rows of fasteners shall be maximum 6 feet, secured at 6 inches oc. maximum spacing.
2. Corners: Spacing of rows of fasteners shall be maximum 4 feet, secured at 6 inches oc. maximum spacing.
3. Provide rows of fasteners within the perimeter and corner conditions, oriented perpendicular to deck flutes.
4. All fasteners shall engage top flute of metal deck.

C. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's specifications.

3.3 MEMBRANE SPLICING/HOT AIR WELDING PROCEDURES

A. Hot-air weld the Sure-Weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller prior to membrane seam cooling. All T joints shall be overlain will Carlisle Pre-fabricated T joint covers.

B. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).

C. Repair all seam deficiencies the same day they are discovered.

D. Apply cut edge sealant on all cut edges of reinforced membrane (where scrim reinforcement is exposed) after seam probing is complete.

3.4 FLASHING

A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane. Sure-Weld non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, scuppers, as well as inside and outside corners when the use of pre-fabricated accessories is not feasible.

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

3.5 YELLOW PRESSURE-SENSITIVE (PS) COVERSTRIP INSTALLATION

A. Install yellow pressure-sensitive (PS) coverstrip in accordance with TPO roofing membrane manufacturer's most current specifications and details and written installation instructions.

3.6 WALKWAYS

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

B. Hot-air weld walkway pads to the membrane in accordance with the manufacturer's specifications.

3.7 DAILY SEAL

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

B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.8 CLEAN UP

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

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

3.9 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

B. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

END OF SECTION 07540

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SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Formed roof drainage system.
2. Formed wall flashing and trim.

1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

PART 2 - PRODUCTS

2.1 SHEET METALS

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

B. Aluminum Sheet: ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:

1. Mill Finish: Standard one-side bright.
2. Alclad Finish: Metallurgically bonded surfacing to both sides.
3. Factory Prime Coating: Factory-applied, baked-on epoxy primer coat.
4. High-Performance Organic Finish: Three-coat, thermocured system containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.
   a. Color: As selected by Architect or indicated in Finish Schedule.

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Felt Underlayment: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

1. Slip Sheet: Rosin-sized paper, minimum 3 lbs/100 sq. ft.

C. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Nails for Copper Sheet: Copper, hardware bronze, or Series 300 stainless steel, 0.109 inch minimum and not less than 7/8 inch long, barbed with large head.
2. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
3. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
4. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide, silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound.

H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat.

2.3 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

D. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

E. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal, and in thickness not less than that of metal being secured.

2.4 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Fabricate from the following material:
   a. Aluminum: 0.050 inch thick.

B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Fabricate downspouts from the following material:
   a. Aluminum: 0.024 inch thick.

2.5 WALL SHEET METAL FABRICATIONS

A. Openings Flashing in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high end dams. Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
2. Aluminum: Use aluminum or stainless-steel fasteners.
3. Copper: Use copper, hardware bronze, or stainless-steel fasteners.
4. Stainless Steel: Use stainless-steel fasteners.

H. Seal joints with elastomeric sealant as required for watertight construction.

I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.

1. Do not solder prepainted, metallic-coated steel and aluminum sheet.

3.2 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

3.3 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Reglets: Installation of reglets is specified in Division 4 Section "Unit Masonry Assemblies."

C. Openings Flashing in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

END OF SECTION 07620

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SECTION 07710 - MANUFACTURED ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Steel pre-engineered eyebrow canopies.

1.3 REFERENCES

A. ASTM A 500 – Specification for Structural Tubing for construction of bridges and buildings.

B. ASTM A 653 – Specification for Steel Sheet, zinc coated by the hotdip process.

1. Structural Quality.

C. ASTM A 924 – General requirements for Steel Sheet, metallic coated by the hot-dip process.

D. AISI – Specification for the Design of Cold-Formed steel structural members.

1.4 SYSTEM DESCRIPTION

A. Design of canopy shall be in accordance with applicable local building Codes and certified by a registered Professional Engineer who is licensed in state in which Project is located.

1.5 QUALITY ASSURANCE

A. Manufacturer: Shall have a minimum of 10 years' experience in the manufacture of steel canopies.

B. Installer: Shall have a minimum of 5 years' experience installing pre-engineered steel canopies, Installation shall be in accordance with manufacturers shop drawings.

1.6 REGULATORY REQUIREMENTS

A. Conform to the Local Building Code Requirements.

1.7 SUBMITTALS

A. Submit shop drawings and product data.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials on site in a manner so they will not be damaged. Materials shall be placed so water will drain and not accumulate.

1.9 WARRANTY

A. Provide one year manufacturer's warranty.

B. Warranty: Includes coverage of materials and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide one of the following:

1. Childers Carports & Structures, Inc., Houston, TX.
2. Carolina Canopies, Inc., Monroe, NC.
3. Overhead Door Company (Multiple Locations).
4. Mapes Canopies, LLC, Lincoln, NE.

2.2 MATERIALS

A. Roof deck and trim shall be pre-painted, hot-dip galvanized steel meeting ASTM Specification A-653. Grade 50. 50,000 psi yield. Galvanizing shall meet ASTM Specification A-924, G-90 Class. Paint shall be factory applied baked polyester with a full coat on color side and a uniform wash coat on reverse.

B. Roof beams shall meet ASTM Specification A-653 Grade 50, 50,000 psi yield. Galvanizing shall meet ASTM specification A 924. G-90 Class

C. Color: As indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install canopy in accordance with manufacturer's drawings and specifications.

3.2 TOLERANCES

A. Maximum Variation From Plan or Location Indicated on Drawings: None.

B. Maximum Offset From True Alignment between Adjacent Members Butting or In Line: None.

3.3 INSPECTION

A. Verify that canopies are installed straight and true.

3.4 ADJUSTING AND CLEANING

A. Clean up site and remove excess material.

END OF SECTION 07710

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SECTION 07720 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Roof curbs.
2. Equipment supports.
3. Roof hatches.

1.3 SUBMITTALS

A. Samples: For each exposed finish

1.4 QUALITY ASSURANCE

A. Standards: Comply with the following

1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
2. NRCA's "Roofing and Waterproofing Manual" details for installing units.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Galvanized Steel Sheet: ASTM A 653/A 653M with G90; commercial steel, unless otherwise indicated.

1. Structural Quality: Grade 40, where indicated or as required for strength.

B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, with Class AZ-50 coating, structural quality, Grade 40, or as required for strength.

C. Insulation: Manufacturer's standard rigid or semi-rigid glass-fiber board of thickness indicated.

D. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for above ground use, complying with AWPA C2; not less than 1-1/2 inches thick.

E. Fasteners: Same metal as metals being fastened, or non-magnetic stainless steel or other non-corrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.

1. Provide non-removable fastener heads where removal of exterior exposed fasteners affords access to building.

F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.

G. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.

H. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

I. Elastomeric Sealant: Recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25.

J. Roofing Cement: ASTM D 4586, non-asbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.2 ROOF CURBS AND EQUIPMENT SUPPORTS

A. General: Units capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Coordinate dimensions with equipment to be supported.

1. Provide preservative-treated wood nailers at tops of units and formed flange at perimeter bottom for mounting to roof.
2. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
3. Fabricate units to minimum height of 8 inches, unless otherwise indicated.
4. Where slope of roof deck exceeds ¼ inch per foot, fabricate support units with height tapered to match slope to level tops of units.

B. Roof Curbs:

1. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.0747-inch thick, structural quality, hot-dip galvanized or aluminum-zinc alloy-coated steel sheet; factory primed and prepared for painting with welded or sealed mechanical corner joints.
2. Installation: Manufacturer's standard rigid or semi-rigid insulation where indicated.
3. Cants: Formed cants and base profile coordinated with roof insulation thickness.

2.3 ROOF HATCHES

A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated double-wall curb frame with integral deck mounting flange and lid frame counter-flashing. Fabricate with welded and sealed corner joints. Provide continuous weather-tight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Bilco Company (The)
   b. J.L. Industries, Inc.

2. Loads: Fabricate roof hatches to withstand 40-lbf/sq. ft. external and 20-lbf/ sq. ft. internal loads.
3. Type and Size: Single-leaf lid, 30 by 36 inches.
4. Curb and Lid Material: Aluminum sheet, 0.090 inch thick.
   a. Finish: High-performance organic coating.
5. Insulation: Glass-fiber board.
6. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
7. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb.
8. Fabricate units to minimum height of 12 inches, unless otherwise indicated.
9. Hardware: Stainless-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside.
10. Ladder Safety Post: Manufacturer's standard ladder safety post. Post to lock in place on full extension. Provide release mechanism to return post to closed position.

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

C. Verify dimensions of roof openings for roof accessories.

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

3.2 INSTALLATION

A. General: Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction to ensure that combined elements are waterproof and weather-tight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

B. Install roof accessory items according to construction details in NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated.

C. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent serration.

D. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form seal.

E. Cap Flashing: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counter flashing). Seal overlap with thick bead of mastic sealant.

F. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

G. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 07720

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SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes joint sealants for the following:

1. Exterior joints in vertical surfaces and horizontal non-traffic horizontal surfaces.
2. Exterior joints in horizontal traffic surfaces.
3. Interior joints in vertical surfaces and horizontal non-traffic surfaces.
4. Interior joints in horizontal traffic surfaces.

1.3 SUBMITTALS

A. Sealant compatibility and adhesion test reports.

B. Reconstruction field-adhesion test reports

1.4 QUALITY ASSURANCE

A. Sealant Compatibility and Adhesion Testing: Use sealant manufacturer’s standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates according to the method indicated in Part 3 “Field Quality Control” Article.

1.5 WARRANTY

A. Special Installer’s Warranty: Written warranty in which Installer agrees to repair or replace elastomeric joint sealants that do not meet requirements specified in this Section or fail in adhesion within specified warranty period two years from date of Substantial Completion.

B. Special Manufacturer’s Warranty: Manufacturer’s standard form in which manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with requirements specified in this Section within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

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

B. Colors of Exposed Joint Sealants: As selected by Contract Administrator from Manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants, General: ASTM C 920.

1. Continuous-Immersion Sealants: For immersion in water, products tested according to ASTM C 1247, including initial six-week immersion period and one additional immersion four-week immersion(s), without failing in adhesion or cohesion when tested with substrates indicated.
2. Sealants for Contact with Food: Comply with 21 CFR 177.2600.

B. Mildew-Resistant Silicone Sealant (ES#1):

1. Products: Subject to compliance with requirements, provide the following:
   a. Dow Corning: 786 Mildew Resistant.
   b. GE Silicones: Sanitary 1700
2. Type and Grade: S (single component) and NS (non-sag).
3. Class: 25
4. Exposure: Use NT (non-traffic)
5. Substrates: Uses G, A, and O, as applicable to joint substrates indicated.

C. Pourable Silicone Sealant (ES#2):

1. Products: Subject to compliance with requirements, provide the following:
   a. Dow Corning: 890-SL
2. Type and Grade: S (single component) and P (pourable).
3. Class: 25
4. Additional Movement Capability: 100 percent movement in extension and 50 percent in compression when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719.
5. Exposure: Use T (traffic).
6. Substrates: M and, as applicable to joint substrates indicated, O.

D. Multi-component Non-sag Urethane Sealant (ES#3):

1. For joints not subject to traffic and requiring additional movement capability, provide the following:
   a. Products:
      1) Pecora Corporation: Dynatrol II
      2) Sika Corporation: Sikaflex-2c NS
      3) BASF Corp. Building Systems: Sonneborn Sonolastic NP2
   b. Type and Grade: M (multi-component) and NS (non-sag).
   c. Class: 25.

d. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719
e. Exposure: Use NT (non-traffic)
f. Substrates: M, G, A, and as applicable to joint substrates indicated, O.

2. For joints subject to traffic (ES#4), provide the following:
   a. Products
      1) Pecora Corporation: Dynatred
   b. Type and Grade: M (multi-component) and NS (non-sag)
   c. Class: 25
   d. Exposure: Use T (traffic)
   e. Substrates: Uses M, A, and as applicable to joint substrates indicated, O.

2.3 LATEX JOINT SEALANTS

A. Latex Sealant: ASTM C 834 (LS#5)

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation: AC-20
   b. BASF Corp. Building Systems: Sonneborn Sonolac.
   c. Tremco: Tremflex 834

2.4 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, of size and density to control sealant depth and otherwise contribute to produce optimum sealant performance:

1. Type C (closed-cell material with a surface skin) O (open-cell material).

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Surface cleaning of Joints: Clean out joints immediately before installing joint sealants.

1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form-release agents from concrete.
4. Clean non-porous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues could interfere with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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

E. Install sealant backings to support sealants during application and at position required to produce optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
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 materials.

F. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

G. Place sealants so they directly contact and fully wet joint substrates.

1. Completely fill recesses provided for each joint configuration.
2. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

H. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Joint Configuration: Concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

I. Clean off excess sealant or sealant smears adjacent to joints as installation progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.2 JOINT-SEALANT SCHEDULE

A. Exterior joints in the following vertical surfaces and non-traffic horizontal surfaces.

1. Control and Expansion Joints in Cast-in-Place Concrete: ES#3 sealant.
2. Joints between Architectural Pre-cast Concrete Units: ES#3 sealant.
3. Control and Expansion Joints in Unit Masonry: ES#3 sealant.
4. Joints in Exterior Insulation and Finish Systems: As provided by manufacturer.
5. Joints between Metal Panels:ES#3 sealant
6. Joints between Different Materials Listed above: ES#3 sealant
7. Perimeter Joints between Materials Listed above and Frames of Doors and Windows: ES#3 sealant.
8. Control and Expansion Joints in Ceiling and Overhead Surfaces: ES#3 sealant.

B. Exterior joints in the following horizontal traffic surfaces:

1. Control, Expansion, and Isolation Joints in Cast-in-Place Concrete Slabs: ES#2 sealant.
2. Joints between Different Materials Listed above: ES#2 sealant
3. Other exterior horizontal traffic surfaces as directed by Contract Administration: ES#2 sealant.

C. Interior joints in the following vertical surfaces and horizontal non-traffic surfaces:

1. Control and Expansion Joints on Exposed Interior Surfaces of Exterior Walls: ES#4 sealant.
2. Perimeter Joints of Exterior Openings Where Indicated: ES#4 sealant.
3. Tile Control and Expansion Joints: ES#1 sealant
4. Vertical Control Joints on Exposed Surfaces of interior Unit Masonry and Concrete Walls and Partitions: ES#4 sealant.
5. Perimeter Joints between Interior Wall Surfaces and Frames of Interior Doors, Windows, and Elevator Entrances: LS#5 sealant.
6. Joints between Plumbing Fixtures and Adjoining Walls, Floors, and Counters: LS#5.
7. Other interior surfaces as directed by Contract Administrator.

D. Interior Joints in the following horizontal traffic surfaces:

1. Control and Expansion Joints in Cast-in-Place Concrete Slabs: ES#2 sealant.

END OF SECTION 07920

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