

PROJECT MANUAL

PROJECT/CONTRACT NUMBER: Z-035-803

Bid Number: B-06-18-19 / CP2881

DW Roofing (MP)

at

Mount Pleasant High School

EAST SIDE UNION HIGH SCHOOL DISTRICT

VOLUME 2 of 2

September 26, 2018

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SECTION 02 41 19.13

SELECTIVE BUILDING DEMOLITION (ROOF DEMOLITION)

PART I – GENERAL

1.01 SCOPE OF WORK:

- A. Remove and dispose of existing built up roofing system, insulation and all associated base flashings and perimeter flashings.
- B. Leave the lightweight concrete in place on the main roof section.
- C. Remove existing lightweight concrete that is found to be wet.
- D. Repair lightweight concrete found to be damaged.
- E. Comply with owner recommendations for setup of debris removal boxes, chutes and dumpsters.
- F. Protect adjacent surfaces from damage during removal.
- G. Where specified, remove and dispose of existing rooftop equipment not in use. Check with owner to verify what equipment is to be removed.
- H. All hazardous waste shall be removed in accordance with all Local, State, Federal, and Owner requirements. Hazardous waste removal is not part of this section.

1.02 REGULATIONS

- A. Comply with all requirements as set forth in the 2016 California Building Code including State and Local Amendments (Effective December 12, 2013).
- B. Comply with the 2016 California Building Code as it pertains to construction waste reduction, disposal and recycling.

1.03 GENERAL:

- A. During all phases of work, contractor shall comply with all applicable sections of the Federal Occupational Safety and Health Administration (OSHA) regulations, including the Hazardous Waste Operations and Emergency Response Regulation (Title 8, Section 5192 and 29 CFR 1910.120).
- B. All project staging shall have the approval of the Owner's Representative.

PART 2 – PRODUCTS

NONE

PART 3 – EXECUTION

3.01 EXAMINATION:

- A. Survey existing conditions to determine extent of demolition required.
- B. Arrange operations to reveal concealed structural conditions for examination and verification before removal or demolition.
- C. Verify actual conditions to determine whether removal or demolition will result in structural deficiency, overloading, failure or unplanned collapse.
- D. Items to remain shall be protected against damage during the demolition operations.
- E. Demolish and remove existing construction only to the extent required by the new construction and as indicated.
- F. Perform selective demolition using methods that are least likely to damage work to remain and which provide proper surfaces for patching.
- G. Promptly remove all debris to avoid excessive loads on supporting walls, floors, and framing.
- H. Remove debris from Owner property on a daily basis to a legal disposal site.

3.02 UNIDENTIFIED MATERIALS:

- A. If the contractor in the course of normal inspections identifies any unidentified items, including materials that may contain asbestos or any other potentially hazardous substances that will (or may) require additional demolition and removal other than as required by the this contract, the contractor shall immediately report to the project engineer.
- B. The Owner will arrange for necessary testing and analysis of unidentified materials and will provide instructions to the contractor regarding the removal, handling, storage, transport and disposal of the materials.

3.03 DUST CONTROL:

- A. Accomplish demolition and removal with the minimum accumulation of dust and debris.
- B. Work shall proceed in such a manner as to minimize the spread of dust and flying debris.

3.04 PROTECTION:

- A. Provide for the protection of persons passing around and through the area of demolition.
- B. Provide protective measures to ensure free and safe passage of persons to and from occupied areas.
- C. Execute demolition work in a manner that will ensure the safety of adjacent property and persons occupying such property against any damages or injuries which might

occur from falling debris, unprotected excavations, holes, voids, etc. Airborne residue or other causes; and so as not to interfere with the use of adjacent public and private property of the free and safe passage to and from the same.

- D. Take all necessary precautions to prevent damage to any existing construction scheduled to remain, whether located on the site or on adjacent property.
- E. Protect existing walls, floors and other new or existing work including finishes from damage during the demolition process.
- F. Any item damaged or disturbed which was required to remain in place shall be replaced, repaired, or reset to the satisfaction of the Owner's Representative at no cost to the Owner.
- G. Contractor shall monitor weather predictions and cease work when rain or heavy fog is forecast.

3.05 DISPOSAL:

- A. Disposal facilities shall be in compliance with all federal and state regulations. Applicable regional and local laws, rules and regulations shall be those of the government or quasi-governmental agencies, or other entities having jurisdiction at the disposal facility.
- B. Disposal of any material as non-hazardous waste shall not relieve the contractor from complying with the requirements of the contract documents and the requirements of all federal, state, regional and local laws, rules, and regulations regarding the removal and transport of materials as specified.

3.06 CLEANUP:

- A. Inspect existing surfaces or structures adjacent to demolition and removal operations, including surfaces or structures on adjacent public or private property for damage and stains. Repair or clean existing surfaces or structures not indicated to be removed including surfaces or structures on adjacent public or private property prior to the completion of the work at no additional cost.
- B. Keep the project site clear of all debris resulting from demolition and removals operations and remove all debris from the site on a daily basis during the progress of the work. The cost of removal, hauling, and dumping shall be borne by the contractor.

3.07 UTILITY SERVICES:

- A. Maintain existing utilities, keep in service and protect against damage during demolition operations.
- B. Do not interrupt existing utilities servicing occupied or used facilities, except when authorized in writing by Owner's Representative. Provide temporary services during interruptions to existing utilities as acceptable to owner.

END OF SECTION

SECTION 06 10 50

MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide miscellaneous wood blocking and plywood, including blocking for roofing system and related flashing.
 - 1. Provide plywood panel boards.
 - 2. Preservative treat wood members as indicated.
- B. Related Sections:

1.2 REFERENCES

- A. Forest Products Society (FPS): National Design Specification for Stress Grade Lumber and its Fastening.

1.3 SUBMITTALS

- A. Product Data: Submit wood treatment certifications and instructions for proper use of each type of treated material.

1.4 QUALITY ASSURANCE

- A. Lumber Grades: Provide visible grade stamp of an agency certified by FPS.
- B. Lumber Standard: Comply with US Product Standard PS20 for each indicated use, including moisture content and actual sizes related to indicated nominal sizes.
- C. Plywood Standard: Comply with PS1 (ANSI A199.1).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. System Requirements: Provide miscellaneous wood blocking and plywood, including blocking for roofing system and related flashing.
- B. Regulatory Requirements: Comply with applicable code requirements for miscellaneous rough carpentry.
- C. Blocking: Provide dimensional lumber graded in accordance with FPS Grading Rules; Construction Grade, Douglas Fir; minimum S-Dry.
- D. Plywood: Provide minimum APA C-D exterior (CDX) plywood; stress rated where spanning between supporting members; fire retardant treated; minimum 3/4" thick unless otherwise indicated.

- E. Plywood Panel Boards: Provide panel boards for electrical and communication panel boards; APA C-D plugged, interior type plywood with exterior glue, fire retardant treated; minimum 1/2" thick.
- F. Nails, Spikes and Staples: Galvanized; size and type to suit application.
- G. Bolts, Nuts, Washers, Lags, Pins and Screws: Medium carbon steel; galvanized; size and type to suit application.
- H. Fasteners: Provide fasteners as required for complete, secure installation of miscellaneous rough carpentry.
 - 1. Solid Masonry or Concrete: Expansion shield and lag bolt type.
 - 2. Steel: Bolts or powder activated type.

2.2 FABRICATION

- A. Wood Preservation: Treat lumber and plywood to comply with applicable requirements of American Wood Preservers Association and applicable codes.
 - 1. Decay Resistance Treatment: Pressure treat wood in accordance with AWPA U1 using preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - a. Treat wood members based on AWPA U1 Use Categories as appropriate to Project location and exposure.
 - b. Kiln-dry wood to a maximum moisture content of 19% after treatment with water-borne preservative.
 - 2. Complete fabrication of treated items prior to treatment, wherever possible; if cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment.
 - 3. Inspect each piece after drying and discard damaged and defective pieces.

PART 3 - EXECUTION

3.1 PLACEMENT

- A. Place miscellaneous rough carpentry true to lines and levels.
- B. Correlate location so attached work will comply with design requirements and be properly located.
- C. Construct members of continuous pieces of longest possible lengths.
- D. Fit carpentry work to other work; scribe and cope as required for accurate fit.
- E. Shim with metal or slate for bearing on concrete and masonry.

- F. Securely attach carpentry work to substrates by anchoring and fastening as required by recognized standards.
 - 1. Provide washers under bolt heads and nuts in contact with wood.
- G. Wood Blocking: Provide blocking of S4S lumber not less than 1-1/2" wide and of thickness required to provide adequate support or to properly locate attached material.
 - 1. Provide attachment to other work; form to shapes shown.
 - 2. Countersink bolts and nuts flush with surfaces.
 - 3. Remove temporary blocking when no longer needed.
- H. Plywood: Comply with recommendations of American Plywood Association (APA) for fabrication and installation of plywood work.

END OF SECTION

SECTION 07 28 00

BUILDING ENVELOPE UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide complete building envelope underlayment air and water barrier systems including siding, roofing, flashing and sheet metal, and penetration underlayment with accessories as required for complete watertight installation.
 - 1. Wall Underlayment: Provide vapor permeable self-adhering sheet underlayment and flashing for exterior wall applications, with related concealed metal flashings and accessories as required for complete airtight and watertight installation.
 - 2. Flashings and Sheet Metal Underlayment: Provide self-adhering sheet membrane underlayment at flashings and sheet metal, with accessories as required for complete watertight installation.
 - 3. Self-Adhering Sheet Membrane (SASM) Flashing at Penetrations: Provide SASM flashing for around penetrations through building paper including windows and doors, with accessories as required for complete watertight installation.
- B. Related Sections:
 - 1. Section 07 60 00: Exposed metal flashing.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Meeting: Convene one week prior to commencing work; require attendance of parties directly affecting underlayment.
 - 1. Review procedures and coordination required with related work.

1.3 SUBMITTALS

- A. Product Data: Furnish manufacturer's literature for each type of underlayment.
- B. Samples: Furnish samples of each material.

1.4 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives.

1.5 WARRANTY

- A. Extended Correction Period: Provide for correcting failure of system to resist damage from anticipated sources including damage from water penetration. Repair system and pay for or replace damaged materials and surfaces.
 - 1. Period: Two years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. System Description: Provide complete building envelope underlayment air and water barrier systems including siding, roofing, flashing and sheet metal, and penetration underlayment with accessories.
- B. Regulatory Requirements: Provide materials conforming to applicable air quality management district limitations on volatile organic compound (VOC) emissions.
- C. Wall Underlay: Provide vapor permeable water barrier type self-adhering sheet underlayment system for complete watertight installation as recommended by manufacturer for substrates and applications indicated.
 - 1. Manufacturers:
 - a. Grace Construction Products/Perm-A-Barrier VPS Self-Adhering Sheet.
 - b. Henry Company/Blueskin SA and SA HT Air and Weather Barrier.
 - c. Carlisle Corp./CCW 705 MSDS.
 - d. Substitutions: Or equal in accordance with Section 01 62 00.
 - 2. Provide specific membrane types as recommended by system manufacturers for each type of application.
- D. Sheet Metal and Flashing Underlayment: Self-adhering rubberized sheet membrane with primers and seam sealers as required for complete watertight installation; type as recommended by manufacturer for substrate and for applications indicated.
 - 1. Manufacturers:
 - a. Grace Construction Products.
 - b. Henry Company.
 - c. Carlisle Corp.
 - d. Protecto Wrap Company.
 - e. Substitutions: Or equal in accordance with Section 01 62 00.
 - 2. Provide specific membrane types as recommended by system manufacturers for each type of application.

- E. Self-Adhering Sheet Membrane (SASM) Flashing at Penetrations: SASM with primers and seam sealers as required for complete watertight installation; type as recommended by manufacturer for substrate and for applications indicated.
 - 1. Manufacturers:
 - a. Grace Construction Products.
 - b. Henry Company.
 - c. Carlisle Corp.
 - d. Protecto Wrap Company.
 - e. Substitutions: Or equal in accordance with Section 01 62 00.
 - 2. Provide specific membrane types as recommended by system manufacturers for each type of application.
- F. Concealed Metal Flashings Integral with Underlayment: Minimum 26 gage thick steel with minimum 0.90 oz/sq.ft. galvanized coating; ASTM A653.
 - 1. Fasteners: Standard round wire type of hot dipped galvanized steel; minimum 19/64" head diameter and 0.104" shank diameter; minimum 7/8" long.
- G. Bituminous Paint: Acid and alkali resistant type; black color.
- H. Accessories: Provide as recommended by underlayment manufacturers for specific applications.

2.2 FLASHING FABRICATION

- A. Fabricate metal flashings as recommended by Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Sheet Metal Manual".
- B. Form flashings to drain water to exterior at roofing and siding construction for penetrations, sill and header flashings.
- C. Form sections square, true and accurate to size, in maximum possible lengths and free from distortion and other defects detrimental to appearance or performance.
- D. Hem exposed edges of metal flashings minimum 1/4" on underside.
- E. Apply bituminous paint on concealed surfaces of metal flashings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Install underlayment over surfaces that are dry, free of ridges, warps and voids that could damage paper.
- B. Coordinate installation with installation of components and items projecting through underlayment.

3.2 FLASHINGS INSTALLATION

- A. Install flashings as recommended by Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Sheet Metal Manual".
- B. Weatherlap joints minimum 2" and seal with plastic cement; secure in place.
- C. Fastenings: Concealed in completed installation.

3.3 UNDERLAYMENT INSTALLATION

- A. Install underlayment in accordance with recommendations of underlayment manufacturer and of manufacturers of products to cover underlayment; comply with applicable code requirements.
 - 1. Walls: Provide one layer sheet membrane underlayment.
 - 2. Flashing and Sheet Metal: Provide one layer sheet membrane underlayment.
 - 3. Penetrations: Apply layer of self-adhering sheet membrane extending minimum 18" from penetrations, including windows and doors; start at bottom of penetration and weatherlap joints.
 - a. Apply top layer over metal flashing to direct water to exterior.
 - 4. Weatherlap joints as recommended by system manufacturer.
 - 5. Secure underlayment in place, stagger joints between layers; lap ends minimum 6"; stagger end joints.
- B. Prime substrates and roll sheet membrane underlayment smooth, firmly and completely to surfaces indicated, with no fishmouths or bunches of material.
- C. Weatherlap items projecting through underlayment and seal with sealer recommended by sheet membrane underlayment manufacturer at sheet membrane underlayment.

END OF SECTION

SECTION 07 54 00

THERMOPLASTIC MEMBRANE ROOFING

PART 1 – GENERAL

1.01 SCOPE OF WORK UNDER THIS SECTION:

- A. Provide deck leveling as specified in this section.
- B. Provide odor control measures at all air intakes as specified.
- C. Increase the width and slope of existing drainage crickets as specified.
- D. Install crickets on the high sides of all curbs and along the drainage edge between primary drains as specified.
- E. Mechanically attach or adhere specified insulation and coverboard to the deck as specified.
- F. Mechanically attach or adhere specified tapered insulation and coverboard to the deck as specified.
- G. Mechanically attach or adhere specified thermoplastic membrane as specified.
- H. Adhere specified thermoplastic membrane up and over the adjacent parapet walls – refer to the detail drawings.
- I. Install walk pads from roof access points to all serviceable equipment as specified or shown on the plan drawings.
- J. Any equipment that will not have curb heights of 8” above the final roof surface shall be extended or raised. If the proposed roofing system manufacturer will accept curb heights less than 8”, contractor shall submit request in writing (from manufacturer) to owner and engineer to withdraw this requirement. If a particular piece of equipment is impossible or not financially feasible to lift, raise or extend, contractor shall notify the engineer prior to the bid date for direction.
- K. Perimeter and projection flashings:
 - 1. Provide all flashing and penetration details in accordance with the detail drawings and manufacturer guidelines as specified in this.
 - 2. Drawings included with these specifications are not meant to accurately depict substrate conditions. They are meant to provide NRCA guidelines for basic flashing installation according to the system specified.
 - 3. If a manufacturer standard and required detail differs from that shown on the project detail drawings included in these specifications, contractor shall submit manufacturer approved drawing to the Owner and Engineer for approval. If the manufacturer requirements for a flashing detail is less stringent than those shown in the project drawings, the more stringent flashing detail shall govern with the approval of the manufacturer providing the warranty for this project.
- L. Provide owner with a five (5) year contractor guarantee as specified.
- M. Provide owner with a twenty (20) year no-dollar-limit manufacturer warranty covering labor, materials, and metal flashings as specified.

1.02 QUALITY ASSURANCE

- A. Contractor shall:
 - 1. Be experienced in single ply roofing.
 - 2. Be certified or approved for the installation of proposed manufacturer's warranted roofing systems.

1.03 SYSTEM REQUIREMENTS

- A. Roofing system shall comply with the 2016 California Building Code.
- B. All materials shall comply with section 5.504 of the 2013 California Building Code. This requirement shall apply regardless of the products listed in these specifications. It is the responsibility of the contractor and manufacturer to comply with this requirement.
- C. FIRE RATING - UL Class A: Proposed roofing system must have approvals from Underwriters Laboratories that indicate that the existing fire ratings attain a UL Class A assembly.
- D. WIND UPLIFT: Any of the following.
 - 1. Factory Mutual: FM 4450, FM 4470 design standard for wind uplift is acceptable for this project.
 - 2. Underwriter's Laboratory: UL 580 or UL 1897.
 - 3. ASCE 7 Wind Design loads.
- E. Perimeter flashings shall meet ANSI/SPRI ES-1 – American National Standard Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- F. The new roof system shall comply with all mandatory requirements under The California Green Building Standards as listed under Title 24 Part 11.

1.04 TECHNICAL SUBMITTALS

- A. Submittal requirements: Contractor shall highlight anything in the submittal package that conflicts with or changes specifications or drawings. Include a reason for the change. Any submittals that alter existing specifications or drawings shall be approved by the engineer and owner prior to implementation.
- B. The following submittals are to be made in conjunction with any other submittal requirements set forth in the bid documents.
- C. The contractor shall submit the following upon request of the owner or engineer:
 - 1. Manufacturer specification data sheets. Submit for the following products:
 - a. Roof assembly.

- b. Single ply membrane.
 - c. Adhesives.
 - d. Walk pads (must be approved by owner).
 - e. Any other product used on this project.
2. Manufacturer literature describing the installation procedure of the specified system.
 3. Letter from manufacturer approving these specifications and drawings. Any changes in plans or specs to meet manufacturer requirements shall be submitted and highlighted. If manufacturer requirements conflict with these specifications or drawings, more stringent requirements will apply.
 4. Shop drawings of any details that may be different than the NRCA standard details included in these specifications. This includes manufacturer detail drawings that may be different than NRCA drawings. All flashing detail designs shall be approved by the Owner.
 5. Material safety data sheets.
 6. Test reports:
 - a. Perimeter flashings shall meet ANSI/SPRI ES-1 – American National Standard Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems. Provide documentation from the manufacturer along with detail drawings for this requirement.
 - b. Written verification from roofing material supplier that roofing system meets or exceeds regulatory agency/s requirements. A photocopy of the UL Class "A" listing for the specified system with the proposed manufacturer as listed in the most recent UL Building Materials Directory. The Components of the system listed as UL Class "A" must match the system specified for each respective building.
 - c. Perimeter wind uplift: ASCE 7 (latest version Wind Design loads as calculated by the manufacturer for this specific project. Submit calculations for wind ratings using ASCE 7 for the specific building AND a letter or documentation from the manufacturer that roof attachment meets or exceeds these requirements.
 - d. Wind uplift rating. Submit any of the following:
 - Factory Mutual I-60. FM listing is not required, but an FM design standard for wind uplift is acceptable for this project. Submit calculations for wind ratings for FM 1-60 for the specific building AND a letter or documentation from the manufacturer that roof attachment meets or exceeds these requirements.
 - UL Class 60 wind uplift rating. Submit a letter or documentation from the manufacturer that roof attachment meets or exceeds this requirements.

1.05 SUBMITTALS OF RFI's (Requests for Information)

- A. Refer to Section 3.07 of this specification for explanations of the procedures

surrounding flashing design changes.

- B. RFI's for design clarifications shall be submitted prior to bid opening. If an RFI for the design of a flashing is submitted after the bid opening, contractor may be liable for compensating the owner and engineer for time spent responding.
- C. RFI's can only be made after the bid opening if as a result of removing the existing roofing/flashing an unforeseen condition arises that affects the flashing design or the manufacturer required design.
- D. It is the responsibility of the contractor to carefully review specifications and drawings prior to bidding. If conflicts are found between drawings and specifications (and between manufacturer requirements), submit an RFI prior to bidding. After the bid opening, it will be assumed that the contractor has reviewed the drawings and specifications and has bid the more stringent requirement. At this point, no change orders will be given for such discrepancies.

1.06 WARRANTY & GUARANTEE

- A. Warranty: The Roofing Manufacturer shall provide a full system no dollar limit (NDL) warranty covering the roofing system against labor and/or material deficiencies for a minimum period of twenty (20) years from the date of acceptance by the owner. This shall be a continuous warranty without the need for renewing. Manufacturer may require inspections throughout the warranty period, but any costs associated must be included in this initial contract.
- B. Contractor Warranty: Upon project completion and owner acceptance, effective upon complete payment, Contractor shall issue owner a warranty against defective workmanship and materials for a period of five (5) years. This warranty shall cover all aspects of the project as specified. It shall not be limited to leaks, but include any and all defects that may become apparent during the warranty period.

PART 2 – MATERIALS

2.01 GENERAL:

- A. All materials used on this project shall be new products.
- B. Any materials that are seconds, out of date, or used, shall be removed from the job site.
- C. Single ply membrane shall be white with a Cool Roof and Energy Star rating.
- D. FIRE RATING: UL Class A: Proposed roofing system must have approvals from Underwriters Laboratories that indicate that the existing fire ratings attain a UL Class A assembly.
- E. WIND UPLIFT: The system shall attain a Factory Mutual I-60 or UL Class 60 wind

uplift rating. FM listing is not required, but an FM design standard is adequate for this project.

2.02 RELATED MATERIALS:

- A. TAPERED INSULATION for cricket enhancement: Isocyanurate as approved by membrane manufacturer.
- B. FLAT STOCK INSULATION: Isocyanurate 2" thickness (three layers to obtain 6" total thickness) as approved by membrane manufacturer.
- C. COVERBOARD:
 - 1. USG Securerock,
 - 2. Densdeck Prime 1/4"
 - 3. or approved equal.
 - 4. Note: Wood fiber or perlite coverboard is not acceptable for this project even if it is approved by the manufacturer.
- D. COATED METAL FLASHINGS: All coated metal flashing shall be supplied by the manufacturer and covered under the warranty.
- E. ADHESIVES: Shall be approved by the membrane manufacturer. Adhesives shall be voc compliant.
- F. WALK PADS: Shall be furnished by the membrane manufacturer. Walk treads shall be of the highest quality provided by the manufacturer. Samples of the walk treads shall be provided to the owner for approval.
- G. FASTENERS AND STRESS PLATES: Shall be a non-corrosive type approved by the membrane manufacturer.
- H. CAULK: Shall be a high-grade silicone or urethane as recommended by a membrane manufacturer.
- I. POND PATCH: Shall be approved by the manufacturer providing the membrane for this project.

2.03 PRE-APPROVED ROOFING SYSTEMS/MANUFACTURERS:

Note: When systems are fully adhered, use fleece backed membrane only.

A. PVC Thermoplastic Membrane 80 mils thickness

- 1. Sarnafil G410
- 2. Manville Specification SPPU
- 3. Carlisle Sure-Flex
- 4. IB
- 5. Durolast

6. GAF

B. TPO Thermoplastic Membrane 80 mils thickness

1. Firestone UltraPly
2. Johns Manville
3. Carlisle SureWeld
4. GAF Everguard

PART 3 – EXECUTION

3.01 GENERAL

- A. It is the responsibility of the contractor to ensure that all requirements for the specified 20 year NDL warranty are accomplished and included in the bid for this project. No change orders will be approved for non-specified details, techniques, materials or procedures in order to obtain this warranty. If major problems or challenges are noted with regards to these requirements, the contractor shall notify the owner prior to the bid opening.
- B. When using adhesives for membrane or flashings, contractor shall follow manufacturer's guidelines for installation during particular weather conditions. High humidity and/or low temperatures can adversely affect adhesives, especially low VOC and water based adhesives. Contractor shall take care on a daily basis to ensure that the use of these adhesives is restricted to weather conditions that are acceptable to the manufacturer.
- C. Difficult areas of roofing:
 - 1. It is not the intention of this specification to provide means or methods of roof installation. However, means and methods of roof installation must adhere to industry and manufacturer standards and shall have the approval of the owner and engineer.
 - 2. Unusual, unorthodox, or dangerous methods of roof removal or installation shall be reported to and approved by the owner prior to execution.
 - 3. If rooftop equipment or any other building component needs to be modified or moved in order to properly install the roofing system, it will be the responsibility of the contractor to perform the work under the base bid for this project without change order request. Contractor shall obtain permission from the owner prior to bid opening for any equipment or building component modification. Any damage that is incurred to the equipment or building component as a result of movement or modification shall be repaired or replaced by the contractor at no cost to the owner.
- D. Perimeter and projection flashings: Please refer to section 3.06 of these specifications for specific instructions regarding flashings.

3.02 SURFACE PREPARATION:

- A. Remove designated roof membrane and flashings down to the deck of the canopies and down to the lightweight concrete of the main roof as specified in section 02 41 19.13.
- B. Repair damaged lightweight concrete and/or replace wet lightweight concrete as needed with the approval of the owner and roof consultant.
- C. Concrete deck deflection:
 - 1. Check decking for deflection using a string-line.

2. Modify decking in order to eliminate deflected areas that may cause ponding. Decking can be leveled using a manufacturer approved filler such as Pond Patch or by using insulation board.
 3. If decking is significantly deflected, notify owner and engineer immediately because this could be an indication of roof deck damage.
- D. Ensure that the substrate is dry and free of dirt, debris, and other foreign matter prior to the installation of new materials.

3.03 ODOR CONTROL

- A. Contractor shall take the following steps to ensure that odor does not penetrate into work space during installation of roofing system:
1. Provide charcoal filters over air intakes.
 2. Provide duct extensions or diverters when working near air intakes. Intake diverters may be flex hosing or plywood structures.
 3. Work with the building occupants to coordinate work around air intake units. In some cases it may be possible to re-circulate or shut air intake system down.
- B. The contractor is ultimately responsible for odor control as part of the contract. The owner and roof consultant shall determine if contractor has provided adequate odor control measures.

3.04 INSTALLATION OF NAILERS:

- A. Install nailers as required by the manufacturer.

3.05 INSTALLATION OF CRICKETS, INSULATION AND COVERBOARD:

- A. Crickets: Increase the width of all drainage crickets to meet the following specifications. Half diamond crickets (at walls and behind curbs) shall have a width that equals $1/6^{\text{th}}$ of the length. Full diamond crickets shall have a width of $1/3^{\text{rd}}$ of the length.
- B. Install drainage crickets at the high side of all curbs.
- C. Install drainage crickets along the perimeter between primary drains.
- D. Mechanically attach or adhere the specified insulation and coverboard filling all voids greater than $1/4''$ and staggering all joints. If using fasteners, fasten only into upper flutes. (For applications on metal decks). Fastener length should not penetrate down below the lower flutes because conduits are mounted on the underside of the deck.
- E. Sump the insulation at drains 36 inches square from the edge of the drain to provide a positive slope. Drain sump shall have tapered insulation to provide a uniform slope down to the drain.
- F. Stagger all joints between layers.

- G. Cut insulation to fit snugly around all penetrations. Fill any voids greater than ¼” with like material.
- H. SPECIAL NOTE: At this time the contractor shall put a string line on the completed insulation in order to determine if there are any low areas that will cause ponding water. Variations greater than ½” shall be treated with filler material (pond patch) or additional insulation. Be careful to check drainage valleys at all crickets. These are areas most susceptible to ponding water.

3.06 INSTALLATION OF MEMBRANE:

- C. Install perimeter sheets using approved adhesive in accordance with manufacturer's requirements.
- D. Follow manufacturer recommendations for the installation of perimeter or membrane venting.
- E. Inspect the membrane for factory defects or shipping damage. Defective and/or damaged membrane will be rejected. (Note: No more than ten (10) patches per sheet.)
- F. Position field sheets so that side laps are single lapped with the slope and in accordance with the manufacturer's recommendation.
- G. Fully adhered membrane: Adhere the membrane using approved adhesive in accordance with the manufacturer's requirements to satisfy specified wind uplift requirements.
- H. Mechanically attached membrane: Mechanically attach membrane using approved fasteners in order to obtain specified wind ratings.
- I. Prevent wrinkling of membrane as much as possible. (If excessive wrinkling occurs, the Consultant may require the contractor to tack-weld the lap seams and then complete the entire weld.)
- J. Set the seam welder to the manufacturer's required setting. Make a test run and check the seam for proper welds. (All test runs shall be performed on a daily basis.
- K. Probe seams daily and repair loose edges, fish-mouths, and other defects the same day.
- L. Insure that qualified personnel perform all welding.
- M. The seam welder shall be powered by a dedicated power supply so as to ensure proper, adequate, and uniform voltage for sufficient seaming procedures. Also, the welder shall be equipped with voltage regulator cut-off features such as infrared sensors and other similar devices to insure consistent voltage, thereby reducing the possibility of cold or inadequate welds. The extension cord to welding units from power supply shall not exceed one (1) cord of 100 feet in length.

3.07 FLASHINGS

- A. General flashing requirements:
 - 1. Elastomeric Flashing:
 - a. Adhere elastomeric sheeting completely to flashing surface, cant, and roofing

- with Flashing Adhesive. Embed flashing into adhesive immediately.
- b. Ensure complete bond and continuity without wrinkles or voids.
 - c. Any equipment that will not have curb heights of 8" above the final roof surface shall be extended or raised. If the proposed roofing system manufacturer will accept curb heights less than 8", contractor shall submit request in writing (from manufacturer) to owner and engineer to withdraw this requirement. If a particular piece of equipment is impossible or not financially feasible to lift, raise or extend, contractor shall notify the engineer prior to the bid date for direction.
- B. Install flashings in accordance with detail drawings and manufacturer guidelines. Details depicted in the drawings shall also conform with manufacturer guidelines. Where conflict exists, the more stringent detail shall govern. If conflict exists between depicted drawings and manufacturer guidelines, the following process shall apply:
1. Manufacturer shall inspect the detail and provide a recommended flashing design to the contractor and engineer.
 2. Contractor shall install the flashing only after it has been approved by the engineer and Owner.
 3. There shall be no additional charges for this proposed detail. It is the responsibility of the contractor to ensure that all manufacturer guidelines are accounted for in the base bid for this project.
- C. ANY DETAIL NOT COVERED IN THESE SPECIFICATIONS SHALL BE INSTALLED IN ACCORDANCE WITH GOOD ROOFING PRACTICE, N.R.C.A. RECOMMENDATIONS AND HAVE THE APPROVAL OF THE MANUFACTURER PROVIDING THE WARRANTY FOR THE ROOFING SYSTEM. If a detail is not covered in these specifications the following process will take place prior to bid opening:
1. Contact manufacturer responsible for flashing guarantee. Manufacturer shall inspect the detail and provide a recommended flashing design to the contractor. OR contractor may bid using the approved manufacturer detail.
 2. Contractor shall bid using the manufacturer-approved detail.
 3. Contractor shall submit detail drawing to Owner as part of the submittals.
 4. No change order will be given to the contractor for flashing details that were visible prior to construction. It is the responsibility of the contractor to cover in his bid all approved and specified details.
- D. Hidden Conditions warranting a change in scope of work or change order:
1. A hidden condition is defined as a condition that is revealed when the existing roof or flashing is removed AND that condition requires additional work above and beyond the work specified. For example, damaged substrate that must be replaced.
 2. If after removal of the roof or flashing, the substrate differs from that shown on the drawings, it shall not be considered a hidden condition unless it requires a change in scope of work.
 3. If nailers are required by the manufacturer, contractor shall install nailers if not

present. If nailers are present, contractor may re-use if nailers are approved by the manufacturer.

3.08 SPECIAL INSTRUCTIONS:

- A. Obsolete Penetrations - Verify with owner all obsolete penetrations and remove from the roof.
- B. Delicate mechanical equipment – All mechanical equipment that is damaged or too delicate to move shall be identified at the pre-bid meeting or prior to bid.
- C. Sleepers - All sleepers should run perpendicular with the flow of water. If this is not possible, the sleepers should be boxed in and a diverter placed on the upside to prevent water from ponding. For extremely large sleepers that cannot be boxed in, contractor shall install tapered insulation between the sleepers in order to evacuate water from underneath the unit.
- D. Existing Horizontal Conduits that do not need to be mechanically attached to the roof surface and are less than 1.5" diameter – Install Copper B Line supports or approved equal. Adhere supports to the roof surface using approved sealant or adhesive in order to prevent movement of the lines. Refer to drawing entitled "Copper B Line Support."
- E. Existing Horizontal Pipes that do not need to be mechanically attached to the roof surface for seismic support – Install pipe hanger system in accordance with manufacturer requirements. Carefully support existing lines in order to prevent breakage during installation.
- F. Condensate lines – Install Copper B Line supports or approved equal. Adhere supports to the roof surface using approved sealant or adhesive in order to prevent movement of the lines. All condensate lines shall be set in a manner to facilitate drainage. Contractor shall replace or repair damaged or missing condensate lines or lines damaged during roof installation. Contractor shall run condensate lines to nearest drain outlets. Refer to drawing entitled "Copper B Line Support."
- G. Gas lines and electrical lines that need to be attached to the roof surface: Install blocking and attach to the roof deck. Install membrane flashing over blocking. Install another blocking on top of the covered blocking. Install sheet metal pan covering. Attach line to curb with U bracket. U bracket shall be attached to the metal pan and underlying blocking. Do not penetrate the membrane covered blocking. Refer to detail drawing entitled "protected wood sleeper" attached to these specifications.
- H. Equipment Legs and Supports - All supports for equipment and like items shall be set on wood blocks with membrane protection pads underneath or rubber pads.
- I. Existing Galvanized Jacks: All sheet metal roof jacks that house conduits will be removed will incorporate manufacturer approved boot sleeves.
- J. Remove Josam type drains and install manufacturer approved drain inserts in accordance with section 22 14 29.13 Roof Drainage.
- K. MECHANICAL EQUIPMENT NOT MEETING 8" HEIGHT REQUIREMENT FOR BASE FLASHING: It is not the intention of this contract to perform major mechanical alteration in order to provide 8" heights on flashings. If a mechanical unit exists that does not meet a flashing height requirement, the contractor may install flashings in a manner that does not require major alteration. It is still the

responsibility of the contractor to perform the flashing in a watertight manner, and the flashing will be included in the contractor guarantee. If the manufacturer requires a particular flashing height, it is acceptable for the manufacturer to exempt the mechanical unit from the warranty with approval of the owner and engineer. If a manufacturer is not willing to exempt a specific flashing, then it is the responsibility of the contractor to either comply with the manufacturer requirement, or use another manufacturer.

3.09 WALK PADS:

- A. Clean roof surface of all dirt and debris where walk pads are to be placed.
- B. Install walk pads as approved and warranted by the membrane manufacturer.
- C. Walk pads shall be heat-welded to the membrane by a method approved by the manufacturer. If approved, the preferred method of walk pad attachment is by tack-welding corners.
- D. Locations of walk pads: Completely around all serviceable equipment. From serviceable equipment to roof access point. If there is no designated roof access point, install walk pads between units only. Also follow designated layouts on roof plan drawings if provided.
- E. Cut slots or spaces in walk pads that may impede drainage. Avoid welding walkpads over membrane seams if possible.
- F. Contractor shall be responsible to estimate linear footage of required walk pads in accordance with the above specification.

3.10 POWER SOURCE:

- A. The Contractor shall be responsible for supplying his own power source.
- B. The power shall be of sufficient voltage to insure that welds are made properly.

3.11 AESTHETICS:

- A. Contractor shall coordinate aesthetics with Owner.
- B. Contractor shall take precaution against overspray as directed by Owner.
- C. Contractor shall paint areas marked by spillage as directed by the Owner.
- D. Paint all sheet metal in accordance with Section 099113.
- E. Any dirt, stains from any materials, or other foreign matter shall be removed from the newly installed membrane to restore the surface to a clean, spot-free, and as-new condition, using methods as recommended by the manufacturer.

3.12 FINAL TESTING, INSPECTION & PUNCHLIST:

- A. Contractor shall notify the owner when roof is ready for final inspection.
- B. Owner shall coordinate final inspection and provide contractor with punch list.

- C. Contractor shall perform punchlist items within seven (7) working days of having received the final inspection punchlist.
- D. Owner shall coordinate an inspection verifying that all punchlist items have been complete. If punchlist items remain, contractor may be subject to compensating the owner for additional final punchlist verification inspections.
- E. Drain testing.
 - 1. Contractor shall flood test each drain to ensure that drain inserts are properly installed.
 - 2. Install balloon plug within the drain plumbing at a location lower than the drain insert.
 - 3. Fill the drain and drain sump with water. Allow to stand for 24 hours. Check for leakage by observing inside of the building. The owner may use a capacitance scanner to ensure that water has not penetrated under the membrane.
- F. Final inspection of drainage:
 - 1. Contractor shall flood test the roof in order to verify successful drainage. Flood testing shall occur with owner observation.
 - 2. After 48 hours, the roof will be inspected by the owner. Water remaining on the roof shall be categorized as ponding water in accordance with California Building Code. At this time, the contractor shall be responsible for correcting ponding on the roof through the installation of pond patch filler and new membrane. The procedure shall be approved by the manufacturer. Even though the manufacturer approves standing (ponding) water, this does not alleviate the contractor from the responsibility of correcting ponding water on this project.

END OF SECTION

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide galvanized steel flashing and sheet metal including accessories as required for complete weathertight installation.
 - 1. Flashing and sheet metal includes gutters, downspouts, rainwater leaders, reglets, and similar fabricated components.
 - 2. Provide concealed sealants used in conjunction with installation of metal flashing and sheet metal.
 - 3. Provide miscellaneous sheet metal flashing and reglets not provided by other trades or suppliers.
 - a. Where reglets are to be installed in conjunction with other work, provide in adequate time for installation.
 - b. Where reglets are to be surface applied, provide continuous gasket between reglet and surface.
- B. Related Sections:
 - 1. Section 06 10 50: Miscellaneous rough carpentry.
 - 2. Section 07 28 00: Concealed metal flashing integral with underlayment.

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual.

1.3 SUBMITTALS

- A. Product Data: Furnish literature for manufactured products.
- B. Shop Drawings: Clearly indicate dimensioning, layout, general construction details including closures, flashings, locations and types of sealants, anchorages, and method of anchorage.
- C. Samples: Furnish samples of typical metal flashing fabrication indicating standard soldered joints and edge conditions.

1.4 WARRANTY

- A. Extended Correction Period: Provide for correcting failure of system to resist damage from anticipated sources including damage from wind and water penetration. Repair system and pay for or replace damaged materials and surfaces.
 - 1. Period: Two years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. System Description: Provide galvanized steel flashing and sheet metal including reglets and accessories as required for complete weathertight installation.
- B. Design Criteria: Allow for movement of components without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to 100 year seasonal temperature ranges.
- C. Flashing and Sheet Metal: ASTM A924 and A653 G90 galvanized steel; minimum 24 gage.
 - 1. Accessories: Provide strainers, outlet tubes, screens, baffles, hangers and gutter ends as required for a complete system and complying with SMACNA Manual.
 - 2. Provide heavier gage metal where recommended by SMACNA Manual for size of component.
 - 3. Mill phosphatized where indicated to be field painted.
- D. Steel Tube Downspouts: Cold formed ASTM A500; or hot rolled, ASTM A501; minimum Grade B; seamless; hot dipped galvanized minimum G90 after fabrication.**
- E. Manufactured Reglets: Snap-on type, for two piece flashing; metal to match flashing and sheet metal.
 - 1. Manufacturers:
 - a. Fry Reglet Corp./Springlok System.
 - b. W.P. Hickman Co./The Leading Edge Drive Lock System.
 - c. Substitutions: Or equal in accordance with Section 01 62 00.
- F. Solder and Fasteners: As recommended by SMACNA and complying with applicable codes and regulations; hot dipped galvanized minimum coating comparable to G90.
- G. Concealed Sealant: Butyl type for use in conjunction with sheet metal; non-staining; non-corrosive; non-shrinking and non-sagging; ultra-violet and ozone resistant for exterior concealed applications.
- H. Bituminous Paint: Acid and alkali resistant type; black color; asbestos free.

- I. Plastic Cement: Cutback asphaltic type; asbestos free.
- J. Sealing Compound: Type recommended by roofing manufacturer; asbestos free.
- K. Gaskets: Type suitable for use in conjunction with sheet metal; non-staining, non-corrosive, non-shrinking, non-sagging, ultra-violet resistant, and ozone resistant; for exterior concealed applications.
 - 1. Manufacturers:
 - a. Emseal USA, Inc./Emseal MST Multi-Use Sealant Tape.
 - b. Substitutions: Or equal in accordance with Section 01 62 00.

2.2 FABRICATION

- A. Fabricate sheet metal in accordance with SMACNA Architectural Sheet Metal Manual.
- B. Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
 - 1. Fabricate corners and intersections in shop with solder joints; watertight fabrication.
- C. Form sections in maximum 10'-0" lengths; make allowance for expansion at joints.
- D. Hem exposed edges on underside 1/2".
- E. Backpaint flashings with heavy bodied bituminous paint where in contact with cementitious materials or dissimilar metals.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install metal flashing and sheet metal in accordance with SMACNA Architectural Sheet Metal Manual.
 - 1. Install tight in place, with corners square, surfaces true and straight in planes, and lines accurate to profiles as indicated on Drawings.
 - 2. Lap joints in direction of water flow.
 - 3. Hold downspouts in position, clear of wall, by hangers spaced not more than 10'-0" on center; securely fasten hangers to wall without exposed damage to wall surface.
- B. Exercise care when cutting materials on site, to ensure cuttings do not remain on finished surfaces.
- C. Provide expansion joints concealed within system.

- D. Use concealed fasteners, continuous cleat type, except where specifically approved by Architect.
 - 1. Exposed fasteners may be used, where clearly indicated on shop drawings and approved by Architect, at areas not exposed at exterior walls nor in sight of interior spaces.
- E. Apply sealing compound at junction of metal flashing and felt flashing.
- F. Lock seams and end joints; fit flashing tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- G. Counter-flash mechanical and electrical items projecting through roof membrane.
- H. Install sealants where required to prevent direct weather penetration.
 - 1. Install continuous gasket behind surface applied reglets.
- I. Completed installation shall be free of rattles, noise due to thermal and air movement, and wind whistles.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide firestopping as required to maintain effective barrier against spread of flame, smoke and gases, and to retain integrity of time-rated construction as indicated and at following types of locations.
 - 1. Provide at fire rated system perimeters, and at duct, conduit, piping penetrations through time-rated construction, and as required by applicable codes.
 - 2. Coordinate requirements for firestopping with work involving penetrations through fire rated assemblies.
 - 3. Review Project and Contract Documents to ascertain extent of penetrations in fire rated assemblies and methods included in other sections for maintaining fire ratings.
- B. Related Sections:
 - 1. Section 07 90 00: Non-fire rated joint sealants.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate firestopping with fire rated assemblies and penetrations through fire rated assemblies to ensure compliance with applicable codes and regulations to maintain integrity of fire rated assemblies.
 - 1. Firestopping may be integral with some systems and may be specified as part of other systems including mechanical and electrical systems.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's literature including data for materials and prefabricated devices, including descriptions sufficient to identify materials and devices on job.
 - 1. Submit Underwriter's Laboratory approval numbers for required fire ratings; approval of other laboratories contingent upon acceptance of applicable authorities.
 - 2. Deferred Approvals: Submit data necessary for applicable authorities for each type of firestopping required including firestopping at fire rated assembly junctures, and penetrations through fire rated assemblies.
- B. Shop Drawings: Submit manufacturer's installation details.

- C. Certificates of Compliance: Submit manufactures' certificates, accompanied by classifications, indicating material or combination of materials used meets requirements specified for flame spread and fire resistance.
 - 1. Certificates to be supported by test reports by nationally recognized testing authority or otherwise satisfactory to authorities.
- D. Manufacturer's Instructions: Maintain copy of manufacturer's installation instructions and recommendations at each work area.

1.4 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements relative to finish material pollution control for sealants.

1.5 DELIVERY, STORAGE, AND HANDING

- A. Deliver materials in their original unopened packages and store in location providing protection from damage and exposure to elements.
- B. Damaged or deteriorated materials shall be removed from site.

PART 2 - PRODUCTS

2.1 SYSTEMS MANUFACTURERS

- A. 3M Fire Protection Products Div./3M Fire Barrier Products.
- B. Specified Technologies, Inc. (STI)/SpecSeal and Pensil Firestopping.
- C. Hilti, Corp./Hilti Firestop Systems.
- D. Substitutions: Or equal in accordance with Section 01 62 00.

2.2 MATERIALS

- A. System Description: Provide firestopping as required to maintain effective barrier against spread of flame, smoke and gases, and to retain integrity of time-rated construction.
 - 1. Choose products and methods meeting applicable codes and Specification requirements for each firestopping application, subject to Architect's acceptance.
- B. Regulatory Requirements: Comply with California Building Code, Chapter 7 requirements for firestopping, including both F Ratings and T Ratings as applicable.
- C. Design Requirements: Provide materials tested in accordance with following standards, unless otherwise specified.
 - 1. American Society for Testing and Materials (ASTM) Publications:
 - a. ASTM E84, Surface Burning Characteristics of Building Materials.
 - b. ASTM E119, Fire Tests of Building Construction and Materials.
 - c. ASTM E814, Fire Tests of Through-Penetration Fire Stops.
 - d. ASTM E1966, Test Method for Fire-Resistive Joint Systems.

- D. Firestopping Materials: Furnish materials for penetrations in time-rated floor, wall, and partition assemblies capable of preventing passage of flame, smoke, and hot gases.
 - 1. Penetration Test: Furnish materials passing ASTM E814 or E1966 for penetration fire stopping indicating maintenance of time-rated adjacent assemblies.
 - a. Additional Tests: Where required by applicable authorities, provide materials passing ASTM E119 time-temperature fire conditions for fire ratings indicated for assemblies.
 - 2. Flame Spread: ASTM E84 flame spread rating of 25 or less.
 - 3. Smoke Density: ASTM E84 smoke density rating of 450 or less.
- E. Firestopping: Maintain fire rating of assembly in which firestopping is installed, such as floor, partition, or wall, in accordance with ASTM E119 tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and conditions receiving or affecting the work. Do not proceed until unsuitable conditions are corrected.

3.2 INSTALLATION

- A. Install firestopping in accordance with manufacturer's recommendations and installation instructions.
- B. Completely fill void space with firestopping materials regardless of geometric configuration, subject to tolerances established by firestopping manufacturer.
- C. Apply firestopping materials at penetrations of pipes, conduits, and ducts prior to application of insulation.
 - 1. Remove insulation already in place at penetration prior to application of firestopping materials unless insulation meets requirements for fire ratings indicated.

3.3 FIELD QUALITY CONTROL

- A. Inspection: Keep area of work available for inspection by Architect and applicable authorities before and after application of firestopping.

3.4 REPAIR AND CLEAN-UP

- A. Repair damage caused by work of this section; clean exposed surfaces soiled by work and leave work ready to receive following work.
- B. On completion of work, remove debris, excess materials, and equipment from site.

END OF SECTION

SECTION 07 90 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Provide joint sealants, for interior and exterior joints not specified elsewhere, with backing rods and accessories as required for complete installation.

1. Joint sealants include joint sealers and caulking as indicated.

B. Related Sections:

1. Section 07 60 00: Flashing and sheet metal concealed sealants.

2. Section 07 84 00: Firestopping type joint sealants.

1.2 SUBMITTALS

A. Product Data: Furnish manufacturer's descriptive literature.

B. Samples: Furnish samples of each type of exposed joint sealer in required colors.

C. Certifications:

1. Furnish manufacturer's certification joint sealers comply with Contract Documents and are suitable for Project applications.

2. Furnish certification indicating installers are trained in proper use of specified products, qualified, and familiar with proper installation techniques.

1.3 QUALITY ASSURANCE

A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for adhesives, sealants, and caulks.

1. Provide joint sealants as required by applicable codes and regulations to fill joints and openings in building envelope separating conditioned space from unconditioned space.

B. Installer Qualifications: Firm with minimum five years successful experience on projects of similar type and size, using specified products.

1. Installers shall be familiar with proper application procedures to ensure maximum joint sealer expansion and contraction capabilities.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, cure time, and mixing instructions.

1.5 SITE CONDITIONS

- A. Do not proceed with installation of joint sealers under unfavorable weather conditions.
- B. Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer.

1.6 WARRANTY

- A. Extended Correction Period: Extend correction period to two years.
 - 1. Repair or replace joint sealers which fail to perform as intended, because of leaking, crumbling, hardening, shrinkage, bleeding, sagging, staining, loss of adhesion, and loss of cohesion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. System Description: Provide joint sealants with backing rods and accessories.
- B. Performance Requirements:
 - 1. Select materials for compatibility with joint surfaces and indicated exposures.
 - 2. Where not indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.
 - 3. Comply with applicable limitations on volatile organic compound (VOC) emissions.
- C. Regulatory Requirements: Comply with applicable regulatory requirements regarding limitations on volatile organic compound (VOC) emissions limitations.
- D. Elastomeric Sealants:
 - 1. Single Component Low Modulus Silicone Sealant: ASTM C920 Type S, Class 25, Grade NS; minimum 50% expansion and compaction capability.
 - a. Provide at exterior locations not exposed to traffic.
 - b. Manufacturers:
 - 1) General Electric Co./Silpruf, Silglaz or GESIL.
 - 2) Dow Corning Corp./790 or 795.
 - 3) Pecora Corp./864 Architectural Silicone.
 - 4) Tremco/Spectrem 3.
 - 5) Substitutions: Or equal in accordance with Section 01 62 00.

2. Multi-Component Polyurethane Sealant: ASTM C920, Type M, Grade P, Class 25, self-leveling; minimum 25% expansion and compaction capability.

- a. Provide at traffic bearing locations.

- b. Manufacturers:

- 1) Pecora Corp./Urexpan NR-200, or Dynatrol II-SG.
- 2) Tremco/THC 900-901, or Vulkem 445 SSL.
- 3) BASF/MasterSeal SL 2
- 4) Substitutions: Or equal in accordance with Section 01 62 00.

3. Mildew-Resistant Silicone Rubber Sealant: ASTM C920, Type S, Grade NS, Class 25, compounded with fungicide, specifically for mildew resistance and recommended for interior joints in wet areas.

- a. Provide at interior joints in wet areas.

- b. Manufacturers:

- 1) General Electric Co./SCS 1702 Sanitary Sealant.
- 2) Dow Corning Corp./786 Bathtub Caulk.
- 3) Pecora Corp./898 Sanitary Mildew Resistant Sealant.
- 4) Tremco/Tremsil 200.
- 5) Substitutions: Or equal in accordance with Section 01 62 00.

E. Non-Elastomeric Sealants:

1. Acrylic-Emulsion Sealant: ASTM C834 acrylic or latex-rubber-modified acrylic sealant, permanently flexible, non-staining and non-bleeding; recommended for general interior exposure; compatible with paints specified in Section 09 90 00.

- a. Provide at general interior applications.

- b. Manufacturers:

- 1) Pecora Corp./AC-20.
- 2) Tremco/Tremflex 834.
- 3) Substitutions: Or equal in accordance with Section 01 62 00.

2. Air Seals: Provide non-staining and non-bleeding sealers, calks, or foams appropriate to specific applications for filling openings between conditioned and unconditioned spaces.

- a. Type: As recommended by manufacturer for each specific application; compatible with adjacent materials.

- b. Manufacturers:

- 1) Dow/Great Stuff.
- 2) Owens Corning/EnergyComplete Air Sealant.
- 3) Substitutions: Or equal in accordance with Section 01 62 00.

- F. Miscellaneous Materials:
1. Primers/Sealers: Non-staining types recommended by joint sealer manufacturer for joint surfaces to be primed or sealed.
 2. Joint Cleaners: Non-corrosive types recommended by joint sealer manufacturer; compatible with joint forming materials.
 3. Bond Breaker Tape: Polyethylene tape as recommended by joint sealer manufacturer where bond to substrate or joint filler must be avoided for proper performance of joint sealer.
 4. Sealant Backer Rod: Compressible polyethylene foam rod or other flexible, permanent, durable non-absorptive material as recommended by joint sealer manufacturer for compatibility with joint sealer.
 - a. Oversize backer rod minimum 30% to 50% of joint opening.
- G. Colors: Provide colors indicated or as selected by Architect from manufacturer's full range of colors.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare joint surfaces in accordance with ASTM C1193 and as recommended by joint sealer manufacturer.
- B. Clean joint surfaces immediately before installation of joint sealer; remove dirt, insecure materials, moisture and other substances which could interfere with bond of joint sealer.
- C. Prime or seal joint surfaces where recommended by joint sealer manufacturer; do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- D. Ensure protective coatings on surfaces in contact with joint sealers have been completely stripped.

3.2 INSTALLATION

- A. Comply with manufacturer's printed instructions and ASTM C1193, except where more stringent requirements are shown or specified.
- B. Set sealant backer rods at proper depth or position in joint to coordinate with other work, including installation of bond breakers and sealant; do not leave voids or gaps between ends of backer rods.
 1. Do not stretch, twist, puncture or tear backer rods.
- C. Install bond breaker tape as required to avoid three-sided bond of sealant to substrate and where required by manufacturer's recommendations to ensure joint sealers will perform properly.

- D. Size materials to achieve required width/depth ratios.
- E. Employ installation techniques that will ensure joint sealers are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of bond surfaces equally on opposite sides.
- F. Joint Configuration: Fill sealant joint to a slightly concave surface, slightly below adjoining surfaces, unless otherwise indicated.
- G. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture or dirt.
- H. Install joint sealers to depths recommended by joint sealer manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. Horizontal Joints: 75% width with minimum depth of 3/8".
 - 2. Elastomeric Joints: 50% width with minimum depth of 1/4".
 - 3. Non-Elastomeric Joints: 75% to 125% of joint width.
- I. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces.
 - 1. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- J. Cure joint sealers in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.
- K. Maintain finished joints free of embedded matter, ridges and sags.

END OF SECTION

SECTION 09 91 13

EXTERIOR PAINTING

PART 1 - GENERAL

1.01 SCOPE OF WORK:

- A. Provide all labor and materials required to complete all painting and finishing work required by this Specification.
- B. Work shall include:
 - 1. Painting of all new and existing sheet metal flashings and other metal elements that are part of the roof assembly. Pre-finished Kynar coated sheet metal with color approved by the owner does not have to be painted.
 - 2. Painting of all wood elements that are adjacent to the roof assembly including but not limited to walls and fascia.
 - 3. Painting of any metal or wood component that is stained or contaminated by work performed under this contract.

1.02 QUALITY ASSURANCE:

- A. Comply with all state and local regulations governing the use of paint materials. All paint primers and finishes will comply with the Environmental Protection Agency regulations.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to the work site in unopened containers bearing manufacturer's name and product description.
- B. Store materials in a dry, clean, well ventilated area. Close containers.

1.04 TECHNICAL SUBMITTALS

- A. Submittal requirements: Contractor shall highlight anything in the submittal package that conflicts with or changes specifications or drawings. Include a reason for the change. Any submittals that alter existing specifications or drawings shall be approved by the engineer and owner prior to implementation.
- B. The following submittals are to be made in conjunction with any other submittal requirements set forth in the bid documents.
- C. The contractor shall submit the following upon request of the owner or engineer:
 - 1. Manufacturer specification data sheets. Submit for the following products:
 - a. Paint.
 - b. Primer.

2. Manufacturer literature describing the installation procedure of the specified system.

PART 2 - PRODUCTS

2.01 PAINT MATERIALS:

- A. Sinclair Paint Company (ICI Paint Stores)
- B. Dunn-Edwards Paint Corporation
- C. Sherwin-Williams Co.

2.02 EXTERIOR PAINT SYSTEMS:

- A. Zinc Coated Metal & Lead Flashings:
 1. Pretreatment - (ICI Sinclair Vinyl Wash Primer, Dunn-Edwards Galva-Etch GE 123, Sherwin Williams B50W3).
 2. 1st coat - Primer Coat. (ICI Devoe Devguard #4120, Dunn-Edwards W 711, Sherwin Williams B42N8).
 3. 2nd coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)
 4. 3rd coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)
- B. Wood:
 1. 1st Coat - Exterior Wood Primer (ICI Sinclair Ultra-Hide Durus #2110, Dunn-Edwards W 42-1, Sherwin Williams Y24W20).
 2. 2nd Coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)
 3. 3rd Coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)

PART 3 - EXECUTION:

3.01 CONDITION OF SURFACES:

Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence and quality of work. Do not apply paint or finish until conditions are satisfactory.

3.02 PREPARATION:

- A. Prepare surfaces in a skillful manner to produce finish work of first class appearance and durability.

- B. Clean surfaces free of dust, dirt, oil, grease and other foreign matter prior to the application of the prime coat.
- C. Repair all voids, nicks, cracks, dents, etc., with suitable patching material and finish flush to adjacent surface.

3.03 APPLICATION:

- A. Apply material evenly, free from sags, runs, crawls, holidays or defects.
- B. Apply paint by brush, roller or spray.
- C. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer.
- D. Allow each coat to dry before succeeding coat application.

3.04 REINSTALLATION OF REMOVED ITEMS:

Following completion of painting each space, promptly reinstall all items removed for painting, using only workmen skilled in the particular trade.

3.05 CLEANING:

Remove all surplus materials and debris from the work site at completion of each days work. Remove all splatterings from all finish surfaces.

END OF SECTION

SECTION 22 14 26.13

ROOF DRAINAGE

PART 1 - GENERAL

1.01 SCOPE:

A. The work required under this section consists of all plumbing and roofing related items necessary to complete the work as indicated in the Contract Documents.

B. The Contractor shall provide all items, articles, materials, operations, methods listed, mentioned or scheduled on the drawings and/or specified herein, including all labor, materials, equipment, and incidentals necessary and required for their completion.

C. WORK INCLUDED:

1. Provide new condensate drain lines from all condenser units.
2. Install drain inserts as specified.
3. If not present, install overflow drains or scuppers at all primary drains. Overflow drain outlet shall be located 2" above primary drain outlet. Overflow drain opening shall be equal to or greater than primary drain.
4. During the construction process protect exposed roof drain plumbing from debris.
5. The Contractor shall water test all roof drains prior to roof removal to ensure that all drains are clear. The Contractor shall water test all roof drains for leakage and blockage at the completion of the project and shall clear all blocked drain lines.

1.02 REGULATORY REQUIREMENTS:

Provide all work and materials in full accordance with the latest rules and regulations of the State Fire Marshal, safety orders of the Division of Industrial Safety and the Uniform Plumbing Code as published by the Western Plumbing Officials Association and other applicable laws or regulations.

1.03 PROJECT CONDITIONS:

Contractor shall examine and familiarize himself with all site conditions, plans and specifications. Report any discrepancies to owner's representative prior to bid for clarification. No allowance shall be made to Contractor for failure to comply with this requirement.

1.04 SUBMITTALS:

- A. Drain inserts if not using RAC.

- B. Drain insert capacity (gal/min) for each size drain being used on this project.
- C. Condensate line supports if not using Cooper B-line or PHP.
- D. Any other material not listed in these specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Condensate Line Piping: DWV copper tube. Conform with ASTM B-306. Condensate supports shall be pre-fabricated flexible sleeves.
- B. Mechanical Code: Components of the condensate disposal system shall be cast iron, galvanized steel, copper, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Condensate waste and drain line size shall be not less than ¾" internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for the condensate drainage, the pipe or tubing shall be sized in accordance with an approved method. All horizontal sections of drain piping shall be install in uniform alignment at a uniform slope.
- C. Pipe Hangers, support rods, anchors: Install in accordance with 2016 California Code of Regulations (CCR), Part 2, Title 24. Assemblies will be of standard manufacturer rated for service used. Hanger rods shall have galvanized finish.
- D. Drain inserts – RAC, Thunderbird, Hercules RetroDrain, or approved equal. Drain insert shall be approved by the manufacturer of the membrane being installed. Drain inserts shall have the following characteristics:
 - 1. The reason for requiring drain inserts and replacing Josam type drains is as follows:
 - a. The elimination of a "pressure fit" seal required by Josam type drain systems. Drain inserts do not rely on sealant and pressure fits for water integrity.
 - b. The elimination of a barrier to drainage. Josam type drain rings add ¼" to ½" height that water must build up in order to enter the drain. Drain inserts do not add any height or barrier to drainage eliminated standing water directly around the drain.
 - 2. Insert plumbing shall be the maximum diameter to insert into existing plumbing. Contact drain insert manufacturer to determine proper drain insert diameters.
 - 3. Inserts shall have coated flanges for heat welding into the membrane. If no coated flanged insert is approved by the manufacturer, please provide this in writing. Inserts shall have a metal flange that can be adhered to the roof membrane with a manufacturer approved adhesive.
 - 4. Plumbing insert shall have manufacturer pre-made sealant system. Hand sealant not allowed.

5. Drain insert shall have metal strainer.
 6. If interior plumbing does not allow for a drain insert (because plumbing elbows do not allow for enough space for insert), contractor shall obtain a modified drain insert or shorten the insert pipe outlet. Contact drain insert manufacturer for customized unit. Note: The Thunderbird drain inserts have only a 2" long male insert. These should be sufficient for any drain that elbows directly below the bowl. Also, the Thunderbird male insert comes in 2" diameter.
 7. Special Note: If the contractor believes that a drain insert cannot be installed, please notify the engineer by way of RFI. If a drain insert cannot be installed, a credit will be given back to the owner. The existing Josam drain will be modified as directed by the engineer prior to re-installation.
- E. Condensate line supports: Cooper B-line, PHP or approved equal. Provide support unit appropriate for pipes being supported in accordance with manufacturer recommendations.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install drain sumps around all primary drains and scuppers. Drain sumps shall be continuous so that no water stands at the drain areas.
- B. Flash all penetrations of pipe through roof and outside walls with approved method to prevent water or moisture from entering structure.
- C. Install condensation lines in accordance with California Plumbing and Mechanical Codes. Support condensate lines 5' O.C. Condensate lines shall be sloped to drain and shall drain to nearest roof drainage point.
- D. Penetrations through Fire Rated Walls & Ceilings: Pipes passing through fire rated surfaces shall have the space around the pipe sealed with fire rated materials in accordance with all code requirements.
- E. The Contractor shall do all cutting, fitting or patching of existing construction and his work as may be required to install roof drainage equipment to match existing materials. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore.
- F. Drain inserts:
 1. Install drain inserts in accordance with manufacturer requirements.
 2. Drains shall be set at deck level. If necessary, cut out the existing drain bowl so that the new drain can be installed at the deck level allowing for maximum sumping to the drain.
 3. If drain insert stem is too long, follow manufacturer requirements for shortening stem and installing new sealant system.

3.02 TESTING:

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SAN JOSE, CA**

Water test all roof drains and downspouts with a hose prior to completion of project for a minimum of one hundred eighty (180) minutes. Inspector shall be present during test. All drain lines shall be cleared of debris and any defective conditions corrected to operable condition.

END OF SECTION