ADDENDUM NO. 1

Date February 27, 2023
Eugene School District 4J
Gilham Elementary School Roof Replacement 2023

This addendum is being issued for clarification and / or revision of the Contract Documents as noted. This document is hereby made a part of the Contract Documents to the extent as though it was originally included herein.

Bidder shall notify all sub-bidders of this addendum, and shall acknowledge receipt of this addendum by inserting the above addendum number in the space provided on the bid response form prior to submitting bids. Failure to acknowledge receipt of any addendum may subject the bidder to disqualification.

The following are clarifications to the Contract Documents:

Item	Reference	Description
1.01	*Project Manual* *Section 000101* *"Title Page"*	Replace section with attached revised Title Page. Note the following changes: • Updated contact phone number.
1.02	*Project Manual* *Section 000110* *"Table of Contents"*	Replace section with attached revised Table of Contents. Note the following changes: • Corrected section numbers. • Added additional sections.
1.03	*Specification Section 075113 "Built-Up Asphalt Roofing"*	Replace section with attached revised Section 075113. Note the following changes: • Updated external fire exposure rating.
1.04	*Specification Section 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing"*	Add Section 075216 to the project manual.
1.05	*Specification Section 075400 "Thermoplastic Membrane Roofing"*	Replace section with attached revised Section 075400. Note the following changes: • Overhauled entire section.
1.06	*Specification Section 076200 "Sheet Metal Flashing and Trim"*	Replace section with attached revised Section 076200. Note the following changes: • Added channel support. • Added seismic joint cover. • Revised Sheet Metal Fabrications Schedule.
1.07	*Specification Section 084523 "Translucent fiberglass Panel Skylights"*	• Add Section 084523 to the project manual.
1.08	*Specification Section 221423 "Storm Drainage Piping Specialties"*	Replace section with attached revised Section 221423. Note the following changes: • Revised cast-iron, large-sump, general-purpose roof drain requirements.
1.09	*Drawing Sheet GI-1*	Replace sheet with attached revised Sheet GI-1. Note the following changes: • Updated drawing sheet index.

1.10	*Drawing Sheet GI-2*	Replace sheet with attached revised Sheet GI-2. Note the following changes: • Updated detail 10/GI-2.
1.11	*Drawing Sheet GI-3*	Replace sheet with attached revised Sheet GI-3. Note the following changes: • Updated Alternate No. 1 details for SBS roofing.
1.12	*Drawing Sheet R102*	Replace sheet with attached revised Sheet R102. Note the following changes: • Clarified Area H name designations.
1.13	*Drawing Sheet R105*	Replace sheet with attached revised Sheet R105. Note the following changes: • Added fall protection. • Updated detail tags.
1.14	*Drawing Sheet R106*	Replace sheet with attached revised Sheet R106. Note the following changes: • Added fall protection. • Updated detail tags. • Updated key note tags.
1.15	*Drawing Sheet R107*	Replace sheet with attached revised Sheet R107. Note the following changes: • Added fall protection. • Updated detail tags.
1.16	*Drawing Sheet R108*	Replace sheet with attached revised Sheet R108. Note the following changes: • Added fall protection. • Updated detail tags.
1.17	*Drawing Sheet R200*	Replace sheet with attached revised Sheet R200. Note the following changes: • Revised details.
1.18	*Drawing Sheet R202*	Replace sheet with attached revised Sheet R202. Note the following changes: • Revised details. • Added detail 4/R202.
1.19	*Drawing Sheet R204*	Replace sheet with attached revised Sheet R204. Note the following changes: • Revised details.
1.20	*Drawing Sheet R205*	Replace sheet with attached revised Sheet R205. Note the following changes: • Revised details. • Omitted detail 1/R205.

1.21	*Drawing Sheet R206*	Replace sheet with attached revised Sheet R206. Note the following changes: • Revised details.
1.22	*Drawing Sheet R207*	Replace sheet with attached revised Sheet R207. Note the following changes: • Revised details.
1.23	*Drawing Sheet R208*	Replace sheet with attached revised Sheet R208. Note the following changes: • Revised details. • Omitted detail 2/R208.
1.24	*Drawing Sheet R210*	Replace sheet with attached revised Sheet R210. Note the following changes: • Revised details.
1.25	*Drawing Sheet R211*	Replace sheet with attached revised Sheet R211. Note the following changes: • Revised details. • Added details 7, 8 & 9/R211.
1.26	*Drawing Sheet R212*	Add Sheet R212.

END OF ADDENDUM No. 1

DOCUMENT 00 01 01
TITLE PAGE

PROJECT MANUAL:
Gilham Elementary School Roof Replacement Project
Eugene Public School District 4J
Eugene, Oregon
C.I.P. Project No. **460-960-P0003**

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DATE: 02/27/23

DOCUMENT 00 01 10
PROJECT MANUAL TABLE OF CONTENTS
Gilham Elementary School Roof Replacement Project
CIP No. 460-960-P0003
February 22, 2023

The following is a list of all Divisions, Sections, and Drawings which are included in the Project Manual

BUILT-UP ASPHALT ROOFING

SECTION 075113

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Five-ply asphalt built-up roofing system (4 fiberglass plies + cap).
2. Vapor retarder.
3. Rigid roof insulation.

B. Related Requirements:

1. Section 061000 "Miscellaneous Rough Carpentry" for wood nailer, blocking, and replacement of selected exterior wood siding.
2. Section 070150 "Preparation for Re-Roofing" for methods of existing roof tear-off procedures and requirements.
3. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counter flashings.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to Work of this Section.

B. Hot Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mopping application and 75 centipoise for mechanical application, within a range of plus or minus 25 deg. F, measured at the mop cart or mechanical spreader immediately before application.

1.4 REROOFING (PREINSTALLATION) CONFERENCE

A. Reroofing (Preinstallation) Conference: Reference Section 070150 “Preparation for Reroofing.”

1.5 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For built-up roofing. Include plans, elevations, sections, details, and attachments to other work, including:

1. Base flashings and built-up terminations.
2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.

C. Qualification Data: For Installer and manufacturer.

D. Manufacturer Certificates: Signed by roofing manufacturer certifying that built-up roofing complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of compliance with performance requirements.

E. Sample Warranties: For contractor’s and manufacturer's special warranties.

F. Maintenance Data: For built-up roofing to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for built-up roofing identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by built-up roofing manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1. In continuous business under same name for a minimum of the past 5 years.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.

B. Provide tarps or plastic sheeting required to protect opened roofs and flashings and to prevent the entrance of moisture or rain water into the existing structure until new materials have been applied and roof is in a watertight condition.

C. Have necessary waterproof canvas or plastic sheeting readily available in case of emergency. The Contractor will be held liable for any damage to building interior due to Contractor’s negligence.

D. Roofing materials shall not be applied when water in any form (i.e., rain, dew, ice, frost, snow, etc.) is present on the deck.

E. Adhesive and / or asphalt applied roofing materials shall not be applied when dirt, dust, debris, oil, etc. is present on the deck.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period.

1. Special warranty includes built-up roofing membrane, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of built-up roofing.
2. Warranty Period: 20 years from date of Substantial Completion.

B. Installer’s Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, and vapor retarders, for the following warranty period:

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed built-up roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Built-up roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D4272.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by built-up roofing manufacturer based on testing and field experience.

C. Roofing System Design: The completed membrane roof system shall meet or exceed the uplift criteria as shown on the structural drawings.

D. UL Listing:

1. Provide built-up bituminous roofing systems and components that have been tested for application and slopes indicated and are listed by Underwriter's Laboratories (UL) for Class B external fire exposure.
2. Provide built-up bituminous roofing system materials bearing UL Classification marking on bundle, package, or container, indicating that materials have been produced under UL's Classification and follow-up service.
3. Provide built-up bituminous roofing systems that can be installed to comply with UL requirements for Fire Classified and Class 90 wind-uplift requirements.

E. Insulation Fire Performance Characteristics:

1. Provide insulation materials that are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
2. Surface Burning Characteristics: ASTM E84.
3. Fire Resistance Ratings: ASTM E119.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products and systems by one of the following:

1. Built-up Asphalt Roofing:
   a. Johns Manville International, Inc.; 5GIC.
   b. Malarkey Roofing Company; M5-XIA-H.
   c. Garland Company; SBS cap sheet over four fiberglass plies.
   d. Or pre-bid approved equal.

2.3 ROOFING MEMBRANE SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft..

B. Nailed Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

C. Ply Sheet: ASTM D 2178, Type VI, asphalt-impregnated, glass-fiber felt.

A. Cap Sheet: ASTM D 3909, non-woven fiberglass mat cap sheet, coated on both sides with oxidized bitumen, and surfaced with ceramic granules, fire rated:

1. Minimum thickness 105-mils nominal at selvage edge, minimum weight 72-pounds per 100 square feet.
2. Granule Color: White.
   a. Products
      1) GlasKap, by Johns Manville.
      2) 502 Cap, by Malarkey.
      3) StressPly FR Mineral, by Garland.
      4) Or pre-bid approved equal.

D. Reinforcing Sheet: ASTM D 4601, Type I, asphalt-impregnated and -coated, glass-fiber base sheet, dusted with fine mineral surfacing on both sides.

E. Flashing Sheet: ASTM D 6163, Grade G, Type I, Random Glass mat or scrim reinforced SBS modified bitumen cap sheet, mineral granule surfaced, fire rated:

1. Granule Color: White.
   a. Products
      1) GlasKap Plus, by Johns Manville.
      2) 601 Paragon, by Malarkey.
      3) StressPly FR Mineral, by Garland.
      4) Or pre-bid approved equal.

2.4 ASPHALT MATERIALS

A. Asphalt Primer: ASTM D 41/D 41M.

B. Roofing Asphalt: ASTM D 312, Type IV.

1. Each container or bulk shipping ticket shall include Equiviscous Temperature (EVT), finished blowing temperature (FBT), and flash point (FP).
2. Asphalt must be manufactured by roofing materials manufacturer, or, considered approved by manufacturer, in writing, prior to installation of membrane.

2.5 AUXILIARY BUILT-UP ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing manufacturer for application.

C. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

D. Lead Pipe Flashings: Two-piece 4 pound desilverized lead flashing.

E. Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match color of cap sheet.

F. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.6 VAPOR RETARDER

A. Vapor Retarder: Polyethylene film laminated to layer of butyl rubber adhesive, minimum 30-mil total thickness; maximum permeance rating of 0.1 perm; self-adhered, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

2.7 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Insulation Performance Requirements:

1. Thermal Resistance: 5.7 per inch minimum R-value per manufacturer’s data.
2. Required assembly R-Value: As indicated on Sheet GI-2

C. Flat Stock Rigid Insulation – Type 1: ASTM C 1289, Type II, rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.

1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
2. Compressive strength: Nominal 20 psi per ASTM D 1621.
3. Flame spread: 35 or less per ASTM E 84.
4. Panel Thickness: 2.6-inch.
5. Board size: 4-foot by 4-foot.
6. Attachment method: Adhesive Ribbons and Mechanically Attached – Reference Sheet GI-2.

D. Flat Stock Rigid Insulation – Type 2: ASTM C 1289, Type II, rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.

1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
2. Compressive strength: Nominal 20 psi per ASTM D 1621.

3. Flame spread: 35 or less per ASTM E 84.
4. Panel Thickness: 2-inch
5. Board size: 4-foot by 8-foot.
6. Attachment method: Mechanically Attached.

E. Tapered Rigid Insulation: ASTM C 1289, Type II, tapered rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.

1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
2. Compressive strength: Nominal 20 psi per ASTM D 1621.
3. Flame spread: 35 or less per ASTM E 84.
4. Slope: 1/4-inch per foot.
5. Board size: 4-foot by 4-foot.
6. Attachment method: Adhesive Ribbons

F. Insulation Crickets: ASTM C 1289, Type II; Rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.

1. Units shall be 4-foot by 4-foot, 1/2-inch minimum thickness at the start-point of the tapered insulation system.
2. Slope: As indicated on the Drawings.
3. Attachment method: Hot Asphalt or Adhesive Ribbons.

2.8 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with built-up roofing.

B. Asphalt: Certified for full compliance with the requirements for Type IV asphalt listed in Table 1, ASTM D 312. Each container, or bulk shipping ticket, shall indicate equiviscous temperature, finished blowing temperature, and flash point.

C. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

D. Insulation and cover board adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows.

1. Bead applied, low-rise, one component or multicomponent urethane adhesive.
2. Adhesive material shall meet FM I-90 (Class 4450) with approved insulation boards.
3. Approved Manufacturers:
   a. OMG Roofing Products; OlyBond 500.
   b. Or pre-bid approved equal.

B. Cant Strips: ASTM C 728, perlite insulation board with 3-inch vertical (3 7/8-inch face) minimum, and as shown on the drawings.

E. Tapered Edge Strip: Rigid polyisocyanurate board of both 12-inch and 24-inches wide, 4-foot long tapering from 0-inch to 2-inch in thickness. Stack units to achieve required thickness where indicated on Drawings.

1. Products:
   a. Atlas Roofing Corporation; Gemini Tapered Edge Strip.
   b. Or pre-bid approved equal.

F. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for slope to drain. Fabricate to slopes indicated.

2.9 COVER BOARD

A. General: Provide preformed roof cover boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Cover Board – Type 1: Multi-ply, semi-rigid asphaltic panel composed of mineral-fortified asphaltic core, formed between two asphalt-saturated fiberglass liners and a plastic separator sheet.

1. Dimensions
   a. Minimum thickness: 1/4-inch
   b. Maximum dimensions: 4-feet by 4-feet
   c. Minimum dimension: 12-inches by 24-inches
2. Manufacturers
   a. Sopra-board by Soprema.
   b. Sturdy-Dek by Blue Ridge.
   c. Or pre-bid approved equal.

2.10 WALKWAYS

A. Walkway Pads: Manufacturer’s standard walkway pad for use on BUR roofs, or a walkway pad consisting of same product as the cap sheet.

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 Work:

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

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

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION, GENERAL

A. Comply with built-up roofing manufacturer's written instructions.

1. NOTE: This building includes steep-sloped roof areas that may require supplemental installation methods to meet the manufacturer’s requirements. Adhere to all required supplemental installation requirements.

B. Asphalt Heating: Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application. Circulate asphalt during heating. Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating. Do not heat asphalt within 25 deg F of flash point. Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.

1. Apply hot roofing asphalt within plus or minus 25 deg F of equiviscous temperature.

C. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.

3.4 VAPOR-RETARDER INSTALLATION

A. Self-Adhering Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 inches and 6 inches, respectively. Seal laps by rolling.

B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.5 INSULATION INSTALLATION

A. Install where indicated on drawings.

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

C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

D. Comply with membrane roofing system and rigid insulation manufacturer's written instructions for installing roof insulation and the Contract Documents.

E. Roof insulation assembly units that become wet or damaged after installation must be removed and replaced.

F. Provide pressure treated wood along gutter edges and as otherwise shown on the drawings. Provide additional stops as recommended by the manufacturer of the roofing materials.

G. Mechanically Fastened and Adhered Insulation: Secure insulation utilizing the attachment method outlined on Sheet GI-2.

1. Where mechanical attachment is indicated, utilize the manufacturer specified fastener pattern as required to resist uplift pressure at corners, perimeter, and field of roof.
2. Where adhesive ribbons are indicated, utilize the manufacturer specified ribbon spacing/pattern as required to resist uplift pressures at corners, perimeter, and field of roof.
    a. Firmly press and compress insulation until the adhesive has fully bonded the insulation in place.

H. Joints of insulation units shall be butted tight; leave no more than 1/4-inch gap between abutting boards, maximum. Joints exceeding 1/4 inch shall be filled with insulation.

I. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 with insulation.

1. Offset the joints of the insulation board stock a minimum of 1-foot from the joints of the underlying rigid insulation units.
2. Offset the joints of the insulation board stock a minimum of 1-foot from the joints of the preceding row of rigid insulation units.

J. Cut and fit insulation within 1/4-inch of nailers, projections, and penetrations.

K. Install tapered insulation under area of roofing to conform to slopes indicated.

L. Install crickets formed out of tapered edge strips at all curbed penetrations.

M. Tapered Edge Strip Assembly Installation at Roof Drain Sumps:

1. Lay-out insulation assembly and tapered edge strip products to result in sump configuration shown in the Drawings.

2. Install perlite tapered edge strip at the full perimeter of each sump to conform to the configurations, as shown in the Drawings. Adhere to vapor retarder with hot asphalt.
3. Bevel-cut corners of flat stock insulation and/or cover board as necessary to create a smooth and continuous transition for membrane installation without creating a bridging membrane condition.

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

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

P. Install cover board in a continuous straight line and with end joints staggered between rows. Cut and fit insulation within 1/4-inch of nailers, projections, and penetrations. Fill gaps exceeding 1/4-inch with asphalt.

1. Adhere cover board in adhesive ribbons to resist uplift pressure at corners, perimeter, and at field of roof.

Q. Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.

3.6 BUILT-UP ROOFING INSTALLATION, GENERAL

A. Install roofing according to roofing manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

B. Coordinate installation of roofing so insulation and other components of built-up roofing not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed built-up roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Asphalt Heating:

1. Heat roofing asphalt and apply within plus or minus 25 deg. F of equiviscous temperature unless otherwise required by roofing system manufacturer.
2. Do not raise roofing asphalt temperature above equiviscous temperature range more than one hour before time of application.
3. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating.
4. Do not heat roofing asphalt within 25 deg. F of flash point.
5. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.

3.7 ROOFING MEMBRANE INSTALLATION

A. Install built-up bituminous roofing membrane according to roofing manufacturer's written instructions, starting at the low point of the roof.

B. Adhere to roof system manufacturer's supplemental requirements for steep-slope roof installation where applicable.

C. Ply Sheets Installation:

1. Apply four (4) ply sheets over installed cover board using a felt laying machine or mop in by hand.
2. Ply sheets shall be installed into Type IV hot asphalt.
3. All layers of roofing shall be laid free of wrinkles, creases, or fish mouths.
4. Sheets shall be laid directly behind the asphalt applicator. Sufficient pressure shall be exerted during application, using an aluminum rake or broom, to ensure prevention of air pockets.
5. Sheets shall be fully bonded to the prepared substrate and each other.
6. Install ply sheets to result in full 4-ply construction, with 8-1/2-inches ply sheet exposure.
7. Install ply sheets with end laps no less than 6-inches, minimum.
8. Install roofing membrane sheets so side and end laps shed water.
9. Accurately align roofing membrane sheets, without stretching, and maintaining uniform side and end laps.
10. All mopping of asphalt shall be a nominal 25 pounds per 100 square feet and shall be total in coverage leaving no breaks or voids.
11. Prime metal flanges into uniform layer of plastic cement, and provide reinforcing sheets, installed into hot asphalt, over all sheet metal flanges.

D. Cap Sheet Installation:

1. Cut cap sheet into manageable lengths between 12 feet and 16 feet long. Lay cut sections flat and allow to relax and flatten per manufacturer's recommendations.
2. Install cap sheet sections "flopped" into hot asphalt, maintaining a rolling motion toward outside edge. Broom in cap sheet to eliminate voids and entrapment of air pockets.
3. Install cap sheet parallel with slope, unless otherwise approved by the manufacturer.
4. Install cap sheet with all ends lapped minimum 12-inches, and side laps minimum 2-inches.
5. Install cap sheet with end laps staggered minimum 3 feet from adjacent sections of cap sheet.
6. Set each sheet in a solid uniform coating of asphalt. Laps shall not buck water and shall be totally sealed.
7. All mopping of asphalt shall be nominal 25 pounds per 100 square feet and shall be total in coverage leaving no breaks or voids.
8. 45 degree cut underlying cap sheet corners at all T-joint locations and step in all T-joints. T-joints shall be fully sealed without voids.
9. The cap sheet shall be carefully installed so as to not track asphalt onto finished surface. All spills and tracks shall be treated with embedded granules.
10. Apply roofing granules to cover exuded bead at laps while bead is hot (carry a granule bag during application of top ply sheet).

11. At the end of the day's work or when precipitation is imminent, a water cut-off shall be built at all open edges. Cut-offs can be built using adhesive or plastic cement and non-porous roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the installation of resumption of roofing.

3.8 FLASHING AND STRIPPING INSTALLATION

A. Bridge junctures of vertical and horizontal surfaces with 45-degree cant strips.

B. Install reinforcing sheets at horizontal to vertical transitions, including curbed penetrations and flange type penetrations.

C. Install reinforcing sheet over cant strips and other sloping and vertical surfaces, at roof edges, and over flange at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Adhere reinforcing sheet over roofing membrane at cants in a solid mopping of hot roofing asphalt.
3. Install reinforcing sheet and adhere to substrate in a solid mopping of hot roofing asphalt.

D. Flashing sheet:

1. Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg. F. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.
2. Extend flashing sheet up walls or parapets a minimum of 8-inches above roofing membrane and 6-inches onto field of roofing membrane.
3. Install lengths not greater than 6-foot long.
4. Install in a manner to avoid bridging / voids. Verify all end laps overlap a minimum of 4-inches and are totally sealed.
5. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing at 8-inches on center.
6. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
7. Provide corner patches or folded corners at base flashing corners. Blind cut corners are not acceptable. Folded corner tabs shall be cut so that tabs do not exceed 4".

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 Roof Consultant.

1. Notify Roof Consultant or Owner 48 hours in advance of date and time of inspection.

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

3.10 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Roof Consultant and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

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

END OF SECTION 075113

STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

SECTION 075216

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
2. Vapor retarder.
3. Rigid roof insulation.

B. Related Requirements:

1. Section 012300 "Alternates" for administrative and procedural requirements for alternates.
2. Section 061000 "Miscellaneous Rough Carpentry" for wood nailer, blocking, and replacement of selected exterior wood siding.
3. Section 070150 "Preparation for Re-Roofing" for methods of existing roof tear-off procedures and requirements.
4. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counter flashings.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 REFERENCES

A. ARMA: Asphalt Roofing Manufacturers Association

B. ASTM: American Society for Testing and Materials

1. ASTM C1396: Gypsum Board
2. ASTM D5147: Test Methods for Sampling and Testing Modified Bituminous Sheet Material
3. ASTM E119: Test Method for Fire Tests of Building Construction and Materials

4. ASTM E84: Test Method for Surface Burning Characteristics of Building Materials
5. ASTM C1289: Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

C. NRCA: National Roofing Contractors Association

1. Quality Control Recommendations for Polymer Modified Bitumen Roofing
2. NRCA Roofing and Waterproofing Manual

D. TIMA: Thermal Insulation Manufacturers Association

1. RIC/TIMA Bulletin #281-1

E. UL: Underwriters Laboratories Inc.

1. Requirements for Roof Deck Constructions

1.5 REROOFING (PREINSTALLATION) CONFERENCE

A. Reroofing (Preinstallation) Conference: Reference Section 070150 “Preparation for Reroofing.”

1.6 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:

1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes.
3. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Qualification Data: For Installer and manufacturer.

D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

E. Sample Warranties: For manufacturer's special warranties.

F. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by built-up roofing manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
   1. In continuous business under same name for a minimum of the past 5 years.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

   1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.

B. Provide tarps or plastic sheeting required to protect opened roofs and flashings and to prevent the entrance of moisture or rain water into the existing structure until new materials have been applied and roof is in a watertight condition.

C. Have necessary waterproof canvas or plastic sheeting readily available in case of emergency. The Contractor will be held liable for any damage to building interior due to Contractor’s negligence.

D. Roofing materials shall not be applied when water in any form (i.e., rain, dew, ice, frost, snow, etc.) is present on the deck.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period.

1. Special warranty includes built-up roofing membrane, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of built-up roofing.
2. Warranty Period: 20 years from date of Substantial Completion.

B. Installer's Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, and vapor retarders, for the following warranty period:

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed built-up roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Built-up roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D4272.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by built-up roofing manufacturer based on testing and field experience.

C. Roofing System Design: The completed membrane roof system shall meet or exceed the uplift criteria as shown on the structural drawings.

D. UL Listing:
1. Provide built-up bituminous roofing systems and components that have been tested for application and slopes indicated and are listed by Underwriter's Laboratories (UL) for Class B external fire exposure.
2. Provide built-up bituminous roofing system materials bearing UL Classification marking on bundle, package, or container, indicating that materials have been produced under UL's Classification and follow-up service.
3. Provide built-up bituminous roofing systems that can be installed to comply with UL requirements for Fire Classified and Class 90 wind-uplift requirements.

E. Insulation Fire Performance Characteristics:
1. Provide insulation materials that are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

2. Surface Burning Characteristics: ASTM E84.
3. Fire Resistance Ratings: ASTM E119.

2.2 MANUFACTURERS

A. Source Limitations: Obtain components including roof insulation, and fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.3 SBS ROOFING

A. Manufacturers: Subject to compliance with requirements.

2.4 ROOFING SHEET MATERIALS

A. Assembly Configuration: Refer to Sheets GI-2 and GI-3 for specific roof assembly components and configurations.
   1. Steep Slope Requirements: Steep sloped roof areas must be able to achieve the specified external fire exposure rating, be a UL tested assembly, and approved by the manufacturer for warrantable installation on steep slope applications.

B. Base Ply Sheet (Torch Applied – allowable for low and steep slope applications):

   1. Random fibrous glass mat impregnated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM D 6163, Type I, Grade S.
   2. Minimum Slope allowable for Usage: >3:12
   3. Minimum thickness: 110 mils.
   4. Minimum weight: 76 pounds per 100 square feet.
   5. Application method: Torch Application.

C. Base Ply Sheet (Self-Adhered – allowable for low and steep slope applications):

   1. Random fibrous glass mat impregnated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM D 6163, Type I, Grade S.
   2. Minimum thickness: 98 mils.
   3. Minimum weight: 72 pounds per 100 square feet.
   4. Application method: Self-Adhered.

D. Base Ply Sheet (Mechanically Attached – allowable for steep slope applications only):

   1. Dimensionally stable non-woven polyester mat reinforced sheet saturated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM D 6164, Type I, Grade S.
   2. Minimum Slope allowable for Usage: >3:12
   3. Minimum thickness: 118 mils.
   4. Minimum weight: 81 pounds per 100 square feet.
   5. Application method: Mechanically Attached.

E. Top Ply Sheet (Option 1):

1. Random fibrous glass mat impregnated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM 6163, Type II, Grade G.
2. Average Thickness: 154-mils.
3. Minimum thickness: 126-mils at selvage edge.
4. Minimum weight: 125 pounds per 100 square feet.
5. Granule color: White.
6. Application method: Torch Application.

F. Top Ply Sheet (Option 2):

1. Random fibrous glass mat impregnated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM 6163, Type I, Grade G.
2. Average Thickness: 138-mils.
3. Minimum thickness: 98-mils at selvage edge.
4. Minimum weight: 125 pounds per 100 square feet.
5. Granule color: White.
6. Application method: Torch Application.

G. Reinforcing Ply Sheet:

1. Random fibrous glass mat impregnated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM D 6163, Type I, Grade S.
2. Minimum thickness: 110 mils.
3. Minimum weight: 76 pounds per 100 square feet.
4. Application method: Torch Application.

H. Flashing Sheet:

1. Foil clad membrane with fiberglass scrim/fiberglass mat composite impregnated with styrene-butadiene-styrene (SBS) modified bitumen. ASTM D 6298.
2. Minimum thickness 146-mils.
3. Minimum weight: 96 pounds per 100 square feet.
4. Surface: Aluminum.
5. Application method: Torch or Cold Adhesive.

2.5 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Roofing Cement / Flashing Cement / Plastic Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

C. Primer: Asphalt, solvent blend, conforming to ASTM D 41.

D. Primer for Self-Adhered Sheets: Quick drying, low VOC, water based, high tack primer specifically designed to promote adhesion of roofing sheets to approved substrates.

E. Cants: Rigid perlite board, 3-inch vertical (with 3-7/8-inch face) minimum, and as shown on the drawings, ASTM C728.

F. Mastic Sealant: Polyisobutylene (plain or bituminous modified), nonhardening, nonmigrating, non-skinning, and nondrying.

G. Sealant in contact with roof membrane materials: Moisture-curing, non-slump elastomeric sealant designed for roofing applications. Sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.

H. Fasteners: Galvanized steel, fluoropolymer-coated steel, or nonferrous metal screws. Size, length, and type recommended by manufacturer as suitable for material to be fastened, substrate, and that will comply with requirements of governing authorities and listing agencies.

I. Ceramic Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match color of top ply (cap) sheet.

J. Radiant Barrier Coating: As recommended by the manufacturer for use in covering asphaltic bleedout on the flashing sheet application.

1. Color: Match flashing sheet.

K. Walk Pads: Manufacturer’s standard cold-applied walk pad suitable for use with their SBS membrane assemblies.

L. Reinforced Fluid Applied Flashing Membrane: Liquid applied, layered membrane, fully reinforced and seamless flashing system; Polymethyl Methacrylate (PMMA).

1. Siplast Inc.; Parapro 123 Flashing System.
2. Or pre-bid approved equal.

M. Lead Sheet: 4 lbs. desilverized lead sheet.

N. Preformed Pipe Flashing: Two piece, four pound lead pipe jack with integral flashing flange and flashing cap.

O. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.6 VAPOR RETARDER

A. Vapor Retarder: Polyethylene film laminated to layer of butyl rubber adhesive, minimum 30-mil total thickness; maximum permeance rating of 0.1 perm; self-adhered, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

2.7 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Insulation Performance Requirements:
   1. Thermal Resistance: 5.7 per inch minimum R-value per manufacturer's data.
   2. Required assembly R-Value: As indicated on Sheets GI-2 and GI-3.

C. Flat Stock Rigid Insulation – Type 1: ASTM C 1289, Type II, rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.
   1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
   2. Compressive strength: Nominal 20 psi per ASTM D 1621.
   3. Flame spread: 35 or less per ASTM E 84.
   4. Panel Thickness: 2.6-inch.
   5. Board size: 4-foot by 4-foot.
   6. Attachment method: Adhesive Ribbons and Mechanically Attached – Reference Sheet GI-2.

D. Flat Stock Rigid Insulation – Type 2: ASTM C 1289, Type II, rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.
   1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
   2. Compressive strength: Nominal 20 psi per ASTM D 1621.
   3. Flame spread: 35 or less per ASTM E 84.
   4. Panel Thickness: 2-inch
   5. Board size: 4-foot by 8-foot.
   6. Attachment method: Mechanically Attached.

E. Tapered Rigid Insulation: ASTM C 1289, Type II, tapered rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.
   1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
   2. Compressive strength: Nominal 20 psi per ASTM D 1621.
   3. Flame spread: 35 or less per ASTM E 84.
   4. Slope: 1/4-inch per foot.
   5. Board size: 4-foot by 4-foot.
   6. Attachment method: Adhesive Ribbons

F. Insulation Crickets: ASTM C 1289, Type II; Rigid closed-cell polyisocyanurate foam board, felt or glass-fiber mat facer on both major surfaces.

1. Units shall be 4-foot by 4-foot, 1/2-inch minimum thickness at the start-point of the tapered insulation system.
2. Slope: As indicated on the Drawings.
3. Attachment method: Adhesive Ribbons.

2.8 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening flat stock rigid roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Tapered Insulation and Cover Board Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.

D. Tapered Edge Strip: Rigid polyisocyanurate board of 24-inches wide, 4-foot long tapering from 0-inch to 2-inch in thickness. Stack units to achieve required thickness where indicated on Drawings.

1. Products:

a. Atlas Roofing Corporation; Gemini Tapered Edge Strip.
b. Or pre-bid approved equal.

E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.9 COVER BOARD

A. General: Provide preformed roof insulation cover boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Cover Board – Type 3: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, factory primed.

1. Unit thickness: 1/4-inch.
2. Board size:
   a. 4-foot x 4-foot at Adhesive Ribbons
   b. 4-foot x 8-foot at Mechanically Attached
3. Attachment method – Reference Sheets GI-2 and GI-3 for attachment method:
   a. Adhesive Ribbons.
   b. Mechanically Attached.
4. Approved manufacturers:

a. Ultralight Coated Glass-Mat Roof Board, by United States Gypsum Company.
b. DensDeck Prime, by Georgia Pacific.
c. Or pre-bid approved equal.

2.10 WALK PADS

A. Walk Pads: Manufacturer's standard factor-formed, nonporous, heavy-duty, slip-resistant, surface-textured, walk pad for use in conjunction with PVC roof membranes.

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 Work:

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that concrete substrate is visibly dry and free of moisture.

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

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions, provided they do not conflict with the requirements herein.

B. This building includes steep-sloped roof areas that may require supplemental installation methods to meet the manufacturer's requirements. Adhere to all required supplemental installation requirements.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

D. Install roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

3.4 VAPOR-RETARDER INSTALLATION

A. Self-Adhering-Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 inches and 6 inches, respectively. Seal laps by rolling.

B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.5 INSULATION INSTALLATION

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

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

G. Adhered Tapered Insulation: Install each layer of tapered insulation and adhere to substrate as follows:

1. Set each layer of tapered insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

H. Mechanically Fastened and Adhered Insulation: Secure insulation utilizing the attachment method outlined on Sheets GI-2 & GI-3.

1. Where mechanical attachment is indicated, utilize the manufacturer specified fastener pattern as required to resist uplift pressure at corners, perimeter, and field of roof.
2. Where adhesive ribbons are indicated, utilize the manufacturer specified ribbon spacing/pattern as required to resist uplift pressures at corners, perimeter, and field of roof.

a. Firmly press and compress insulation until the adhesive has fully bonded the insulation in place.

I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together.

1. Install into ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:

1. Deck Type: N (nailable).
2. Adhering Method: Torch Application or self-adhering, varies by system assembly.
3. Number of SBS-Modified Asphalt Sheets: Two.
4. Surfacing Type: M (mineral-granule-surfaced cap sheet).

B. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Install modified bituminous roofing sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Unroll roofing sheets and allow them to relax for minimum time period required by manufacturer.

D. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

E. Install roofing sheets so side and end laps shed water.

3.7 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Flashing-Sheet Application (Option 1): Adhere flashing sheet to substrate in asphalt roofing cement at rate required by roofing system manufacturer.
3. Flashing-Sheet Application (Option 2): Torch apply flashing sheet to substrate.

B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

1. Seal top termination of base flashing.

D. Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.

E. Apply radiant barrier coating over all adhesive bleed-out in the flashing sheet application.

F. Roof Drains: Set 30-by-30-inch metal flashing in bed of asphaltic adhesive on completed roofing membrane. Cover metal flashing with roofing cap-sheet stripping, and extend a minimum of 6 inches beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

1. Install stripping according to roofing system manufacturer's written instructions.

3.8 REINFORCED FLUID APPLIED PMMA MEMBRANE FLASHING INSTALLATION

A. Substrate Examination/Preparation:

1. General: Ensure that substrates are free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles/friable matter, rust or any other material that would be detrimental to adhesion of the catalyzed primer and/or resin to the substrate. Some surfaces may require scarification, shotblasting, or grinding to achieve a suitable substrate.
2. Preparation of Steel/Aluminum Substrates: Grind to generate a "white-metal" surface and remove loose particles. Extend preparation area a minimum of 1/2-inch beyond the termination of the roofing/flashing system. Notch steel surfaces to provide a rust-stop where detailed.
3. Rigid Plastic Flashing Substrates: Evaluate the plastic for compatibility with the resin materials. Lightly abrade the surface to receive the flashing system, clean plastic substrates using the specified the cleaner/solvent and allow to dry. Extend the preparation area a minimum of ½- inch beyond the termination of the flashing system.

4. Preparation of Wood/Plywood Flashing Substrates to receive Resin: Prime wood/plywood surfaces to receive the specified flashing system with the specified PMMA-based primer at the rate specified by the resin manufacturer and allow primer to cure. Tape the joints between plywood or wood panels using the specified tape and prior to application of the flashing system.

B. Mixing of Resin Products:

1. Preparation/Mixing/Catalyzing Resin Products: Pour the desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir the liquid for the time period specified by the resin manufacturer. Calculate the amount of catalyst powder needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin component. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before pot life expires.

C. Preparation Paste and Primer Mixing/Applications:

1. Primer Application: Apply primer resin using a roller or brush at the rate specified by the primer manufacturer over qualified and prepared substrates. Apply primer resin at the increased rate specified by the primer manufacturer over DensDeck Prime or other porous substrates. Do not let resin pool or pond. Do not under-apply or over-apply primers as this may interfere with proper primer catalyzation. Make allowances for waste, including saturation of roller covers and application equipment.
2. Paste Application: Apply catalyzed preparation paste using a trowel over prepared and primed substrates. Before application of any resin product over cured paste, wipe the surface of the paste using the specified cleaner/solvent and allow to dry. Treat the surface again if not followed up by resin application within 60 minutes.

D. Flashing Membrane Application:

1. Base Flashing Application:

a. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to cure.
b. Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.
c. Apply an even, generous base coat of flashing resin to prepared surfaces using a roller at the rate specified by the resin manufacturer. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin immediately following embedment of the fleece at the rate specified by the resin manufacturer, ensuring that the fleece is fully saturated. Ensure that the flashing resin is applied to extend beyond the fleece (maximum ¼-inch (6 mm)). Remove the tape before the catalyzed resin cures.

Make allowances for waste, including saturation of roller covers and application equipment.

d. Should work be interrupted for more than 12 hours or the surface of the cured resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.

3.9 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size, according to walkway pad manufacturer's written instructions.

1. Set walkway pads in cold-applied adhesive.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Roof Consultant.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

1. Notify Roof Consultant and Owner 48 hours in advance of date and time of inspection.

3.11 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to the Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 075216

THERMOPLASTIC MEMBRANE ROOFING

SECTION 075400

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Adhered single-ply roof membrane system.
2. Mechanically attached cover board.

B. Related Requirements:

1. Section 061000 "Miscellaneous Rough Carpentry" for wood nailer, blocking, and replacement of selected exterior wood siding.
2. Section 070150 "Preparation for Re-Roofing" for methods of existing roof tear-off procedures and requirements.
3. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counter flashings.

1.3 REFERENCE STANDARDS

A. ANSI/SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

B. ANSI/SPRI FX-1 - American National Standard - Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

D. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

E. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

F. ASTM D4434/D4434M - Standard Specification for Poly (Vinyl Chloride) Sheet Roofing.

G. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

H. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association.

I. SMACNA (ASMM) - Architectural Sheet Metal Manual.

J. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.

1.4 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.5 REROOFING (PREINSTALLATION) CONFERENCE

A. Reroofing (Preinstallation) Conference: Reference Section 070150 “Preparation for Reroofing.”

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For single-ply roofing. Include plans, details, and attachments to other work, including:

1. Base flashings and built-up terminations.
2. Crickets, saddles, and tapered edge strips, including slopes.

C. Samples for Verification: For the following products:

1. Sheet roofing, of color required.
2. Walkway pads or rolls, of color required.

D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

E. Qualification Data: For qualified Installer and manufacturer.

F. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of compliance with performance requirements.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

H. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.

I. Field quality-control reports.

J. Warranties: Sample of special warranties.

K. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer's Qualifications and Requirements:

1. A qualified manufacturer that has UL listing and FM Approval for roofing system identical to that used for this Project.
2. Technical representative of materials manufacturer shall periodically observe provide written documentation of the work in progress.
3. The technical representative, as a minimum, shall be present to observe deck preparation, general installation procedures, and final completion; submit documentation of manufacturer's final acceptance.
4. Work shall not proceed until such observations have been made and conditions have been approved in writing by the manufacturer.
5. Technical representative shall perform a punch list inspection upon substantial completion of the project indicating all items in need of attention, including conformance to manufacturer's published installation instructions and these contract documents; provide documentation.

B. Installer Qualifications and Requirements:

1. A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
2. In continuous business under same name for past ten (10) years.
3. Completed at least five (5) successful installations of specified materials and systems on projects of similar scope.
4. Contractor shall provide all personnel trained in application of materials and systems and shall maintain supervision as specified elsewhere.
5. Installer Field Supervision: Require Installer to maintain a full-time supervisor / foreman on the job site during times that roofing system installation is in progress, and who is experienced in installation of the specified roofing systems.

C. Source Limitations: Obtain components including roof insulation fasteners for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Packing, Shipping, Handling, and Unloading:

B. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

1. Do not leave unused rigid insulation and other sheet materials on the roof overnight or when roofing work is not in progress unless protected and elevated from weather or other moisture sources.

C. Storage and Protection:

1. Store and handle roofing sheets in a dry, well-ventilated, weathertight place to ensure no possibility of significant moisture pickup.

D. Control temperature of storage areas in accordance with the manufacturer's instructions.

E. Store materials on pallets, blocking, or other means to keep materials from coming into contact with moisture, dirt, debris, and other contaminates.

F. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

G. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

H. Protect roof level rigid insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with rigid insulation manufacturer's written instructions for handling, storing, and protecting during installation.

I. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed in accordance with manufacturer's written recommendations and warranty requirements.

B. Have necessary waterproof canvas or plastic sheeting readily available in case of emergency. The Contractor will be held liable for any damage to building interior due to Contractor's negligence.

C. Protect open roofs and flashings to prevent the entrance of moisture or rain water into the existing structure until new materials have been applied and roof is in a watertight condition.

D. Roofing materials shall not be applied when water in any form (i.e., rain, dew, ice, frost, snow, etc.) is present on the deck.

E. Adhesive applied roofing materials shall not be applied when dirt, dust, debris, oil, etc.is present on the deck.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of the new membrane roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, substrate board, roofing accessories, and other components of the new membrane roofing system.
2. Warranty Period: 20 years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, and walkway products, for the following warranty period:

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Roofing System Design: The completed membrane roof system shall meet or exceed the uplift criteria as shown on the structural drawings.

D. Solar Reflectance Index: Not less than 47 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.2 ROOFING MEMBRANE

A. Source Limitations: Obtain components including roof insulation, fasteners, cover board, and adhesive for roofing system from same manufacturer as membrane roofing.

B. PVC Sheet: ASTM 4434/ 4434D fiberglass reinforced Type II.

1. Thickness: 80 mils, minimum.
2. Exposed Face Color: Owner to select from Gray and Tan options.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Carlisle – Syntec: Sure-Flex FRS.
   b. Sarnafil: G 410-80
   c. Or pre-bid approved.

2.3 AUXILIARY MEMBRANE ROOFING AND INSULATION MATERIALS

A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Flashing Sheet: Manufacturer's standard sheet flashing of same material, type, reinforcement, and color as sheet membrane.

1. Thickness: 60 mils, minimum.
2. Exposed Face Color: Match field membrane.

C. Membrane Bonding Adhesive: Manufacturer's standard.

D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

E. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1-inch-wide by 0.05 inch thick, pre-punched.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to wood substrate, and acceptable to membrane roofing system manufacturer.

G. Membrane Clad Metallic Coated Steel Sheet: Manufacturer's standard membrane coated, heat weldable sheet metal capable of being formed into a variety of shapes and profiles; 24-gauge core steel, G90 galvanized steel with PVC coating laminated to one side.

H. Miscellaneous Accessories: Provide pourable sealers, preformed cone, and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

I. Sealant: Provide manufacturer's standard butyl sealant or tape for compression type terminations to membrane. Polyurethanes are not permitted.

J. Backer Rod: Closed cell, polyethylene, flexible, rope-like foam joint backing material complying with ASTM C1330 and ASTM D5249. Sized for application of seismic joint.

K. Seismic Joint Cover: Reference Section 076200 "Sheet Metal Flashing and Trim."

2.4 COVER BOARD

A. General: Provide preformed roof insulation cover boards that comply with the requirements and referenced standards and selected from manufacturer's standard size and of thickness indicated.

B. Cover Board: 1/2-inch thick, closed-cell polyisocyanurate foam core bonded to high performance coated glass fiber facers on both sides; conforming to ASTM C 1289, Type II, Class 4, (80 psi minimum) with square edges.

1. Products: Subject to compliance with requirements, provide the following:
   a. Atlas: AC Foam. HS Cover Board.
   b. Hunter Panel: H-Shield. HD Cover Board.
   c. Or pre-bid approved equal.

2.5 WALKPADS

A. Flexible Walkpads: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, manufactured by roofing system manufacturer.

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 Work:

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations, and that nailers match thicknesses of insulation.

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

3.2 PREPARATION

A. Prepare existing roof system in accordance with requirements of 070150 Preparation for Reroofing.

B. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections and protrusions.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

D. Verify that the existing drainage system is free flowing prior to beginning work.

E. Prepare all surfaces and details in accordance with the manufacturer's written installation instructions and these Contract Documents.

3.3 ROOFING INSTALLATION, GENERAL

A. Demolish existing membrane base flashings, penetration field wraps, penetration boot flashings and other existing roof membrane components that will prevent installation of new membrane base flashings and detailing in direct contact with the existing non-membrane substrates.

1. Remove only as much of the existing roof in one day as can be made watertight in the same day.

B. Vent (cut membrane in grid pattern) existing membrane in the field of the roof as recommended by manufacturer.

C. Install roofing system according to roofing system manufacturer's written instructions, provided they do not conflict with the requirements herein.

1. Install roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

D. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of each workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.4 INFILL INSULATION INSTALLATION

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

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Install insulation under area of roofing where indicated on Drawings to achieve required thickness to match elevation of existing insulation assembly. Install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

3.5 COVER BOARD INSTALLATION

A. Install cover board over prepared existing roof membrane.

B. Install cover board under area of roofing to be completed by end of each work day.

C. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

D. Install cover boards over prepared substrate with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 12-inches in each direction. Loosely butt cover boards together adhere to insulation assembly.

1. Mechanically attach cover boards to resist uplift pressure at corners, perimeter, and field of roof as shown on the Structural Drawings.

3.6 ADHERED ROOFING INSTALLATION

A. Adhere roofing over cover board or substrate board at areas to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.

1. Install sheet according to manufacturer’s written installation instructions for the specified warranty term limits.

B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

C. Accurately align roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer.

D. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer and follow the roofing manufacturer’s adhesive installation recommendation. Do not apply to splice area of roofing membrane.

E. In addition to adhering, mechanically fasten roofing membrane securely at terminations, penetrations over 18-inches wide, and perimeter of roof in accordance with manufacturer requirements.

F. Apply roofing with side laps shingled with slope of roof deck where possible.

G. Seams: Overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation. Clean seam areas prior to welding when soiled or contaminated.

1. Test lap edges with probe to verify seam weld continuity. Apply cut-edge sealant to seal cut edges of sheet when required or recommended by the manufacturer's written installation instructions.
2. Verify field strength of seams a minimum of twice daily, take samples from membrane overages to be trimmed for fit and finish.
    a. Submit tests to Owner / Consultant daily with time and location of test clearly identified upon request.
    b. Do not tack weld test samples to finished product.
3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

I. Spread sealant over field membrane at roof edges to receive integrated membrane clad metal flashing. Embed and mechanically attach membrane clad metal flashing and strip into roofing for watertight performance in accordance with the manufacturer's installation recommendations.

3.7 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates in a fashion acceptable to the manufacturer.

1. Apply bonding adhesive to substrate and underside of sheet flashing at required rate. Do not apply to seam area of flashing.
2. Overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
3. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.
4. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

3.8 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

1. Locate walkway directly adjacent to and full length of curbed mechanical equipment on serviceable sides of equipment.
2. At low sides of walkways allow weeps in continuous weld 4-inches long every four feet minimum one per walkway.

3.9 SPLASH PADS:

A. Splash Pads: Install 16-inch by 24-inch walkway products at locations of downspout outlets where drainage evacuates to roof level. Heat weld to adhere walkway products to roof membrane according to roofing system manufacturer's written instructions.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Consultant.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

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

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.11 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Consultant and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

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

END OF SECTION 075416

SHEET METAL FLASHING AND TRIM

SECTION 076200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.
4. Formed equipment support flashing.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 075113 “Built-Up Asphalt Roofing" for installation of sheet metal flashing and trim integral with BUR roofing.
3. Section 075419 “Polyvinyl-Chloride (PVC) Roofing" for installation of sheet metal flashing and trim integral with roofing.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 REROOFING (PREINSTALLATION) CONFERENCE

A. Reroofing (Preinstallation) Conference: Reference Section 070150 “Preparation for Reroofing.”

1.5 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Detail fabrication and installation layouts, and keyed details. Distinguish between shop- and field-assembled work.
2. Include identification of material, thickness, weight, and finish for each item and location in Project.
3. Include details for forming, including profiles, shapes, seams, and dimensions.
4. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
5. Include details of termination points and assemblies.
6. Include details of roof-penetration flashing.
7. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
8. Include details of special conditions.
9. Include details of connections to adjoining work.
10. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches.

C. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.

D. Qualification Data: For fabricator.

E. Sample Warranty: For special warranty.

F. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

1.7 DELIVERY, STORAGE, AND HANDLING

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

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.8 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on the Structural Drawings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Stainless-Steel Sheet: ASTM A167, Grade 2D, Type 304, soft temper, smooth finish No 2B bright; cold rolled finish.

1. Gauge: As indicated in the Sheet Metal Fabrications Schedule.

C. Pre-painted, Metallic-Coated Steel Sheet (exposed flashing & coping): ASTM A6531 A653M G90 coating designation. Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-coated by the coil-coating process to comply with ASTM A 755/A 755M.

1. High-Performance Organic Finish: Two-coat thermocured system containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2604, except as modified for 1000 hours of humidity and salt spray resistance.
2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5-mil.
3. Gauge: As indicated in the Sheet Metal Fabrications Schedule.
4. Color: To vary by location and be selected by the Owner from manufacturer's full range of standard colors.

D. Membrane Clad Metallic Coated Steel Sheet: Metallic-coated steel sheet coated with a layer of non-reinforced PVC roofing membrane flashing.

1. Gauge: As indicated in the Sheet Metal Fabrications Schedule.
2. Color: As indicated in the Sheet Metal Fabrications Schedule.

2.3 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, and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Self-Adhered High Temperature Sheet: High temperature, minimum 30-mil- thick, SBS or butyl-based rubberized sheet; maximum permanence rating of 0.05 perm, self-adhering sheet with thermoplastic film on exterior face and release-paper backing.

1. Henry Blueskin PE 200 HT.
2. Grace Ultra.
3. Carlisle WIP 300 HT.
4. Or pre-bid approved equal.

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

1. General:
   a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM sealing washers under heads of exposed fasteners bearing on weather side of metal.
   b. Blind Fasteners: Galvanized self-drilling screws gasketed with hex washer head.

c. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
d. Pop Rivet: Westward Steel with Button head, 1/8-inch diameter blind rivet, in color to match color of sheet metal.

D. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

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

1. Products:
   a. Pecora Corporation; BC-158.
   b. Tremco Incorporated; Butyl Sealant.
   c. Or pre-bid approved equal.

2. Location of Use: As indicated on the Drawings and in locations protected from UV degradation.

F. Elastomeric Sealant: Single component, Nonsag, Fast Curing, Silyl-Terminated Polyether or Polyurethane Sealant: ASTM C920, Type S, Grade NS, Class 50 for Use NT, M, A, G and O.

1. Products:
   a. BASF Building Systems; Masterseal NP 150.
   b. Tremco Incorporated; Dymonic FC.
   c. Or pre-bid approved equal.

2. Location of Use: Exposed joints in sheet metal flashing and trim, and other metal-to-metal applications.

G. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

H. Channel Support: Stainless steel A 240 (Type 304) channel supports of sufficient strength to support intended equipment.

1. Manufacturer's:
   a. Unistrut
   b. Or pre-bid approved equal.

I. Clamping Bands: Stainless steel, sizes as dictated by conditions, screw type tightening system.

J. Lead Sheet: 4 lbs. desilverized lead sheet.

K. Plastic Cement: ASTM D4856, asbestos free, of consistency required for application.

L. Seismic Joint Cover: Weather-proof exterior covers consisting of flexible rubber membrane and a closed cell foam bellows with two metal flashings adhesively and mechanically combined to the bellows. To be compatible with and acceptable to the single-ply membrane manufacturer where integral with the single-ply membrane application.

1. Configurations as indicated on the drawings:
   a. Curb-to-Wall
   b. Curb-to-Curb
   c. Cant-to-Wall

2. Manufacturer:
   a. Expand-O-Flash Expansion Joint Cover, by Johns Manville
   b. Or pre-bid approved equal.

M. Solder:

1. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
2. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn60, 60 percent tin and 40 percent lead.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Use lapped expansion joints where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

E. Seams (where indicated for soldering): Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

1. Soldering: Completely penetrate or sweat the joint. Pre-tin surfaces with the use of non-corrosive resin flux. Remove flux residue after soldering or tinning.

F. Seams (for non-solderable metal): Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 SHEET METAL FABRICATIONS SCHEDULE

A. Beauty Ring: Fabricate with profile as shown on the drawings.

1. Joint Style: Sealed and riveted.
2. Pre-painted, Metallic-Coated Steel Sheet: 24 gauge.
3. Color: To be selected by the Owner.

B. Cleat: Fabricate with profiles as shown on the Drawings.

1. Joint Style: 1/4" gap between butted ends.
2. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal. Size cleats a minimum of one gauge thicker than component to be cleated.

C. Coping: Fabricate with profile as shown on the drawings.

1. Joint Style: Standing seam.
2. Pre-painted, Metallic-Coated Steel Sheet: 24 gauge.
3. Color: To be selected by the Owner.

D. Counter Flashing: Fabricate with profile as shown on the drawings.

1. Joint Style: Lapped and sealed.
2. Pre-painted, Metallic-Coated Steel Sheet: 24 gauge.
3. Color: To be selected by the Owner.

E. Curb Cap Flashing: Fabricate with profile as shown on the drawings.

1. Joint Style: Seamed and soldered.
2. Stainless Steel: 24 gauge.

F. Drip Edge: Fabricate with profiles as shown on the Drawings.

1. Joint Style: Lapped and sealed, with interlocked hem.
2. Pre-painted, metallic-coated steel sheet: 24 gauge.
3. Color: To be selected by the Owner.

G. Drip Edge (Clad Metal): Fabricate with profiles as shown on the Drawings.

1. Joint Style: 1/8” - 1/4" gap between butted ends
2. Membrane clad metallic sheet: 24 gauge.
3. Color: Match roof membrane.

H. Edge Flashing (Clad Metal): Fabricate with profiles as shown on the Drawings.

1. Joint Style: 1/8” - 1/4" gap between butted ends

2. Membrane clad metallic sheet: 24 gauge.
3. Color: Match roof membrane.

I. Fascia Panel: Fabricate with profile as shown on the drawings.

1. Joint Style: S-locks at 48-inches on center.
2. Pre-painted, metallic-coated steel sheet, 22 gauge.
3. Provide vertically oriented breaks at 24" on center in sheet metal panels to control oil-canning (flat fascia panels only).
4. Color: To be selected by the Owner.

J. Metal Wall Panel: Fabricate with profiles to match existing coping condition.
1. Joint Style: S-Locks at 48-inches on center.
2. Sheet Metal: Pre-painted, metallic-coated sheet, 24 gauge.
3. Color: To be selected by the Owner.

K. Saddle Flashing: Fabricate with profiles as shown on the Drawings.

1. Joint Style: Seamed, riveted and sealed, with interlocking hem.
2. Pre-painted, metallic-coated steel sheet, 24 gauge.
3. Color: To be selected by the Owner.

L. Scupper Liner: Fabricate scuppers to dimensions as indicated on the Drawings.

1. Joint Style: Seamed and soldered.
2. Stainless Steel: 24 gauge.

M. Scupper Liner (Clad Metal): Fabricate with profile as shown on the drawings.

1. Joint Style: Varies as required by manufacturer of roofing system.
2. Sheet Metal: Membrane clad metallic sheet, 24 gauge.
3. Color: Match roof membrane.

N. Storm Collars:

1. Joint Style: Interlocking, seamed, and soldered. Pop-rivet for extra strength where required.
2. Stainless Steel: 24 gauge.
3. Products – Type as indicated on the drawings:
   a. SBC Industries, Clamp Umbrella
   b. SBC Industries, Bell
   c. Or pre-bid approved equal.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter

thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.

1. Gutter Profile: As indicated in the drawings and according to cited sheet metal standard.
2. Color: To be selected by the Owner.
3. Gutters with Girth up to 15 Inches: Fabricate from the following materials:
   a. Pre-painted, Metallic-Coated Steel Sheet: 0.022 inch thick.
4. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
5. Gutter Brackets: Form from 1/8-inch-thick by 1-1/2inch wide steel. Prime and paint to match or provide cover to match gutter.
6. Gutter Hangers: Hang Fast.

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

1. Hanger Style: Straps.
2. Color: To be selected by the Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

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

3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective

coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 1 inch apart. Attach each cleat at the rates indicated on the Drawings and with two fasteners minimum. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering.
2. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
3. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.
2. Anchor and loosely lock back edge of gutter to continuous cleat.
3. Anchor gutter with gutter hangers spaced not more than 36 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
4. 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.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 36 inches o.c.
2. Provide elbows at base of downspout to direct water away from building.

D. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

1. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 6-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Extend counterflashing 4 inches over base flashing unless noted otherwise. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

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

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

TRANSLUCENT FIBERGLASS PANEL SKYLIGHTS

SECTION 084523

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the insulated translucent sandwich panel skylight system and accessories as shown and specified. Work includes providing and installing:

1. Flat factory prefabricated structural insulated translucent sandwich panels.
2. Aluminum installation system.
3. Aluminum flashing attached to skylights.

1.2 SUBMITTALS

A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of skylight components.

B. Submit shop drawings. Include elevations and details.

C. Submit manufacturer's color charts showing the full range of colors available for factory-finished aluminum.

1. Submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.

a. Sandwich panels: 14-inches x 28-inches units
b. Factory finished aluminum: Manufacturers Color Chart

D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.

E. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.

1. Reports required are:

a. International Building Code Evaluation Report – including thermally broken panels.
b. Flame Spread and Smoke Developed (UL 723) – Submit UL Card.
c. Burn Extent (ASTM D 635).
d. Color Difference (ASTM D 2244) – on outdoor weathered face-sheets.
e. Impact Strength (UL 972).
f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037).
g. Bond Shear Strength (ASTM D 1002).
h. Beam Bending Strength (ASTM E 72).
i. Fall Through Resistance (ASTM E 661).

j. Insulation U-Factor (NFRC 100).
k. NFRC System U-Factor Certification (NFRC 700).
l. Solar Heat Gain Coefficient (NFRC or Calculations).
m. Condensation Resistance Factor (AAMA 1503).
n. Air Leakage (ASTM E 283).
o. Structural Performance (ASTM E 330).
p. Water Penetration (ASTM E 331).
q. Class A Roof Covering Burning Brand (ASTM E 108).

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope and location. At least three of the projects shall have been in successful use for ten years or longer.
2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an accredited agency.
3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with AC177 “Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems” as issued by the ICC-ES.

B. Installer’s Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified skylight systems for at least two consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

1.4 PERFORMANCE REQUIREMENTS

A. The manufacturer shall be responsible for the configuration and fabrication of the complete skylight panel system.

1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Standard skylight system shall have less than 0.01 cfm/ft² air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.
3. Structural Loads: Provide skylight system capable of handling the loads as defined in the structural general notes.

1.5 DELIVERY STORAGE AND HANDLING

A. Deliver panel system, components and materials in manufacturer's standard protective packaging.

B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.6 WARRANTY

A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work, which fails in materials or workmanship within five years of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering, defects in accessories, insulated translucent sandwich panels and other components of the work.

B. Extended Warranty: 10 Years on the following items:

1. Delamination affecting structural strength.
2. External exposure of reinforcing glass fibers for the exterior face.
3. Color change in excess of 8 Delta E units caused by normal weathering.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers: Subject to compliance with requirements, ASTM D2244 testing on outdoor weathered face sheet, and ICC-ES listing including thermally broken panel. Provide products by one of the following:
1. Kalwall Corporation; Skyroofs
2. Major Industries; Guardian 275
3. Or pre-bid approved equal.

2.2 PANEL COMPONENTS

A. Face Sheets

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.

a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.

2. Interior face sheets:

a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 50 and smoke developed no greater than 250 when tested in accordance with UL 723.
b. Burn extent by ASTM D 635 shall be no greater than 1-inch.

3. Exterior face sheets:

a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south, determined by the average of at least three white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.

b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact minimum of 70 ft. lbs. without fracture or tear when impacted by a 3-1/4-inch diameter, 5 lb. free-falling ball per UL 972.

4. Appearance:

a. Exterior face sheets: Smooth, .070-inch thick and Crystal or White in color.
b. Interior face sheets: Smooth, .045-inch thick and Crystal or White in color.
c. Face sheets shall not vary more than ± 10% in thickness and be uniform in color.

B. Grid Core

1. Thermally broken I beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16-inch.
2. I-beam Thermal break: Minimum 1", thermoset fiberglass composite or pour and debridged.

C. Laminate Adhesive

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives".
2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:

a. 50% Relative Humidity at 68° F: 540 PSI
b. 182° F: 100 PSI
c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.3 PANEL CONSTRUCTION

A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.

1. Thickness: 2-3/4-inch.
2. NFRC VLT: 13% to 28% depending on face sheet selection.
3. NFRC Solar heat gain coefficient: 0.21 to 0.30 depending on face sheet selection.
4. Panel U-factor by NFRC certified laboratory: 0.23.
5. Complete insulated panel system shall have NFRC certified U-factor of 0.30.
6. Grid pattern: Nominal size 12-inch x 24-inch Shoji pattern.

B. Standard panels shall deflect no more than 1.9-inch at 30 PSF in 10-feet 0-inches span without a supporting frame by ASTM E 72.

C. Thermally broken panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.

D. Skylight System:

1. Skylight system shall pass Class A Roof Burning Brand Test by ASTM E 108.

E. Skylight System shall meet the fall through requirements of OSHA 1910.23 as demonstrated by testing in accordance with ASTM E661, thereby not requiring supplemental screens or railings.

2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure system:

1. Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
2. Curved closure system may be roll formed.
3. Skylight perimeter closures at curbs shall be factory sealed to panels.

B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.

C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.

D. Finish:

1. Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color to be selected from manufacturer's standards.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Installer shall examine substrates, supporting structure and installation conditions.

B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3.3 INSTALLATION

A. Install the skylight system in accordance with the manufacturer's suggested installation recommendations and approved shop drawings.

1. Anchor component parts securely in place by permanent mechanical attachment system.

2. Accommodate thermal and mechanical movements.
3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.

B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 FIELD QUALITY CONTROL

A. Water Test: Installer to test skylights according to procedures in AAMA 501.2.

B. Repair or replace work that does not pass testing or that is damaged by testing and retest work.

3.5 CLEANING

A. Clean the skylight system interior and exterior, immediately after installation.

B. Refer to manufacturer's written recommendations.

END OF SECTION 084523

STORM DRAINAGE PIPING SPECIALTIES

SECTION 221423

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Roof drains.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 METAL ROOF DRAINS

A. Cast-Iron, Large-Sump, Side Outlet, General-Purpose Roof Drains:

1.	Standard:	ASME A112.6.4, for general-purpose roof drains.
2.	Body Material:	Cast iron.
3.	Dimension of Body:	14-inch diameter, minimum.
4.	Drain Line Outlet:	3” field verify.
5.	Combination Flashing Ring and Gravel Stop:	Required.
6.	Flow-Control Weirs:	Not required.
7.	Outlet:	Side outlet.
8.	Outlet Type:	As required to connect to downspout extension.
9.	Extension Collars:	Not required.
10.	Underdeck Clamp:	Required.
11.	Expansion Joint:	Not required.
12.	Sump Receiver Plate:	Required.
13.	Dome Material:	Cast iron.

14. Perforated Gravel Guard: Not required.
15. Vandal-Proof Dome: Not required.
16. Water Dam: Not required.

2.2 FLASHING MATERIALS

A. Lead Flashing Sheet: 4.0-lb/sq. ft.

B. Fasteners: Metal compatible with material and substrate being fastened.

C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

D. Solder: ASTM B 32, lead-free alloy.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install replacement roof drains where indicated on the Drawings.

1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.

3.2 FLASHING INSTALLATION

A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Solder joints of 4.0-lb/sq. ft. lead sheets, 0.0625-inch thickness or thinner.

3.3 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221423

GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

GENERAL NOTES

1. VERIFY ALL DIMENSIONS AND CONDITIONS OF THE PROJECT, INCLUDING EXISTING CLADDING SYSTEM CONSTRUCTION AND MATERIALS.
2. STAGING AND STORAGE AREAS SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE AT THE PRE-CONSTRUCTION MEETING. ASSUME A REASONABLE AMOUNT OF STORAGE AND STAGING SPACE WILL BE MADE AVAILABLE.
3. PROTECT BUILDING SURFACES, FINISHES, AND SYSTEMS FROM DAMAGE, DISCOLORATION, ETC. DURING THE COURSE OF ALL CONSTRUCTION ACTIVITIES. REPAIR / REPLACE PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE EXECUTION OF THE WORK; RETURN DAMAGED PROPERTY TO PRE-CONSTRUCTION CONDITION.
4. PROVIDE NECESSARY MEASURES FOR PERSONAL FALL PROTECTION DURING THE COURSE OF CONSTRUCTION. PERSONAL FALL PROTECTION DEVICES ARE NOT, NOR WILL BE, PROVIDED BY THE OWNER ON ANY BUILDING AREA DESIGNATED TO RECEIVE WORK.
5. EXISTING MATERIALS AND CONSTRUCTION ARE NOTED ON THE DRAWINGS AS EXISTING OR EXIST. ALL OTHER NOTATIONS INDICATE NEW MATERIALS, PRODUCTS, AND CONSTRUCTION UNLESS OTHERWISE STATED OR INDICATED.
6. ALL CONSTRUCTION SHALL CONFORM TO THE 2022 OREGON STRUCTURAL SPECIALTY CODE, AND ALL LOCAL GOVERNING BUILDING CODES AND ORDINANCES.
7. LOCATE ALL EXISTING UTILITIES WITHIN OR SERVING AREAS OF WORK WHETHER SHOWN HEREIN OR NOT. PROTECT EXISTING UTILITIES FROM DAMAGE.
8. THE REQUIREMENTS FOR THE WORK OF THIS CONTRACT ARE DESCRIBED IN THIS DRAWING SET AND THE PROJECT MANUAL.
9. PROTECT BUILDING OCCUPANTS AND PASSERS-BY FROM FALLING DEBRIS OR EQUIPMENT. DO NOT THROW MATERIALS FROM THE BUILDING OR STAGING AREAS.
10. ROOF AND BUILDING ACCESS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. NO INTERIOR ACCESS IS PRESENT.
11. ALL ITEMS TRANSPORTED TO THE AREAS OF WORK SHALL BE TRANSPORTED USING APPROVED AND SAFE METHODS OF LOADING. DO NOT OVER-LOAD THE STRUCTURE.
12. EMPLOY MEANS OF PROTECTING THE BUILDING OCCUPANTS AND GENERAL PUBLIC AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
13. TEMPORARY STAGING, SCAFFOLDING, AND RUNWAYS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PLACED IN DESIGNATED LOCATIONS ONLY.
14. COORDINATE PERMITS REQUIRED FOR PERFORMANCE OF THE WORK, INCLUDING BUT NOT LIMITED TO ROAD CLOSURES, PARKING STALLS, SIDEWALK CLOSURES, AND SCAFFOLD ERECTION, WITH THE OWNER'S REPRESENTATIVE.
15. PROTECT BUILDING GROUNDS INCLUDING LANDSCAPE AREAS DURING CONSTRUCTION ACTIVITIES.
16. RESTORE SITE TO PRE-CONSTRUCTION CONDITION AT PROJECT COMPLETION.
17. ALL EXISTING ROOF SURFACES THAT WILL BE SUBJECTED TO FOOT AND/OR EQUIPMENT TRAFFIC IN ANY WAY SHALL BE PROTECTED.
18. ALL SCAFFOLDING, STAIR TOWERS, LADDERS, AND OTHER MEANS OF STAGING AND/OR ACCESS SHALL BE SECURED AT ALL TIMES TO PREVENT PEDESTRIAN ACCESS.
19. EXISTING ROOF SYSTEMS HAVE BEEN TESTED FOR ASBESTOS CONTAINING MATERIALS (ACM). NO ASBESTOS WAS IDENTIFIED WITHIN ROOFING SAMPLES TAKEN FROM ROOF AREAS TO BE REPLACED AS PART OF THIS SCOPE OF WORK.
20. WHILE NOT TESTED FOR ASBESTOS CONTAINING MATERIALS (ACM), ALL REPAIR MASTICS/SEALANTS ARE ASSUMED TO BE ACM. ADDITIONAL TESTING MAY BE REQUIRED BY THE CONTRACTOR TO ENSURE ALL MATERIALS TO BE DEMOLISHED ARE HANDLED APPROPRIATELY WITH REGARD TO OROSHA, DEQ AND OWNER.
21. THIS PROJECT INCLUDES A BASE BID AND TWO ALTERNATES. BID WORK DOES NOT INCLUDE ANY INCREASE IN AREA OR CHANGES TO OCCUPANCY.

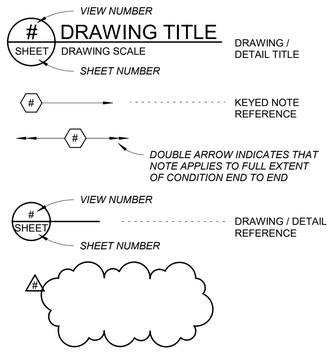
BASE BID: INCLUDES, BUT IS NOT LIMITED TO COMPLETE REMOVAL OF THE EXISTING BUILT-UP ROOF MEMBRANE ASSEMBLIES AT SECTORS A & B. REMOVAL OF EXISTING SHEET METAL FLASHINGS, CURBED EDGES, DRAINS WHERE INDICATED, AND ABANDONED EQUIPMENT. INSTALLATION OF NEW 4-PLY AND A CAP BUILT-UP ROOF MEMBRANE ASSEMBLIES, FLASHINGS, WALL PANELS, COPING, GUTTERS AND DRAINS. INSTALLATION OF PERMANENT FALL PROTECTION . INSTALLATION OF ROOF REPAIRS AT AREAS G, I & L.

ALTERNATE NO.1: DUPLICATES THE BASE BID ARTICLE ABOVE WITH THE REPLACEMENT MEMBRANE AT SECTORS A & B TO BE A TWO-PLY SBS MODIFIED BITUMEN MEMBRANE ASSEMBLY IN LIEU OF 4-PLY AND A CAP BUILT- UP ROOFING.

ALTERNATE NO. 2: INCLUDES, BUT IS NOT LIMITED TO ROOF OVERLAY OF THE EXISTING JP STEVENS HYPALON ROOF ASSEMBLIES AT SECTORS C & D WITH A NEW PVC SINGLE-PLY ROOF RE-COVER ASSEMBLY. DEMOLITION OF EXISTING AND INSTALLATION OF NEW FLASHINGS, WALL PANELS, COPING, SEISMIC JOINT COVERS AND SKYLIGHTS. INSTALLATION OF PERMANENT FALL PROTECTION.

SYMBOLS & ABBREVIATIONS

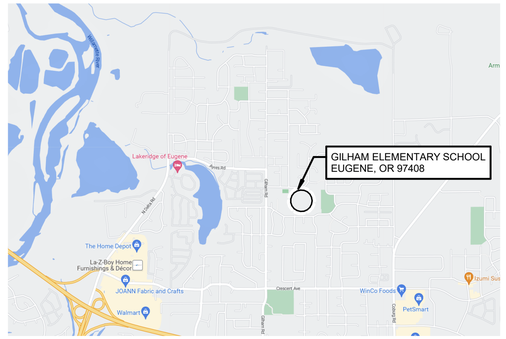
SYMBOLS



ABBREVIATIONS

@	AT (SPACING / FREQUENCY)
CONT.	CONTINUOUS
DIA. or Ø	DIAMETER
EXIST. or (E)	EXISTING
GA	GAGE (THICKNESS)
GALV.	METALLIC-COATED (FOR SHEET METAL) - or - HOT DIPPED GALVANIZED (FOR STRUCTURAL / MISCELLANEOUS METAL)
MAX.	MAXIMUM
MIN.	MINIMUM
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER (SPACING / FREQUENCY)
SIM.	SIMILAR
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
w/	WITH

SITE MAPS



1 GI-1 LOCATION MAP
NOT TO SCALE

N

2 GI-1 VICINITY MAP
NOT TO SCALE

N

3 GI-1 AERIAL VIEW
NOT TO SCALE

N

PROJECT TEAM

OWNER

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200 N. Monroe St.
Eugene, OR 97402

(541) 790-7700

Contact: Glen Macdonald,
Capital Improvement Program

ROOF CONSULTANT

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(503) 280-8759

Contact: Thomas Bertrand, RRO, AHERA

STRUCTURAL CONSULTANT

TM Rippey Consulting Engineers
7650 SW Beveland St. Suite 100
Tigard, Oregon 97223

(503) 443-3900

Contact: Ralph Turnbaugh, P.E.

DRAWING SHEET INDEX

BID SET

PROFESSIONAL ROOF CONSULTANTS INC
606 SE 9th Avenue
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EUGENE SCHOOL DISTRICT 4J

GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
GENERAL INFORMATION

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO SCALE INDICATED.

Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

Drawn: GC
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PRC No.: R3282.11

Sheet No.:
GI-1

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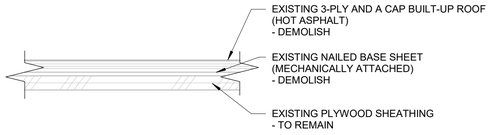
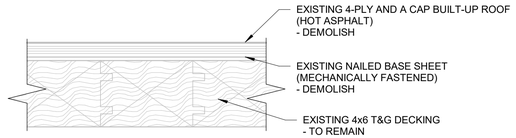
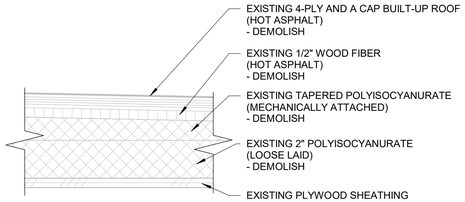
EXISTING ROOF SYSTEMS



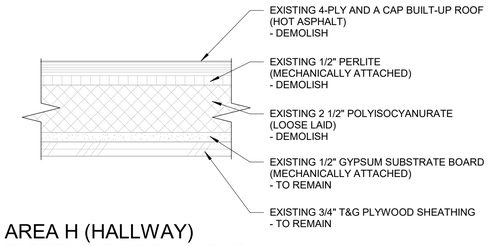
1 GI-2 — AREAS A, B, D, E & K
EXISTING ROOF ASSEMBLY
3" = 1'-0"



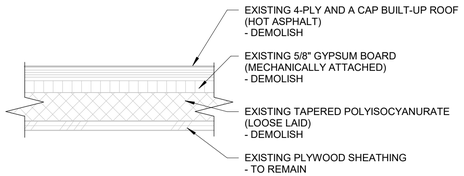
5 GI-2 — AREA H (BASE OF DOME)
EXISTING ROOF ASSEMBLY
3" = 1'-0"



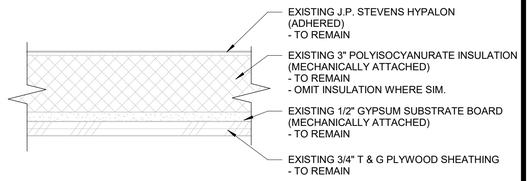
2 GI-2 — AREA C
EXISTING ROOF ASSEMBLY
3" = 1'-0"



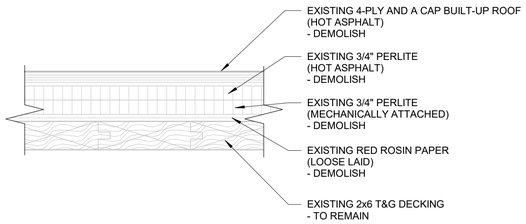
6 GI-2 — AREA H (HALLWAY)
EXISTING ROOF ASSEMBLY
3" = 1'-0"



3 GI-2 — AREA F
EXISTING ROOF ASSEMBLY
3" = 1'-0"

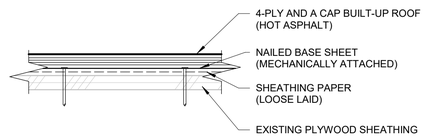


7 GI-2 — AREAS N,P,T,V & W
EXISTING ROOF ASSEMBLY
3" = 1'-0"

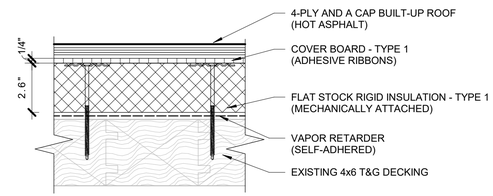


4 GI-2 — AREA H (DOME)
EXISTING ROOF ASSEMBLY
3" = 1'-0"

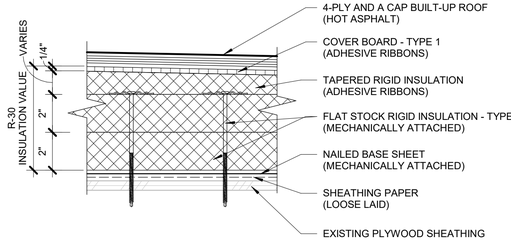
NEW BASE BID ROOF SYSTEMS



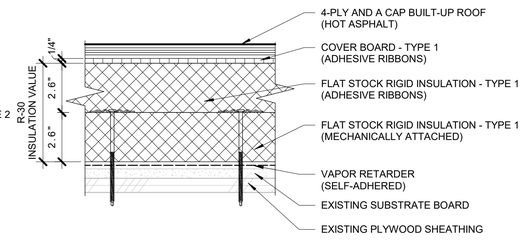
8 GI-2 — AREAS A, B, D, E, & K
ROOF ASSEMBLY 1
3" = 1'-0"



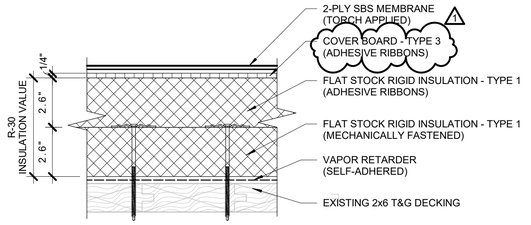
11 GI-2 — AREA H (BASE OF DOME)
ROOF ASSEMBLY 4
3" = 1'-0"



9 GI-2 — AREAS C & F
ROOF ASSEMBLY 2
3" = 1'-0"



12 GI-2 — AREA H (HALLWAY)
ROOF ASSEMBLY 5
3" = 1'-0"



10 GI-2 — AREA H (DOME)
ROOF ASSEMBLY 3
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J

GILHAM ELEMENTARY SCHOOL

ROOF REPLACEMENT

Sheet Title:
ROOF ASSEMBLIES

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

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Revisions:
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Drawn: GC
Checked: TWB

PRC No.: R3282.11

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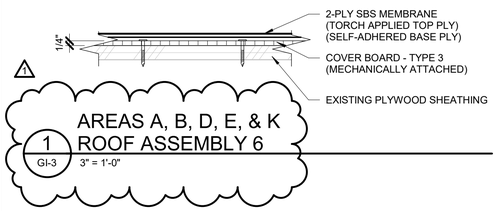
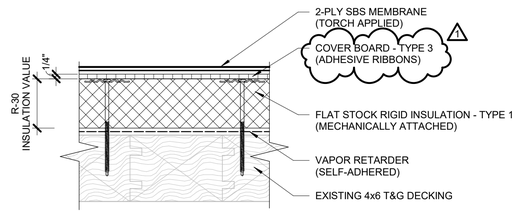
GI-2

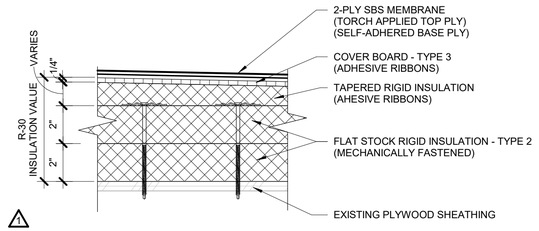
NEW ALTERNATE NO. 1 ROOF SYSTEMS



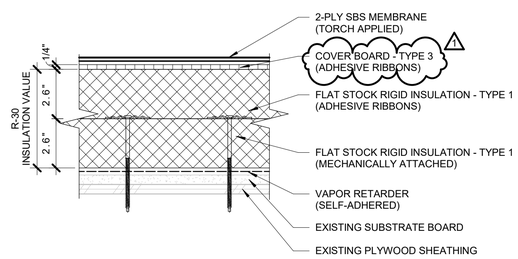
1 GI-3 AREAS A, B, D, E, & K ROOF ASSEMBLY 6
3" = 1'-0"



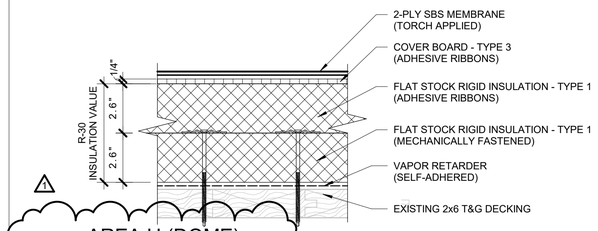
4 GI-3 AREA H (BASE OF DOME) ROOF ASSEMBLY 9
3" = 1'-0"



2 GI-3 AREAS C & F ROOF ASSEMBLY 7
3" = 1'-0"

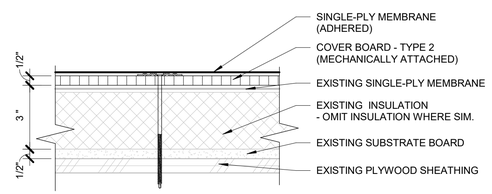


5 GI-3 AREA H (HALLWAY) ROOF ASSEMBLY 10
3" = 1'-0"



3 GI-3 AREA H (DOME) ROOF ASSEMBLY 8
3" = 1'-0"

NEW ALTERNATE NO. 2 ROOF SYSTEMS



6 GI-3 AREAS N, P, T, V & W ROOF ASSEMLY 11
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J

GILHAM ELEMENTARY SCHOOL

ROOF REPLACEMENT

Sheet Title:
ROOF ASSEMBLIES - ALTERNATES NO. 1 AND NO. 2

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

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Revisions:
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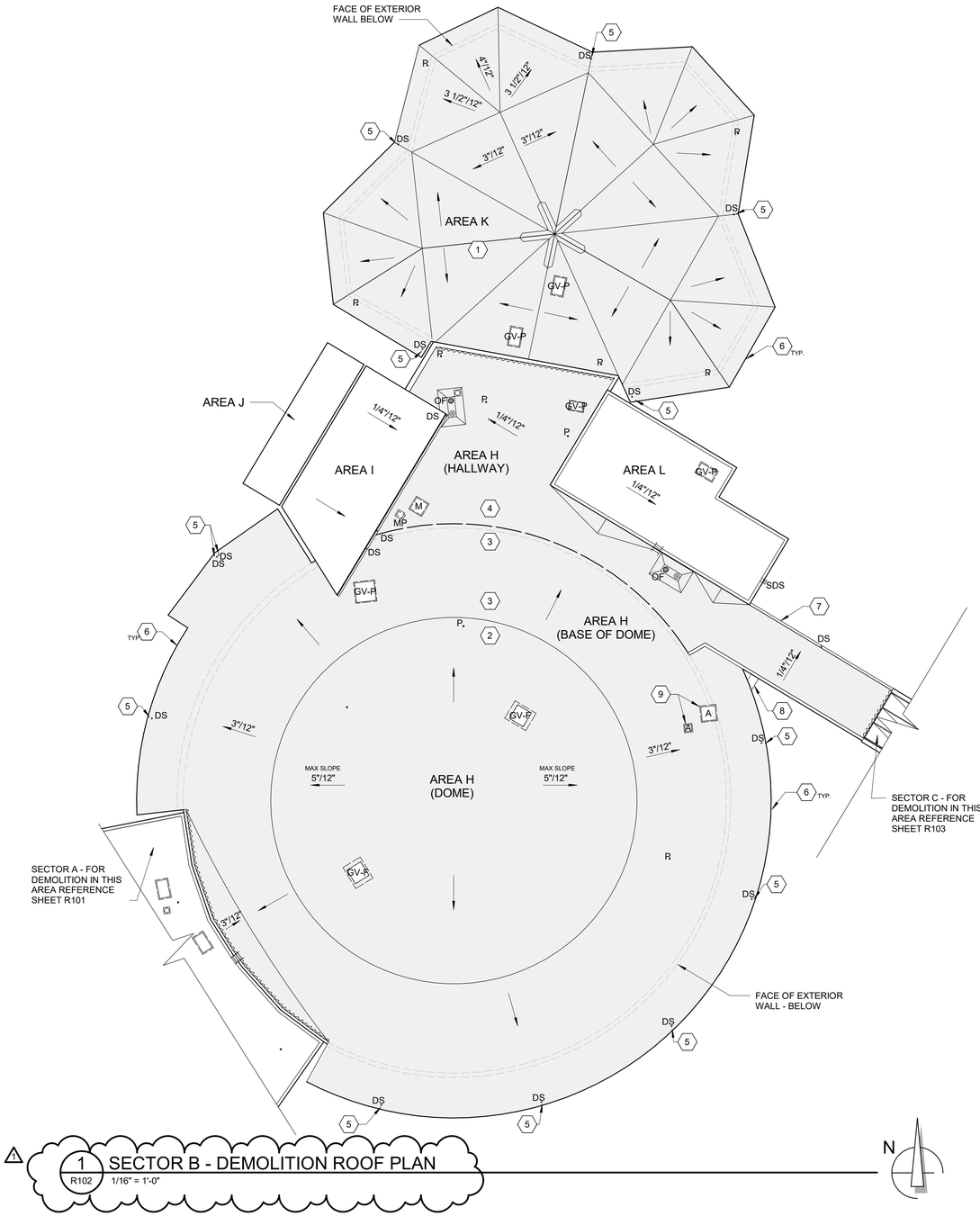
PRC No.: R3282.11

Sheet No.:
GI-3



1 R102 SECTOR B - DEMOLITION ROOF PLAN

1/16" = 1'-0"

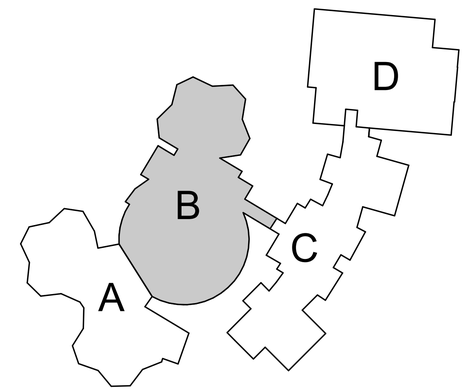
KEY NOTES

1. DEMOLISH EXISTING 3-PLY AND A CAP BUILT-UP ROOF DOWN TO THE EXISTING DECK.
   -REFERENCE DETAIL 1/GI-2 FOR EXISTING ASSEMBLY
2. DEMOLISH EXISTING 4-PLY AND A CAP BUILT-UP ROOF DOWN TO THE EXISTING DECK.
   -REFERENCE DETAIL 4/GI-2 FOR EXISTING ASSEMBLY
3. DEMOLISH EXISTING 4-PLY AND A CAP BUILT-UP ROOF DOWN TO THE EXISTING DECK.
   -REFERENCE DETAIL 5/GI-2 FOR EXISTING ASSEMBLY
4. DEMOLISH EXISTING 4-PLY AND A CAP BUILT-UP ROOF DOWN TO THE EXISTING SUBSTRATE BOARD.
   -REFERENCE DETAIL 6/GI-2 FOR EXISTING ASSEMBLY
5. DEMOLISH EXISTING DOWNSPOUT DROP DRAIN
   -REFERENCE SHEET R106
6. DEMOLISH EXISTING CURBED EDGE BLOCKING AND SHEET METAL FLASHING.
7. DEMOLISH EXISTING GUTTER ASSEMBLY, DO NOT DAMAGE EXISTING DOWNSPOUT AND DOWNSPOUT CONNECTION THROUGH THE WALL.
8. DEMOLISH METAL ROOF PANEL.
9. DEMOLISH ABANDONED CURBS.

LEGEND (SYMBOLS APPLY TO SHADED AREA ONLY)

- SHADED AREA INDICATES EXTENT OF ROOF DEMOLITION SCOPE OF WORK
- RISE / RUN — X" / 12" — DOWNWARD DIRECTION OF SLOPE — EXISTING ROOF SLOPE
- OF — EXISTING SUMPED ROOF DRAIN AND OVERFLOW DRAIN
- SDS — EXISTING THROUGH WALL SCUPPER AND CONDUCTOR HEAD w/ DOWNSPOUT
- P — EXISTING PLUMBING VENT PIPE PENETRATION
- MP — EXISTING CURBED MULTI-PIPE PENETRATION
- GV-F — EXISTING CURBED FABRA-SYLE GRAVITY VENT
- GV-P — EXISTING CURBED PENTHOUSE-STYLE GRAVITY VENT
- M — EXISTING CURBED MECHANICAL UNIT
- EXISTING CURBED FAN
- EXISTING WALL-MOUNTED ACCESS LADDER
- EXISTING SEISMIC JOINT
- A — ABANDONED CURB -REFERENCE ASSOCIATED KEY NOTE.
- DS — EXISTING GUTTER AND DOWNSPOUT
- EXISTING RIDGE VENT
- DS — EXISTING DOWNSPOUT DROP

KEY PLAN



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EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
SECTOR B - DEMOLITION PLAN

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

Drawn: GC
Checked: TWB

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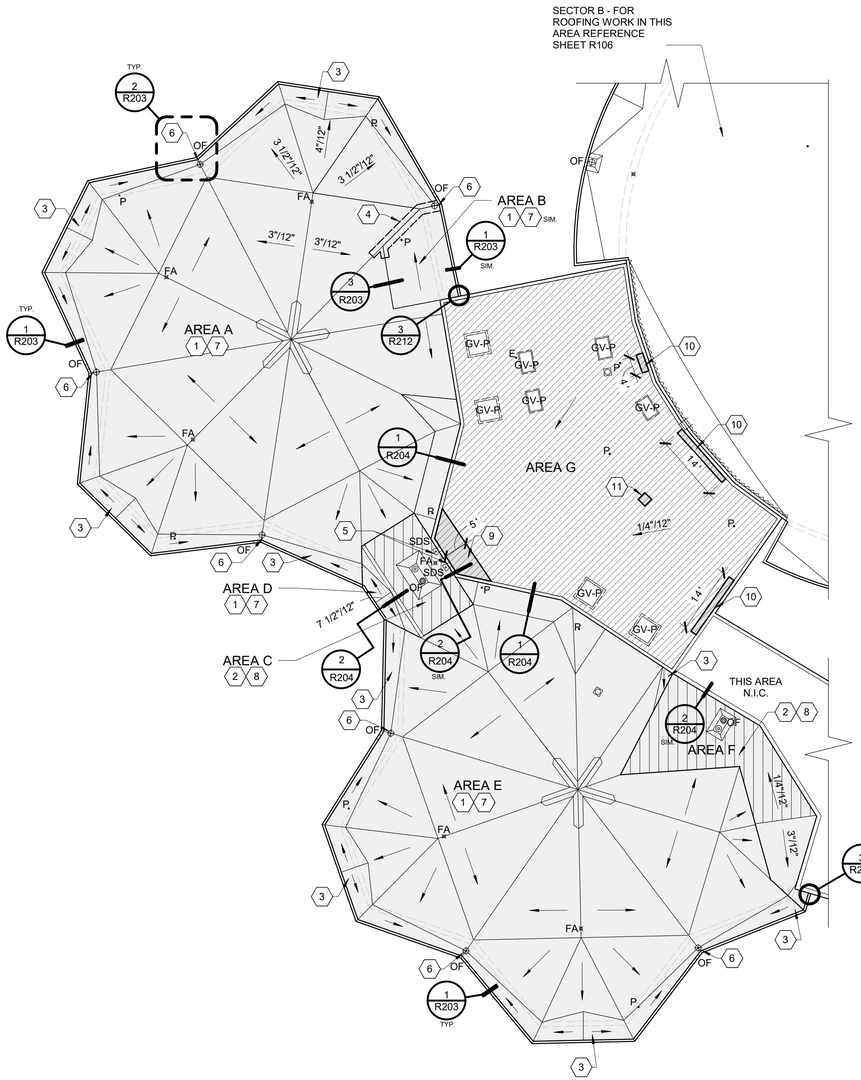
Sheet No.:
R102



1 SECTOR A - ROOF PLAN
R105 1/16" = 1'-0"

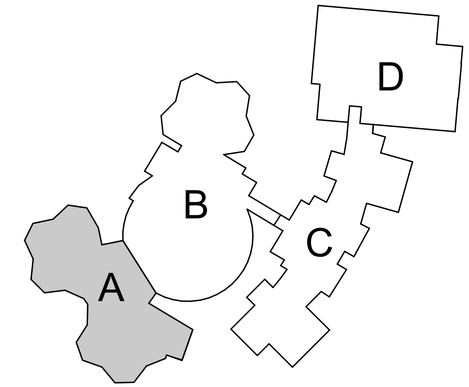
KEY NOTES

1. INSTALL 4-PLY AND A CAP BUILT-UP ROOF ASSEMBLY (ROOF ASSEMBLY 1) -REFERENCE 8/GI-2
2. INSTALL 4-PLY AND A CAP BUILT-UP ROOF ASSEMBLY (ROOF ASSEMBLY 2) -REFERENCE 9/GI-2
3. INSTALL CRICKETS PROVIDING A MINIMUM OF 1/4" FINISH SLOPE IN THE DIRECTION OF DRAINAGE.
4. INSTALL REINFORCED FLUID-APPLIED FLASHING OVER THE FINISHED ROOF MEMBRANE ASSEMBLY WITHIN 12" OF CENTERLINE OF VALLEY.
5. RAISE DOWNSPOUT OUTLETS TO ADJUST FOR NEW ROOF THICKNESS
6. REPAIR ROOF DECK AT DEMOLISHED DOWNSPOUT DROP DRAIN -REFERENCE STRUCTURAL
7. ALTERNATE NO.1: INSTALL 2-PLY SBS ROOF ASSEMBLY (ROOF ASSEMBLY 6). -REFERENCE 1/GI-3
8. ALTERNATE NO.1: INSTALL 2-PLY SBS ROOF ASSEMBLY (ROOF ASSEMBLY 7). -REFERENCE 2/GI-3
9. BUR MEMBRANE REPAIR - REINFORCED FLUID-APPLIED MEMBRANE APPLICATION: COAT AREA OF PONDING TO THE EXTENTS INDICATED.
10. BUR MEMBRANE REPAIR - ALUMINUM COATING APPLICATION.
11. BUR MEMBRANE REPAIR - MEMBRANE PATCH

LEGEND (SYMBOLS APPLY TO SHADED/HATCHED AREAS ONLY)

- SHADED AREA INDICATES EXTENT OF ROOF REPLACEMENT SCOPE OF WORK
- HATCH INDICATES AREAS TO BE REPAIRED
- SHADED HATCH INDICATES PORTION OF ROOF TO RECEIVE A TAPERED INSULATION ASSEMBLY
- INDICATES APPROXIMATE EXTENT / LOCATION OF REPAIR ACTIVITIES REFERENCE KEY NOTES AND SPECIFICATIONS.
- RISE / RUN — X" / 12" — DOWNWARD DIRECTION OF SLOPE — INDICATES DIRECTION OF ROOF SLOPE- SLOPE IS STRUCTURAL EXCEPT WHERE CRICKETS OR TAPERED INSULATION IS SPECIFICALLY INDICATED.
- 1A/R209 1B/R209 OF — SUMPED ROOF DRAIN AND OVERFLOW DRAIN
- SDS — EXISTING THROUGH WALL SCUPPER AND CONDUCTOR HEAD w/ DOWNSPOUT
- 7/R210 P — EXISTING PLUMBING VENT PIPE PENETRATION
- GV-P — EXISTING CURBED PENTHOUSE-STYLE GRAVITY VENT
- 1/R210 — EXISTING CURBED FAN
- EXISTING WALL-MOUNTED ACCESS LADDER
- 4/R203 — EXISTING RIDGE VENT
- OF — ROOF DRAIN & OVERFLOW SCUPPER
- 1 SIM 8/R211 FA — FALL PROTECTION TIE-OFF ANCHOR -REFERENCE STRUCTURAL

KEY PLAN



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606 SE 9th Avenue
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P: (503) 280-8759 | F: (503) 280-8866

EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
SECTOR A - ROOF PLAN

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

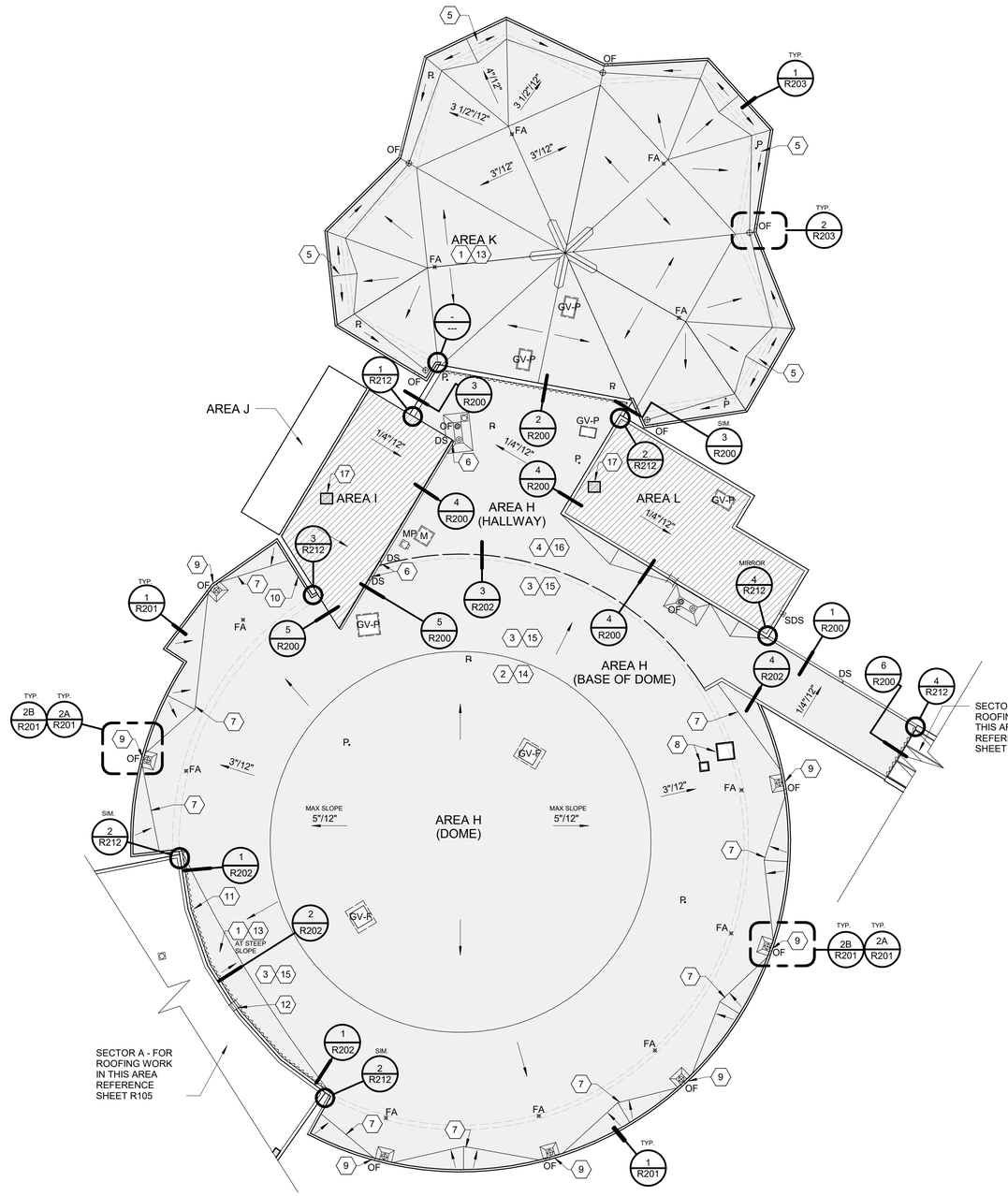
Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

Drawn: GC
Checked: TWB

PRC No.: R3282.11

Sheet No.:
R105



1 R106 SECTOR B - ROOF PLAN

1/16" = 1'-0"

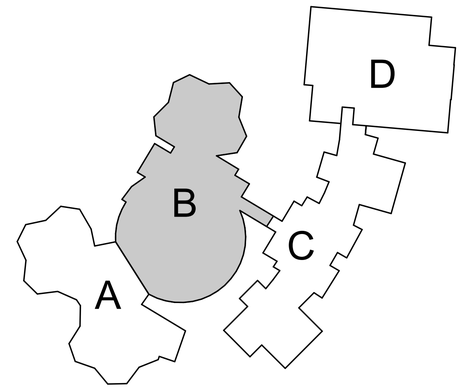
KEY NOTES

1. INSTALL 4-PLY AND A CAP BUILT-UP ROOF ASSEMBLY (ROOF ASSEMBLY 1) -REFERENCE 8/GI-2
2. INSTALL 2-PLY SBS MEMBRANE ROOF ASSEMBLY (ROOF ASSEMBLY 3) -REFERENCE 10/GI-2
3. INSTALL 4-PLY AND A CAP BUILT-UP ROOF ASSEMBLY (ROOF ASSEMBLY 4) -REFERENCE 11/GI-2
4. INSTALL 4-PLY AND A CAP BUILT-UP ROOF ASSEMBLY (ROOF ASSEMBLY 5) -REFERENCE 12/GI-2
5. INSTALL CRICKETS PROVIDING A MINIMUM OF 1/4" FINISH SLOPE IN THE DIRECTION OF DRAINAGE
6. RAISE DOWNSPOUT OUTLETS TO ADJUST TO NEW ROOF THICKNESS
7. INSTALL INSULATION CRICKET WITH 1/2" PANEL SLOPE UTILIZING A 3:1 LENGTH/WIDTH RATIO
8. INFILL DECK AT DEMOLISHED ABANDONED EQUIPMENT -REFERENCE STRUCTURAL
9. REPAIR ROOF DECK AT DEMOLISHED DOWNSPOUT DROP DRAIN -REFERENCE STRUCTURAL
10. TAPER PARAPET ALONG INDICATED EDGE OF ROOF TO PREVENT PARAPET FROM RAISING ABOVE AND BLOCKING THE ADJACENT WINDOWS. TAPER PARAPET TO A CURBED EDGE. -REFERENCE ADJACENT DETAILS.
11. REMOVE EXISTING FOIL FACED TAPE FROM ALONG THE EDGE OF THE SEISMIC JOINT COVER. INSTALL EPDM COVER TAPE STRIP ALONG ENTIRE EDGE OF SEISMIC JOINT. - REFERENCE DETAIL 2/R202
12. LADDER REPAIR -REFERENCE STRUCTURAL
13. ALTERNATE NO. 1: INSTALL 2-PLY SBS MEMBRANE ROOF ASSEMBLY (ROOF ASSEMBLY 6) -REFERENCE 1/GI-3
14. ALTERNATE NO. 1: INSTALL 2-PLY SBS MEMBRANE ROOF ASSEMBLY (ROOF ASSEMBLY 8) -REFERENCE 3/GI-3
15. ALTERNATE NO. 1: INSTALL 2-PLY SBS MEMBRANE ROOF ASSEMBLY (ROOF ASSEMBLY 9) -REFERENCE 4/GI-3
16. ALTERNATE NO. 1: INSTALL 2-PLY SBS MEMBRANE ROOF ASSEMBLY (ROOF ASSEMBLY 10) -REFERENCE 5/GI-3
17. SINGLE-PLY MEMBRANE REPAIR - MEMBRANE PATCH

LEGEND (SYMBOLS APPLY TO SHADED/HATCHED AREA ONLY)

- SHADED AREA INDICATES EXTENT OF ROOF REPLACEMENT SCOPE OF WORK
- HATCH INDICATES AREAS TO BE REPAIRED
- INDICATES APPROXIMATE EXTENT / LOCATION OF REPAIR ACTIVITIES REFERENCE KEY NOTES AND SPECIFICATIONS.
- RISE / RUN; X" / 12"; DOWNWARD DIRECTION OF SLOPE — ROOF SLOPE; ROOF DECK IS STRUCTURALLY SLOPED TO THE RATIO INDICATED UNLESS OTHERWISE NOTED
- 1A R209 / 1B R209 — EXISTING SUMPED ROOF DRAIN AND OVERFLOW DRAIN
- SDS — EXISTING THROUGH WALL SCUPPER AND CONDUCTOR HEAD w/ DOWNSPOUT
- 7 R210 / 1 R211 / 2 R211 / 3 R211 — EXISTING PLUMBING VENT PIPE PENETRATION
- 5 R210 MP — EXISTING CURBED MULTI-PIPE PENETRATION
- 2 R210 / 3 R210 GV-R — EXISTING CURBED FABRA-SYLE GRAVITY VENT
- 4 R210 GV-P — EXISTING CURBED PENTHOUSE-STYLE GRAVITY VENT
- 6 R210 M — EXISTING CURBED MECHANICAL UNIT
- 1 R210 / 4 R210 — EXISTING CURBED FAN
- EXISTING WALL-MOUNTED ACCESS LADDER
- EXISTING SEISMIC JOINT
- DS — EXISTING GUTTER AND DOWNSPOUT
- 4 R203 — EXISTING RIDGE VENT
- OF — ROOF DRAIN & OVERFLOW SCUPPER
- 9 R211 FA — FALL PROTECTION TIE-OFF ANCHOR -REFERENCE STRUCTURAL
- OF — SUMPED DRAIN WITH SCUPPER OVERFLOW

KEY PLAN



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EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
SECTOR B - ROOF PLAN

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

Drawn: GC
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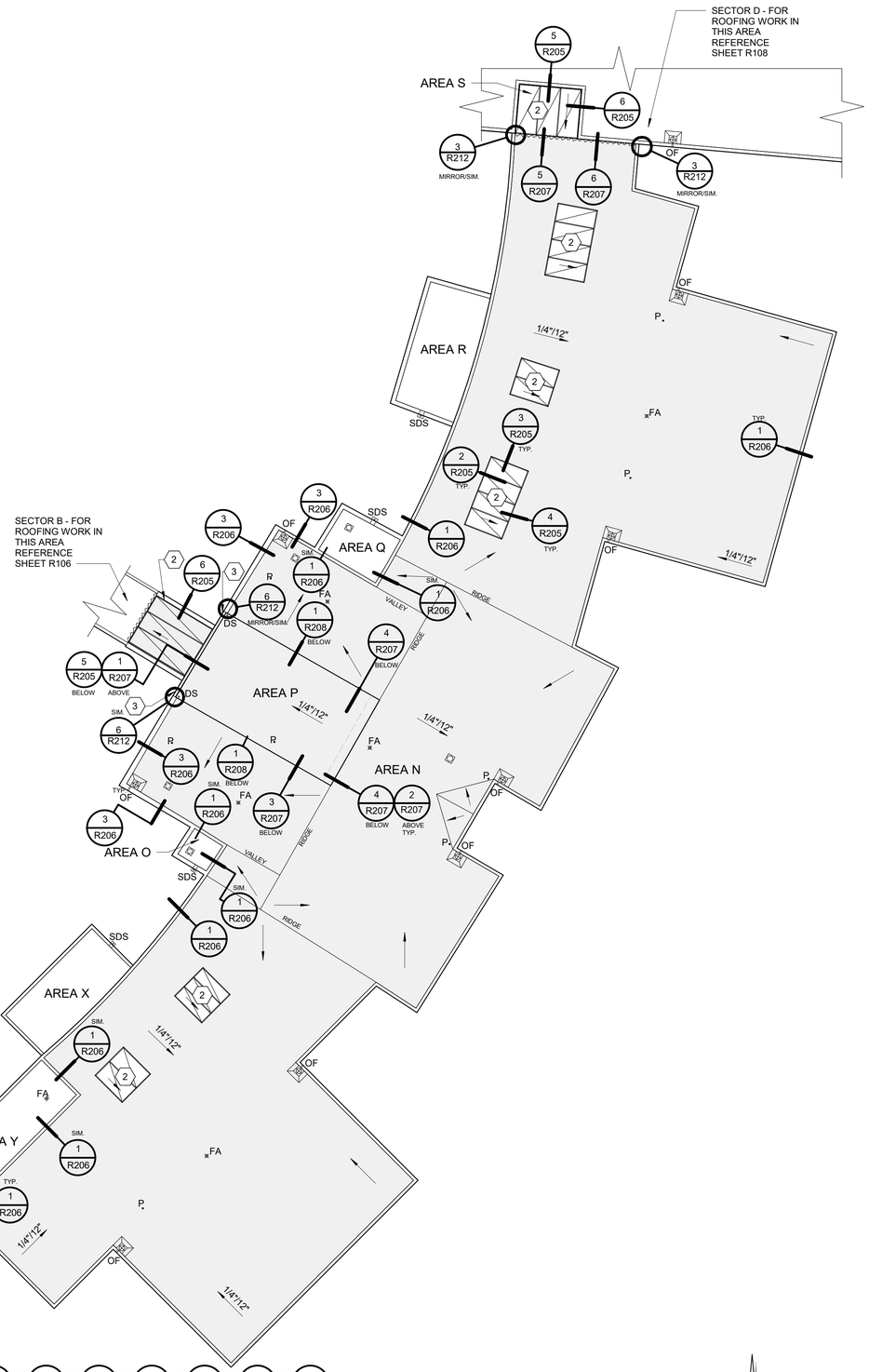
PRC No.: R3282.11

Sheet No.:
R106



1 R107 SECTOR C - ROOF PLAN - ALTERNATE NO. 2

1/16" = 1'-0"

N

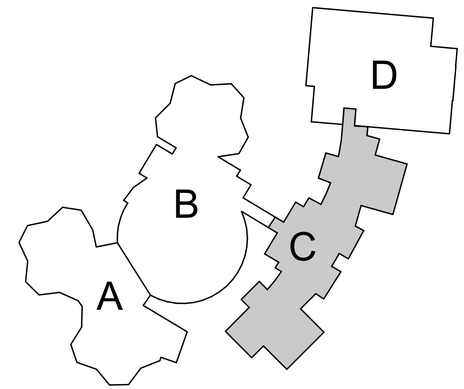
KEY NOTES

1. ALTERNATE NO. 2: INSTALL SINGLE-PLY MEMBRANE ASSEMBLY OVERLAY (ROOF ASSEMBLY 11) -REFERENCE 6/GI.3
2. ALTERNATE NO. 2: INSTALL TRANSLUCENT SKYLIGHT ASSEMBLY
3. ALTERNATE NO. 2: DIRECT DOWNSPOUTS TO DRAIN ONTO AREA N, BELOW. PROVIDE WALKPAD TO PROTECT THE ROOF BELOW OUTLET

LEGEND (SYMBOLS APPLY TO SHADED AREA ONLY)

- SHADED AREA INDICATES EXTENT OF ROOF REPLACEMENT SCOPE OF WORK
- RISE / RUN — X" / 12" — DOWNWARD DIRECTION OF SLOPE — EXISTING ROOF SLOPE; ROOF DECK IS STRUCTURALLY SLOPED TO THE RATIO INDICATED UNLESS OTHERWISE NOTED
- 4/R206, 2/R206 — OF — EXISTING SUMPED ROOF DRAIN & THROUGH WALL OVERFLOW (OF) SCUPPER
- 4/R211 — EXISTING CURBED FAN
- EXISTING SEISMIC JOINT
- 1 — CURBED TRANSLUCENT SKYLIGHT
- 9/R211 — FA — FALL PROTECTION TIE-OFF ANCHOR -REFERENCE STRUCTURAL
- 5/R211 — P — EXISTING PLUMBING VENT PIPE PENETRATION

KEY PLAN



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ROOF REPLACEMENT

Sheet Title:
SECTOR C - ROOF PLAN - ALTERNATE NO. 2

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

Drawn: GC
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PRC No.: R3282.11

Sheet No.:
R107

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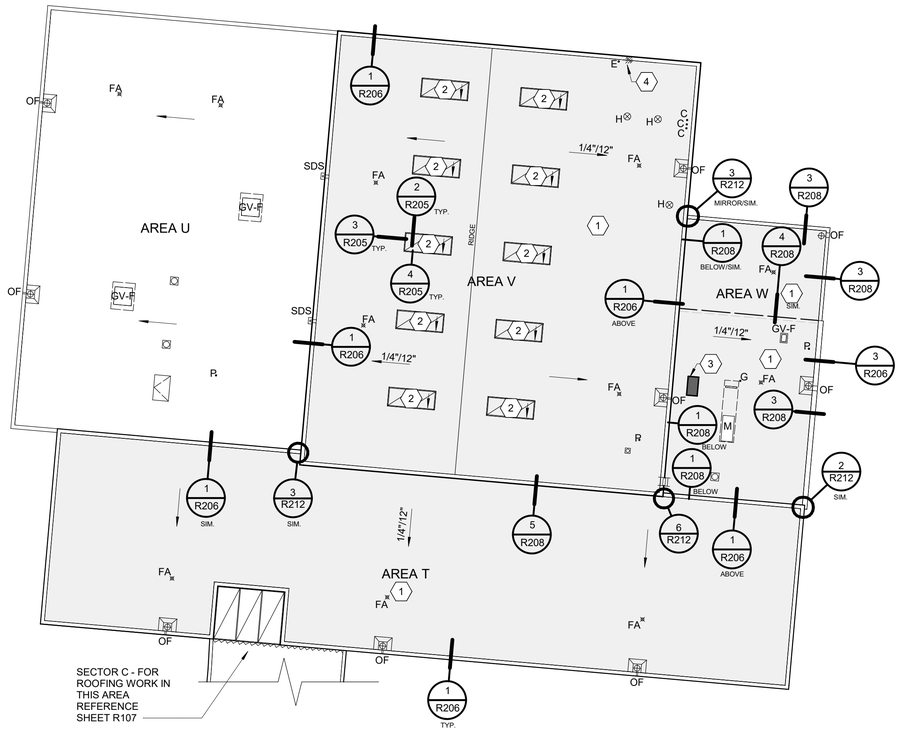


1 SECTOR D - ROOF PLAN - ALTERNATE NO. 2
R108 1/16" = 1'-0"

N

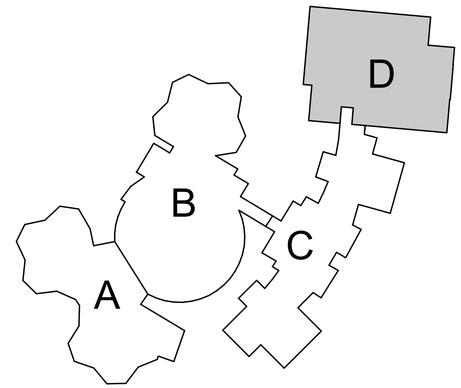
KEY NOTES

1. ALTERNATE NO.2: INSTALL SINGLE-PLY MEMBRANE ASSEMBLY OVERLAY (ROOF ASSEMBLY 11) -REFERENCE 6/GL3
2. ALTERNATE NO.2: INSTALL TRANSLUCENT SKYLIGHT ASSEMBLY
3. ALTERNATE NO.2: INFILL DECK AT DEMOLISHED ABANDONED EQUIPMENT -REFERENCE STRUCTURAL
4. ALTERNATE NO.2: DETACH AND SALVAGE COPING-MOUNTED ANTENNA AND UNISTRUT FOR REINSTALLATION ONTO THE ROOF SIDE VERTICAL FACE OF THE COPING

LEGEND (SYMBOLS APPLY TO SHADED AREA ONLY)

- SHADED AREA INDICATES EXTENT OF ROOF REPLACEMENT SCOPE OF WORK
- RISE / RUN — X" / 12" — DOWNWARD DIRECTION OF SLOPE — EXISTING ROOF SLOPE; ROOF DECK IS STRUCTURALLY SLOPED TO THE RATIO INDICATED UNLESS OTHERWISE NOTED
- 2/R206 OF — EXISTING SUMPED ROOF DRAIN & THROUGH WALL OVERFLOW SCUPPER
- 5/R211 P — EXISTING PLUMBING VENT PIPE PENETRATION
- 6/R211 G — EXISTING GAS PIPE PENETRATION
- 6/R211 C — EXISTING CONDENSATION PIPE PENETRATION
- 6/R211 E — EXISTING ELECTRICAL CONDUIT PENETRATION
- 7/R211 H — EXISTING FLANGED HOT STACK
- GV-F — EXISTING CURBED FABRA-SYLE GRAVITY VENT
- 6/R208 SDS — EXISTING THROUGH WALL SCUPPER DRAIN AND CONDUCTOR HEAD w/ DOWNSPOUT
- 4/R211 — EXISTING CURBED FAN
- CURBED TRANSLUCENT SKYLIGHT
- 1 / 9/R211 FA — FALL PROTECTION TIE-OFF ANCHOR - REFERENCE STRUCTURAL
- EXISTING WALL-MOUNTED ACCESS LADDER
- 1 / SIM. 4/R211 M — EXISTING ANTENNA w/ ELECTRICAL CONDUIT; EXISTING HVAC UNIT ON SLEEPER AND CURB.
- SIM. 2/R206 OF — EXISTING ROOF DRAIN & THROUGH WALL OVERFLOW SCUPPER

KEY PLAN



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GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
SECTOR D - ROOF PLAN - ALTERNATE NO. 2

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

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PRC No.: R3282.11

Sheet No.:
R108

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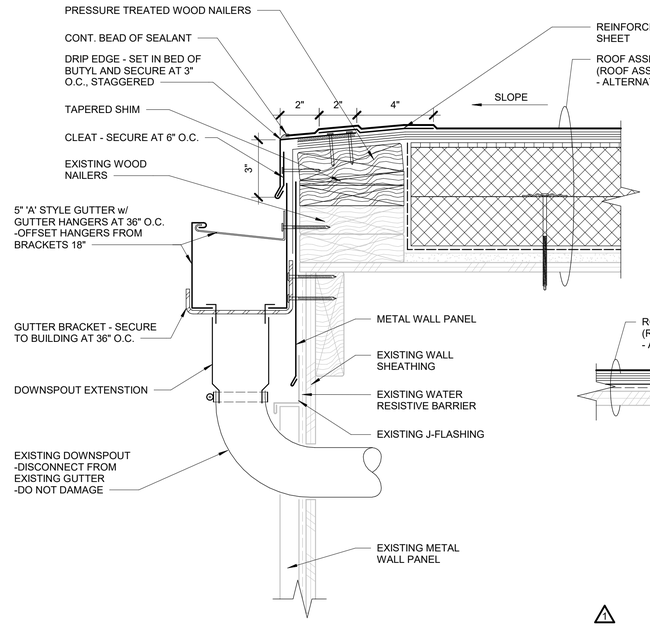
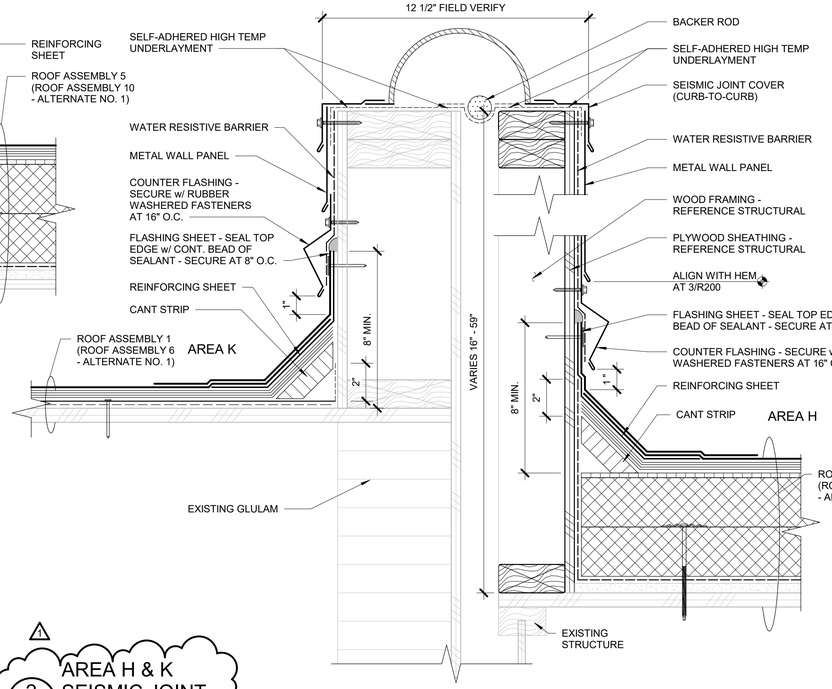
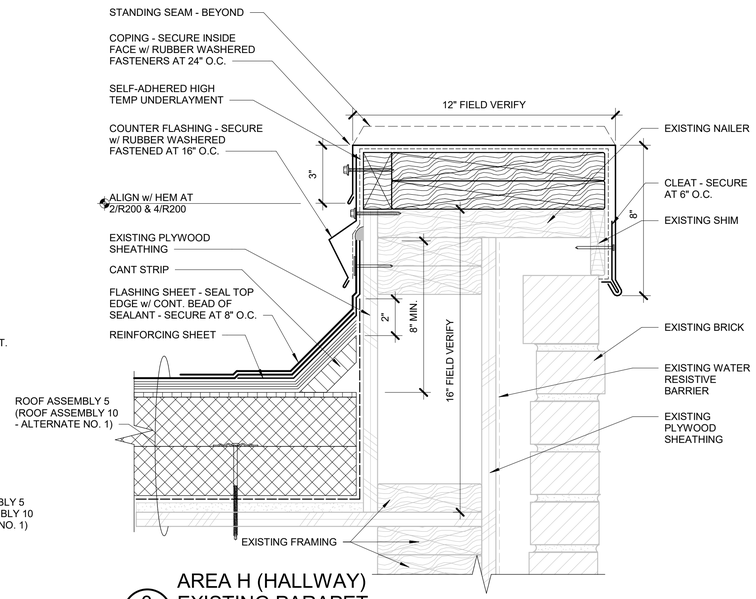


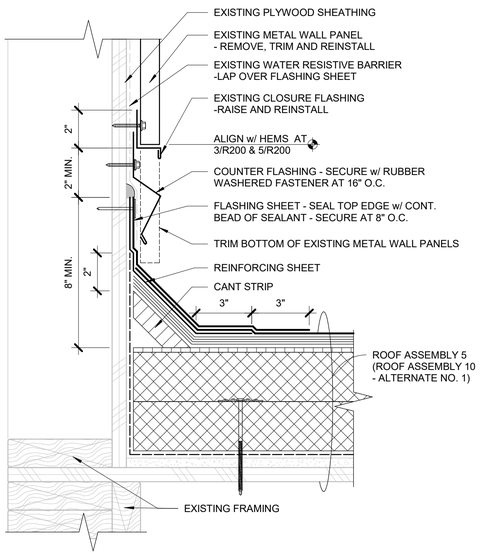
1 R200 AREA H (HALLWAY) GUTTER EDGE
3" = 1'-0"



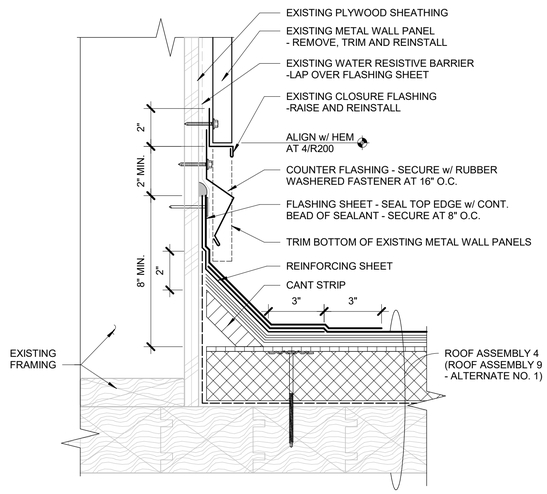
2 R200 AREA H & K SEISMIC JOINT
3" = 1'-0"



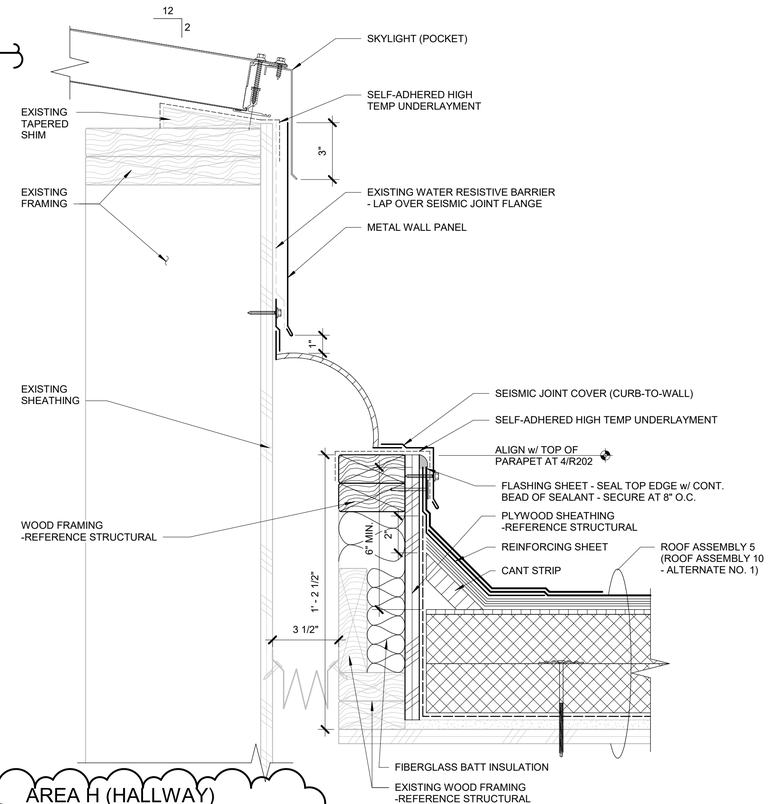
3 R200 AREA H (HALLWAY) EXISTING PARAPET
3" = 1'-0"



4 R200 AREA H (HALLWAY) BASE OF WALL AT AREAS I & L
3" = 1'-0"



5 R200 AREA H (BASE OF DOME) BASE OF WALL AT AREA I (SOUTH END)
3" = 1'-0"



6 R200 AREA H (HALLWAY) BASE OF WALL AT AREA M
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS

1/4" 1/2" 1" 2"

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1 02/27/2023 - ADM #1

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PRC No.: R3282.11

Sheet No.:
R200

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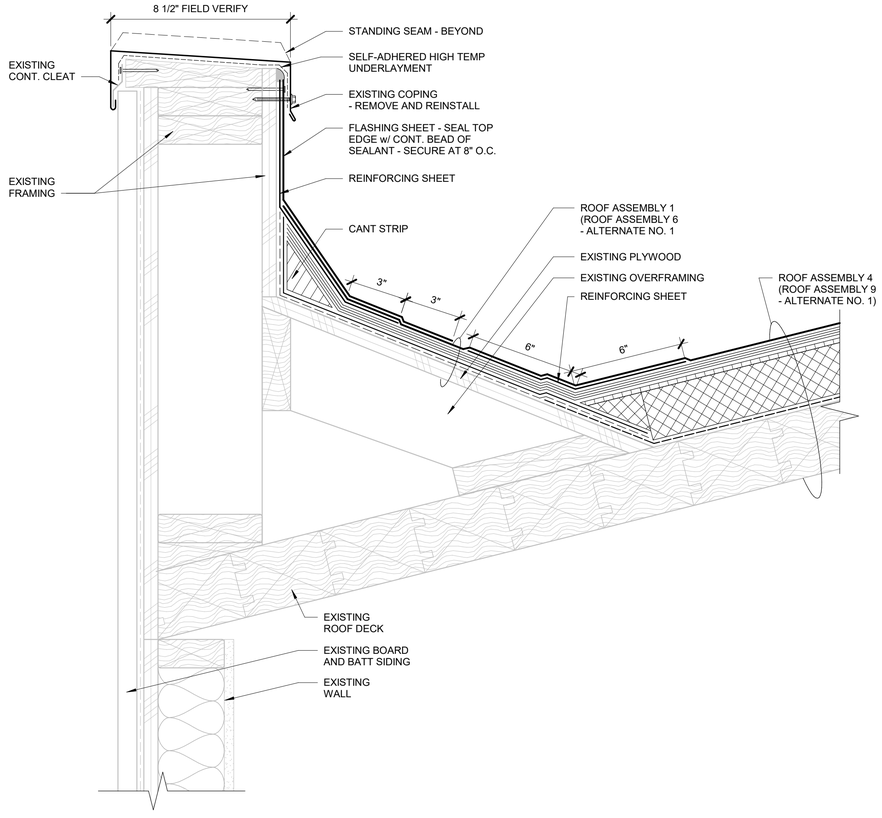
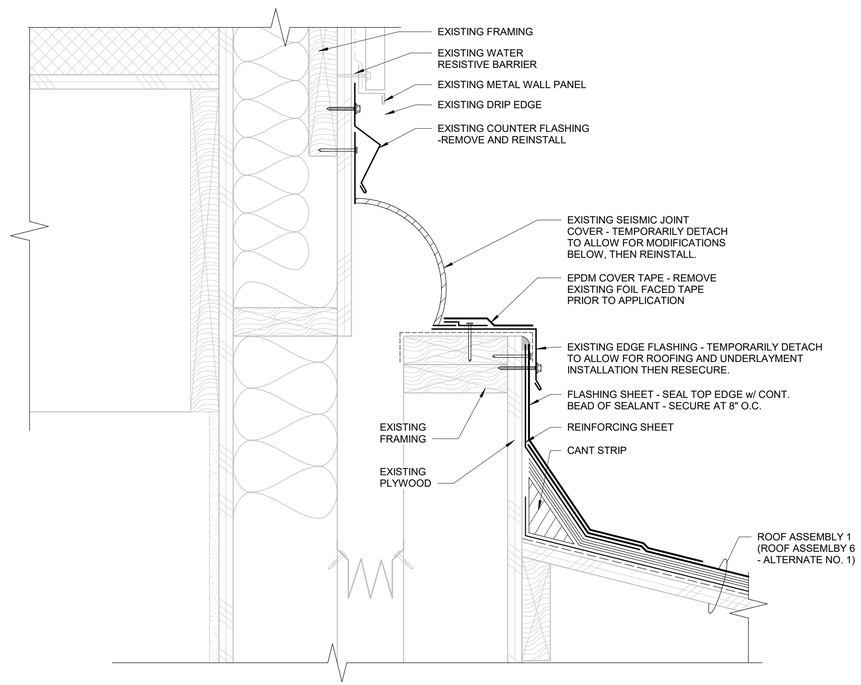
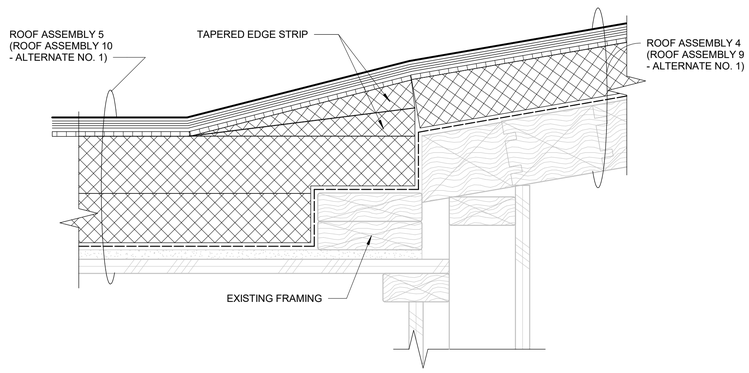


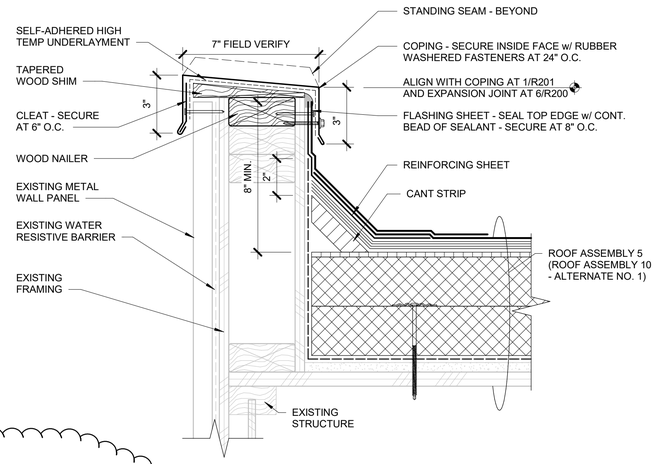
1 R202 AREA H (BASE OF DOME)
BASE OF WINGWALL AT AREA G
3" = 1'-0"



2 R202 AREA H (BASE OF DOME)
BASE OF WALL AT AREA G
3" = 1'-0"



1 3 R202 AREA H
TRANSITION FROM BASE OF DOME TO NORTH HALLWAY
3" = 1'-0"



1 4 R202 AREA H (HALLWAY)
PARAPET
3" = 1'-0"

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GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

Revisions:
1 02/27/2023 - ADM #1

Drawn: GC
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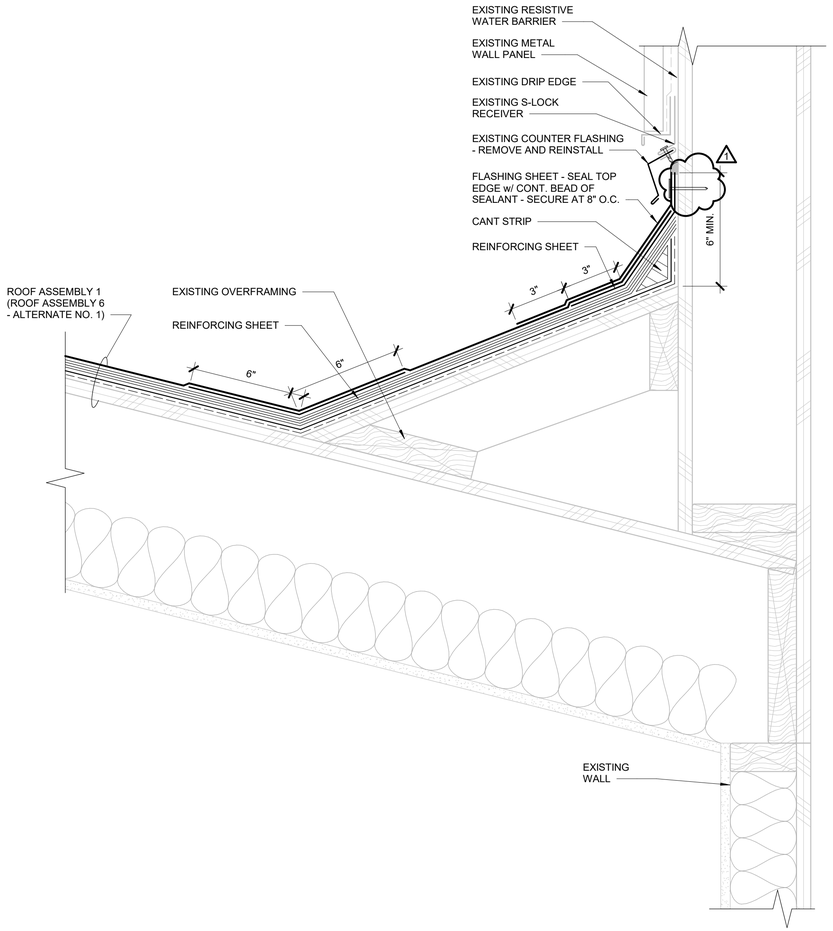
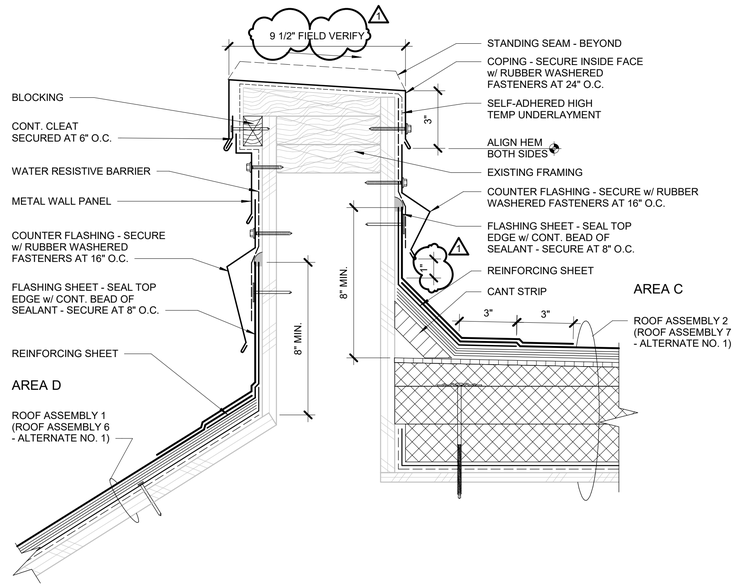
PRC No.: R3282.11

Sheet No.:
R202



1 R204 AREAS A & E
BASE OF WALL AT AREA G
3" = 1'-0"



2 R204 AREAS C & D
SEPARATION WALL
3" = 1'-0"

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Sheet Title:
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1/4" 1/2" 1" 2"

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PRC No.: R3282.11

Sheet No.:
R204

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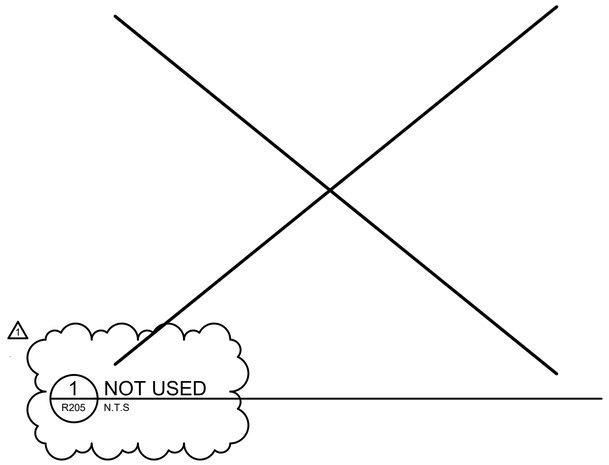
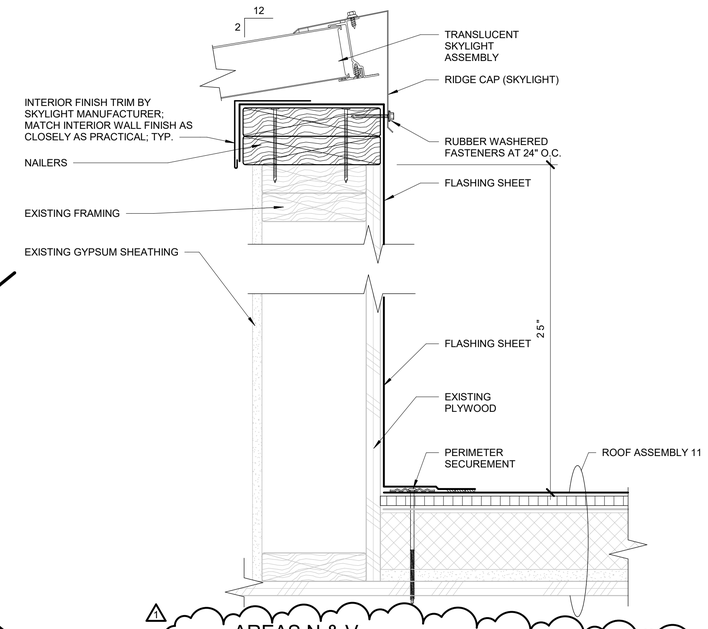
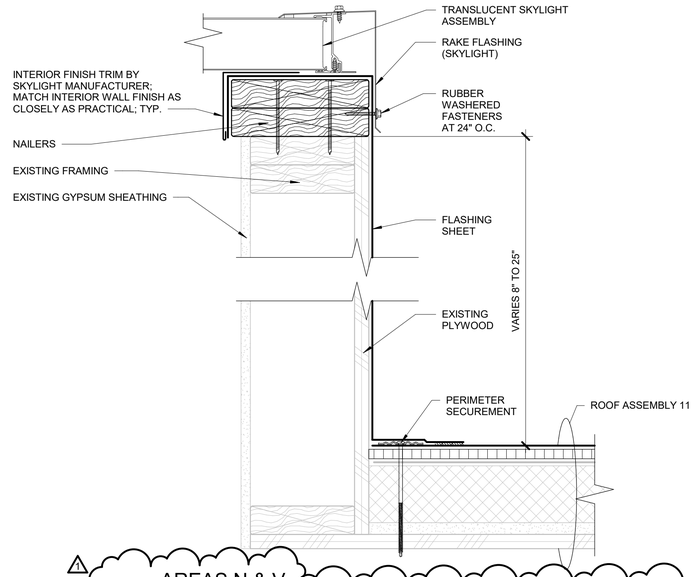


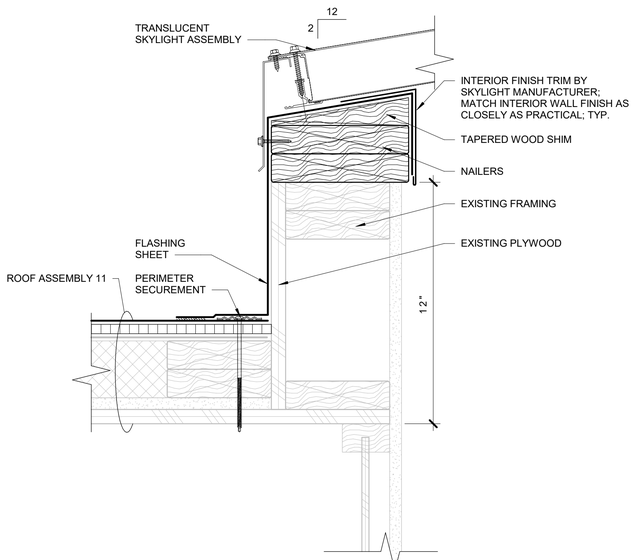
1 R205 NOT USED N.T.S



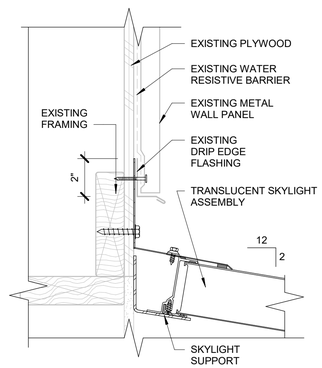
2 R205 AREAS N & V RIDGE AT CURBED TRANSLUCENT SKYLIGHTS 3" = 1'-0"



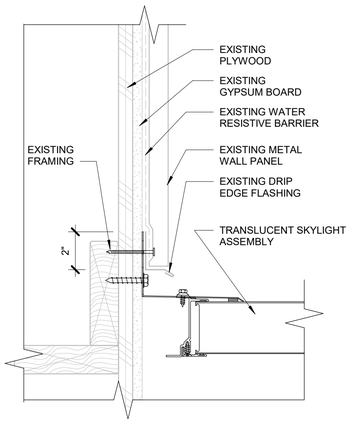
3 R205 AREAS N & V RAKE EDGE AT CURBED TRANSLUCENT SKYLIGHTS 3" = 1'-0"



4 R205 AREAS N & V DRIP EDGE AT CURBED TRANSLUCENT SKYLIGHTS 3" = 1'-0"



5 R205 AREAS M & S RIDGE AT POCKET TRANSLUCENT SKYLIGHTS 3" = 1'-0"



6 R205 AREAS M & S RAKE EDGE AT POCKET TRANSLUCENT SKYLIGHTS 3" = 1'-0"

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P: (503) 280-8759 | F: (503) 280-8866

EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS - ALTERNATE NO.2

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

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1 02/27/2023 - ADM #1

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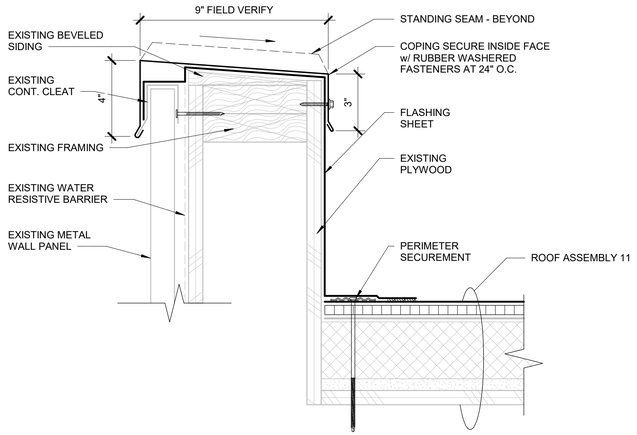
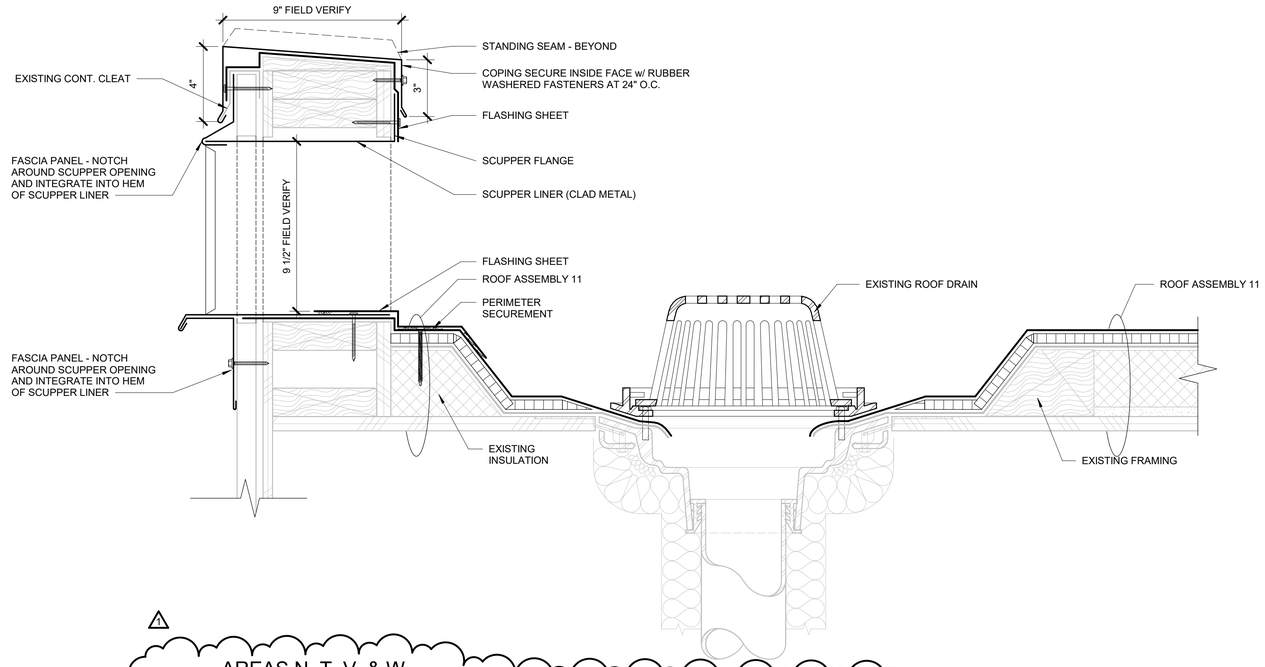
PRC No.: R3282.11

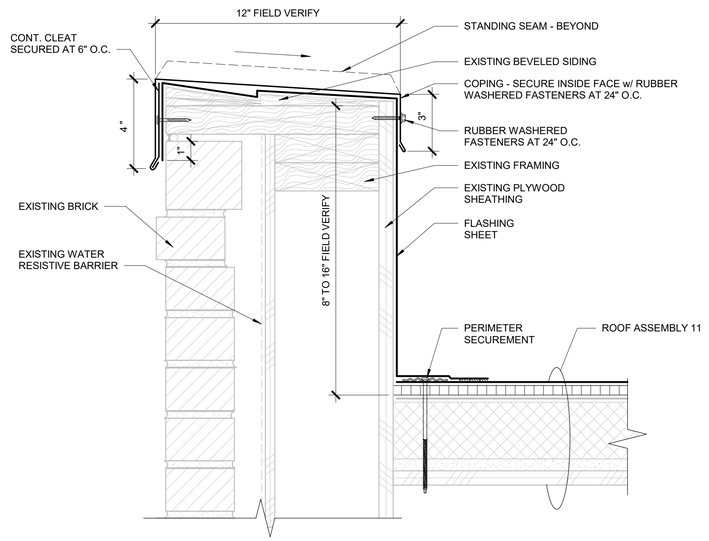
Sheet No.:
R205



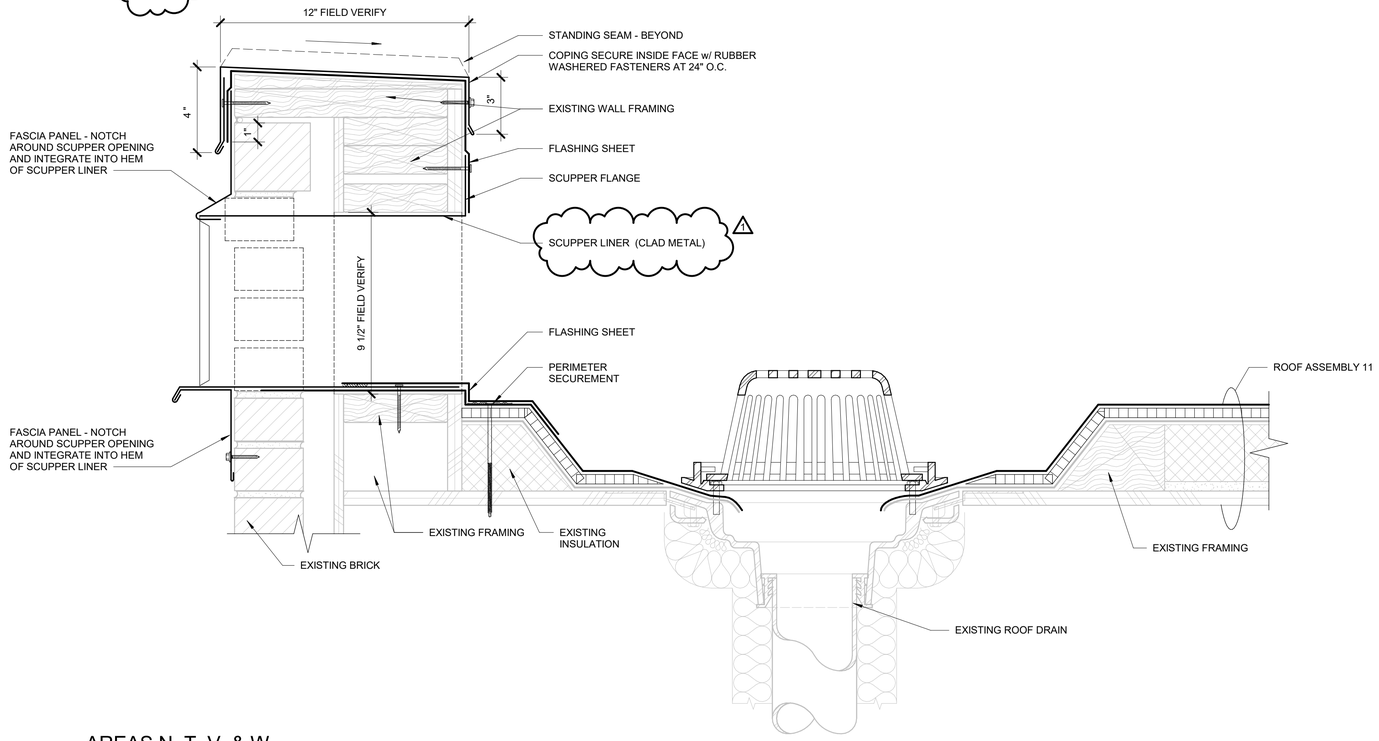
1 R206 AREAS N, T, V, & W
TYPICAL PARAPET AT METAL WALL PANELS
3" = 1'-0"



1 2 R206 AREAS N, T, V, & W
ROOF DRAIN & SCUPPER OVERFLOW AT METAL WALL PANELS
3" = 1'-0"



3 R206 AREAS N, T, V, & W
TYPICAL PARAPET AT BRICK
3" = 1'-0"



4 R206 AREAS N, T, V, & W
ROOF DRAIN & SCUPPER OVERFLOW AT BRICK
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS - ALTERNATE NO. 2

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

Date: FEB 21, 2023

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PRC No.: R3282.11

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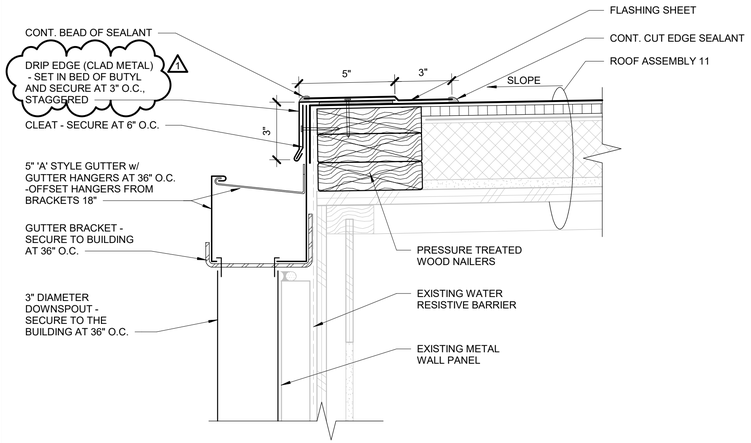
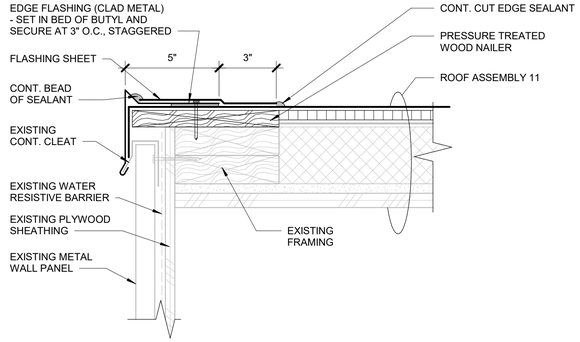
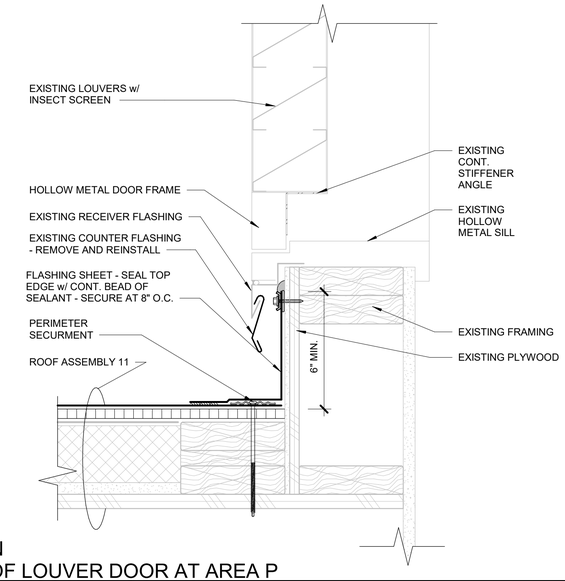
R206



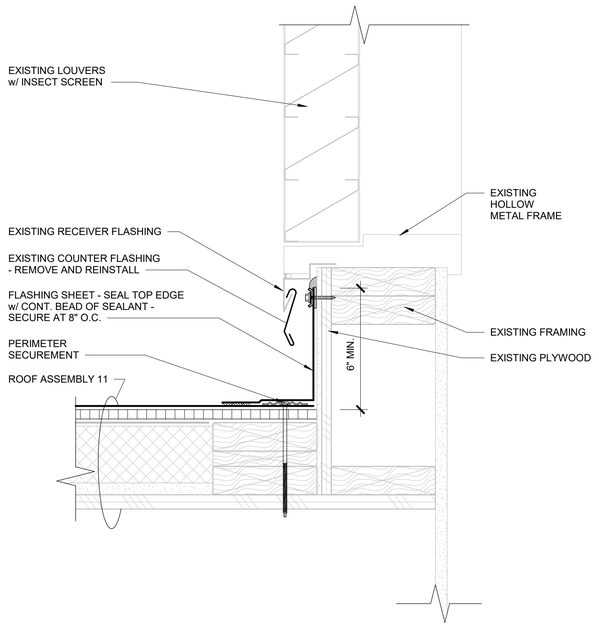
1 R207 AREA P
GUTTER EDGE
3" = 1'-0"



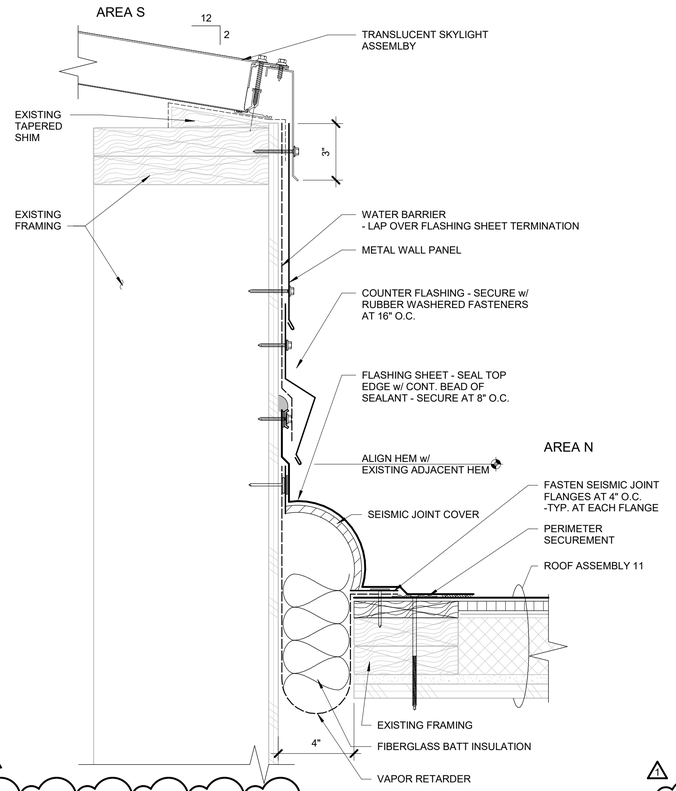
1 2 R207 AREA P
RAKE / RIDGE EDGE
3" = 1'-0"



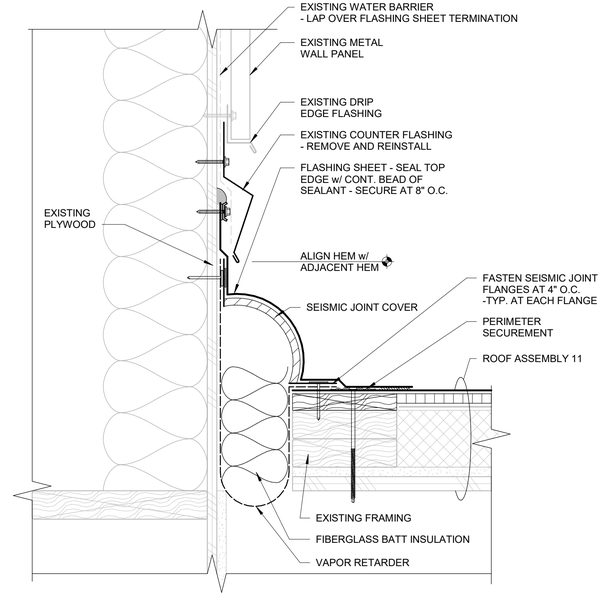
3 R207 AREA N
BASE OF LOUVER DOOR AT AREA P
3" = 1'-0"



4 R207 AREA N
BASE OF LOUVER AT AREA P
3" = 1'-0"



1 5 R207 AREA N
BASE OF WALL AT AREA S
3" = 1'-0"



1 6 R207 AREA N
SEISMIC JOINT AT AREA T
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS - ALTERNATE NO. 2

1/4" 1/2" 1" 2"

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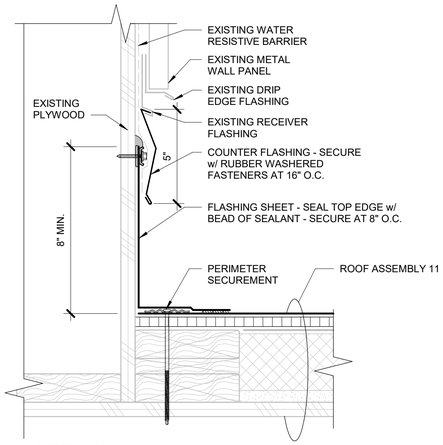
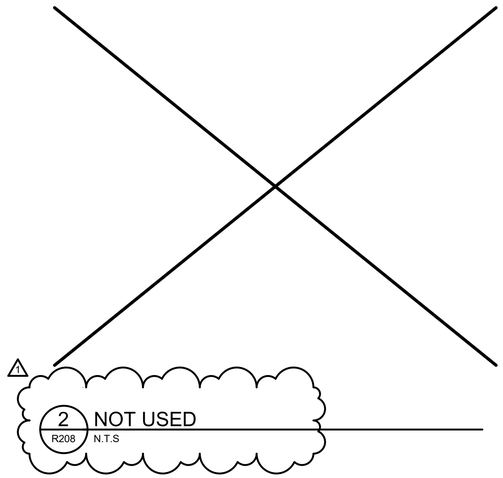
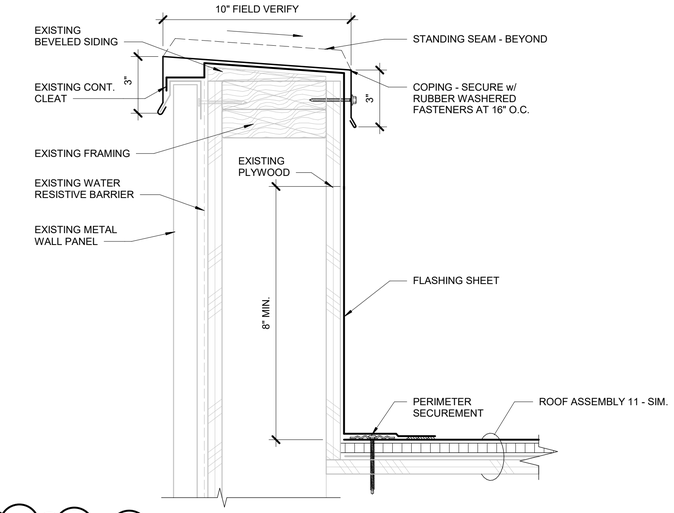


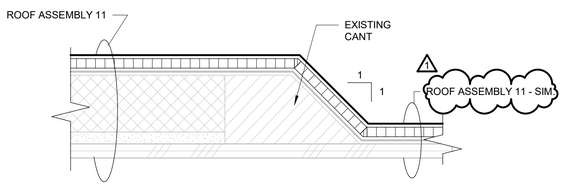
1 R208 AREA W COUNTER FLASHING
3" = 1'-0"



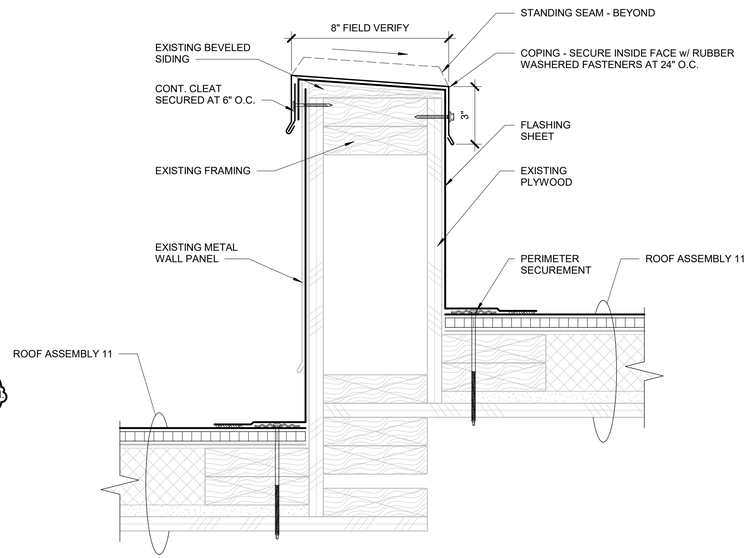
2 R208 NOT USED
N.T.S



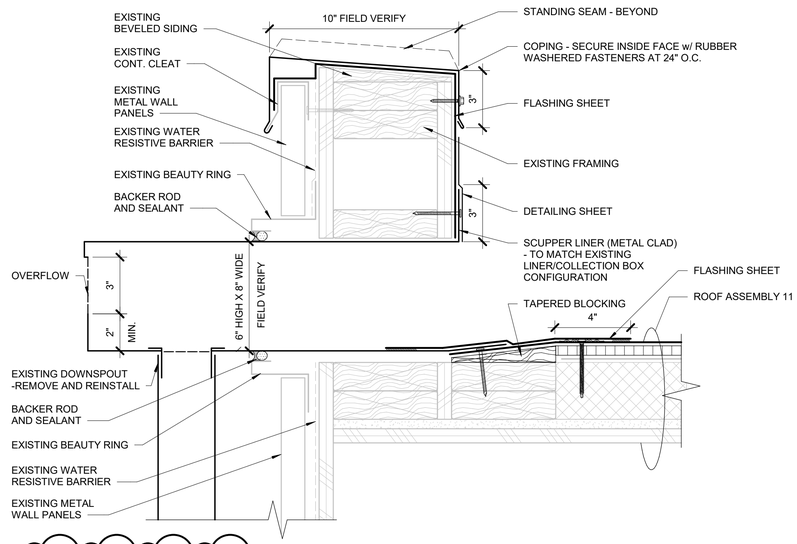
3 R208 AREA W PARAPET WALL AT UNINSULATED ROOF
3" = 1'-0"



4 R208 AREA W ROOFING TRANSITION
3" = 1'-0"



5 R208 AREAS T & V SEPARATION WALL
3" = 1'-0"



6 R208 AREA V SCUPPER DRAIN
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J
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ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS - ALTERNATE NO. 2

1/4" 1/2" 1" 2"

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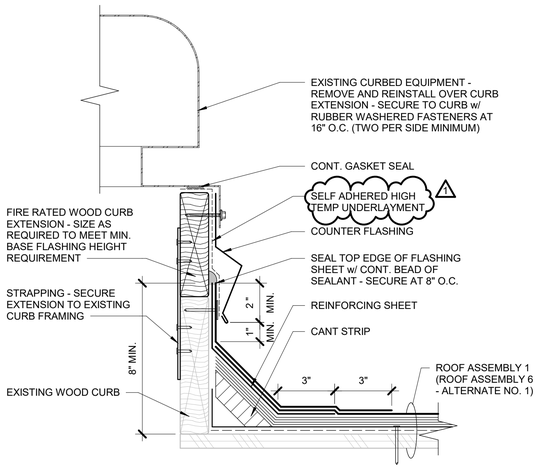
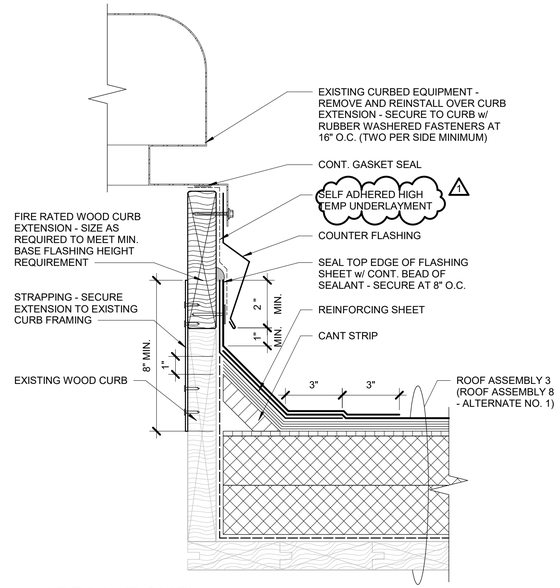
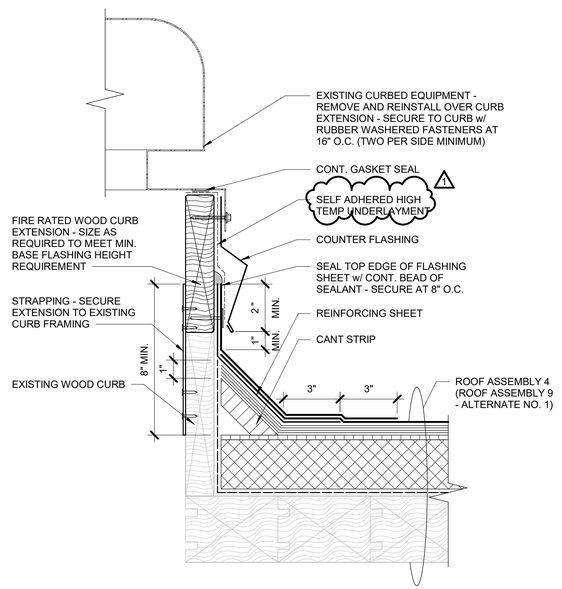


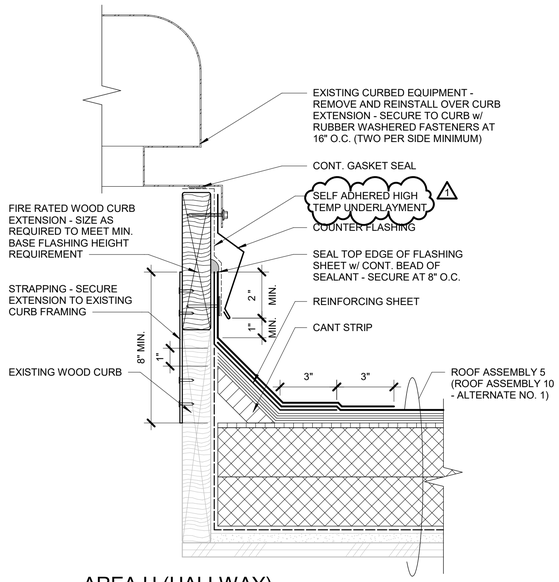
1 R210 AREAS A, B, D, E & K CURBED FAN FLASHING
3" = 1'-0"



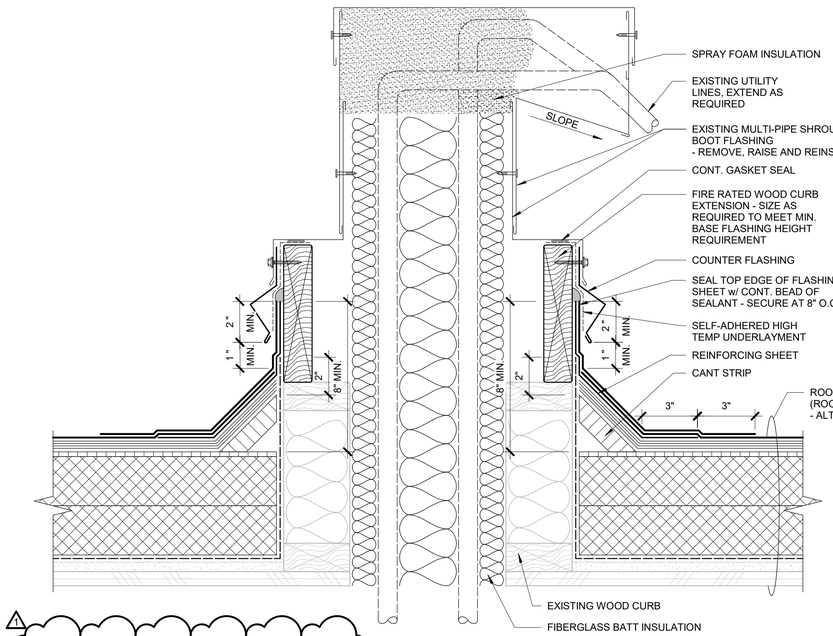
2 R210 AREA H (DOME) CURBED FAN FLASHING
3" = 1'-0"



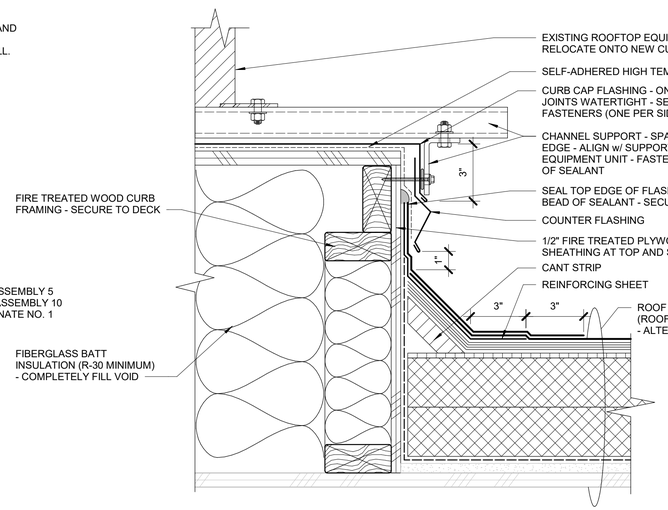
3 R210 AREA H (BASE OF DOME) CURBED FAN FLASHING
3" = 1'-0"



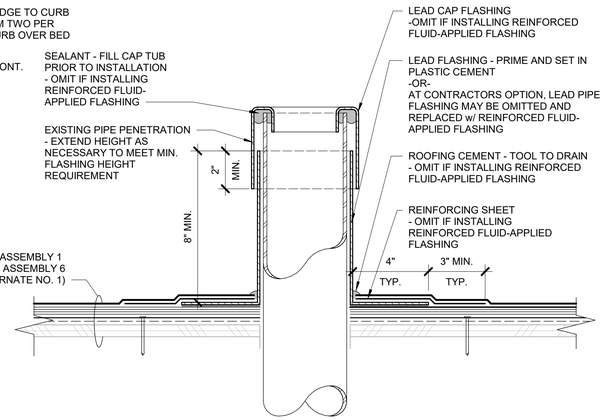
4 R210 AREA H (HALLWAY) CURBED FAN FLASHING
3" = 1'-0"



1 5 R210 AREA H MULTI-PIPE PENETRATION
3" = 1'-0"



6 R210 AREA H EQUIPMENT CURB
3" = 1'-0"



7 R210 AREAS A, B, D, E, & K PLUMBING VENT PIPE
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J

GILHAM ELEMENTARY SCHOOL

ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS

1/4" 1/2" 1" 2"

THIS BAR SCALE MEASURES 2 INCHES IN LENGTH WHEN THE SHEET IS PRINTED FULL-SIZE. IF THIS BAR IS NOT 2 INCHES LONG, THE VIEWS ON THIS SHEET ARE NOT TO THE SCALE INDICATED.

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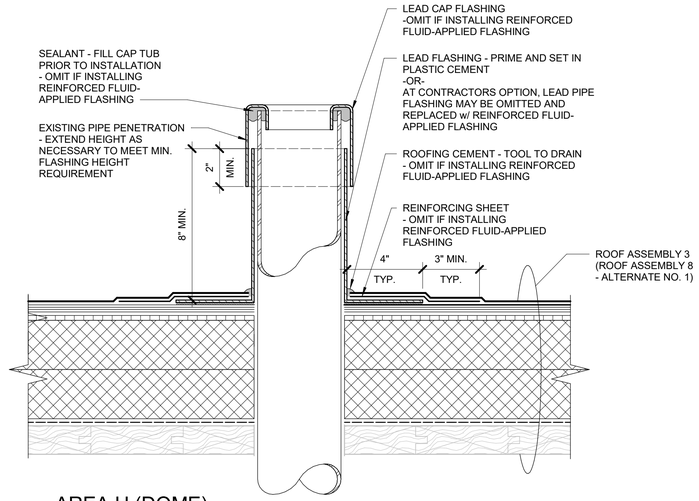
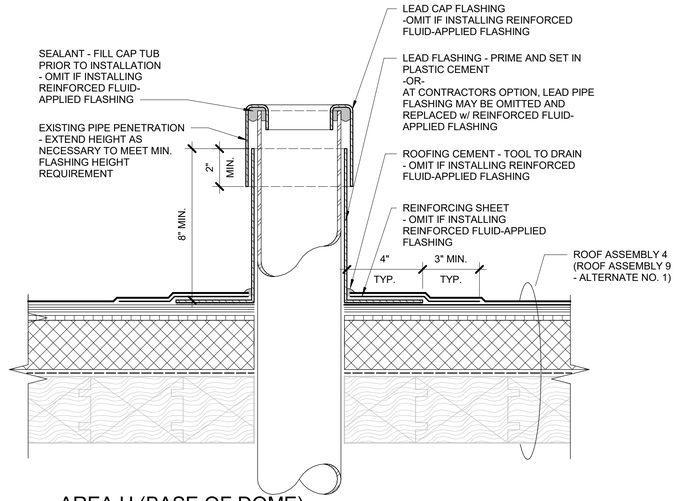
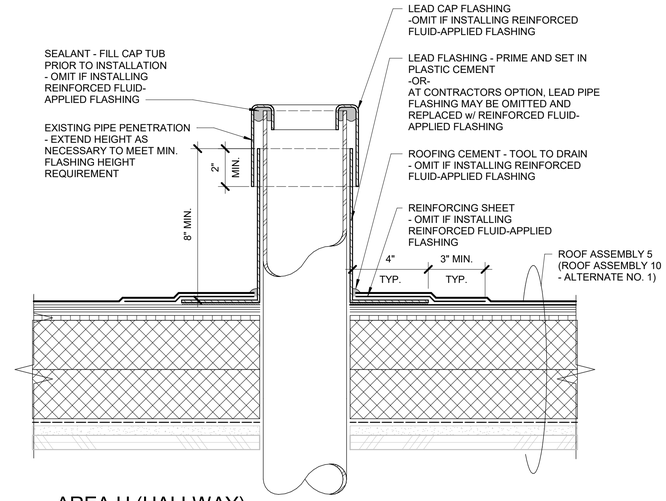
R210



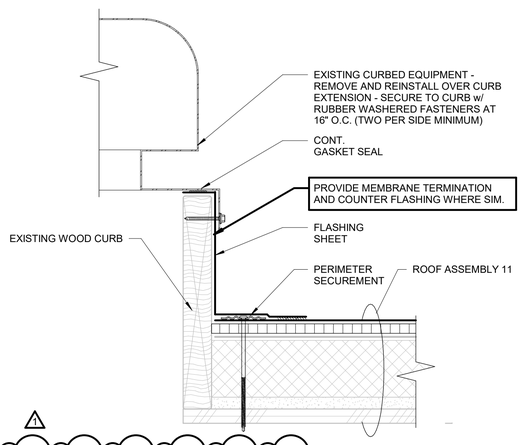
1 R211 AREA H (DOME) PLUMBING VENT PIPE
3" = 1'-0"



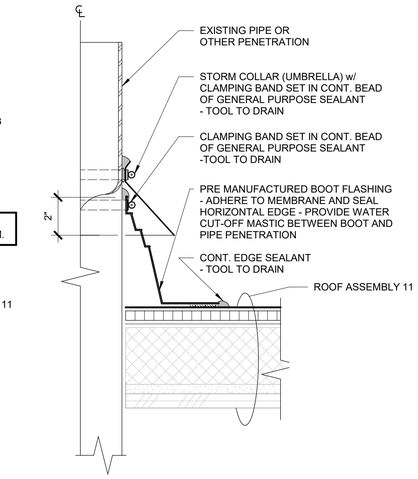
2 R211 AREA H (BASE OF DOME) PLUMBING VENT PIPE
3" = 1'-0"



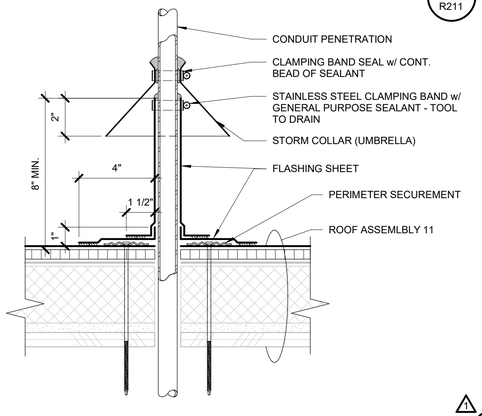
3 R211 AREA H (HALLWAY) PLUMBING VENT PIPE
3" = 1'-0"



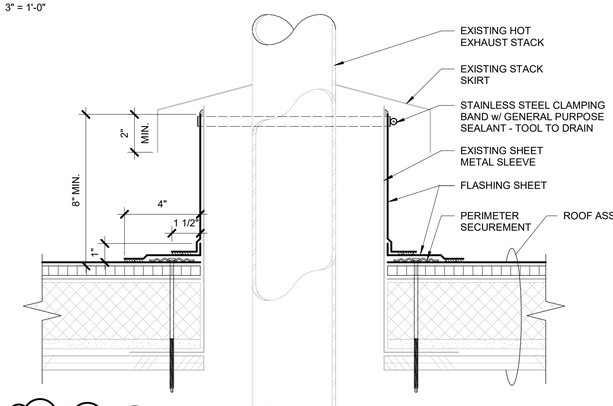
1 R211 4 AREAS N, P, T, V & W CURBED FAN FLASHING
3" = 1'-0"



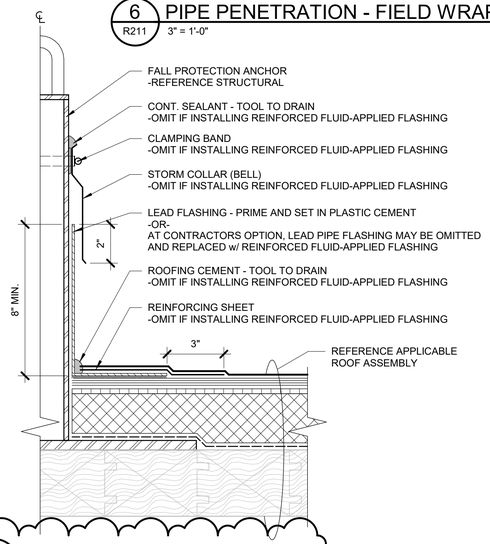
5 R211 AREAS N, P, T, V & W PLUMBING VENT PIPE
3" = 1'-0"



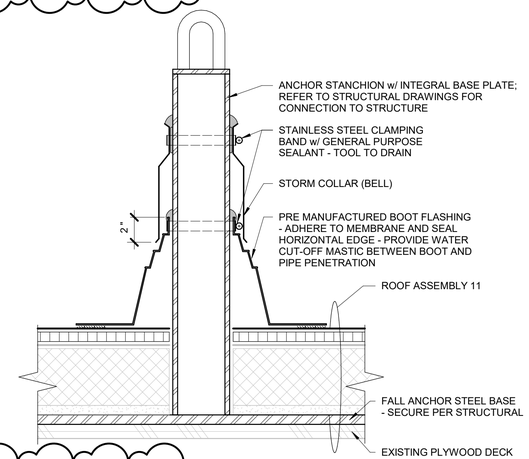
6 R211 AREAS N, P, T, V & W PIPE PENETRATION - FIELD WRAP
3" = 1'-0"



1 R211 7 AREA V HOT EXHAUST STACK
3" = 1'-0"



1 R211 8 FALL PROTECTION ANCHOR
3" = 1'-0"



1 R211 9 AREAS N, P, T, V & W FALL PROTECTION ANCHOR
3" = 1'-0"

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EUGENE SCHOOL DISTRICT 4J
GILHAM ELEMENTARY SCHOOL
ROOF REPLACEMENT

Sheet Title:
ROOF DETAILS

1/4" 1/2" 1" 2"

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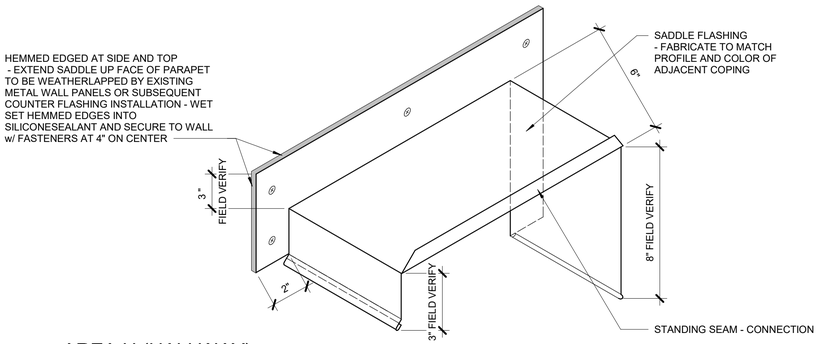
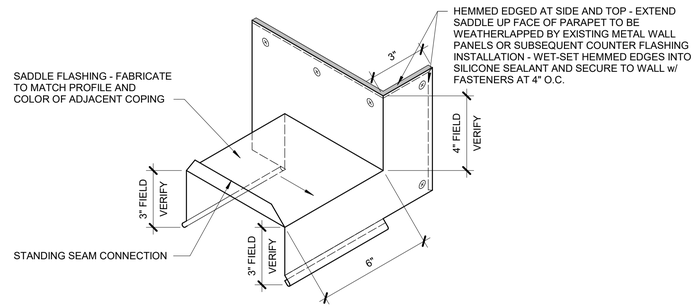
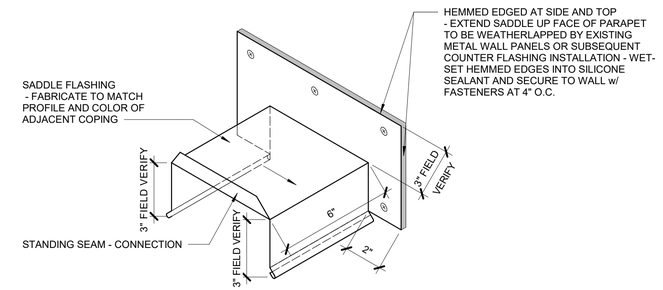


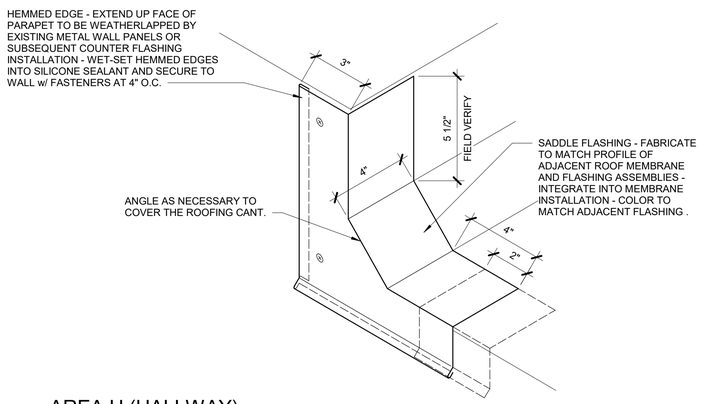
1 R212 AREA H (HALLWAY) SADDLE FLASHING
3" = 1'-0"



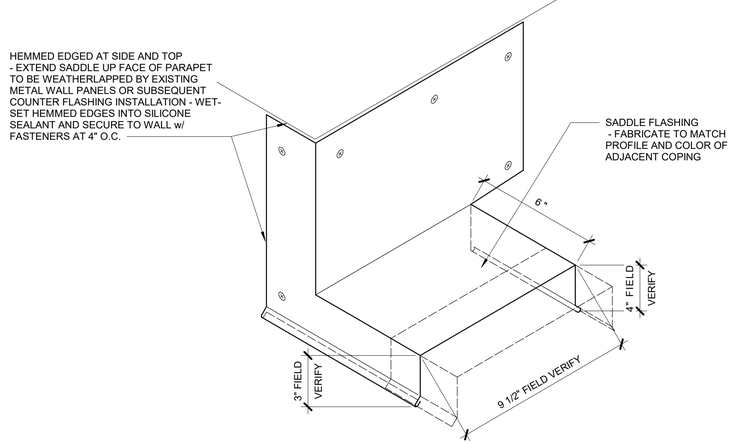
2 R212 SADDLE FLASHING
3" = 1'-0"



3 R212 SADDLE FLASHING
3" = 1'-0"



4 R212 AREA H (HALLWAY) SADDLE FLASHING
3" = 1'-0"



6 R212 SADDLE FLASHING
3" = 1'-0"

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1/4" 1/2" 1" 2"

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Sheet No.:
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