Addendum #1

PART 1 - GENERAL INFORMATION

1.1 PROJECT IDENTIFICATION: The Roof Replacement project for the Burnet County AgriLife and Library project.

1.2 PROJECT SUMMARIES:

A. NOTICE TO ALL BIDDERS: This addendum forms a part of the Contract Documents and modifies the original Bidding Documents. Where provisions of the following Addendum differ from the original specifications, the Addendum shall govern and take precedence. Acknowledge receipt of this addendum IN THE PROPOSAL FORM. Failure to do so may subject the bidder to disqualification.

Item 1: A full set of construction plans and additional specifications has been added to the project as part of this addendum. The construction plans and specifications are in addition to the existing summary of work, as outlined in Exhibit A.

Item #2: Exhibit A Summary of Work: Paragraph C Line #8 Omit the below

~~8. Install new S-5 Clips and carbon steel bar galvanized metal grating to serve as a walkway to all HVAC units and around each unit 360 degrees. Grating to be 24 inches minimum in width. Install approximately 400 linear feet of grading for walkway access.~~

Add: New Line 8 Below to the Summary of Work

8. Install new S-5 Clips onto the roof panel seam at existing structural purlin locations. Coordinate with the Owner and the roofing manufacturer for locations. Install new FIBERGRATE Fiberglass Impact Resistant Molded Grating, Corvix, and FIBERGRATE Fiberglass grating clip 316 stainless steel fits 1 ½ in bearing bar spacing. Install in locations noted on the construction plans for a walkway to HVAC units.

Item #3: Clarification Burnet County Library: The specified wall panels are to be installed on both sides of the roof area C&D per plans, at the upper and lower wall areas. Install a new 22-gauge hat channel and trim according to the manufacturer's specifications.

Item #4: The roofing contractor is to include the architect/engineering stamping fee for the roof plans and wind-uplift calculations for each building in the bid price to Burnet County. The low-slope roofing manufacture shall provide architect/engineered stamped plans to the county before the start of the project.

Item #5: Clarification Burnet County Library: The Base Flashings at roof area C&D per the plans will utilize Pro-Stop Primer and a self-adhering roof membrane as the base ply.

END OF SECTION

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide cutting and patching work to properly complete the work of the project, complying with requirements for.
   1. Visual requirements, including detailing and tolerances.
   2. Inspection, preparation, and performance.
   3. Cleaning.

B. Do not cut and patch in a manner that would result in a failure of the work to perform as intended, decreased energy performance, increased maintenance, decreased operational life, or decreased safety.

1.02 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut or alter any structural Work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.

PART 2 - MATERIALS

A. Except as otherwise indicated, or as directed by the Owner, use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect.

B. Use materials for cutting and patching that will result in equal-or-better performance characteristics Execute cutting, fitting and patching, including excavation and fill, to complete Work and to: Fit the several parts together, to integrate with other Work. Uncover Work to install ill-timed Work. Remove and replace defective and non-conforming Work. Remove samples of installed Work for testing. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

PART 3 - PRODUCTS

3.01 MATERIALS

A. Match existing materials for cutting and patching work with new materials conforming to protect requirements.

PART 4 - EXECUTION

4.01 INSTALLATION

A. Inspect conditions prior to work to identify scope and type of work required. Protect adjacent work. Notify Owner of work requiring interruption to building services or Owner's operations.

B. Perform work with workmen skilled in the trades involved. Prepare sample area of each type of work for approval.

C. Cutting: Use cutting tools, not chopping tools. Make neat holes. Minimize damage to adjacent work. Check for concealed utilities and structure before cutting.

D. Patching: Make patches, seams, and joints durable and inconspicuous. Comply with tolerance for new work

E. Clean work area and areas affected by cutting and patching operations.

END OF SECTION 01 73 29

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. The following are pre-requisites to substantial completion. Provide the following:
   1. Punch list.
   2. Supporting documentation.
   3. Certification.

B. Final payment request with supporting affidavits.
   1. Final payment request with supporting affidavits.
   2. Completed punch list.
   3. Warranties.
   4. Final release of liens.
   5. Release of surety.

C. Provide a marked-up set of drawings including changes which occurred during construction.

D. Provide the following closeout procedures:
   1. Submission of record documents.
   2. Submission of maintenance manuals.
   3. Final cleaning and touch up.
   4. Removal of temporary facilities.

PART 2 - PRODUCTS - Not applicable to this section.

PART 3 - EXECUTION - Not applicable to this section.

END OF SECTION 01 77 00

SECTION 01 62 00 - PRODUCT OPTIONS

PART 1 - GENERAL

1.01 PRODUCT LIST

A. Within 14 days after date of Contract, submit to the Owner/Engineer complete list of all products which are proposed for installation.
   1. Tabulate list by each specification section.

B. For products specified under Reference Standards, include with listing of each product:
   1. Name and Address of Manufacturer.
   2. Trade Name.
   3. Manufacturer's Data.
   4. Model or Catalog Designation.

1.02 CONTRACTORS OPTIONS

A. For products specified only by Reference Standards, select any product meeting standards, by any manufacturer.

B. For products specified by naming several products or manufacturers, select any product and manufacturer named.

C. For products specified by naming one or more products, but indicating the option of selecting equivalent products e.g., by stating "or pre-approved substitution" after specified product, Contractor must submit request as required for substitution, for any product not specifically named.

D. For products specified by naming only one manufacturer, contractor shall use only the manufacturer and product as specified.

1.03 SUBSTITUTION

A. During bidding, the Owner/Engineer will consider only written request from prime bidders for substitutions that meet these performance requirement listed in the specification, received at least 7 days prior to bid date; request received after that time will not be considered. In the event a substitution is accepted, all bidders shall be notified of the acceptable alternate within three (3) days prior to bid date. Requests for substitution shall include five (3) copies of:
   1. Complete data substantiating compliance of proposed substitution with Contract Documents.
   2. For products: Substitutions will only be considered if submitted by a prime bidder who attends the pre-bid conference.
      a. Product identification, including manufacturer's literature, manufacture's name, address and location of manufacturing facility or facilities.
      b. Current certificate comparing the physical and performance attributes of the proposed material with those of the specified.
      c. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.
      d. List of at least five (3) local jobs, where the proposed alternate material was used under similar conditions. These jobs must be available for inspection by the Owner. Names and phone numbers are required for verification.
   3. For construction methods:
      a. Detailed description of proposed method.
      b. Drawings illustrating methods.
   4. Itemized comparison of proposed substitution with product or method specified.

5. Data related to changes in construction schedule.
6. Relation to separate contracts.

B. In making request for substitution, Bidder/Contractor represents:
1. He has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
2. He will provide the same guarantee for substitution as for product or method specified.
3. He will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
4. He waives all claims for additional cost related to substitution that consequently becomes apparent.
5. Cost data is complete and includes all related cost under his contract or other contracts, which may be affected by the substitution.
6. He will reimburse the Owner for all redesign cost substitute may require.

C. Substitution will not be considered if:
1. Product or method to be considered does not have a minimum of fifteen (15) years of successful performance in the United States.
2. Any discrepancies in the test data, or if the tests or submittals are incomplete.
3. They are indicated or implied on Shop Drawings or Project Data Submittals without formal request submitted in accordance with Article 1.3, Paragraph A of this specification section.

D. Acceptance will require substitution revision of Contract Documents.

PART 2 - PRODUCTS – Not applicable to this section.

PART 3 - EXECUTION – Not applicable to this section.

END OF SECTION 01 62 00

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. Scope of Work:
   1. Provide all labor, equipment, and materials to install wood, nails, bolts, framing anchors, rough hardware and other items needed for rough Carpentry in this work and as shown in the drawings.
   2. Replace any damaged or rotten wood nailers as required.
   3. Install new treated wood blocking at perimeter roof edge to accommodate new insulation height.

B. Related Sections:
   1. Section 07 01 50.19 “Preparation for Re-Roofing”.
   2. Section 07 22 16 “Roof Board Insulation”.
   3. Section 07 52 16.13 “Modified Bituminous Membrane Roofing”.
   4. Section 07 62 00 “Sheet Metal Flashing and Trim”.

1.02 DELIVERY AND STORAGE

A. Time delivery and installation of carpentry work to avoid delaying other trades whose work is dependent on or affected by the carpentry work. Keep materials dry during delivery.

B. Store lumber and plywood in stacks with provisions for air circulation within stacks. Protect bottom of stacks against contact with damp or wet surfaces.

C. Protect exposed materials against water and wind. Remove damaged or unsuitable material from the job site.

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Use experienced installers.

B. Lumber Standards: American Softwood Lumber Standards PS 20-70 by U.S. Department of Commerce.

C. Plywood Standards: U.S. Product Standard PSI-74/ANSI A 199.1 or latest APA Performance Standards for American Plywood Association.

D. Factory Marking: Mark each piece of lumber or plywood to indicate type, grade, agency providing inspection service.

E. Size and Shape: Dress lumber 4 sides (S4S) and work to shapes and patterns shown. Nominal sizes shown and specified refer to undressed lumber dimensions. Detailed dimensions do not show actual lumber lumber size required.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Construction Lumber: Standard Grade Douglass Fir, Western Larch, Western Hemlock (WWPA or WCLB) or No. 2 dimension Southern Pine (SPIB).

B. Exterior Type Plywood: ¾”APA rated sheathing, EXT.

C. Bucks, Nailers, Blocking, Curb, Etc. Pressure treated with water-borne preservatives to comply with AWPB LP-2. After treatment kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19% to 15%.

D. Anchorage and Fastening: Proper type, size material and finish for each application.

E. Quality: Sound, seasoned, well manufactured materials of longest practical lengths and sizes in minimize joining. Free from warp which cannot be easily corrected by anchoring and attachment. Discard material with defects which would impair quality of work.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify measurements and dimensions as shown before proceeding with carpentry work.

B. Examine supporting structure and conditions under which carpentry work is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

C. Correlate location of nailers, blocking and similar supports for attached work.

D. Scribe and cope as required for accurate fit of carpentry work to other work.

3.02 PROTECTION

A. Protect installed work from damage by other trades until acceptance of work.

3.03 INSTALLATION

A. Provide decking, nailers, blocking, curbs, and sleepers where shown on the drawings or required for attachment of other work. Coordinate with location with other work involved; refer to shop drawings of such work.

B. Attach to substrate securely as required to support applied loading. Countersink bolts and nuts flush with surfaces.

C. Securely attach wood nailers to substrate in accordance with Factory Mutual Loss Prevention Data Sheet I-49 and as required by recognized standards.

D. Provide washers under bolt heads and nuts in contact with wood.

E. Do not wax or lubricate fasteners that depend on friction for holding power.

F. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish material.

G. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required. Do not drive threaded friction type fasteners; turn into place. Tighten bolts and lag screws at installation and re-tighten as required for tight connections prior to closing in or at completion of work.

END OF SECTION 06 10 00

SECTION 07 01 50.19 - PREPARATION FOR RE-ROOFING

1. GENERAL

1.01 SUMMARY

A. Scope of Work:
   1. Remove existing roofing membrane and sheet metal accessories.
   2. Quantify and repair any damaged or deficient metal decking.
   3. Install new mechanically attached base sheet.

B. Related Sections:
   1. Section 06 10 00 “Rough Carpentry”.
   2. Section 07 22 16 “Roof Board Insulation”.
   3. Section 07 52 16.13 “Modified Bituminous Membrane Roofing”.
   4. Section 07 62 00 “Sheet Metal Flashing and Trim”.

1.02 PRE-INSTALLATION CONFERENCE

A. Attend conference specified in Section 07 52 16.13 “Torch-Applied SBS Modified Bituminous Membrane Roofing”.

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

1.03 SUBMITTALS

A. Submit product data and samples of materials to be used.

B. Submit Roof System Manufacturer’s project-specific wind uplift calculations with base sheet fastening patterns.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Do not remove roofing existing roofing panels or decking when weather conditions threaten the integrity of the building contents or intended continued occupancy. Maintain continuous temporary protection prior to new roofing system

1.05 PROTECTION

A. Roofing Contractor is to be responsible for all mechanical, electrical and plumbing services required for the removal and re-installation of the new roof system.

B. During execution or work covered by these specifications, the Contractor shall provide protection for equipment, materials, and personnel inside and outside the building against falling debris, sparks, and water.

C. It shall be the Contractor’s responsibility to respond immediately to correction of roof leakage during construction. A 4-hour time limit shall be given from the time of notification of emergency conditions. In the event of water penetration during rain or storm, the Contractor shall provide for repair or protection of building contents and interior. If the Contractor does not respond or cannot be contacted, the Owner will affect repairs or emergency action and the Contractor shall be back charged for all expenses and damages, if any.

1.06 SCHEDULING

A. Schedule work to coincide with commencement of installation of new insulation and roofing system.

2. PRODUCTS

2.01 MATERIALS

A. Temporary Protection: Sheet polyethylene. Provide weights to retain sheeting in position.

B. Asphalt Primer: As specified in Section 07 52 16.13 “Torch-Applied SBS Modified Bituminous Membrane Roofing”.

C. Cementious Repair Material: Zono-Patch by Siplast or pre-approved equal.

D. Steel Decking: 22-gauge galvanized decking. Profile shall match existing.

E. Deck Fasteners Screws: #12 self-drilling galvanized steel TEK 5 screws, 1.5 inch in length.

F. Stitch Screws: #10 self-tapping galvanized steel sheet metal screws, 0.75 inch in length.

3. EXECUTION

3.01 EXAMINATION

A. Verify all existing site conditions prior to proceeding with work specified in this Section.

B. Verify that existing roof surface is clear and ready for work of this Section.

C. Verify that work and operations related to this project, performed by others, is complete prior to proceeding with work specified in this Section.

3.02 MATERIAL REMOVAL

A. Remove all membrane, insulation, cant strips, base flashings and items shown on the drawings. Ensure the complete removal of all nails to leave a smooth even surface for re-roofing.

B. Under certain conditions it will be necessary and desirable to incorporate on or more of the following methods for removal of dirt, silt, gravel, debris, roof membrane and insulation from the roof surface in order to preserve the ecology, eliminate unsightly conditions and protect building:
   1. Roof vacuum system.
   2. Crane and hopper with dump truck system.
   3. Enclosed chutes with protective shrouds on building and ground surfaces.

C. All debris dumped from the roof shall be transported from the roof via chutes into dumpsters or trucks, and this debris shall, be removed from the premises when vehicles are full. No debris shall be transported from the area being worked over an existing finished roof without and underlayment of 3/4" plywood.

D. All roof equipment not in use or left filled will be parked on the column lines on 3/4" plywood.

E. Contractor shall provide tie-ins at the end of each days work. Prime existing roof surface prior to making tie-ins.

3.03 TEMPORARY PROTECTION

A. Provide temporary protective sheeting over uncovered deck surface.

B. Retain sheeting in position with weights or temporary fasteners.

C. Provide for surface drainage from sheeting to existing drainage facilities.

D. Do not permit traffic over unprotected or repaired deck surface

3.04 REPAIR OF DAMAGED OR DETERIORATED DECKING

Deck Removal and Replacement. The following procedures shall be followed:

1. Where possible, the owner shall be notified a minimum of 48-hours (weekdays only) in advance of the Contractor's intended deck replacement Work.
2. Following removal of the built-up roofing and insulation the Contractor shall broom and completely clean the deck and flutes of all debris, dust, etc.
3. All welds shall be ground loose and the deck removed in sections. The use of cutting torches is prohibited. Caution shall be exercised to not damage the bar joists or other steel structural members during deck removal.4.
4. Decking shall be moved from the roof to the storage or demolition area on the day it is removed. Stocking of removed panels on the roof surface overnight is prohibited. Deck panels shall be removed to the ground by controlled lift or crane.
5. The top chords of each bar joist shall be inspected and repaired as required. Existing welds shall be ground smooth and flush with the top chord so as to prevent conflicts with the new decking. All ground surfaces shall be primed with one coat of red oxide primer.
6. Lay metal deck panels perpendicular to the existing bar joists and fastened along each joist with specified TEK screws spaced at 6 inches on centers. Fully seat side laps in adjacent deck panels or set within 0.25-inch of other side stops. End laps shall be handled as shown in the manufacturer's shop drawings. End laps shall occur over existing bar joists only. Side laps shall be fastened with stitch screws spaced at 12 inches on centers.
7. Installation of new insulation shall not occur until all decking is in place and has been observed by the manufactures representative.
8. Debris dropped below the deck shall be removed in its entirety. Any damaged materials below the deck, occurring as a part of this Work, shall be remedied to the Owner's and Architect's satisfaction.

B. Deck Repair – Large Sheet Replacement
   1. New decking shall match the existing profile.
   2. Sheet replacement shall cover a minimum of two spans.
   3. New decking shall extend a minimum of 6 inches over each end joist with the entire width of the sheets being replaced.
   4. New decking shall be fastened with specified screws spaced at 6 inches on centers along each bar joist.
   5. All laps shall have sheet metal stitch screws spaced at 12 inches on centers.

C. Metal Deck Repair – Surface Rust
   1. Remove all rust by wire brush and apply rust bonding red oxide metal primer.

END OF SECTION 07 01 50.19

SECTION 07 22 16 - ROOF BOARD INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Base layer insulation, tapered cricket insulation and secondary/cover board insulation.

B. Related Sections include the following:
   1. Section 06 10 00 “Rough Carpentry”
   2. Section 07 01 50.19 “Preparation for Re-Roofing”.
   3. Section 07 52 16.13 “SBS Modified Bituminous Membrane Roofing”.
   4. Section 07 62 00 “Sheet Metal Flashing and Trim”.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM).

B. Standards:
   1. FM Global Approval Guide
   2. Underwriters Laboratories: Building Materials Directory.
   3. National Roofing Contractors Association (NRCA): The NRCA Roofing and Waterproofing Manual.

C. ASCE 7-10: “Minimum Design Loads for Buildings and Other Structures”.

D. Polyisocyanurate Insulation Manufacturer’s Association: Technical Bulletin 109 – “Storage and Handling Recommendations for Polyisocyanurate”.

1.04 SUBMITTALS

A. Product Data: submit manufacturer’s product data sheets, providing descriptive data, dimensions, LTTR values, and other pertinent criteria for each material proposed for use in construction of roof assembly.

B. Samples: Provide physical examples of materials/components proposed for use to compromise the specified roof system.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Classified by Underwriters Laboratories Inc as Class A rated material.
   2. Follow local, state and federal regulations, safety standards and codes. When conflict exists, the more restrictive document shall govern.

B. Installation:
   1. Install in accordance with manufacturer’s current published application procedures, general requirements of NRCA, and as supplemented by these documents.
   2. Consider roof system manufacturer’s technical specifications part of this Specification and use as reference for specific application procedures.
   3. Install roof system in accordance with prime roof material manufacturer’s technical departments uplift calculations and attachment requirements. Negative pressures shall be based on ASCE 7-10.

1.06 DELIVERY, STORAGE AND HANDLING

A. Store materials in accordance with manufacturer's recommendations.

B. Outdoor Storage:
   1. Tarp and shield insulation from moisture and exposure to sun.
   2. Elevate insulation above substrate 4-inches minimum.
   3. Secure insulation to resist winds.
   4. Do not use insulation which has been determined "wet" or which has been been wet and has dried.
   5. Distribute insulation stored on roof deck to prevent concentrated loads that would impose excessive stress or strain on deck and structural members or impede drainage.

1.07 SEQUENCING AND SCHEDULING

A. Plan roof layout with respect to roof deck slope to prevent rainwater drainage into completed roofing.

B. Do not install more insulation than can be made watertight in same day.

1.08 PROJECT CONDITIONS

A. Environmental recommendations:
   1. Apply roofing and insulation in dry weather.
   2. Do not proceed with roof construction during inclement weather or when precipitation is predicted with 30 percent or higher probability.
   3. Do not apply insulation over wet or moist deck or in foggy conditions.
   4. Wind speeds in excess of 30 mph shall constitute "Inclement Weather".

B. Maintain on-site equipment and material necessary to apply emergency temporary weather protection to incomplete work in event of sudden or unexpected precipitation.

PART 2 - PRODUCTS

2.01 ROOF INSULATION

A. Insulation: Ridge closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
   1. Polyisocyanurate Insulation Board: Rigid flat and tapered polyisocyanurate foam insulation board, meeting ASTM C-1289, Type II, Class 1, Grade 2 with organic insulation board facers.
      a. Maximum Board Size:
         1) 48-inches x 96-inches, where mechanically fastened to metal deck.
         2) 48-inches x 48-inches where adhesively applied. SEP
         3) Board thickness: minimum (2) layers; maximum 2.5-inch thick per layer.

B. Tapered Insulation:
   1. Rigid, closed cell polyisocyanurate rigid board insulation utilizing non-chlorine/non-ozone depleting blowing agent, bonded to non-asphaltic organic fiberglass facers,
      a. ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), tapered 1/2" per foot

C. Secondary Insulation Layer/Cover Board: Moisture resistant,
   1. 1/2-inch thick gypsum roof board, ASTM C 1278; provide 48" by 48" nominal size: " "Densdeck Prime" by United States Gypsum or pre-approved equal.

2.02 RELATED MATERIALS

A. Roof Insulation Board Fasteners:
   1. OMG - Heavy Duty Corrosion resistant screw
   2. SFS Group USA – Deckfast DF

B. Compressible Fill Insulation: Foil or paper-faced compressible fiberglass batten roll insulation of proper size and thickness to insert at openings at penetrations, perimeters, and curbs: Manufactured by Owens Corning or pre-approved equal.

C. Cant Strips: Inorganic fibrous, dimensionally stable and fire resistant with 3-5/8" face.

D. Low-Rise Foam Insulation Adhesive for Cover Board:
   1. Dual-component, VOC compliant, two-part reaction-cure urethane foam adhesive.
      a. "Oly-Bond" by Olympic or approved equal

PART 3 - EXECUTION

3.01 EXAMINATION

A. Roof system manufacturer's representative shall inspect roof deck and associated substrates and provide written acceptance of conditions.

B. Manufacturer's approved roofing contractor shall inspect and approve deck and substrates.

C. Roofing contractor shall examine roof deck and related substrates and verify that there are no conditions that would prevent roof system manufacturer's approved application of roof system. These conditions include, but are not limited to, the following:
   1. Inadequate support or anchorage of decking or substrates to structure.
   2. Accumulations of moisture.
   3. Tears, holes, or punctures.
   4. Ridges, uneven conditions, or gaps.
   5. Rust or other forms of deterioration.
   6. Presence of foreign materials.

D. Start of work constitutes acceptance of substrate and site conditions.

3.02 PROTECTION

A. Provide special protection from traffic on yet to be removed roofing and newly installed roof materials.

3.03 APPLICATION

A. General:
   1. Install insulation to achieve positive drainage across the roof deck in general accordance with manufacturer's guidelines.
   2. Stagger end joints of insulation boards ½ of overall length of board.
   3. Butt joints tightly allowing no more than ¼-inch wide gaps between units. Fill joints between adjacent boards with like insulation or foam adhesive.
   4. Do not use warped, bent or otherwise damaged insulation boards.
   5. Field cut and fit insulation at penetrations, curbs, and walls.
   6. Stagger all joints (side and end) between layers of insulation.
   7. Field cut tapered insulation boards to create crickets at upslope sides of curbs and along walls to achieve a minimum resulting roof slope of ¼" per foot.
   8. Install tapered edge strips at changes in elevations, edge of crickets and other locations to create a monolithic and uniform substrate for installation of roofing membrane.

B. Attachment with Mechanical Fasteners
   1. Approved insulation board shall be fully attached to the deck with an approved mechanical fastening system. As a minimum, the amount of fasteners shall be in accordance with manufacturer's recommendation for FM system.
   2. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.

3. Spacing pattern of fasteners shall be as per manufacturer's recommendations to meet the FM requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.
4. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal, wood and structural concrete decks where not specified by the manufacturer.
5. All joints between layers should be staggered when multiple layers of insulation are installed. Insulation greater than 2.5 inches shall be installed in multiple layers.
6. Insulation shall be kept dry at all times. Install only as much insulation as can be covered with completed roofing membrane before the end of the day's work or prior to onset of inclement weather.
7. Edges shall butt tightly and all cuts shall fit neatly against adjoining surfaces to provide a smooth overall surface. Gaps of greater than 1/4 inch width shall be filled with insulation.
8. Install tapered insulation around roof drains and penetrations to provide adequate slope for proper drainage.

C. Adhered Layers of Insulation:
1. Adhere tapered insulation layer and cover board to base insulation layer.
2. Stagger end joints of insulation boards ½ of overall length of board. Stagger joints of subsequent insulation layers from underlying insulation layer.
3. Butt joints of insulation layers tightly allowing no more than ¼-inch wide gaps between units. Fill joints or gaps greater than 1/8-inch between adjacent boards with low-rise foam adhesive.
4. Do not use warped, bent, or otherwise damaged insulation boards. Discard damaged boards.
5. Field cut and fit insulation boards at penetrations, curbs, and walls. Field cut tapered insulation boards to create crickets at upslope sides of curbs and along walls.
6. Install cover board over insulation in accordance with manufacturer's guidelines.

D. Ribbon Application (Urethane Foam Insulation Adhesive):
1. Dispense 1/2-inch wide continuous ribbons of adhesive on substrate to adhere insulation board.
2. Place the initial ribbon of adhesive 3-inches inside each edge/side of the insulation board in a picture-frame fashion. Apply additional parallel ribbons of adhesive across the remainder of the board in a serpentine fashion and spaced according to roof membrane manufacturer's ASCE 7-10 calculations.
3. Firmly set insulation boards in the ribbons of foam adhesive following application of the adhesive when adhesive has risen to proper height and walk-in the insulation to spread the adhesive ribbons, ensuring maximum contact. Do not push or slide insulation into position. Set weighted objects on ends, sides, and corners of boards until adhesive has set and insulation is firmly attached.
4. On additional insulation layers, dispense ribbons of adhesive in direction perpendicular to the direction of the beads that were dispensed on the underlying layer.
5. Fill voids or open joints in top layer of insulation with spray-foam adhesive to provide monolithic surface to receive new membrane.
6. Adhere partial boards and tapered edge strips with adhesive ribbon positioned in picture-frame fashion along perimeter of board and remaining adhesive ribbons spaced in accordance with location on roof (field, perimeter, corner).
7. At end of each work day, provide staggered ends of installed boards so that proper joint stagger can be achieved on following roof installation.

E. Heat Exhaust Vents:
1. Install heat resistant insulation around existing heat exhaust flue, vent pipes, or other penetrations that experience elevated operating temperature.

2. Install new sheet metal base around insulation and strip flange into new roof.

F. Insulation Filler: Install compressible fiberglass insulation at openings in deck at penetrations, perimeters, expansion joints, and/or curbs.

G. Drains:
   1. Insulation shall be sumped in a perimeter at all drains a minimum of double the slope of the finished roof.

3.04 CLEANING

A. Remove debris and material wrappers from roof to dumpster daily. Leave insulation clean, dry, and ready to receive new roofing.

3.05 ADJUSTING

A. Remove damaged insulation and install acceptable new units before installation of roof membrane system.

END OF SECTION 07 22 16

SECTION 07 52 16.13 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING - TORCH

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Work includes all labor, materials, equipment and services necessary for installation of torch-applied SBS modified bituminous membrane roofing system.

B. Related Sections include the following:
   1. Section 06 10 00 “Rough Carpentry”
   2. Section 07 01 50.19 “Preparation for Re-Roofing”.
   3. Section 07 22 16 “Roof Board Insulation”.
   4. Section 07 62 00 “Sheet Metal Flashing and Trim”.

1.03 REFERENCES

A. American Society of Civil Engineers (ASCE):
   1. ASCE 7-05, Minimum Design Loads for Buildings and Other Structures.

B. American Society for Testing and Materials (ASTM):
   1. ASTM D41 Standard Specification for Asphalt Primer Used in Roofing, Damp Proofing and Waterproofing.
   2. ASTM D312 Standard Specification for Asphalt Used in Roofing.
   3. ASTM D451 Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
   4. ASTM D1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
   5. ASTM D1227 Standard Specification for Emulsified Asphalt used as a Protective Coating for Roofing.
   6. ASTM D1863 Standard Specification for Mineral Aggregate used as a Protective Coating for Roofing.
   7. ASTM D2178 Standard Specification for Asphalt Glass Felt used as a Protective Coating for Roofing.
   8. ASTM D2822 Standard Specification for Asphalt Roofing Cement.
   9. ASTM D2824 Standard Specification for Aluminum-pigmented Asphalt Roof Coating.
   10. ASTM D4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet used in Roofing.
   11. ASTM D5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
   12. ASTM D6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials using a combination of Polyester and Glass Fiber Reinforcements.
   13. ASTM D6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials using Glass Fiber Reinforcements.
   14. ASTM E108 Standard Test Methods for Fire Test of Roof Coverings.

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

D. National Roofing Contractors Association (NRCA):

1. Roofing and Waterproofing Manual.

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

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

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting: Conduct at Project Site.
   1. Meet with Owner, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including set up and mobilization areas for stored material and work area.
   3. Review safety procedures and site-specific requirements relating to the work and areas to be accessed.
   4. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   5. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   6. Review structural loading limitations of roof deck during and after roofing.
   7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
   8. Review governing regulations and requirements for insurance and certificates if applicable.
   9. Review temporary protection requirements for roofing system during and after installation.
   10. Review roof observation and repair procedures after roofing installation.
   11. Review notification procedures for weather or non-working days.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with not less than 15 years documented experience.

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

C. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress. Supervisor/Foremen must be fluent in the English language and maintain proper supervision of workmen.

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

E. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.
   1. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
   2. Manufacturer shall have direct authority and control over all fabrication of steel components as well as the raw materials used in their fabrication.

F. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001 approval.

G. Engage the Manufacturer's Field Representative to conduct inspections of work in progress as described herein and shall furnish written documentation of all such inspections.

1.06 SUBMITTALS

A. Comply with pertinent provisions of Division 01 Section “Submittal Procedures, unless otherwise indicated.”

B. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membrane.

C. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class [A] for external fire and meets local or nationally recognized building codes.

D. Manufacturer's Certificate: Certify that the roof system furnished is approved or accepted by Factory Mutual Approval Standard 4470.

E. Manufacturer's Certificate: Certify that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Manufacturer's Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001 compliance certificate.

G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147.

H. Written certification from the roofing system manufacturer certifying the applicator is currently authorized for the installation of the specified roof system.

I. Shop Drawings: Submit copy of manufacturer's wind-uplift calculations.

J. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

1.07 CLOSEOUT SUBMITTALS

A. General: Comply with Requirements of Division 01 Section Closeout Submittals.

B. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.

C. Roofing Maintenance Instructions: Provide a manual of manufacturer's recommendations for maintenance of installed roofing systems.

1.08 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.

1.09 WARRANTY

A. Upon completion of installation, and acceptance by the Owner and Engineer, the Manufacturer will supply to the Owner an "NDL" warranty, without monetary limitations in which manufacture agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Thirty (30) years from date of Substantial Completion.

B. Installer's Warranty: Provide roofing installers warranty to the membrane manufacturer, in which the roofing installer will, at his own expense, make or cause to be made such repairs to or replacements of said work as necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
   1. Warranty Period: Two (2) years from date of Substantial Completion.

C. The Roof System Manufacturer shall provide annual inspection of the roof for the duration of the warranty at no fee to the Owner upon request.

1.10 MANUFACTURER'S FIELD REPRESENTATION

A. Manufacturer's Field Representative: An authorized, full-time employee of the roof system manufacturer shall be assigned to the project to conduct field observations during the installation phase.

B. Regularly scheduled site observations shall be required by the manufacturer's field representative a minimum of hree (3) days per week during the roofing installation period; exceptions being made for inclement weather, holidays, etc.

C. Observation reports shall include the following:
   1. Written report/documentation of the installation progress at the time of the site visit to be delivered to the owner once per week during the duration of the project.
   2. This report shall include documentation of any issues/question and resolution.
   3. This report shall include record of directives given to the roofing contractor.
   4. Digital photographic documentation of the roofing progress; including documentation of specific issues and areas of concern.
   5. Each report shall contain project name, architect's project number, and date/time/duration of site visit.

D. In addition to the progress observations, the manufacturer's representative must:
   1. Attend the roofing trade start-up meeting.
   2. Inspect and approve the roof substrate/deck prior to the start of roofing work.

E. All observation reports shall be kept current and shall be delivered electronically to the owner and contractor within five (5) calendar days after the observation. Progress payments for roofing work may be withheld if observation report submissions are not current.

F. After completion of all roofing work, and prior to acceptance of the roofing installation, the manufacturer's representative shall conduct an observation to document all roofing work to be corrected as a condition of acceptance.
   1. Each item requiring corrective work shall be identified (including specific location) and required corrective action shall be noted.
   2. The final observation report must be produced in writing with photographic back-up. Marking corrective items on the roof alone shall not be acceptable.

1.11 FIELD CONDITIONS

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

B. Do not apply roofing insulation or membrane to damp deck surface.

C. Do not expose materials subject to water or solar damage in quantities greater than can be weatherproofed during same day.

D. Phased Construction will not be accepted.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer: The Garland Company, Inc. or Pre-Approved Equal
   1. 3800 East 91st Street, Cleveland, OH, 44105

B. Modified bituminous roofing shall include but not be limited to:
   1. Field Base Ply Sheet Modified Membrane: Type III membrane complying with ASTM 6163, Grade S. Physical requirements below.
   2. Field Cap Ply Sheet Modified Membrane: Type III membrane complying with ASTM 6163, Grade G. Physical requirements below.
   3. Stripping Ply Sheet Modified Membrane: Type III membrane complying with ASTM 6163, Grade S. Physical requirements below.
   4. Base Flashing Assembly: Two-ply modified, utilizing pro-stop primer and self-adhering roof membrane.

C. Basis of Design Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

2.02 ROOFING SHEET MATERIALS

A. Base Ply Sheet Modified Membrane: ASTM D 6163, Grade S, Type III, 110 mil SBS-modified asphalt sheet; suitable for application method specified, and as follows: Ultra-Shield Torchbase
   1. Tensile Strength, ASTM D 5147:
      a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 125 lbf/in XD 125 lbf/in
      b. 50 mm/min. @ 23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
   2. Tear Strength, ASTM D 5147:
      a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 200 lbf XD 200 lbf
      b. 50 mm/min. @ 23 +/- 2 deg. C MD 1112N XD 1112N
   3. Elongation at Maximum Tensile, ASTM D 5147:
      a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.0% XD 4.0%
      b. 50 mm/min. @ 23 +/- 2 deg. C MD 4.0% XD 4.0%
   4. Low Temperature Flexibility, ASTM D5147, Passes -35 deg. F (-37 deg. C)

B. Granule-Surfaced Roofing Cap Sheet: ASTM D 6163, Grade G, Type III, 195 mil SBS-modified asphalt sheet with fiberglass and polyester composite scrim; suitable for application method specified, and as follows: Stressply IV Plus UV Mineral by The Garland Company, Inc.
   1. Tensile Strength, ASTM D 5147:
      a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
      b. 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
   2. Tear Strength, ASTM D 5147:
      a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 510 lbf XD 510 lbf

b. 50 mm/min. @ 23 +/- 2 deg. C MD 2269 N XD 2269 N
3. Elongation at Maximum Tensile, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 6%
b. 50 mm/min. @ 23 +/- 2 deg. C MD 6% XD 6%
4. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
5. Reflectivity Minimum Requirements:
a. Solar Reflectance Index 0.89
b. Reflectance 0.72
c. Emittance 0.90

C. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

2.03 BASE FLASHING SHEET MATERIALS

A. Base Ply Sheet Modified Membrane: ASTM D 6163, Grade S, Type III 110 mil SBS-modified asphalt sheet; suitable for application method specified, and as follows: SA Base and Pro-Stop Primer by The Garland Company.
1. Tensile Strength, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 125 lbf/in XD 125 lbf/in
b. 50 mm/min. @ 23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
2. Tear Strength, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 200 lbf XD 200 lbf
b. 50 mm/min. @ 23 +/- 2 deg. C MD 1112N XD 1112N
3. Elongation at Maximum Tensile, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.0% XD 4.0%
b. 50 mm/min. @ 23 +/- 2 deg. C MD 4.0% XD 4.0%
4. Low Temperature Flexibility, ASTM D5147, Passes -35 deg. F (-37 deg. C)

B. Granule-Surfaced Roofing Cap Sheet: ASTM D 6163, Grade G, Type III, 195 mil SBS-modified asphalt sheet with fiberglass and polyester composite scrim; suitable for application method specified, and as follows: Stressply IV UV Mineral by The Garland Company, Inc.
1. Tensile Strength, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
b. 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
2. Tear Strength, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 510 lbf XD 510 lbf
b. 50 mm/min. @ 23 +/- 2 deg. C MD 2269 N XD 2269 N
3. Elongation at Maximum Tensile, ASTM D 5147:
a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 6%
b. 50 mm/min. @ 23 +/- 2 deg. C MD 6% XD 6%
4. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
5. Reflectivity Minimum Requirements:
a. Solar Reflectance Index 0.89
b. Reflectance 0.72
c. Emittance 0.90

C. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

2.04 BITUMINOUS ROOFING MATERIALS

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

B. Liquid Flashing – Tuff-Flash: An asphaltic-polyurethane, low order, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.

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

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

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen; non-hardening, non-migrating, non-skinning, and non-drying.

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

2.05 SURFACING

A. Roofing Granules: White ceramic-coated roofing granules as provided by the prime material manufacture, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve, color to match roofing.

B. Solar Reflectively: Meeting Energy Star Requirements Minimum Standards

2.06 RELATED MATERIALS

A. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

B. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the deck material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.

C. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

D. Insulation Adhesive: As provided by the prime roof membrane manufacturer and specified in Division 7 “Roof Board Insulation”.

2.07 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.

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. Solar Reflectance Index: Not less than 70 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

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

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.

B. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

C. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the modified bituminous roofing system.

D. 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.

E. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

F. Apply roofing materials as specified by manufacturer's instructions:
   1. Keep roofing materials dry before and during application.
   2. Do not permit phased construction.
   3. Complete application of roofing plies, modified sheet and flashing in a continuous operation.
   4. Begin and apply only as much roofing in one day as can be completed that same day.

G. Cut-Offs (Waterstops): At end of each day's roofing installation, protect exposed edge of incomplete work, including ply sheets and insulation.

H. Broadcast minerals into the bleed out of bitumen while bitumen is at its recommended EVT temperature to achieve a monolithic appearance.

3.02 EXAMINATION

A. Verify that deck surfaces and project conditions are ready to receive work of this Section.

B. Verify that deck is supported and secured to structural members.

C. Verify that deck is clean and smooth, free of depressions, projections or ripples, and is properly sloped.

D. Verify that adjacent roof substrate components do not vary more than [¼] inch in height.

E. Verify that deck surfaces are dry.

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

3.03 SBS MODIFIED BITUMINOUS BASE PLY MEMBRANE INSTALLATION

A. Install base ply 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. Lay out the roll in the course to be followed and unroll 6 feet (1.8 m).
   2. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and insure a proper bond.
   3. After the major portion of the roll is bonded, re-roll the first 6 feet (1.8 m) and bond it in a similar fashion.

4. Repeat this operation with subsequent rolls with side laps of 4 inches (101 mm) and end laps of 8 inches (203 mm).
5. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.
6. Extend underlayment 2 inches (50 mm) beyond top edges of cants at wall and projection bases.
7. Install base flashing ply to all perimeter and projections details.

B. 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 voids in laps and lapped seams not completely sealed.

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

3.04 SBS MODIFIED BITUMINOUS CAP SHEET MEMBRANE INSTALLATION

A. Install modified bituminous 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. Lay out the roll in the course to be followed and unroll 6 feet (1.8 m).
2. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and insure a proper bond.
3. After the major portion of the roll is bonded, re-roll the first 6 feet (1.8 m) and bond it in a similar fashion.
4. Repeat this operation with subsequent rolls with side laps of 4 inches (101 mm) and end laps of 8 inches (203 mm).
5. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.
6. Immediately broadcast new granules into bleedout while hot bitumen is still at EVT. All loose granules to be removed at end of project.

3.05 BASE 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. Minimum base-flashing height of 8 inches (200 mm) is required. 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. Seal all curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints [and where shown on the drawings] to be flashed with asphalt primer at the rate of one hundred (100) square feet per gallon. Allow primer to dry tack free.
3. Heat fuse entire base ply membrane until burn off paper is gone. Fully adhere membrane to the underlying substrate.
4. After the laps have been tested and complete positive bond has been achieved, the applicator shall heat the seam edge and trowel along the seam edge. Troweling shall continue until a sloped, beveled edge has been produced.
5. Heat fuse finished membrane in the same manner as base ply. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and fiberglass mesh. Install termination bar at top of assembly and seal with a three-course application of trowel-grade mastic and fiberglass mesh.

6. Terminate all base flashings using extruded aluminum termination bar. Three-course all terminations with PVC Mesh and specified mastic.

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

3.06 ROOF DETAIL INSTALLATION

A. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work (as specified in other Sections).

B. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work (as specified in other Sections).

C. Curb Detail:
   1. Minimum curb height is eight (8) inches. Prime vertically at a rate of one hundred (100) square feet per gallon and allow to dry.
   2. Set cant in bitumen. Run all field plies over cant a minimum of two (2) inches.
   3. Install base flashing assembly.
   4. Install pre-manufactured counter-flashing with fasteners and neoprene washers or per manufacturer's recommendations.

D. Flanged Penetration Detail:
   1. Minimum stack height is twelve (12) inches.
   2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
   3. Prime both surfaces of flange of new sleeve. Install properly sized sleeves set in (¼) inch bed of roof cement.
   4. Install stripping ply prior to cap sheet installation.

3.07 FIELD QUALITY CONTROL

A. Perform manufacturer’s field inspection and as required a minimum of two (2) days per week.

B. Correct defects or irregularities discovered during field inspection.

C. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system. A copy of the specification should also be on site at all times.

3.08 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 Architect 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. Remove bitumen adhesive drippings from all walls, windows, floors, ladders and finished surfaces.

D. In areas where finished surfaces are soiled by asphalt or any other sources of soiling caused by work of this Section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.

E. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.09 CONSTRUCTION WASTE MANAGEMENT

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

3.10 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.

B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. The roofing system manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the Roofing Contractor.

D. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas at his own expense.

E. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

F. Notify the Owner and Architect upon completion of corrections.

G. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

H. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

END OF SECTION 07 52 16.13

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Roof penetration sleeves and bonnets.
   2. Receivers.
   3. Counter flashings.
   4. Sanitary vent pipes.
   5. Curb cap flashings.
   6. Exhaust vents.
   7. Copings.
   8. Dip edge.
   9. Gutters and downspouts.
   10. Miscellaneous sheet metal accessories.

B. Related Sections include the following:
   1. Section 06 10 00 “Rough Carpentry”
   2. Section 07 01 50.19 “Preparation for Re-Roofing”.
   3. Section 07 22 16 “Roof Board Insulation”.
   4. Section 07 52 16.13 “SBS Modified Bituminous Membrane Roofing”.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM).

B. Federal Specifications (FS).

C. National Roofing Contractor’s Association (NRCA): NRCA Roofing and Waterproofing Manual, latest edition.

D. Sheet Metal and Air Conditioning Contractor’s National Association, Inc. (SMACNA): Architectural Sheet Metal Manual, latest edition.

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

1.04 WARRANTY

A. Contractor’s Warranty: Provide Owner a written warranty which shall warrant sheet metal work to be free of leaks and defects in materials and workmanship for two years after date of final acceptance by owner.

B. For pre-finished metal, provide manufacturer’s twenty-year guarantee covering deterioration or failure of the flouropolymer finish.

1.05 PERFORMANCE REQUIREMENTS

A. Fabricate and install sheet metal edge flashings to comply with ANSI/SPRI ES-1 requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Pre-Finished Sheet Metal Manufacturer's:
   1. The Garland Co., Inc. or equal.

2.02 SHEET METAL MATERIAL

A. Pre-finished Metal: "Kynar 500" or "Hylar 5000" flouropolymer pre-finished G90 galvanized/galvalume sheet metal, minimum 24 gauge. "Kynar 500" or "Hylar 5000" finish shall consist of a two-coat Polyvinyladine fluoride, minimum 70 percent by weight in coatings, dry film thickness 1 mil, factory applied by metal manufacturer or supplier. Color to be selected by Owner from manufacturer's standard color chart.

B. Zinc-coated (Galvanized) Sheet Metal: Commercial Quality with 0.20 percent copper, in accordance with ASTM A 526 except ASTM A 527 for lock forming; coating designation G() hot-dip galvanized, and mill phosphatized for painting in accordance with ASTM A 525 (paint-grip type), 22 gauge minimum.

C. Sheet Lead: FS QQ-L-201, Grade B; 2-1/2 pounds per square foot, 0.0391-inches thick minimum used for sanitary vent flashing.

D. Stainless Steel Sheet Metal: ASTM A240, Type 304, ASTM A480, No. 2B/2D Mill Finish, gauge as scheduled.

2.03 FASTENERS

A. Fasteners shall be same metal as flashing and sheet metal being joined.

B. Exposed fasteners shall be self-sealing or gasketed for weathertight installation.

C. Heads of fasteners, including but not limited to, rivets, screws, and bolts, that are exposed or visible shall have same manufactured finishes as item being secured; color to match when applicable.

D. Mechanical Fasteners:
   1. Washers: Steel washers with bonded rubber sealing gasket.
   2. Screws: Self-tapping sheet metal type compatible with material fastened.
   3. Rivets: Stainless steel material for the stem with closed end, head of color to match sheet metal items being joined.

2.04 RELATED MATERIALS

A. Solder:
   1. ASTM B 32, alloy grade 58, 50 percent tin, 50 percent lead.
   2. For use with stainless steel: 60-40 tine/lead solder, ASTM B 32.

B. Flux:
   1. Phosphoric acid type, manufacturer's standard.
   2. For use with steel or copper: Rosin flux.
   3. For use with stainless steel: Acid-chloride type flux, except use rosin flux over tinned surfaces.

C. Underlayment: Elastomeric self-adhering sheeting suitable for high-temperature; minimum 30 mil thickness: "WIP 300HT" by Carlisle or pre-approved equal.

D. Adhesives: Type recommended by flashing sheet manufacturer for waterproof and weather resistant seaming and adhesive application of flashing sheet.

E. Metal Accessories: Sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gauge required for performance.

F. Sealant: As recommended by the manufacturer.

G. Termination Bar: 1/8-inch thick, 1-inch wide extruded aluminum bar with flat profile, factory punched holes spaced 6-inches on center.

2.05 FABRICATION, GENERAL

A. Fabricate work in accordance with SMACNA Architectural Sheet Metal Manual and other recognized industry practices and approved shop drawings.

B. Comply with material manufacturer's instructions and recommendations for forming material.

C. Shop fabricate work to the greatest extent possible.

D. Fabricate for waterproof and weather resistant performance with expansion provisions for running work sufficient to permanently prevent leakage, damage, or deterioration of work. Form work to fit substrates.

E. Make angle bends and folds for interlocking metal with full regard for expansion and contraction to avoid buckling.

F. Form materials with straight lines, sharp angles, smooth curves and true levels. Avoid tool marks, buckling, and oil canning.

G. Fold back edges of exposed ends of sheet metal edge to form hem, ½-inch minimum.

H. Lap joints 1-inch minimum. Rivet and solder joints on parts that are to be permanently and rigidly assembled for stainless steel sheet metal. Install rivets, spaced 1-inch on center and apply solder to secure and seal exposed edge of sheet metal in a uniform continuous bead with smooth top finish. Clean residue upon completion of soldering process. Fabricate sheet metal assemblies so that adjoining sections are nested to achieve continuous metal-to-metal contact.

I. Seams:
   1. Fabricate non-moving seams in sheet metal with flat-lock seams.
   2. Pre-finished Galvanized Sheet Metal: Seal pre-finished meatl seams with rivets, spaced 1-inch on center, and sealant.

2.06 FABRICATED ITEMS

A. Receivers and Counter Flashings: Minimum 24-gauge prefinished sheet metal formed in maximum 10-foot lengths.

B. Wind Clips: Minimum 24 gauge stainless steel or pre-finished sheet metal, 1-inch wide, length to engage counter flashing a minimum of ½-inch.

C. Roof Penetration Flashing Pan and Bonnet: Minimum 24 gauge Stainless Steel Sheet Metal. Fabricate pan with ¼-inch hem at top edge, 4-inch wide horizontal flanges; to provide installed minimum clear inside perimeter dimension of 2-inches and 6-inch height. Fabricate bonnet in two-piece adjustable construction with ½-inch caulk through along top edge and a skirt, with hemmed edge; length to extend over top edge of pan a minimum of 2-inches.

D. Cleats/Clips: Continuous strips, 22 gauge sheet metal, same metal type and profile as adjacent metal trim.

E. Sanitary/Plumbing vent Pipe: 2-1/2 pound lead pre-formed flashing sleeve with 4-inch flanges and of proper size/height to fold down inside of vent pipe a minimum of 1-inch.

F. Pipe Box (Base, Hood and Face Plate): 24 gauge Stainless Steel Sheet Metal. Base shall be 8-inches in height with 4-inch wide horizontal flanges. Size to provide minimum 2-inch clearance between box and pipes.

G. Heat Exhaust/Passive Vent: 24 gauge Stainless Steel Sheet Metal Hood to conceal top of base.

H. Drip Edge: 24 gauge pre-finished sheet metal with 6-inch wide cover plates of same material/profile.

I. Gutters: 24 gauge pre-finished sheet metal with straps of the same material/profile.

J. Downspouts: 24 gauge pre-finished sheet metal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that substrates are smooth and clean to extent needed for sheet metal work.

B. Verify that reglets, nails, cants, and blocking to receive sheet metal are installed and free of debris.

C. Do not start sheet metal work until conditions are satisfactory.

3.02 INSTALLATION

A. Install sheet metal with lines, arises, and angles sharp and true, and plane surfaces free from objectionable wave, warp, or buckle. Exposed edges of sheet metal shall be folded back to form 1/4-inch hem on concealed side from view. Finished work shall be free from water retention and leakage under all weather conditions. Install prefabricated corners or transitions at changes in direction, elevation or plane, and at intersections. Locate field joints not less than 12-inches, not more than 3 feet from actual corner. Laps for all metals, except for prefinished metal, shall be 1-inch wide, fastened with rivets spaced 1-inch on-center and soldered.

B. Anchor units of work securely in place to prevent damage or distortion from wind or buckling. Provide for thermal expansion of metal units; conceal fasteners where possible; and set units true to line and level as indicated. Install work with laps, joints, and seams permanently watertight and weatherproof.

C. Install fabricated sheet metal items in accordance with manufacturer's installation instructions and recommendations and with SMACNA Architectural Sheet Metal Manual.

D. Prime all flanged sheet metal and allow to dry completely. Set in a liberal bed of SBS modified mastic and strip in to achieve a full finished two plies of SBS modified roofing membrane.

E. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating affected surfaces with zinc chromate or other permanent liquid-applied or sheet product separation at locations of contact.

F. Continuous Cleat: At exposed edges of metal edge flashings, fascias, copings, and where required, attach continuous cleat at 6-inches on-center with appropriate fasteners metal or steel substrate. At a distance of 10 feet from each direction of corner, install fasteners spaced 3-inches on-center. Install cleat so fascia extends a minimum of 1-inch below top of exterior wall finish.

G. Counter flashings:
   1. Install counter flashings under equipment housing flanges and receivers along rise or parapet walls to extend a minimum of 4-inches below top edge of base flashing.
   2. Secure counter flashing at 6-inches on-center with self-tapping screws.

3. Saw-cut reglet mounted assemblies: Saw cut new joint, 1/2-inch X 1-inch deep, in masonry/concrete where required and to install new receiver. Clean and prepare joint surfaces to receive sealant and insert receiver into joint. Secure new receiver in place with lead wedges spaced 12-inches on-center wedged into joint. Install backer rod into saw-cut reglet and apply a continuous bead of sealant along reglet and top edge of receiver and tool sealant to provide outward sloping finished surface. Secure counter flashing to receiver utilizing self-tapping grommetted screws spaced 6-inches on-center.
4. Surface-mounted assemblies: Secure 2-piece surface-mounted receiver and counter flashing assemblies along substrates. Install sealant tape between receiver and substrate. Secure receiver to substrate with termination bar and appropriate fasteners spaced 12-inches o.c. Install a continuous bead of sealant along caulk trough/top edge of receiver and tool sealant to provide outward sloping finished surface. Secure counter flashing to receiver utilizing grommetted self-tapping screws spaced 6-inches on-center.
5. Install receivers extending behind wall finish and secure vertical flange of receiver 6-inches on-center to back-up wall or metal wall panels. Extend underlayment and/or dampproofing material over vertical flange of receiver, where applicable.
6. Lap adjacent sections of receivers and counter flashings a minimum of 4-inches. Apply a continuous bead of sealant in lap.
7. Secure counter flashing to equipment flanges utilizing self-tapping screws spaced 6-inches on-center.
8. Install wind clips to termination bar spaced 24-inches on-center and engage drip edge of counter flashing a minimum of 1/2-inch.
9. Fabricate the counter flashing to form an integral closure at terminations.

H. Penetration Pans:
1. Install compressible fill insulation between penetrating element and deck.
2. Prime tops and bottoms of flanges of penetration pans.
3. Pop rivet and fully solder joints in pan and flanges.
4. Install penetration pan with flanges set in a uniform troweling of modified bitumen mastic on SBS membrane base ply, secure flange with appropriate fasteners spaced 6-inches on-center, staggered, and strip-in flanges.
5. Fill penetration pan to within 1-inch (25mm) of top of pan with non-shrink grout. Clean surfaces of pan and penetrating element and fill remainder of pan with pourable sealer.
6. Install sheet metal bonnet or hood to conceal the top of the penetration pan.

I. Roof Penetration Hoods and Bonnet:
1. Install sheet metal hood or bonnet on penetrating element to cover the top of the penetration pans.
2. Round or Pipe Penetrations:
   a. Set bonnet in sealant.
   b. Install stainless steel draw-band and tighten to secure to penetration.
   c. Seal top of bonnet with sealant.
3. Square Penetration:
   a. Secure bonnet to penetration with termination bar and self-drilling screws.
   b. Set bonnet in sealant.
   c. Seal top of bonnet with sealant.
4. Angle or Structural Steel Penetration:
   a. Attach bonnet to structural steel member by welding.
   b. Paint assembly after installation.
5.

J. Pipe Box:
1. Pop rivet and fully solder joints and seams in sheet metal base and hood.
2. Prime top and bottom of flanges of base.

3. Install penetration pan with flanges set in a uniform troweling of modified bitumen mastic on SBS membrane base ply, secure flange with appropriate fasteners spaced 6-inches on-center, staggered, and strip-in flanges.
4. Fill base with grout or spray foam to a height of 3/4 of the total pan height.
5. Fill remaining height of base with pourable sealer.
6. Install hood over base, securing to each side with self-tapping screws, and sloping down toward front of box.
7. Install face plate to cover box opening around pipe penetrations and apply sealant around pipe configuration at face plate.

K. Sanitary/Plumbing Vent Pipes:
1. Prime top and bottom flanges of lead flashing sleeve. Set flange or embed in uniform troweling of modified bitumen mastic on SBS membrane base ply. Prime top side of flange to receive strip-in membrane.
2. Fold lead sleeve down inside pipe a minimum of 1-inch. Apply a continuous bead of sealant on inside of pipe prior to folding lead sleeve. Paint exposed lead flashing with elastomeric coating to match color of membrane top ply.

L. Heat Exhaust/Gravity Vent/Turbine Vent/Goose-neck Vent:
1. Prime top and bottom of flanges of base.
2. Install penetration pan with flanges set in a uniform troweling of modified bitumen mastic on SBS membrane base ply, secure flange with appropriate fasteners spaced 6-inches on-center, staggered, and strip-in flanges.
3. At heat exhaust vents, install sheet metal bonnet secured to vent pipe with stainless steel draw band and apply sealant along top edge of bonnet and tool sealant to provide outward sloping finished surface.

3.03 CLEANING

A. Remove flux and residual acid immediately by neutralizing with baking soda and washing with clean water. Leave work clean and free of stains, scrap, and debris.

B. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration/damage of finishes. Paint (color to match) areas of prefinished metal where finish is damaged. Replace sheet metal items when damaged finish can not be repaired to an acceptable condition.

C. Prime soldered area of phosphatized metal after cleaning to prevent rusting.

END OF SECTION 07 62 00

SECTION 074113 - STANDING SEAM ROOF PANELS

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. Work described in this section includes pre-formed metal roofing system complete with clips, perimeter and penetration flashing, closures, gutters, and downspouts.

B. Related work specified elsewhere:

1. Metal roof decks.
2. Wood roof decks.
3. Metal fabrications.
4. Rough carpentry.
5. Flashing and sheet metal. (Not roof panel related).
6. Air barrier and vapor retarder.
7. Thermal insulation.
8. Sealants.

1.3 DEFINITIONS

A. American Architectural Manufacturers Association (AAMA):

1. AAMA 501.1-17: Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.
2. AAMA 621-02: Voluntary/Standard Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates

B. American Iron and Steel Institute (AISI):

1. S100-16: 2016 Edition of the North American Specification for the Design of Cold-Formed Steel Structural Members.

C. American Society of Civil Engineers (ASCE):

1. ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

D. American Society for Testing and Materials (ASTM):

1. A653-19a: Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. A755–18 Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
3. A792-10(2015): Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
4. B209-14: Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
5. D1056-14: Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
6. D3575-14: Standard Test Methods for Flexible Cellular Materials made from Olefin Polymers.
7. E1514-98(2017) e1 Standard Specification for Structural Standing Seam Steel Roof Panels.
8. E1592-05(2017): Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
9. E1637-98(2017) e1 Standard Specifications for Structural Standing Seam Aluminum Roof Panel Systems.
10. E1646-95(2018): Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
11. E1680-16: Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
12. E2140-01(2017): Standard Test Method for Water Penetration of Metal Roof Panels Systems by Static Water Pressure Head.

E. Factory Mutual Approvals (FM):

1. FM 4471, August 1995: Approval Standard for Class I Panel Roofs.

F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

1. Architectural Sheet Metal Manual, 7th edition.

G. Underwriters Laboratory (UL):

1. UL 580, 5th Ed.: Standard for Tests for Uplift Resistance of Roof Assemblies.
2. UL 790, 8th Ed.: Standard for Tests for Fire Resistance of Roof Covering Materials.

H. National Association of Architectural Metal Manufacturers (NAAMM)

1. Metal Finishes Manual for Architectural and Metal Products

1.4 DESIGN AND PERFORMANCE CRITERIA.

A. Thermal Expansion and Contraction.

1. Completed metal roofing and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling or reducing performance ability.
2. The design temperature differential shall be not less than 220 °F (120 °C).
3. Clips shall be designed to allow for expansion and contraction of the roof relative to the structure throughout the temperature range specified above...
4. Resistance to wear through- An assembled specimen at least 3 panels wide spanning 3 or more supports with a 10-pound (4.5 kg) positive load on each clip shall be subjected to 100,000 cycles ½-inch (13 mm) in each direction for a total of 1-inch (25 mm) thermal movement. Upon completion, the panel shall show no signs of wear through from the top nor shall the contact surfaces between the clip and panel show any more than 25% loss in metal thickness. Laboratory test reports shall be independently certified (not by the manufacturer) by a registered professional engineer licensed to practice in any United States jurisdiction.

B. Uniform Wind Uplift Load Capacity.

1. Installed roof system shall withstand negative wind uplift pressures complying with the following criteria.
   a. Design Code: ASCE 7, Method 2 for Components and Cladding.
   b. Safety Factor: As determined in accordance with AISI S100 section D6.2.1, but in no instance shall the safety factor be taken to be less than 1.67 for any roof or wall zone. The provisions of Section D6.2.1a of Appendix A shall NOT be applicable for this project.
   c. Wind Speed:114 mph.
   d. Exposure Category: [C]
   e. Roof Pitch: 1.875 inches per foot.
2. The ultimate capacity of the panel system shall be determined based on performance testing in accordance with ASTM E1592. The allowable load carrying capacity shall be calculated in accordance with AISI S100 section D6.2.1, except the provisions of Section D6.2.1a of Appendix A shall NOT be applicable for this project.

C. Uniform Positive Load Capacity.

1. Uniform positive load capacity shall be determined in accordance with AISI S100.
2. The installed roof system shall be capable of resisting each of the following positive uniform roof loads: Roof Live Load of 20 psf;
3. Installed roof system shall carry positive uniform design loads with a maximum system deflection of L/180 as measured at the rib (web) of the panel.

D. Wind Uplift Classification: The panel system shall be listed as a Class 90 windstorm rated system, as determined by UL 580.

E. Fire Resistance Classification: The panel system shall be listed as a Class A Roof Covering, as determined by UL 790.

F. Air infiltration: The panel system shall be tested in accordance with ASTM E1680, and meet or exceed the following performance requirements:

Pressure	Area Leakage Rate
1.57 PSF	0.0010 cfm/sq.ft.
6.24 PSF	0.0020 cfm/sq.ft.
20.0 PSF	0.0032 cfm/sq.ft.

G. Static air pressure water infiltration: The panel system shall be tested in accordance with ASTM E1646, and meet or exceed the following performance requirements:

Pressure	Result
6.2 Gal/Hr per S.F. and Static Air Pressure of 20.0 psf for 15 minutes	No Leakage

H. Static water pressure head water infiltration.

1. The panel system shall be tested in accordance with ASTM E2140, and pass with no leakage. The test specimen must include a panel end lap condition and successfully withstand being submerged under 6" of water for 6 hours.

I. Dynamic pressure water penetration.

1. The panel system shall be tested in accordance with AAMA 501.1, and pass with no water penetration, other than condensation, when exposed to 8" per hour of dynamic rain and 77 mph wind velocities for not less than five (5) minutes duration. This pertains to the roof panel flashing components.

J. Class I Panel Rating: The specified panel system shall be listed as a Class I Panel Roof, in accordance with FM 4471. The tested system shall be identical to the specified panel for this project regarding profile, gauge, width, and material. The anchor clip spacing for this project name shall be based on E1592 requirements, but the clip spacing for roof zone 1 shall not exceed that of the FM 4471 test reports.

1.5 SUBMITTALS.

A. Shop drawings: Show roof panel system with flashings and accessories in plan view; sections and details. Include metal thicknesses and finishes, panel lengths, joining details, anchorage details, flashings and special fabrication provisions for termination and penetrations. Indicate relationships with adjacent and interfacing work. Shop drawings to be prepared by metal roof panel manufacturer and sealed by a professional engineer registered in the state of the project location.

B. Financial Certification: Provide the building owner with a signed and notarized (sealed) affidavit by an officer of the panel system manufacturer which confirms a current minimum corporate asset-to-liability ratio of not less than 3:1 for the panel manufacturer, or its parent corporation. Financial support information and affidavit must be dated within 30 days prior to the product submittal.

C. Design Test Reports.

1. Submit copies of design test reports for each of the performance testing standards listed in specification article 1.4. This shall be submitted with the contractors bid documents to establish submitted roof system meets all above requirements.

2. Test reports shall be performed by independent, accredited testing laboratories, and shall bear the seal of a registered professional engineer.

D. Warranty: Provide unexecuted specimen warranty documents for each warranty as required in specification article 1.10.

E. Samples.

1. Submit sample of panel section, at least 6-inch x 6-inch (150 mm x 150 mm) showing seam profile and a sample of color selected.

2. Submit sample of panel clip, gable clip, and preformed metal and foam closures.

1.6 QUALITY CRITERIA/INSTALLER QUALIFICATIONS.

A. Engage an experienced metal roofing contractor (erector) to install standing seam system who has a minimum of three (3) years' experience specializing in the installation of structural standing seam metal roof systems.

B. Contractor must be certified by manufacturer specified as a supplier of standing seam system and obtain written certification from manufacturer that installer is approved for installation of the specified system. Contractor will have attended the manufacturers training program for certification.

C. Successful contractor must obtain all components of roof system from a single manufacturer. Any secondary products that are required which cannot be supplied by the specified manufacturer must be recommended and approved in writing by primary manufacturer prior to bidding.

D. Fabricator/Installer shall submit work experience and evidence of adequate financial responsibility. Architect reserves the right to inspect fabrication facilities in determining qualifications.

1.7 DELIVERY, STORAGE, AND HANDLING.

A. Inspect materials upon delivery.

B. Handle materials to prevent damage.

C. Store materials off ground providing for drainage; under cover providing for air circulation; and protected from any debris.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.

B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.9 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of decks, purlins, rafters, parapets, walls and other adjoining work to provide a leak proof, secure, and noncorrosive installation.

1.10 WARRANTIES

A. Endorse and forward to owner the following warranties:

1. The manufacturer's standard 20-year "NDL" roof system weathertightness warranty, jointly signed by the installer and manufacturer. The warranty shall not place any limitations on wind speed, up to a maximum design wind speed as given in Article 1.4 of this specification.

2. The manufacturer's standard 20-year finish warranty covers checking, crazing, peeling, chalking, fading, and adhesion of the pre-painted sheet metal materials.

3. Installer's 2-year warranty covering roof panel system installation and water-tightness.

B. Warranties shall commence on date of substantial completion.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

A. Painted, metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A755/A755M.

1. Recycled Content: Provide steel sheet with average recycled content such that postconsumer recycled content plus one-half of pre-consumer recycled content is at least 70 percent.

2. [24] gauge, Zinc-Coated (Galvanized) Steel Sheet, as per ASTM A653: G90 (Z275) coating designation; structural quality, minimum grade 40 ksi (275 MPa).

3. Texture: [Smooth] surface.

4. Exposed Coil-Coated Finish:

a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Manufacturers' approved applicator to prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

b. Coating system shall provide nominal 1.0 mil (0.025 mm) dry film thickness, consisting of primer and color coat.

c. Color shall be selected from IMETCO's Standard Colors.

5. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

C. Panel Sealants:

1. Seam Sealant: Factory applied hot melt, high viscosity, pressure sensitive adhesive with high heat resistance.

2. Sealant Tape: Non-curing, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1-inch- (13-mm-) wide and 1/16-inch- (3-mm-) thick.

3. Exposed Sealant: ASTM C 920; elastomeric tri-polymer, polyurethane, or other advanced polymer sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.

4. Concealed Sealant: ASTM C 1311: Butyl-Based, Solvent-Release, One-Part Sealant.

2.3 SUBSTRATE BOARD

A. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.

1. Type and Thickness: [Regular, 1/2 inch (13 mm)]

2. The top surface of the substrate board shall be pre-primed to provide for adhesion of the self-adhering underlayment material.

3. Product: Subject to compliance with requirements, provide Dens-Dek Prime by Georgia-Pacific Corporation.

B. Substrate-Board Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FMG 4470, designed for fastening substrate board to substrate.

2.4 UNDERLAYMENT MATERIALS

A. Self-adhering, high-temperature, air, water, and vapor barrier sheet, with a release-paper backing; cold applied.

1. Thermal Stability: Stable after testing at 250 deg F (121 deg C); ASTM D 1970.

2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.

3. Seams shall be lapped in accordance with manufacturer's recommendations.

4. Underlayment shall be approved for 90 days (minimum) of exposure to UV and weather penetrations.

5. Products: Subject to compliance with requirements, provide one of the following:
    a. IntelliWrap UDL by IMETCO of Norcross, GA: a highly flexible 45-mil (1.2 mm) thick sheet composed of a non-slip polymer film laminated to a rubberized asphalt adhesive.

2.5 MISCELLANEOUS METAL FRAMING

A. Miscellaneous Metal Framing, General: ASTM C645, cold-formed metallic-coated steel sheet, ASTM A653, G90 (Z275) hot-dip galvanized.

B. Fasteners for Miscellaneous Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

2.6 MISCELLANEOUS MATERIALS

A. Concealed fasteners: Corrosion resistant steel screws, #10 minimum diameter x length appropriate for substrate, hex washer head or pancake head. Use self-drilling, self-tapping for metal substrate or A-point for wood substrate.

B. Exposed fasteners: 3xx series stainless steel screws (cadmium or zinc coatings are not acceptable) with neoprene sealing washer, or 1/8-inch- (3-mm-) diameter stainless steel rivets.

2.7 STANDING-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips at side laps. Include clips, cleats and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1637.

B. Vertical-Rib, Standing-Seam Metal Roof Panels with field seamed panel legs. Formed with vertical ribs at panel edges and two intermediate pencil beads spaced between ribs; designed for installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

1. Basis-of-Design System: Panel shall be IMETCO (Merchant & Evans) ZIP RIB roof panel system as manufactured by Innovative Metals Company, Inc. (IMETCO), Norcross, Georgia (800-646-3826)

2. Alternate manufacturers are subject to full compliance with specification requirements, have a minimum of 12 years manufacturing panel profile specified and shall be submitted for approval as follows:
    a. KALZIP
    b. BEMO
    c. No other substitutions shall be permitted for this project.
3. Material and Finish: As indicated in specification article 2.1.
4. Characteristics:
    a. The same panel profile from a single manufacturer shall be used for ALL standing seam roof areas.
    b. Configuration: Standing seams incorporating mechanically interlocked, concealed anchor clips which allow thermal movement.
        1) Profile of panel shall have two stiffening beads equally spaced across the panel width.
        2) Exposed fasteners, screws and/or roof mastic are unacceptable and will be rejected. System configuration only allows for exposed fasteners at panel overlap (if required and approved by architect) and trim details (as per manufacturer's guidelines).
        3) Panels must be furnished in continuous lengths from eave to eave with no overlaps accepted. This applies to this application. Fixed point by panel clips will be done at the ridge area determined by panel manufacturer and noted on shop drawings.
        4) Curved panels shall be mechanically curved to the exact radius of each curved roof area. Panels may be mechanically curved in the factory or on site. Curving must be performed with the panel manufacturer’s curving machine and operated by the manufacturer’s full time trained and experienced technician. Flat panels conformed to the roof shape are not acceptable and will be rejected.
    c. Seam must be 2.5-inch (60 mm) minimum height for added strength for negative pressures design.
    d. Panel seam shall contain a non-curing hot melt sealant concealed in the panel leg.
    e. Panel seam shall be field crimped by means of an electric seaming tool to seal adjacent panels into a weathertight system, once installed. Installed panels seams shall be capable of being un-seamed by use of an electric “unzipping” tool. The un-seaming operation shall render each adjacent panel removable and reusable, without any permanent damage.

f. Site Formed Panels Mandatory: Panels are in excess of shippable length and shall be formed on-site. Site formed panels shall meet each of the following requirements:

1) Panels shall be formed on heavy duty factory type roll-formers with no fewer than 18 forming stations to improve quality and minimize oil canning.

2) Panels shall be of identical profile and characteristics as factory formed panels and specimens used as the basis of performance tests.

3) Site roll-forming equipment shall be owned and maintained by the panel manufacturer and operated by the panel manufacturer's trained full-time experienced technician. The installer must provide additional personnel to handle raw materials and finished product as necessary.

4) Panels are to be field fabricated by the Zip Rib panel former. The panels shall be rolled on tilted panel machine directly to the existing roof.

g. Concealed Standard Anchor Clips: Clips must be a two (2) piece sliding type with an 18-gauge (1.3 mm) galvanized steel base and 20-gauge (0.9 mm) [galvanized] [stainless] steel top hook.

1) Clip must maintain a clearance of a minimum of 3/8-inch (9.5 mm) between panel and substrate for proper ventilation to help prevent condensation on underside of panel and eliminate the contact of panel fastener head to panel.

h. Standing Seam Panel Width: [16"]

i. Panel ends shall be folded up 90 degrees at ridge, headwall, and hip conditions, where applicable. No metal shall be cut or otherwise perforated at the folded end.

2.8 ACCESSORIES

A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.

2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips meeting ASTM D1056 and/or D3575; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

3. Gable anchor clips: 18 gauge (1.3 mm) galvanized steel**.**

B. Flashing and Trim: Formed from same material and gauge as roof panels, prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

C. Radius Rake/Gable Trim shall be welded to conform to the radius of the existing barrel roof. This shall be a min of 8-inch (200 mm) vertical face x 96-inch (2.4 m) lengths. Aluminum shall be a minimum of 0.050-inch (1.3 mm), fully welded. Trim shall be post-painted 70 percent PVDF to match the roof panel color. Segmented trims will not be accepted.

D. Gutters: Formed from same material roof panels. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 120-inch (3 m) long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced per SMACNA's recommendation based on gauge and stretch-out, fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match [metal roof panels] [roof fascia and rake trim].

1. Gutter Hangers: External gutter supports shall be 2-inch- (50-mm-) wide x ¼-inch- (6-mm-) thick formed aluminum and shall be spaced at no greater than 36-inch (0.9 m) on center. External supports shall be post-painted with a matching full-strength 70 percent PVDF finish and warranted by the panel manufacturer for same term as specified for material finishes.

2. Gutter Straps: Internal gutter straps shall be 1-inch- (25-mm-) wide x 1/8-inch- (3-mm-) thick formed aluminum and shall be spaced at no greater than 36-inch (0.9 m) on center. Internal straps shall be post-painted with a matching full-strength 70 percent PVDF finish and warranted by the panel manufacturer for same term as specified for material finishes.

E. Downspouts: Formed from same material as roof panels. Fabricate in 120-inch- (3-m-) long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual". Finish downspouts to match gutters.

1. Downspout Brackets: Where detailed, surface mounted downspout protection guards shall be fabricated from ¼-inch- (6-mm-) thick formed aluminum, and shall be post-painted with a matching full-strength 70 percent PVDF finish and warranted by the panel manufacturer for same term as specified for material finishes.

F. Roof Curbs: Fabricated from same material as roof panels, minimum and welded top box and integral full-length cricket. Fabricate curb subframing of minimum 16-gauge- (1.5-mm-) thick, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads, of size and height indicated. Finish roof curbs to match metal roof panels.

2.9 FABRICATION

A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal roof panel seam with factory-installed hot melt, high viscosity, pressure sensitive adhesive with high heat resistance, in a manner that will seal weathertight.

D. Form flashing components from full single width sheet in minimum 120-inch (3 m) sections. Provide mitered corners, joined using closed end pop rivets and butyl-based, solvent released one-part sealant.

E. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2. Sealed Joints: Form nonexpanding but movable joints in metal to accommodate butyl-based sealant to comply with SMACNA standards.

3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

4. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.10 FINISHES

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

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

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

PART 3 - PREPARATION & EXECUTION

3.1 EXAMINATION

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

B. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.

C. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking, and that installation is within flatness tolerances required by metal roof panel manufacturer.

D. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.

E. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

B. Establish straight, side and crosswise benchmarks

C. Use proper size and length fastener for strength requirements. Approximately 5/16-inch (8 mm) is allowable for maximum fastener head size beneath the panel.

D. Rectangular roofs shall be checked for square and straightness. Gable ends may not be straight; set a true line for the gable clips and flashing with string line.

E. Measure the roof lengthwise to confirm panel lengths, overhangs, coverage of flashings at eaves and ridges and verify clearances for thermal movement.

3.3 THERMAL INSULATION INSTALLATION

A. Board Insulation (reference 2.2.C-G): Extend insulation in thickness indicated to cover entire roof. Comply with installation requirements in Division 07 Section "Thermal Insulation."

1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.4 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply over entire roof surface, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6-inches (150 mm) staggered 24-inches (610 mm) between courses. Overlap side edges not less than 3.5-inches (90 mm). Roll laps with roller. Cover underlayment within 90 days.

B. Install flashings to cover underlayment to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."

3.5 STANDING SEAM METAL ROOF PANEL INSTALLATION

A. All details will be shown on in accordance with approved shop drawings and manufacturer's product data, within specified erection tolerances.

B. Directly over the completed roof substrate, install two-piece clips. [All anchor clips will be set on 16-gauge (1.5 mm) galvanized pre-punched bearing plates to distribute the loads on the board insulation.] All anchor clips will be fastened into the structural roof substrate based on the following spacing pattern:

C. Installation of Roof Panels: Unless alternate means are approved by the panel manufacturer, roof panels shall be installed by starting from one end and working towards the opposite end per manufacturer's installation guide.

1. Use three fasteners secured through the panel pan to permanently anchor the panel to the roof deck located at the ridge or head conditions. This is done at each panel along the ridge or head conditions.

    a. Fasteners are positioned behind the panel head closures to create a fixed panel point.

    b. Use a 3/8" shim underneath the panel to maintain a flat and level panel pan to prevent panel pan from being pulled out of plane.

    c. A hand crimping tool is used to crimp the cap around the top of two adjacent panels.

    d. Panel shall then be permanently seamed with manufacturers mechanical seamer.

D. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.

E. Limit exposed fasteners to extent indicated on contract drawings.

F. Seal laps and joints in accordance with roofing system manufacturer's product data.

G. Coordinate flashing and sheet metal work to provide weathertight conditions at roof terminations. Fabricate and install in accordance with standards of SMACNA Manual.

H. Provide for temperature expansion/contraction movement of panels at roof penetrations and roof mounted equipment in accordance with system manufacturer's product data and design calculations.

I. Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.

J. At joints in linear sheet metal items, set sheet metal items in two ¼-inch- (6-mm-) beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

K. Remove damaged work and replace with new, undamaged components.

L. Touch up exposed fasteners using paint furnished by roofing panel manufacturer and matching exposed panel surface finish.

M. Clean exposed surfaces of roofing and accessories after completion of installation. Leave in clean condition at date of substantial completion. Touch up minor abrasions and scratches in finish.

3.6 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of ¼-inch in 20-feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing. Inspections shall occur 3 times per week by employee of the panel manufacturer. Reports shall be submitted to the roofing contractor compiled to weekly submission.

B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.

3.8 CLEANING

A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 56 30 FLUID APPLIED ROOFING RESTORATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Metal Surfaces Roof Restoration

B. Accessories

C. Edge Treatment and Roof Penetration Flashings

1.02 RELATED SECTIONS

A. Section 06100 – Roof Carpentry: Roof blocking installation

B. Section 07620 - Sheet Metal Flashing and Trim: Metal cap flashing and expansion joints

C. Section 15430 - Plumbing Specialties: Piping vents and roof drains

1.03 REFERENCES

A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants

B. ASTM D 1475 - Standard Test Method For Density of Liquid Coatings, Inks, and Related Product

C. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces

D. SRI - Solar Reflectance Index calculated according to ASTM E 1980

E. SMACNA Architectural Sheet Metal Manual

F. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual

1.04 SYSTEM DESCRIPTION

A. Metal Surface Roof Restoration: Renovation work includes:
   1. Surface preparation: Remove loose flaking rust, dust, dirt, debris, secure all gaped panels and replace all loose fasteners with next size larger.
   2. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
   3. Primer: Spot prime rusted areas only
   4. Preparation: Apply CPR Seam Sealer BG on seams, fasteners and around penetration.
   5. Base Coating: Apply CPR White over entire surface

1.05 SUBMITTALS

A. Submit under provisions of Section 01300

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations
   2. Storage and handling requirements and recommendations
   3. Installation methods

C. Verification Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, and color.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and

submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with manufacturer's current Application and Installation Guidelines and the NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.

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

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

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.07 PRE-INSTALLATION CONFERENCE

A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.

B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.

C. Objectives include:
   1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
   2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
   3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
   4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
   5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
   6. Review required inspection, testing, certifying procedures.
   7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
   8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.08 DELIVERY STORAGE AND HANDLING

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

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

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

D. Storage temperatures should be between 60 degrees F to 80 degrees F (15.6 degrees to 26.7 degrees C). Indoor ventilated storage is recommended. Ensure jobsite storage is in a shaded and ventilated area. Do not store in direct sunlight. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

1.09 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Weather Condition Limitations: Product application must not be done when rain or other conditions such as fog or heavy dew are possible within a 24 hour period. Roof surface must be at least 6 Fahrenheit degrees or 3 Celsius degrees above the dew point and rising.

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

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

E. When applying materials with spray equipment, take precautions to prevent over spray from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
   1. Close air intakes into the building
   2. Have a dry chemical fire extinguisher available at the jobsite.
   3. Post and enforce "No Smoking" signs.

F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.

G. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.

H. Take precautions to ensure that materials do not freeze.

I. Minimum temperature for application for most products is 40 degrees F (4 degrees C) and rising for solvent based materials and 50 degrees F (10 degrees C) and rising for water based.

1.10 WARRANTY

A. Warranty Period: 10 years
   1. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the

installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
    a. Metal Surface Roof Restoration

B. Warranty Period: Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
    1. Warranty Period:
        a. 2 years from date of acceptance

1.11 MANUFACTURES FIELD REPRESENTATION

A. Manufacturer's Field Representative: An authorized, full-time employee of the roof system manufacturer shall be assigned to the project to conduct field observations during the installation phase.

B. Regularly scheduled site observations shall be required by the manufacturer's field representative a minimum of three (3) days per week during the roofing installation period; exceptions being made for inclement weather, holidays, etc.

C. Observation reports shall include the following:
    1. Written report/documentation of the installation progress at the time of the site visit to be delivered to the owner once per week during the duration of the project.
    2. This report shall include documentation of any issues/question and resolution.
    3. This report shall include record of directives given to the roofing contractor.
    4. Digital photographic documentation of the roofing progress; including documentation of specific issues and areas of concern.
    5. Each report shall contain project name, architect's project number, and date/time/duration of site visit.

D. In addition to the progress observations, the manufacturer's representative must:
    1. Attend the roofing trade start-up meeting.
    2. Inspect and approve the roof substrate/deck prior to the start of roofing work.

E. All observation reports shall be kept current and shall be delivered electronically to the owner and contractor within five (5) calendar days after the observation. Progress payments for roofing work may be withheld if observation report submissions are not current.

F. After completion of all roofing work, and prior to acceptance of the roofing installation, the manufacturer's representative shall conduct an observation to document all roofing work to be corrected as a condition of acceptance.
    1. Each item requiring corrective work shall be identified (including specific location) and required corrective action shall be noted.
    2. The final observation report must be produced in writing with photographic back-up. Marking corrective items on the roof alone shall not be acceptable.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer: The Garland Company, Inc. (3800 E. 91st St., Cleveland, OH 44105.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 METAL SURFACE ROOF RESTORATION

A. CPR:
   1. Primer: Metal Primer at Rust Areas Only
   2. Base: CPR Base Coat
   3. Coating: CPR White
   4. Flashing: CPR Seam Sealer BG on seams, penetrations and fasteners.
   5. Reinforcement: Partial reinforcement on metal panel seams only.
      a. Grip Polyester

2.03 ACCESSORIES

A. Roof Insulation: In accordance with Section 07220.

B. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel, Fasteners shall be self-clinching type of penetrating type as recommended by the deck manufacturer. Fasten nails and fasteners flush-driven through flat metal discs not less than 1 inch (25 mm) diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than 1 inch (25 mm) diameter are used.

C. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

2.04 EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

B. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight.

C. Fabricated Flashing: Fabricated flashings and trim are specified in Section 07620
   1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

PART 3 - EXECUTION

3.01 EXAMINATION

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

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

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 ROOF PREPARATION AND REPAIR

A. General: All necessary field and flashing repairs must be done according to good construction practices, including the removal of all wet insulation and defective materials as identified through a moisture detection survey such as an infrared scan and replacement with like-materials.
   1. Remove damaged roof flashings from curbs and parapet walls down to the surface of the roof. Remove damaged existing flashings at roof drains and roof penetrations.

2. Existing roof surfaces shall be primed as necessary and allowed to dry prior to installing the roofing system.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Repair all defects such as deteriorated roof decks, saturated materials, loose or brittle membrane or membrane flashings, etc. Verify that existing conditions meet the following requirements:
   1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
   2. Application of roofing materials over a brittle, damaged or poor condition roof membrane is not permitted.

D. Remove all loose dirt and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.

E. Clean and seal all parapet walls, gutters and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope.

F. Confirm local water run-off ordinances and restrictions prior to cleaning roof. Clean the entire roof surface by removing all dirt, algae, mold, moss, paint, oil, talc, rust or other foreign substance. Use a bio-degradable cleaner like Simple Green Oxy Solve when necessary and warm water. Scrub heavily soiled areas with a brush. Power wash roof thoroughly with an industrial surface cleaner equipped with one piece balanced spray rotating jets for streak free close contact cleaning. Rinse with fresh water to completely remove all residuals. Allow roof to dry thoroughly before continuing.

G. Repair existing metal roof as necessary to provide a sound substrate for the liquid membrane. All surface defects must be repaired/renovated and be made watertight. Any repairs must be with be only with materials compatible with the fluid-applied roofing restoration system.

H. Power washing of metal roof surfaces to remove all loose rust or scale is mandatory before application. Use a high volume air broom or compressed air to remove residual dust rust perforations, etc. Deteriorated metal roof decks must be repaired or replaced prior to the application of the coating system.

3.03 INSTALLATION

A. General Installation Requirements:
   1. Install in accordance with manufacturer's current Application and Installation Guidelines and the NRCA Roofing and Waterproofing Manual.
   2. Adequate coating thickness is essential to performance. If the applicator is unfamiliar in gauging application rates, we suggest that a controllable area be measured and the specified material be applied. In all cases, all minimum specified material must be applied and proper minimum dry film thicknesses must be achieved. Care must be taken to ensure that all areas completed including all flashings, roof penetrations, etc. are coated sufficiently to ensure a watertight seal.
   3. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
   4. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

5. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore adjacent work damaged by installation of the roofing system.
6. All primers must be top coated within 24 hours after application, preferably immediately after drying. Clean and re-prime if more time passes after priming.
7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.

B. Metal Surface Roof Restoration: Renovation work includes:
   1. Surface Preparation: Remove loose flaking rust, dust, dirt, debris, secure all gaped panels and replace all loose fasteners with next size larger.
      a. Remove rust by the most rigorous method suitable for the particular project and as approved by Garland.
      b. Tighten all fasteners and verify that neoprene washers are in place.
      c. Replace missing fasteners using oversize fasteners as necessary.
      d. Seal all fastener heads by applying a heavy dab of compatible sealant to the tops and around of all fastener heads.
      e. Repair gaps, holes and joints in the metal roof with appropriate patching materials.
      f. Completely remove existing seam coatings, mastics and sealants.
      g. Ensure skylights, scuppers, gutters, penetrations and structures are firmly secured, watertight and in good working condition.
      h. Where necessary, install water deflecting crickets behind rooftop mechanical units.
      i. All roof areas must promote positive drainage.
   2. Flashing: Repair/Replace metal flashings, pitch pockets, decktites etc.
   3. Primer: Spot prime surfaces with Metal Roof Primer rust inhibitive primer over properly prepped rusted areas only at 1/4 gallon per 100 SF.
   4. Reinforcement: Treatment of field seams and around penetrations:
      a. Application of Grip Polyester Soft with CPR base coat on metal panel end laps, flashings and around penetrations.
         1) Verify that the surface to be coated is properly prepared.
         2) Remove the clear release liner from the back in workable sections
         3) Center 6 inch wide Grip Polyester over the middle of the lap.
         4) Use care to install the tape uniformly. Do not stretch or cause air pockets, wrinkles or fishmouths.
         5) Apply pressure to tape starting at the center and work toward outside edge with a steel roller to activate the bonding process.
         6) Inspect the tape to ensure that it is properly installed. Verify edges are tightly fixed to surface. If any discrepancies are present, repair before the coating is applied.
         7) CPR Brush grade seam sealer at ridge cap and vertical seams panel seams at a rate of 0.67 gallons per 100 square feet. May be applied with a brush or heavy nap roller
      b. Application of CPR Base Coat on uncrimped metal panel side laps:
         1) Verify that the surface to be coated is properly prepared.
         2) Restore the surface to a suitable condition if roof surface becomes contaminated with dirt, dust or other materials that will interfere with adhesion of the coatings.
         3) Apply materials at specified dry film thickness.
         4) Apply Base Coat at minimum 6 inch wide stripes over all seams, flashings and around penetrations at 2.0 gallons per 100 SF.

5) Use fabric reinforcement when panels are gapped and cannot be drawn tightly together.
6) Allow to dry for a minimum of 24 hours before applying finish coats.
7) On vertical surfaces to achieve proper application rate cut your application into two coats to avoid sagging.

c. Coating Application: Ensure the fluid-applied coverage rates are obtained throughout the entire roof surface
1) Material: Apply CPR in a uniform manner at 1.5 gallons per 100 SF over the entire roof surface. Allow to cure thoroughly, but no more than 72 hours. Apply a top coating over base coat at 1.5 gallons per 100 SF.
2) Apply the CPR Base Coat at a coverage rate of 1.5 gal./100 ft.2 (0.61 l/m2) on roof surface(s) and 0.5 gal/100 ft.2 (0.21 l/m2) on metal wall panels.
3) After field seam application and base coat application have been completed and allowed to dry, apply CPR White Coating in a uniform manner at a minimum application rate of 1.5 gallons per 100 ft.
4) Use special attention to coating flashings and other critical areas to build adequate membrane thickness
5) Use multiple coats on verticals or steep slopes to prevent sagging.
6) Apply to the minimum recommended membrane thickness over the entire roof surface.

3.04 REPAIR OF EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. General
1. Repair flashing in accordance with the requirements/recommendations of the coating manufacturer and as indicated on the manufacturer's standard details. Provide system with base flashing, edge flashing, penetration flashing, counter flashing, and all other flashings required for a complete watertight system.
2. Install and repair flashings concurrently with the roofing as the job progresses.
3. Terminate flashings as required by the membrane manufacturer.

3.05 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove coating markings from finished surfaces.

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

3.06 PROTECTION

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

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

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

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

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

3.07 FIELD QUALITY CONTROL

A. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system.

B. Perform field inspection and [and testing] as required under provisions of Section 01410.

C. Correct defects or irregularities discovered during field inspection.

3.08 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.

B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.

C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.

D. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

E. Notify Architect upon completion of corrections.

F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer

END OF SECTION

Burnet County Library
Burnet County Agri-Life Building

Roof Replacement Project

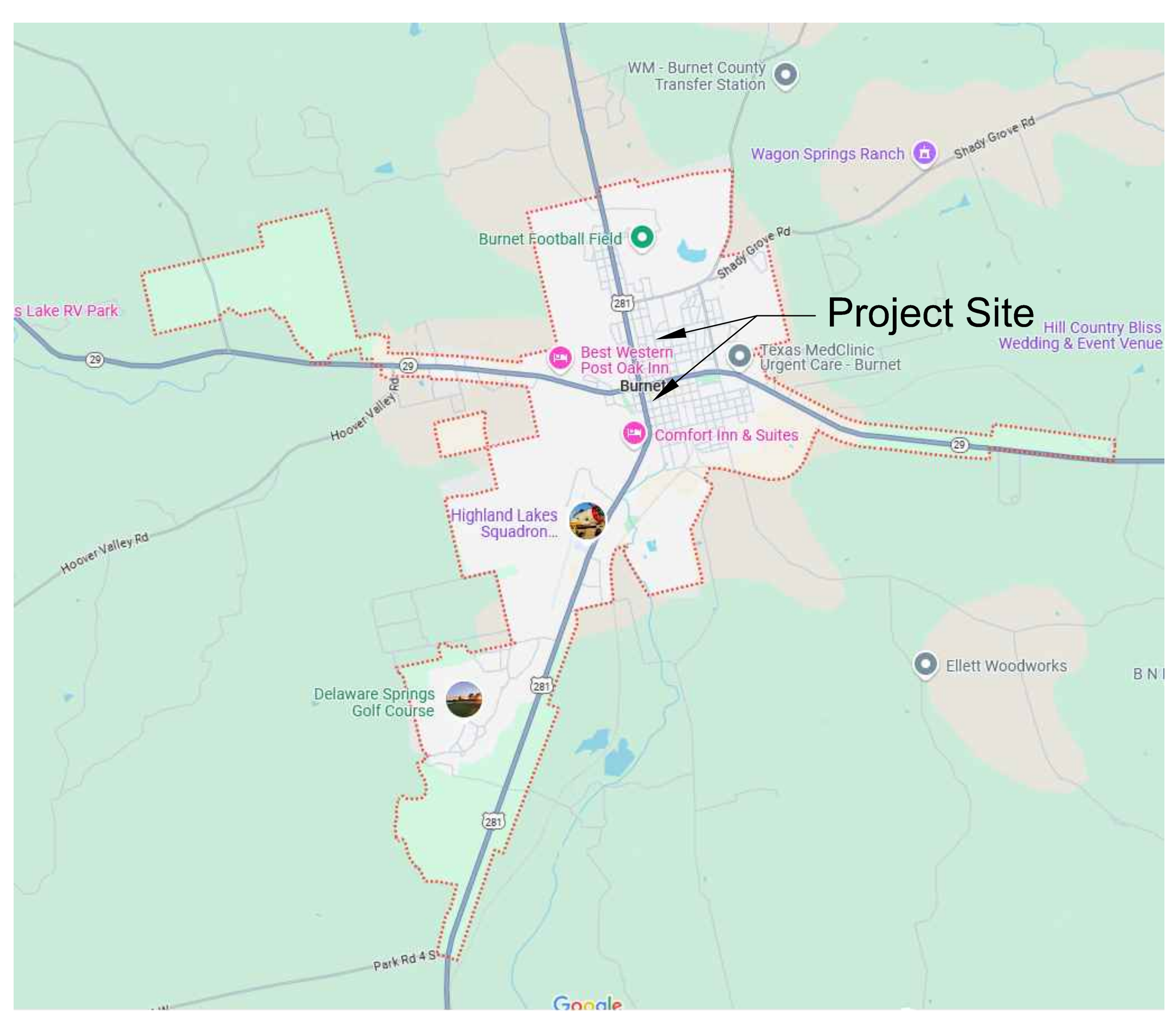
TABLE OF CONTENTS

Burnet County Library
100 E Washington St
Burnet, TX 78611

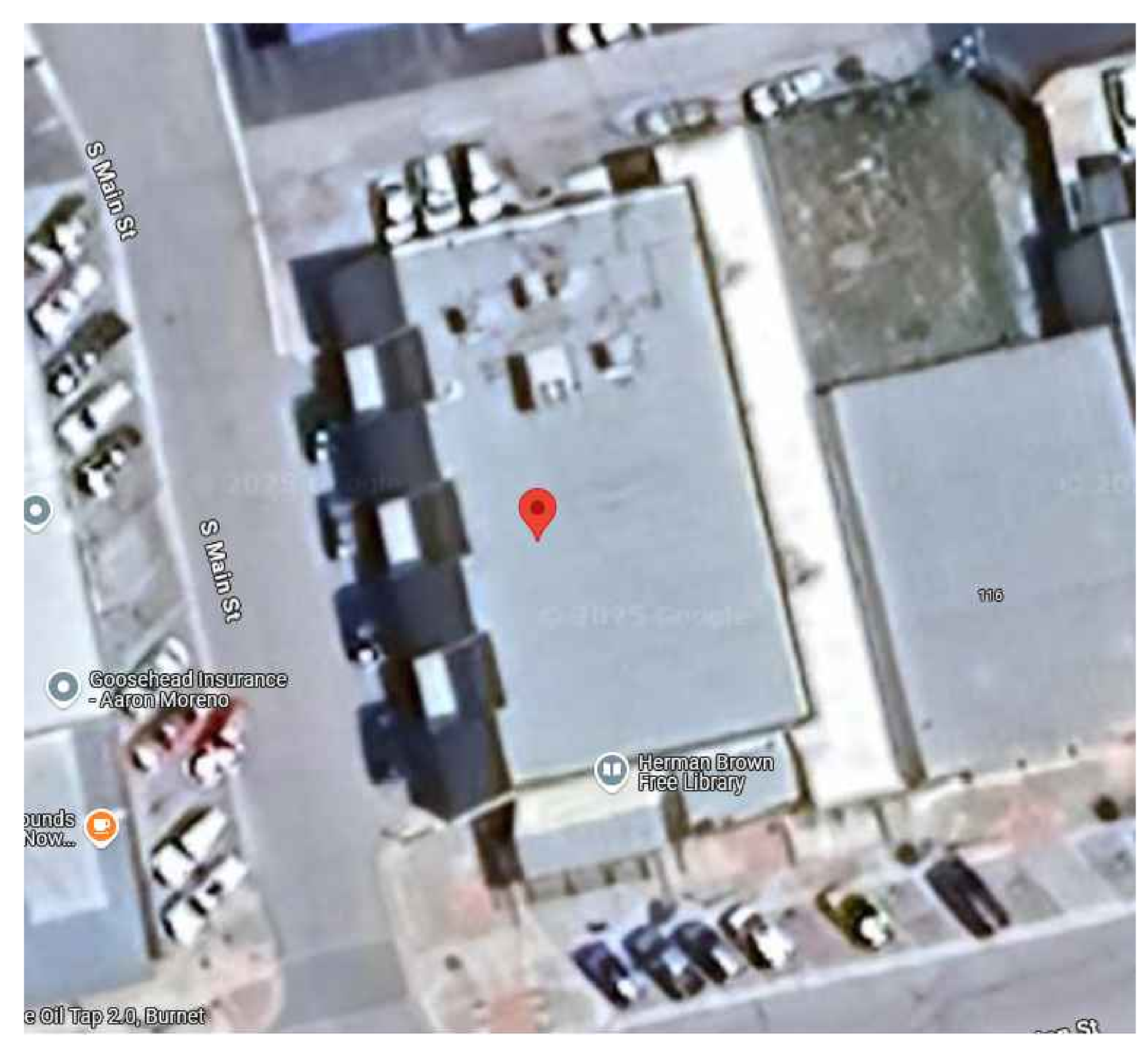
Burnet County Agri-Life Building
607 N Vanderveer
Burnet, TX 78611

NOTE:
STAGING AREAS WILL BE IDENTIFIED AT PRE-BID WALK-THROUGH.

State Map
SCALE: N.T.S.



City Map
SCALE: N.T.S.



100 E WASHINGTON
SCALE: N.T.S.

607 N VANDERVEER
SCALE: N.T.S.

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

R1.0
COVER SHEET

EXISTING ROOF SCHEDULE

ROOF AREA A
- METAL DECKING
- 3 INCH POLYISOCYANURATE
- 1/4 INCH GYPSOME COVERBOARD
- 2-PLY MODIFIED BITUMEN

ROOF AREA B
- METAL DECKING
- 3 INCH POLYISOCYANURATE
- 1/4 INCH GYPSOME COVERBOARD
- 2-PLY MODIFIED BITUMEN

ROOF AREA C
- WOOD DECKING
- 3 INCH POLYISOCYANURATE
- TPO ROOF MEMBRANE

ROOF AREA D
- WOOD DECKING
- 3-4 PLY BUILT-UP ROOF SYSTEM
- 1/4 INCH COVERBOARD
- TPO ROOF MEMBRANE

NOT IN CONTRACT

NEW ROOF SCHEDULE

ROOF AREA A
- REMOVE EXISTING ROOF DOWN TO EXISTING INSULATION BOARDS
- AT ROOF DRAINS REMOVE ROOF SYSTEM DOWN TO METAL DECKING AND INSTALL NEW ROOF DRAIN SUMPS
- INSTALL NEW 1.5 INCH POLYISOCYANURATE OVER EXISTING INSULATION BOARD
- ADHERE NEW 1/2 INCH PRIMED GYPSUM COVERBOARD
- HEAT FUSE TYPE III MODIFIED BITUMEN BASE SHEET
- HEAT FUSE TYPE III MODIED BITUMEN CAP SHEET MEMBRANE
- INSTALL NEW SHEET METAL DETAILS AND COMPONENTS PER PLANS AND SPECIFICATIONS

ROOF AREA B
- REMOVE EXISTING ROOF DOWN TO EXISTING INSULATION BOARDS
- AT ROOF DRAINS REMOVE ROOF SYSTEM DOWN TO METAL DECKING AND INSTALL NEW ROOF DRAIN SUMPS
- INSTALL NEW 1.5 INCH POLYISOCYANURATE OVER EXISTING INSULATION BOARD
- ADHERE NEW 1/2 INCH PRIMED GYPSUM COVERBOARD
- HEAT FUSE TYPE III MODIFIED BITUMEN BASE SHEET
- HEAT FUSE TYPE III MODIED BITUMEN CAP SHEET MEMBRANE
- INSTALL NEW SHEET METAL DETAILS AND COMPONENTS PER PLANS AND SPECIFICATIONS

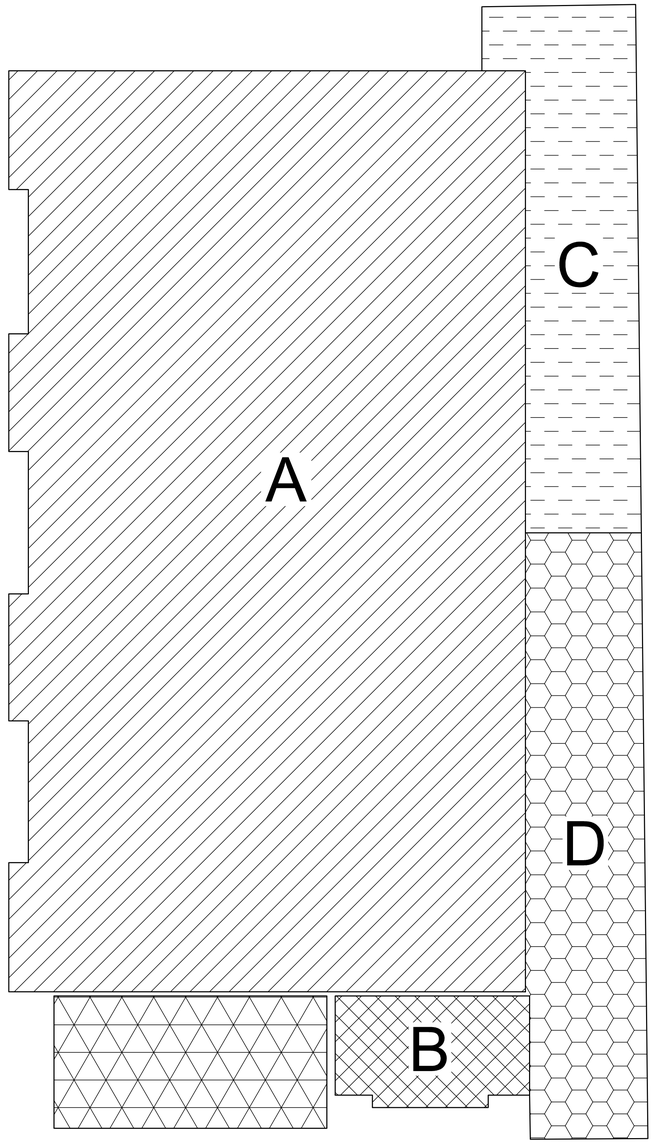
ROOF AREA C
- REMOVE EXISTING ROOF DOWN TO EXISTING DECKING
- INSTALL NEW R-25 INSULATION
- ADHERE NEW 1/2 INCH PRIMED GYPSUM COVERBOARD
- HEAT FUSE TYPE III MODIFIED BITUMEN BASE SHEET
- HEAT FUSE TYPE III MODIED BITUMEN CAP SHEET MEMBRANE
- INSTALL NEW SHEET METAL DETAILS AND COMPONENTS PER PLANS AND SPECIFICATIONS

ROOF AREA D
- REMOVE EXISTING ROOF DOWN TO EXISTING DECKING
- INSTALL NEW R-25 INSULATION
- ADHERE NEW 1/2 INCH PRIMED GYPSUM COVERBOARD
- HEAT FUSE TYPE III MODIFIED BITUMEN BASE SHEET
- HEAT FUSE TYPE III MODIED BITUMEN CAP SHEET MEMBRANE
- INSTALL NEW SHEET METAL DETAILS AND COMPONENTS PER PLANS AND SPECIFICATIONS

DRAINAGE MODIFICATIONS
- ALL BID ITEMS TO INCLUDE INSTALLING NEW 1/2 INCH TAPERED CRICKETS BETWEEN ROOF DRAINS, NEW 1/2 INCH ROOF DRAIN SUMPS AND NEW 1/2 INCH CRICKETS BEHIND HVAC UNITS

MEP MODIFICATIONS
- PROVIDE NEW DURA-BLOCK PIPE SUPPORTS AT ALL EXISTING GAS LINE ONLY
- PRIME AND PAINT EXISTING GAS LINES RUSTOLEUM YELLOW
- INSTALL EXISTING ELECTRICAL PANEL ON NEW EQUIPMENT RAILS
- COORDINATE WITH OWNER ON SATELLITE REMOVAL
- ADJUST ALL HVAC CONDINSATE LINES TO NEW ROOF HEIGHT. ANY DAMAGED LINES TO BE REPLACED. INSTALL ON NEW PIPE SUPPORTS

ACCESS ADDITIONS
- PROVIDE AND INSTALL NEW WALL LADDERS AS SPECIFIED AND INDICATED ON DRAWINGS
- REMOVE EXISTING ROOF LADDER AND INSTALL NEW AS SPECIFIED



KEY PLAN - 100 WASHINGTON

SCALE: NTS

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

R2.0
ROOF NOTES

CHECKED BY:
APPROVED BY:
DESIGNED BY:
DRAWN BY:
DATE:
FILE:

EXISTING ROOF SCHEDULE

ROOF AREA A
- LIGHTWEIGHT CONCRETE DECKING
- VENTING BASE SHEET
- 1 INCH WOOD FIBERBOARD
- 3-5 PLYS BUILT UP ROOF SYSTEM
- 1-3.5 INCHES OF SPF FOAM ROOF SYSTEM

ROOF AREA B
- BUILT UP ROOF SYSTEM
- LIGHT GAUGE RETROFIT METAL FRAMING SYSTEM
- EXPOSED FASTNER R PANEL

ROOF AREA C
- BUILT UP ROOF SYSTEM
- LIGHT GAUGE RETROFIT METAL FRAMING SYSTEM
- EXPOSED FASTNER R PANEL

NEW ROOF SCHEDULE

ROOF AREA A

- REMOVE EXISTING ROOF DOWN TO EXISTING LIGHTWEIGHT CONCRETE DECKING
- ATTACH NEW VENTING BASE SHEET INTO EXISTING LIGHTWEIGHT CONCRETE DECKING
- INSTALL NEW 2 LAYERS OF 2 INCH POLYISOCYANURATE
- INSTALL 1/4 INCH TAPERED INSULATION SYSTEM, SLOPED TO EXTERIOR
- ADHERE NEW 1/2 INCH PRIMED GYPSUM COVERBOARD
- HEAT FUSE TYPE III MODIFIED BITUMEN BASE SHEET
- HEAT FUSE TYPE III MODIED BITUMEN CAP SHEET MEMBRANE
- INSTALL NEW SHEET METAL DETAILS AND COMPONENTS PER PLANS AND SPECIFICATIONS

ROOF AREA B

- REMOVE EXISTING R PANEL DOWN TO PURLINS
- INSTALL NEW STANDING SEAM METAL ROOF PER MANUFACTURES INSTALATION GUIDLINES

ROOF AREA C

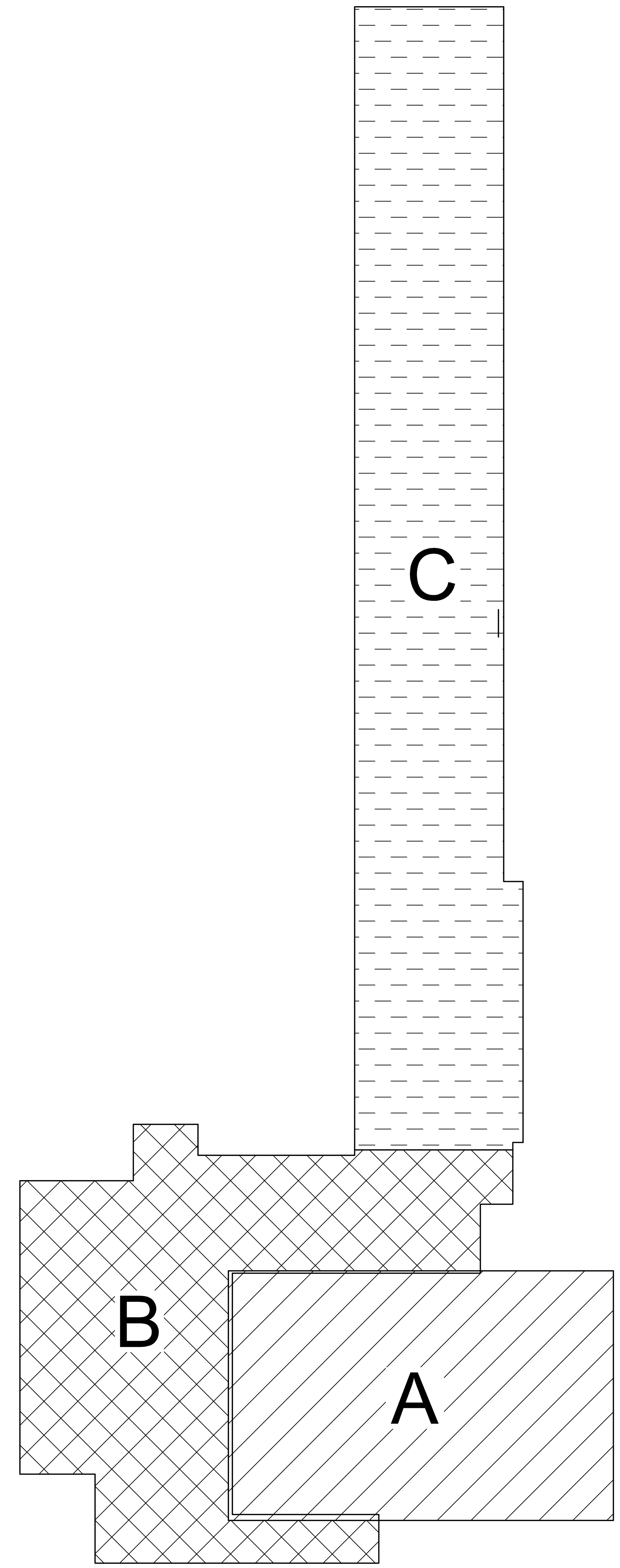
- PRESSURE CLEAN EXISTING ROOF SYSTEM
- REPLACE ALL DAMAGED FASTERS
- INSTALL BASE COAT ELASTOMERIC COATING
- INSTALL TOP COAT ELASTOMERIC COATING
- REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION

MEP MODIFICATIONS

- PROVIDE NEW DURA-BLOCK PIPE SUPPORTS AT ALL EXISTING GAS LINE ONLY
- PRIME AND PAINT EXISTING GAS LINES RUSTOLEUM YELLOW
- INSTALL EXISTING MINI SPLITS ON NEW EQUIPMENT RAILS
- COORDINATE WITH OWNER ON SATELLITE REMOVAL
- ADJUST ALL HVAC CONDINSATE LINES TO NEW ROOF HEIGHT. ANY DAMAGED LINES TO BE REPLACED. INSTALL ON NEW PIPE SUPPORTS

ACCESS ADDITIONS

- PROVIDE AND INSTALL NEW WALL LADDERS AS SPECIFIED AND INDICATED ON DRAWINGS
- REMOVE EXISTING ROOF LADDER AND INSTALL NEW AS SPECIFIED



KEY PLAN - 607 N VANDEVEER

SCALE: NTS

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

R3.0
ROOF NOTES

KEY NOTES

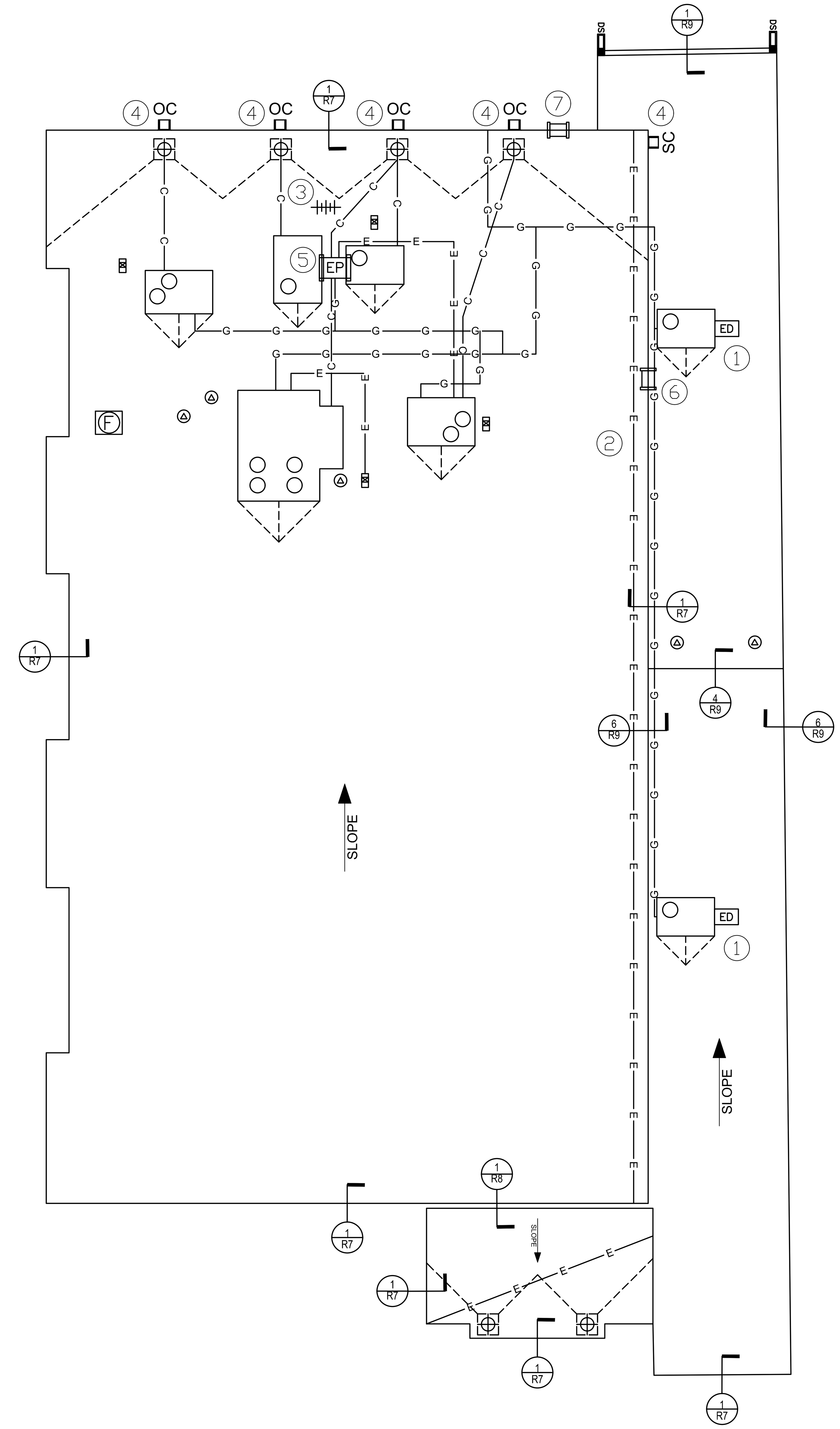
1. INSTALL NEW EQUIPMENT RAILS ONTO THE EXISTING DECKING PER DETAIL
2. REMOVE ELECTRICAL OFF OF PARAPET WALL AND REINSTALL. COORDINATE WITH OWNER
3. COORDINATE WITH OWNER ON REMOVAL AND REINSTALLATION
4. INSTALL NEW 12 INCH BY 6 INCH OVERFLOW SCUPPERS PER DETAIL
5. RELOCATE ELECTRICAL PANEL AND INSTALL ON EQUIPMENT RAILS. COORDINATE WITH OWNER
6. INSTALL NEW LADDER PER SPECS PER DETAIL 3-R11
7. REMOVE EXISTING LADDER AND GIVE TO OWNER
8. RAISE EXISTING HVAC UNIT PER CURB EXTENSION DETAIL 1-R11
9. INSTALL MINISPLIT UNITS ON NEW EQUIPMENT RAILS SECURED TO EXISTING PURLINS

LEGEND

- Sewer Line
- Scupper
- AC Unit Curb
- Capped Curb
- Roof Drain
- Roof Ladder
- Exhaust Fan
- Boiler Fan
- Passive Vent
- Roof Hatch
- Electrical Conduit
- Hose Bib
- Downspout
- Lighting Protection Ground
- Door
- Steel Beam
- Lighting Protection
- HVAC Condensate
- Pitch Pocket
- Vent Through Roof (VTR)
- Slope
- Gas Line
- Existing Lightweight Concrete Slope
- Pipe Penetration Box
- Mini-Split Unit
- Antenna
- A/C Unit on Rails
- Electrical Disconnect Box
- Refrigeration Unit on Rails
- Goose neck on a square curb
- Heat Exhaust
- Fresh Air Intake

GENERAL NOTES

1. ROOFING CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE FACILITIES IN A SECURE WATERTIGHT CONDITION FOR THE DURATION OF THE PROJECT.
2. EXISTING DRAINS AND PIPING SHALL BE EXAMINED AND DOCUMENTED BY THE CONTRACTOR TO DEMONSTRATE PROPER FUNCTION.
3. EXTEND ALL WOOD BLOCKING ON PERIMETERS AND PENETRATIONS TO ACHIEVE NEW ROOF HEIGHT.
4. CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO BIDDING THE PROJECT.
5. ALL WORK MUST MEET MANUFACTURER'S WARRANTY REQUIREMENTS.
6. PROVIDE CRICKETS ON THE HIGH SIDE OF ALL CURBS 24" OR GREATER WIDE.
7. CONTRACTOR SHALL VERIFY OPERATIONAL STATUS OF ROOF TOP EQUIPMENT WITH OWNER PRIOR TO COMMENCING WORK.
8. VERIFY WITH OWNER AND REMOVE ALL ABANDONED OR NON-FUNCTIONAL CURBS AND EQUIPMENT.
9. INCREASE HEIGHT OF ALL EXISTING CURBS AS REQUIRED TO PROVIDE A MINIMUM OF 8" BASE FLASHING HEIGHT ABOVE THE LEVEL OF THE NEW ROOF SYSTEM.
10. PROVIDE NEW PIPE SUPPORTS AT ALL EXISTING GAS, REFRIGERANT.
11. ALL SPECIFIED WORK PERFORMED BY CONTRACTOR SHALL COMPLY WITH THE CURRENT ADOPTED LOCAL BUILDING, PLUMBING, ELECTRIC AND FIRE CODES WITH AMENDMENTS. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IF SPECIFIED SCOPE OF WORK WILL CONFLICT WITH THESE REQUIREMENTS.
12. FASTENING OR ATTACHMENT OF WOOD BLOCKING, NAILERS, STEEL ANGLES, DECKING AND SHEET METAL SHALL BE IN ACCORDANCE WITH ANSI/SPRI ES-1 AND FM 1-49 REQUIREMENTS.
13. ALL WOOD BLOCKING AND LUMBER SHALL BE KILN DRIED (KD). ALL FASTENERS USED IN WOOD SHALL BE STAINLESS STEEL. STAGGER JOINTS WHEN STACKING LUMBER IN MULTIPLE LAYERS A MINIMUM OF 24".
14. INSTALL A 1" PER FOOT MINIMUM SLOPED CONTINUOUS SUBSTRATE BENEATH ALL SHEET METAL CAPS AT EXPANSION JOINTS TO PROMOTE DRAINAGE.
15. USE STAINLESS STEEL FASTENERS FOR LUMBER, UNLESS SPECIFIED OTHERWISE.
16. SHEET METAL WORK SHALL COMPLY WITH SMACNA.
17. PROVIDE BACK-UP AND COVER PLATES AT ALL EDGE METAL JOINTS. PROVIDE DOUBLE BEAD TAPE SEALANT BETWEEN BOTH SIDES OF FASCIA AND PLATES. SECURE PLATES TO FASCIA WITH STAINLESS STEEL POP RIVETS AT 2" O.C. MAX.
18. PROVIDE ROOFING MEMBRANE AND/OR SELF ADHERED, HIGH TEMPERATURE RATED WATERPROOFING MEMBRANE, CONTINUOUS BETWEEN SHEET METAL AND LUMBER, AND BETWEEN STEEL DECKS AND TREATED LUMBER.
19. SOLDER ALL VERTICAL GALVANIZED STEEL AND STAINLESS STEEL SHEET METAL JOINTS, EXCEPT FOR PRE-FINISHED GALVANIZED STEEL. POP-RIVET AND SEAL ALL VERTICAL JOINTS OF PRE-FINISHED GALVANIZED STEEL.
20. ALL EXPOSED FASTENERS SHALL MATCH THE COLOR OF THE PRE-FINISHED METAL, INCLUDING POP-RIVETS.
21. INSTALL ROOF PROTECTION PADS AT ALL ROOF ACCESS POINTS, INCLUDING DOORWAYS AND LADDERS.
22. INSTALL MECHANICAL EQUIPMENT CURB BASE FLASHING, SHEET METALCOUNTERFLASHING, AND SEALING GASKETS PRIOR TO SETTING EQUIPMENT ON CURB. PROVIDE MINIMUM 1" CLEARANCE BETWEEN CURB AND EQUIPMENT FLANGE. DO NOT INSTALL EQUIPMENT PRIOR TO OBSERVATION AND ACCEPTANCE BY ENGINEER.
23. INSTALL MECHANICAL EQUIPMENT OR ACCESSORY CURBS TO BEAR ON STRUCTURAL ROOF DECK OR WOOD NAILERS TO MATCH THE HEIGHT OF THE ROOF SYSTEM. ALL ROOFTOP MEP EQUIPMENT SHALL BE SUPPORTED BY CURBS WITH MINIMUM 8" BASE FLASHING HEIGHT. STRIPPED IN FLANGE VENTS ARE PROHIBITED.
24. SCOPE OF WORK FOR RAISING MECHANICAL EQUIPMENT CURBS AND ROOF MOUNTED PIPING TO SPECIFIED HEIGHTS INCLUDES MODIFYING ALL MECHANICAL, ELECTRICAL, PLUMBING, FIRE ALARMS, AND SECURITY CABLING ASSOCIATED WITH THE EQUIPMENT FOR A COMPLETE OPERATIONAL ASSEMBLY THAT MEETS CURRENT CODE REQUIREMENTS. WORK SHALL BE PERFORMED BY LICENSED INSTALLERS FOR THE APPLICABLE TRADE.
25. PROVIDE ROOF PENETRATION CURB WITH HOODED SHEET METAL ENCLOSURE FOR ALL PIPE AND CONDUIT THAT PENETRATES THE ROOF. SLOPE PIPES DOWN AND AWAY FROM HOOD AND PROVIDE A DRIP LOOP. DO NOT PROVIDE DRIP LOOP IF IT WILL IMPAIR NORMAL OPERATION OF PIPE. INSTALL EXPANDING FOAM TO SEAL AROUND AND BETWEEN PIPES AT DECK TO PROVIDE WEATHER TIGHT BARRIER/SEAL.



100 WASHINGTON ST

SCALE: 1/8"=1'-0"

Overall Roof Plan

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

R4.0
ROOF PLAN

KEY NOTES

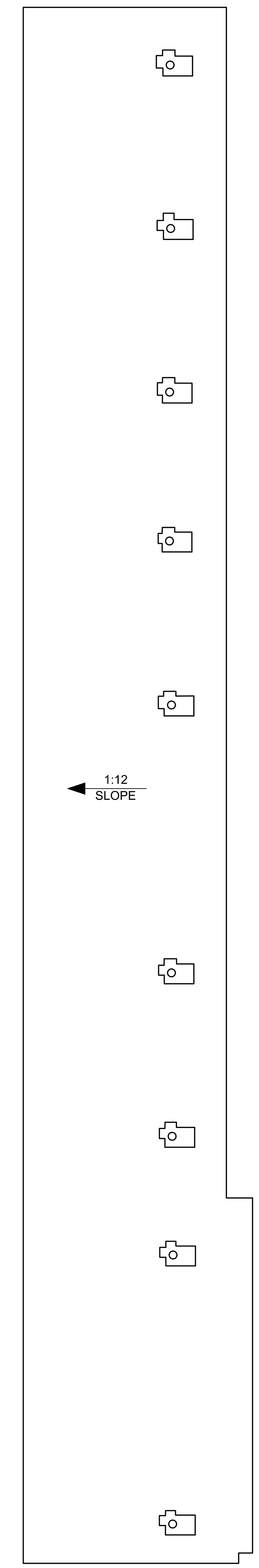
1. INSTALL NEW EQUIPMENT RAILS ONTO THE EXISTING DECKING PER DETAIL
2. REMOVE ELECTRICAL OFF OF PARAPET WALL AND REINSTALL. COORDINATE WITH OWNER
3. COORDINATE WITH OWNER ON REMOVAL AND REINSTALLATION
4. INSTALL NEW 12 INCH BY 6 INCH OVERFLOW SCUPPERS PER DETAIL
5. RELOCATE ELECTRICAL PANEL AND INSTALL ON EQUIPMENT RAILS. COORDINATE WITH OWNER
6. INSTALL NEW LADDER PER SPECS PER DETAIL 3-R11
7. REMOVE EXISTING LADDER AND GIVE TO OWNER
8. RAISE EXISTING HVAC UNIT PER CURB EXTENSION DETAIL 1-R11
9. INSTALL MINISPLIT UNITS ON NEW EQUIPMENT RAILS SECURED TO EXISTING PURLINS

LEGEND

- Sewer Line
- Scupper
- AC Unit Curb
- Capped Curb
- Roof Drain
- Roof Ladder
- Exhaust Fan
- Boiler Fan
- Passive Vent
- Roof Hatch
- Electrical Conduit
- Hose Bib
- Downspout
- Lighting Protection Ground
- Door
- Steel Beam
- Lighting Protection
- HVAC Condensate
- Pitch Pocket
- Vent Through Roof (VTR)
- Slope
- Gas Line
- Existing Lightweight Concrete Slope
- Pipe Penetration Box
- Mini-Split Unit
- Antenna
- A/C Unit on Rails
- Electrical Disconnect Box
- Refrigeration Unit on Rails
- Goose neck on a square curb
- Heat Exhaust
- Fresh Air Intake

GENERAL NOTES

1. ROOFING CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE FACILITIES IN A SECURE WATERTIGHT CONDITION FOR THE DURATION OF THE PROJECT.
2. EXISTING DRAINS AND PIPING SHALL BE EXAMINED AND DOCUMENTED BY THE CONTRACTOR TO DEMONSTRATE PROPER FUNCTION.
3. EXTEND ALL WOOD BLOCKING ON PERIMETERS AND PENETRATIONS TO ACHIEVE NEW ROOF HEIGHT.
4. CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO BIDDING THE PROJECT.
5. ALL WORK MUST MEET MANUFACTURER'S WARRANTY REQUIREMENTS.
6. PROVIDE CRICKETS ON THE HIGH SIDE OF ALL CURBS 24" OR GREATER WIDE.
7. CONTRACTOR SHALL VERIFY OPERATIONAL STATUS OF ROOF TOP EQUIPMENT WITH OWNER PRIOR TO COMMENCING WORK.
8. VERIFY WITH OWNER AND REMOVE ALL ABANDONED OR NON-FUNCTIONAL CURBS AND EQUIPMENT.
9. INCREASE HEIGHT OF ALL EXISTING CURBS AS REQUIRED TO PROVIDE A MINIMUM OF 8" BASE FLASHING HEIGHT ABOVE THE LEVEL OF THE NEW ROOF SYSTEM.
10. PROVIDE NEW PIPE SUPPORTS AT ALL EXISTING GAS, REFRIGERANT.
11. ALL SPECIFIED WORK PERFORMED BY CONTRACTOR SHALL COMPLY WITH THE CURRENT ADOPTED LOCAL BUILDING, PLUMBING, ELECTRIC AND FIRE CODES WITH AMENDMENTS. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IF SPECIFIED SCOPE OF WORK WILL CONFLICT WITH THESE REQUIREMENTS.
12. FASTENING OR ATTACHMENT OF WOOD BLOCKING, NAILERS, STEEL ANGLES, DECKING AND SHEET METAL SHALL BE IN ACCORDANCE WITH ANSI/SPRI ES-1 AND FM 1-49 REQUIREMENTS.
13. ALL WOOD BLOCKING AND LUMBER SHALL BE KILN DRIED (KD). ALL FASTENERS USED IN WOOD SHALL BE STAINLESS STEEL. STAGGER JOINTS WHEN STACKING LUMBER IN MULTIPLE LAYERS A MINIMUM OF 24".
14. INSTALL A 1" PER FOOT MINIMUM SLOPED CONTINUOUS SUBSTRATE BENEATH ALL SHEET METAL CAPS AT EXPANSION JOINTS TO PROMOTE DRAINAGE.
15. USE STAINLESS STEEL FASTENERS FOR LUMBER, UNLESS SPECIFIED OTHERWISE.
16. SHEET METAL WORK SHALL COMPLY WITH SMACNA.
17. PROVIDE BACK-UP AND COVER PLATES AT ALL EDGE METAL JOINTS. PROVIDE DOUBLE BEAD TAPE SEALANT BETWEEN BOTH SIDES OF FASCIA AND PLATES. SECURE PLATES TO FASCIA WITH STAINLESS STEEL POP RIVETS AT 2" O.C. MAX.
18. PROVIDE ROOFING MEMBRANE AND/OR SELF ADHERED, HIGH TEMPERATURE RATED WATERPROOFING MEMBRANE, CONTINUOUS BETWEEN SHEET METAL AND LUMBER, AND BETWEEN STEEL DECKS AND TREATED LUMBER.
19. SOLDER ALL VERTICAL GALVANIZED STEEL AND STAINLESS STEEL SHEET METAL JOINTS, EXCEPT FOR PRE-FINISHED GALVANIZED STEEL. POP-RIVET AND SEAL ALL VERTICAL JOINTS OF PRE-FINISHED GALVANIZED STEEL.
20. ALL EXPOSED FASTENERS SHALL MATCH THE COLOR OF THE PRE-FINISHED METAL, INCLUDING POP-RIVETS.
21. INSTALL ROOF PROTECTION PADS AT ALL ROOF ACCESS POINTS, INCLUDING DOORWAYS AND LADDERS.
22. INSTALL MECHANICAL EQUIPMENT CURB BASE FLASHING, SHEET METALCOUNTERFLASHING, AND SEALING GASKETS PRIOR TO SETTING EQUIPMENT ON CURB. PROVIDE MINIMUM 1" CLEARANCE BETWEEN CURB AND EQUIPMENT FLANGE. DO NOT INSTALL EQUIPMENT PRIOR TO OBSERVATION AND ACCEPTANCE BY ENGINEER.
23. INSTALL MECHANICAL EQUIPMENT OR ACCESSORY CURBS TO BEAR ON STRUCTURAL ROOF DECK OR WOOD NAILERS TO MATCH THE HEIGHT OF THE ROOF SYSTEM. ALL ROOFTOP MEP EQUIPMENT SHALL BE SUPPORTED BY CURBS WITH MINIMUM 8" BASE FLASHING HEIGHT. STRIPPED IN FLANGE VENTS ARE PROHIBITED.
24. SCOPE OF WORK FOR RAISING MECHANICAL EQUIPMENT CURBS AND ROOF MOUNTED PIPING TO SPECIFIED HEIGHTS INCLUDES MODIFYING ALL MECHANICAL, ELECTRICAL, PLUMBING, FIRE ALARMS, AND SECURITY CABLING ASSOCIATED WITH THE EQUIPMENT FOR A COMPLETE OPERATIONAL ASSEMBLY THAT MEETS CURRENT CODE REQUIREMENTS. WORK SHALL BE PERFORMED BY LICENSED INSTALLERS FOR THE APPLICABLE TRADE.
25. PROVIDE ROOF PENETRATION CURB WITH HOODED SHEET METAL ENCLOSURE FOR ALL PIPE AND CONDUIT THAT PENETRATES THE ROOF. SLOPE PIPES DOWN AND AWAY FROM HOOD AND PROVIDE A DRIP LOOP. DO NOT PROVIDE DRIP LOOP IF IT WILL IMPAIR NORMAL OPERATION OF PIPE. INSTALL EXPANDING FOAM TO SEAL AROUND AND BETWEEN PIPES AT DECK TO PROVIDE WEATHER TIGHT BARRIER/SEAL.



607 N VANDEVEER

SCALE: 1/16"=1'-0"

Overall Roof Plan

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

R5.0
ROOF PLAN

KEY NOTES

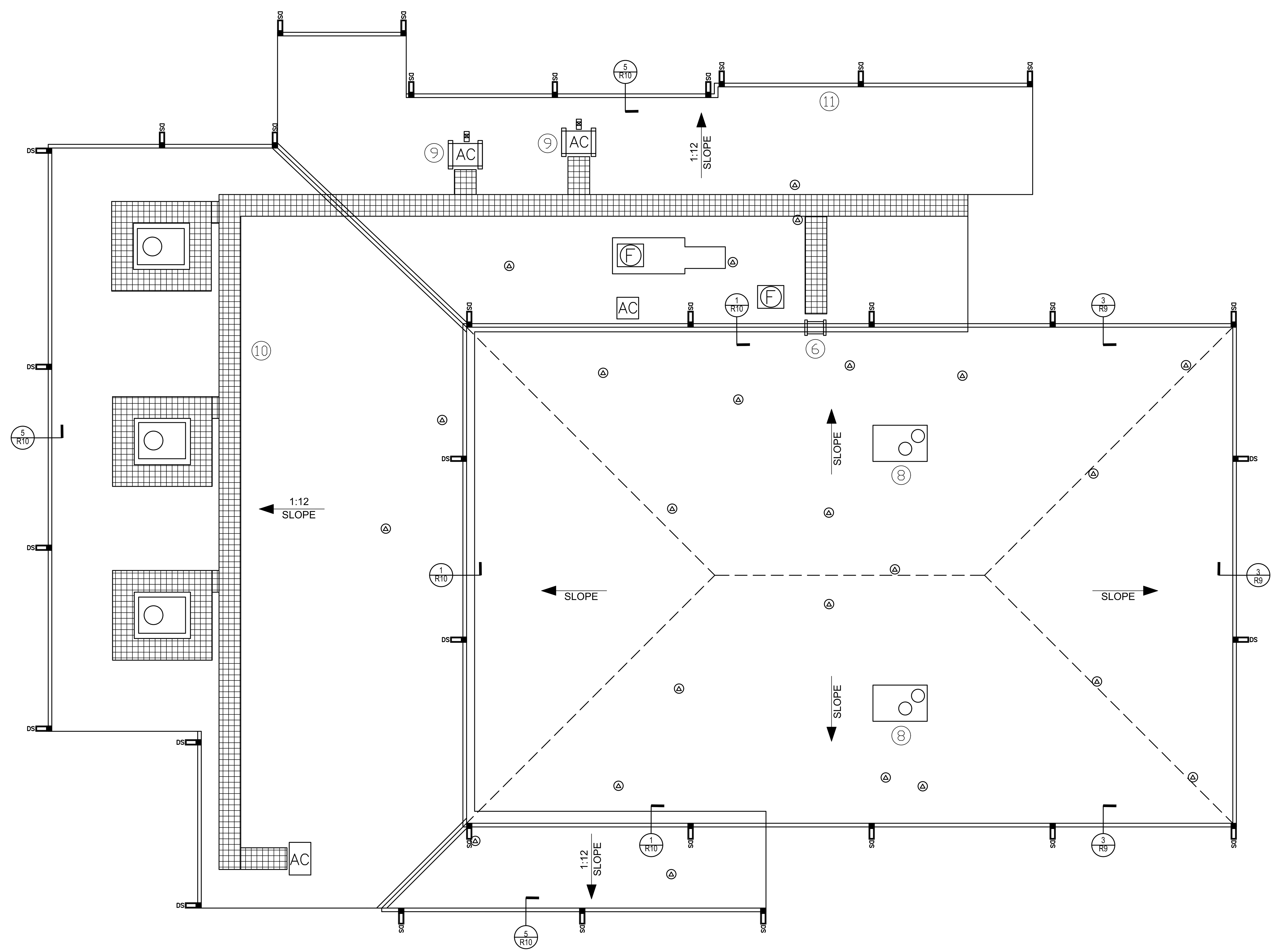
1. INSTALL NEW EQUIPMENT RAILS ONTO THE EXISTING DECKING PER DETAIL
2. REMOVE ELECTRICAL OFF OF PARAPET WALL AND REINSTALL. COORDINATE WITH OWNER
3. COORDINATE WITH OWNER ON REMOVAL AND REINSTALLATION
4. INSTALL NEW 12 INCH BY 6 INCH OVERFLOW SCUPPERS PER DETAIL
5. RELOCATE ELECTRICAL PANEL AND INSTALL ON EQUIPMENT RAILS. COORDINATE WITH OWNER
6. INSTALL NEW LADDER PER SPECS PER DETAIL 3-R11
7. REMOVE EXISTING LADDER AND GIVE TO OWNER
8. RAISE EXISTING HVAC UNIT PER CURB EXTENSION DETAIL 1-R11
9. INSTALL MINISPLIT UNITS ON NEW EQUIPMENT RAILS SECURED TO EXISTING PURLINS
10. INSTALL NEW FIBERGRATE FIBERGLASS MOLDED GRATING ON S-5 CLIPS PER DETAIL 3-R10 AND 4-R10
11. REMOVE EXISTING INTERNAL GUTTER, INSTALL NEW INTERNAL GUTTER AND DOWNSPOUTS
12. HIP DETAIL PER METAL ROOFING MANUFACTURS INSTALLATION DRAWINGS

LEGEND

- S — Sewer Line
- Scupper
- AC Unit Curb
- CC — Capped Curb
- Roof Drain
- Roof Ladder
- F — Exhaust Fan
- B — Boiler Fan
- PV — Passive Vent
- Roof Hatch
- E — Electrical Conduit
- HB — Hose Bib
- DS — Downspout
- Lighting Protection Ground
- Door
- Steel Beam
- L — Lighting Protection
- C — HVAC Condensate
- PP — Pitch Pocket
- Vent Through Roof (VTR)
- SLOPE — Slope
- G — Gas Line
- Existing Lightweight Concrete Slope
- Pipe Penetration Box
- MS — Mini-Split Unit
- Antenna
- AC — A/C Unit on Rails
- ED — Electrical Disconnect Box
- RF — Refrigeration Unit on Rails
- GN — Goose neck on a square curb
- HE — Heat Exhaust
- FA — Fresh Air Intake

GENERAL NOTES

1. ROOFING CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE FACILITIES IN A SECURE WATERTIGHT CONDITION FOR THE DURATION OF THE PROJECT.
2. EXISTING DRAINS AND PIPING SHALL BE EXAMINED AND DOCUMENTED BY THE CONTRACTOR TO DEMONSTRATE PROPER FUNCTION.
3. EXTEND ALL WOOD BLOCKING ON PERIMETERS AND PENETRATIONS TO ACHIEVE NEW ROOF HEIGHT.
4. CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO BIDDING THE PROJECT.
5. ALL WORK MUST MEET MANUFACTURER'S WARRANTY REQUIREMENTS.
6. PROVIDE CRICKETS ON THE HIGH SIDE OF ALL CURBS 24" OR GREATER WIDE.
7. CONTRACTOR SHALL VERIFY OPERATIONAL STATUS OF ROOF TOP EQUIPMENT WITH OWNER PRIOR TO COMMENCING WORK.
8. VERIFY WITH OWNER AND REMOVE ALL ABANDONED OR NON-FUNCTIONAL CURBS AND EQUIPMENT.
9. INCREASE HEIGHT OF ALL EXISTING CURBS AS REQUIRED TO PROVIDE A MINIMUM OF 8" BASE FLASHING HEIGHT ABOVE THE LEVEL OF THE NEW ROOF SYSTEM.
10. PROVIDE NEW PIPE SUPPORTS AT ALL EXISTING GAS, REFRIGERANT.
11. ALL SPECIFIED WORK PERFORMED BY CONTRACTOR SHALL COMPLY WITH THE CURRENT ADOPTED LOCAL BUILDING, PLUMBING, ELECTRIC AND FIRE CODES WITH AMENDMENTS. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IF SPECIFIED SCOPE OF WORK WILL CONFLICT WITH THESE REQUIREMENTS.
12. FASTENING OR ATTACHMENT OF WOOD BLOCKING, NAILERS, STEEL ANGLES, DECKING AND SHEET METAL SHALL BE IN ACCORDANCE WITH ANSI/SPRI ES-1 AND FM 1-49 REQUIREMENTS.
13. ALL WOOD BLOCKING AND LUMBER SHALL BE KILN DRIED (KD). ALL FASTENERS USED IN WOOD SHALL BE STAINLESS STEEL. STAGGER JOINTS WHEN STACKING LUMBER IN MULTIPLE LAYERS A MINIMUM OF 24".
14. INSTALL A 1" PER FOOT MINIMUM SLOPED CONTINUOUS SUBSTRATE BENEATH ALL SHEET METAL CAPS AT EXPANSION JOINTS TO PROMOTE DRAINAGE.
15. USE STAINLESS STEEL FASTENERS FOR LUMBER, UNLESS SPECIFIED OTHERWISE.
16. SHEET METAL WORK SHALL COMPLY WITH SMACNA.
17. PROVIDE BACK-UP AND COVER PLATES AT ALL EDGE METAL JOINTS. PROVIDE DOUBLE BEAD TAPE SEALANT BETWEEN BOTH SIDES OF FASCIA AND PLATES. SECURE PLATES TO FASCIA WITH STAINLESS STEEL POP RIVETS AT 2" O.C. MAX.
18. PROVIDE ROOFING MEMBRANE AND/OR SELF ADHERED, HIGH TEMPERATURE RATED WATERPROOFING MEMBRANE, CONTINUOUS BETWEEN SHEET METAL AND LUMBER, AND BETWEEN STEEL DECKS AND TREATED LUMBER.
19. SOLDER ALL VERTICAL GALVANIZED STEEL AND STAINLESS STEEL SHEET METAL JOINTS, EXCEPT FOR PRE-FINISHED GALVANIZED STEEL. POP-RIVET AND SEAL ALL VERTICAL JOINTS OF PRE-FINISHED GALVANIZED STEEL.
20. ALL EXPOSED FASTENERS SHALL MATCH THE COLOR OF THE PRE-FINISHED METAL, INCLUDING POP-RIVETS.
21. INSTALL ROOF PROTECTION PADS AT ALL ROOF ACCESS POINTS, INCLUDING DOORWAYS AND LADDERS.
22. INSTALL MECHANICAL EQUIPMENT CURB BASE FLASHING, SHEET METALCOUNTERFLASHING, AND SEALING GASKETS PRIOR TO SETTING EQUIPMENT ON CURB. PROVIDE MINIMUM 1" CLEARANCE BETWEEN CURB AND EQUIPMENT FLANGE. DO NOT INSTALL EQUIPMENT PRIOR TO OBSERVATION AND ACCEPTANCE BY ENGINEER.
23. INSTALL MECHANICAL EQUIPMENT OR ACCESSORY CURBS TO BEAR ON STRUCTURAL ROOF DECK OR WOOD NAILERS TO MATCH THE HEIGHT OF THE ROOF SYSTEM. ALL ROOFTOP MEP EQUIPMENT SHALL BE SUPPORTED BY CURBS WITH MINIMUM 8" BASE FLASHING HEIGHT. STRIPPED IN FLANGE VENTS ARE PROHIBITED.
24. SCOPE OF WORK FOR RAISING MECHANICAL EQUIPMENT CURBS AND ROOF MOUNTED PIPING TO SPECIFIED HEIGHTS INCLUDES MODIFYING ALL MECHANICAL, ELECTRICAL, PLUMBING, FIRE ALARMS, AND SECURITY CABLING ASSOCIATED WITH THE EQUIPMENT FOR A COMPLETE OPERATIONAL ASSEMBLY THAT MEETS CURRENT CODE REQUIREMENTS. WORK SHALL BE PERFORMED BY LICENSED INSTALLERS FOR THE APPLICABLE TRADE.
25. PROVIDE ROOF PENETRATION CURB WITH HOODED SHEET METAL ENCLOSURE FOR ALL PIPE AND CONDUIT THAT PENETRATES THE ROOF. SLOPE PIPES DOWN AND AWAY FROM HOOD AND PROVIDE A DRIP LOOP. DO NOT PROVIDE DRIP LOOP IF IT WILL IMPAIR NORMAL OPERATION OF PIPE. INSTALL EXPANDING FOAM TO SEAL AROUND AND BETWEEN PIPES AT DECK TO PROVIDE WEATHER TIGHT BARRIER/SEAL.



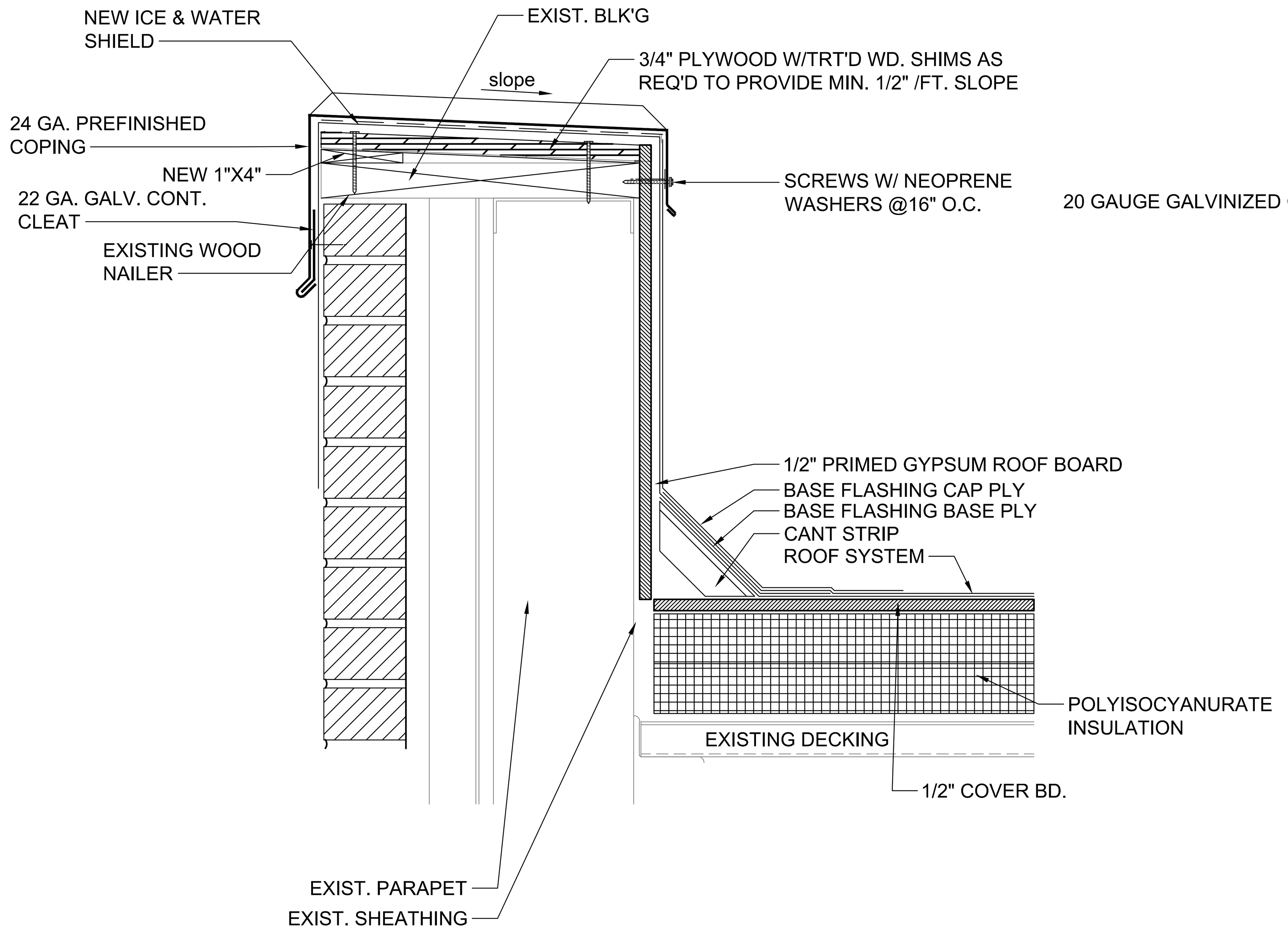
607 N VANDEVEER

SCALE: 1/8"=1'-0"

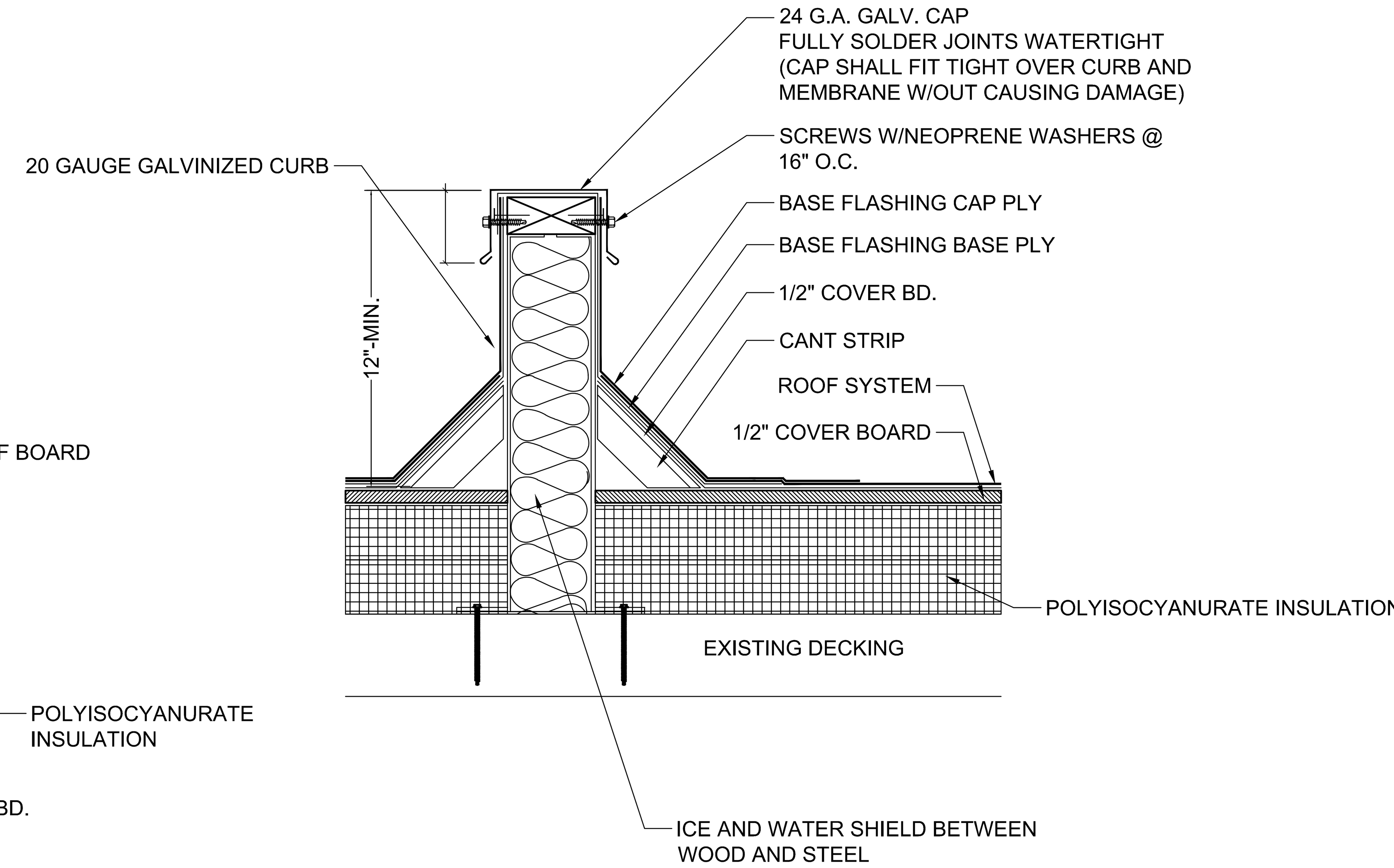
Overall Roof Plan

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

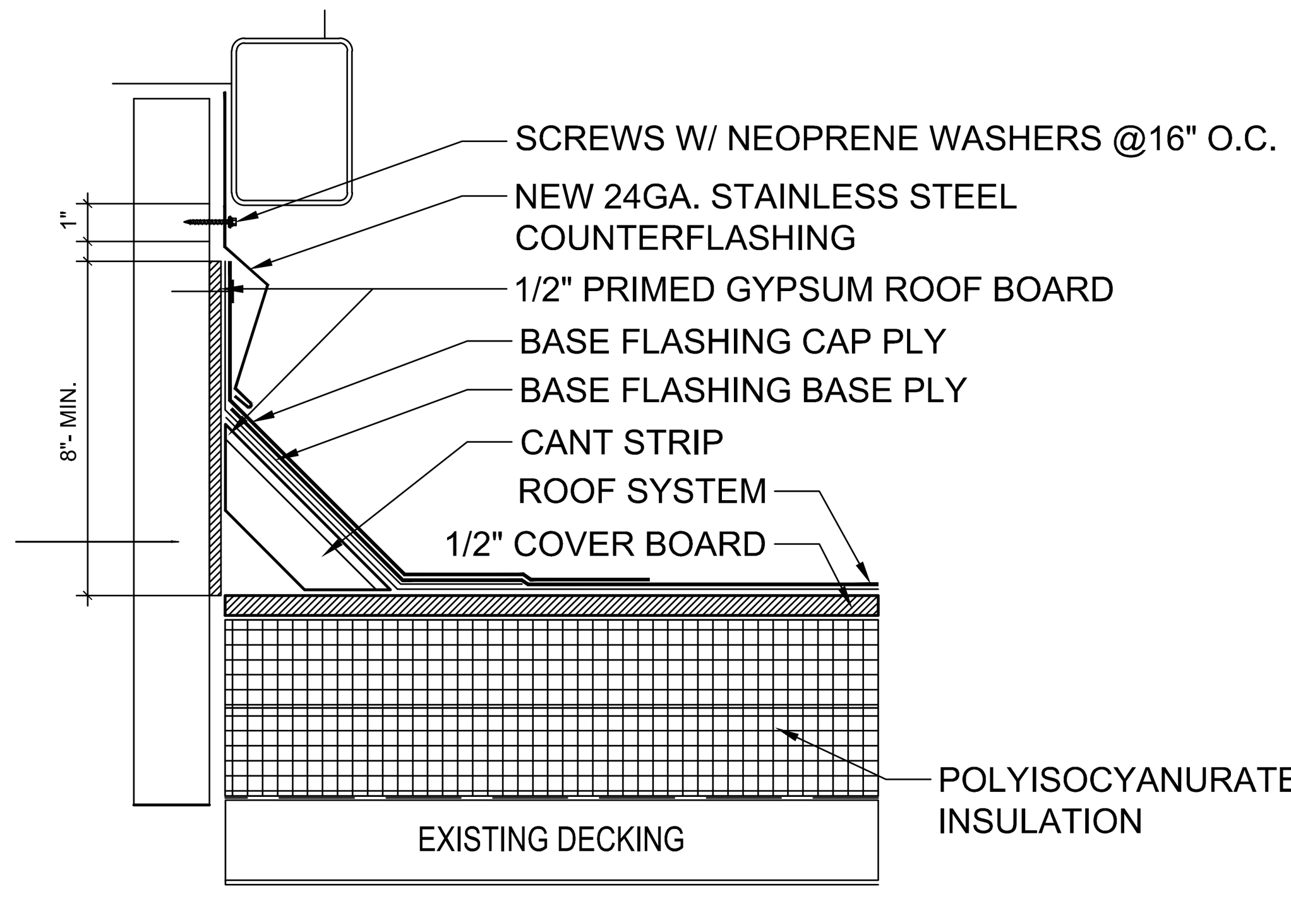
R6.0
ROOF PLAN



1 SHORT PARAPET WALL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



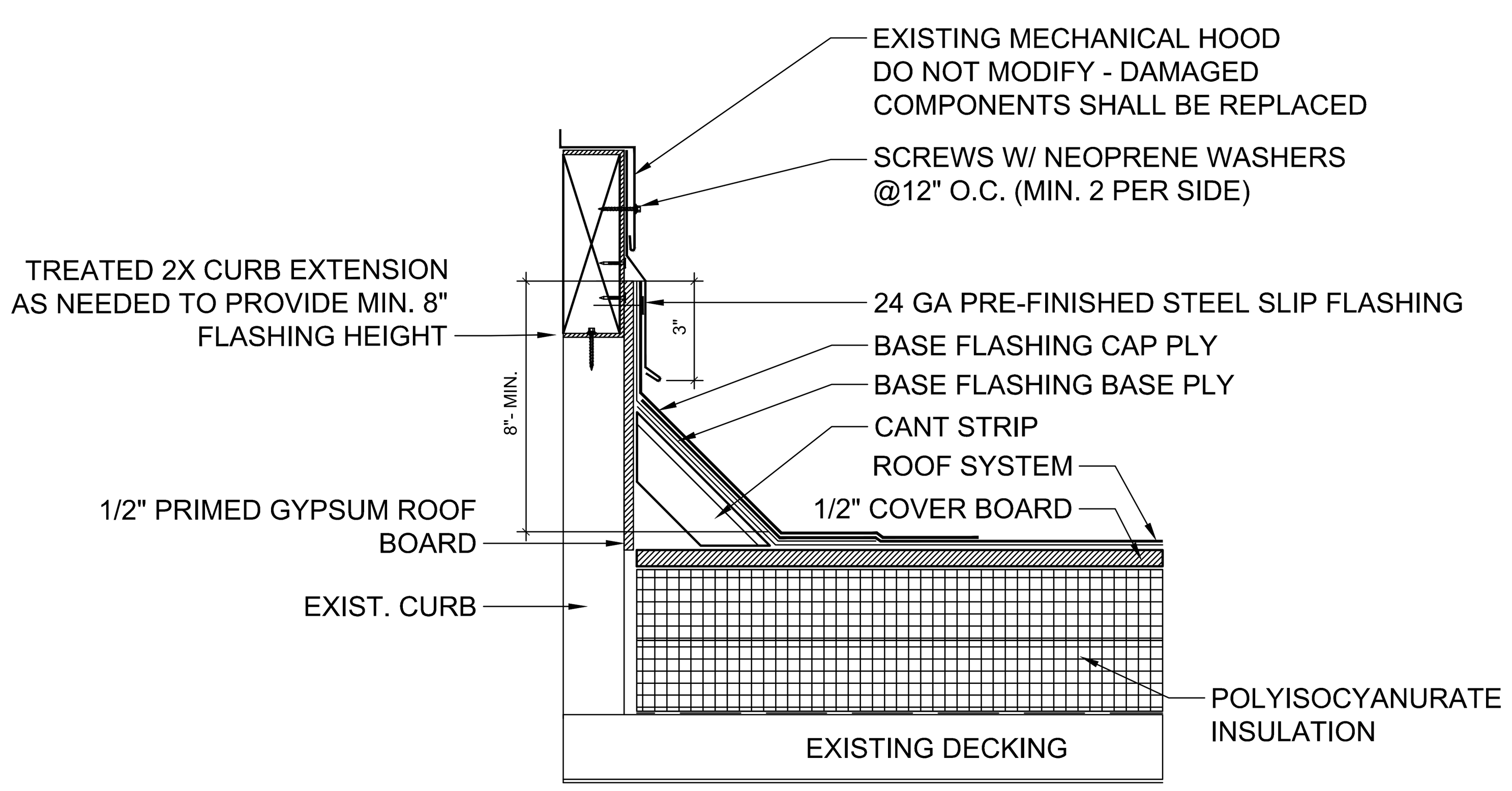
2 EQIPMENT RAIL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



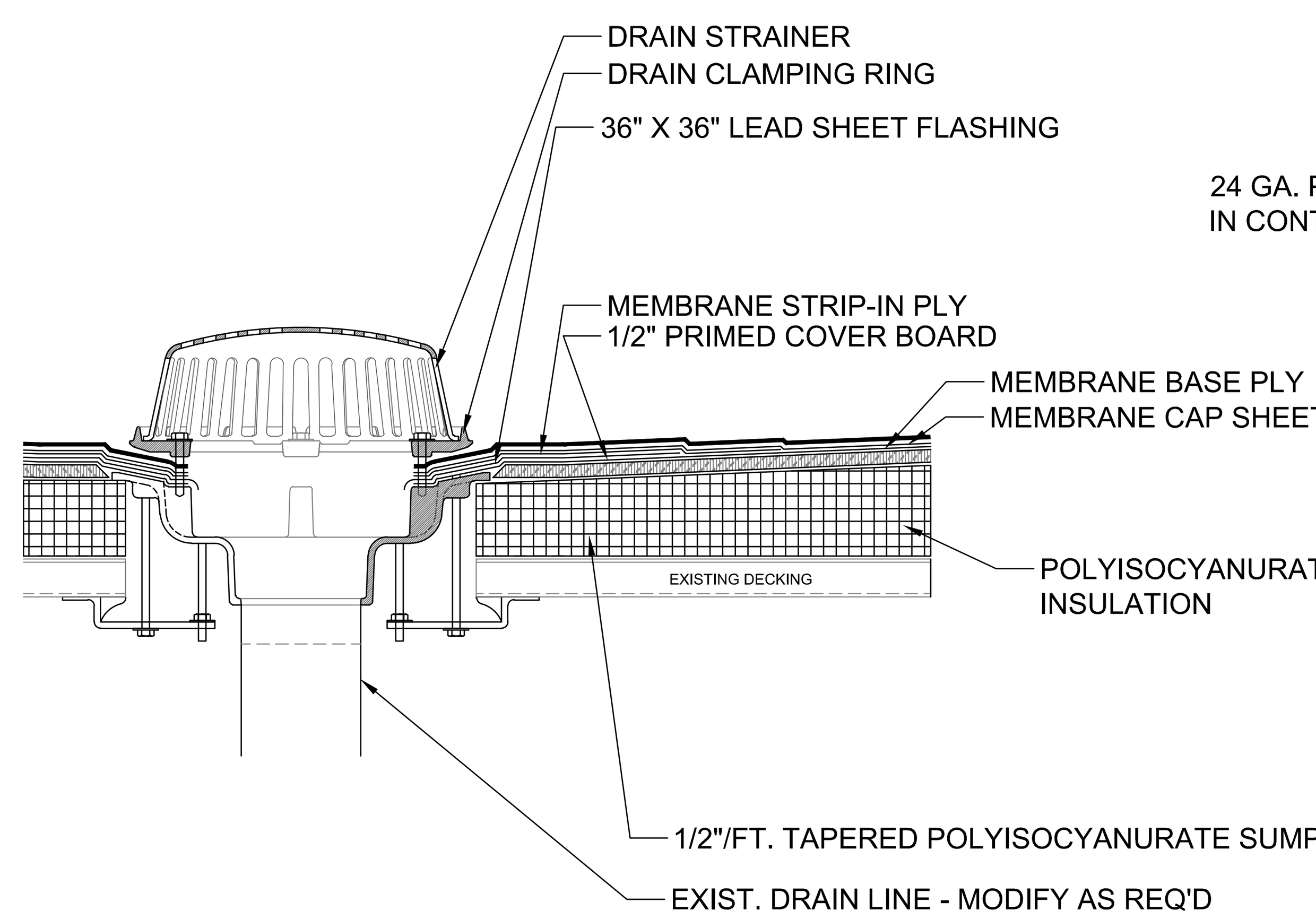
3 HVAC CURB SURFACE MOUNTED COUNTER-FLASHING DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

NOTE:

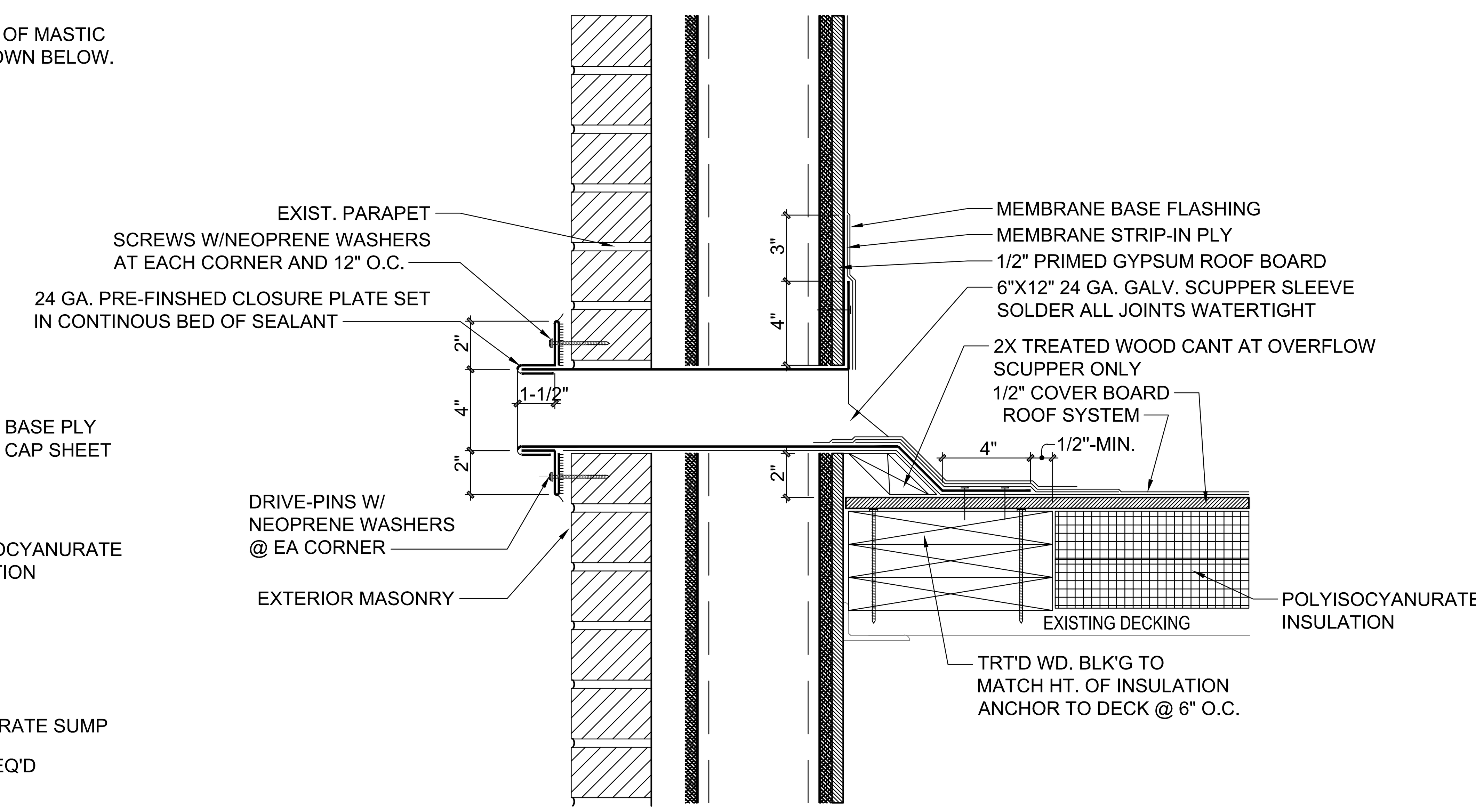
1.LEAD SHEET FLASHING - PRIME ALL SURFACES AND SET IN FULL BED OF MASTIC
2.RAISE OR LOWER DRAIN BOWL AS REQUIRED TO PROVIDE SUMP SHOWN BELOW.



4 EXHAUST FAN DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



5 ROOF DRAIN DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

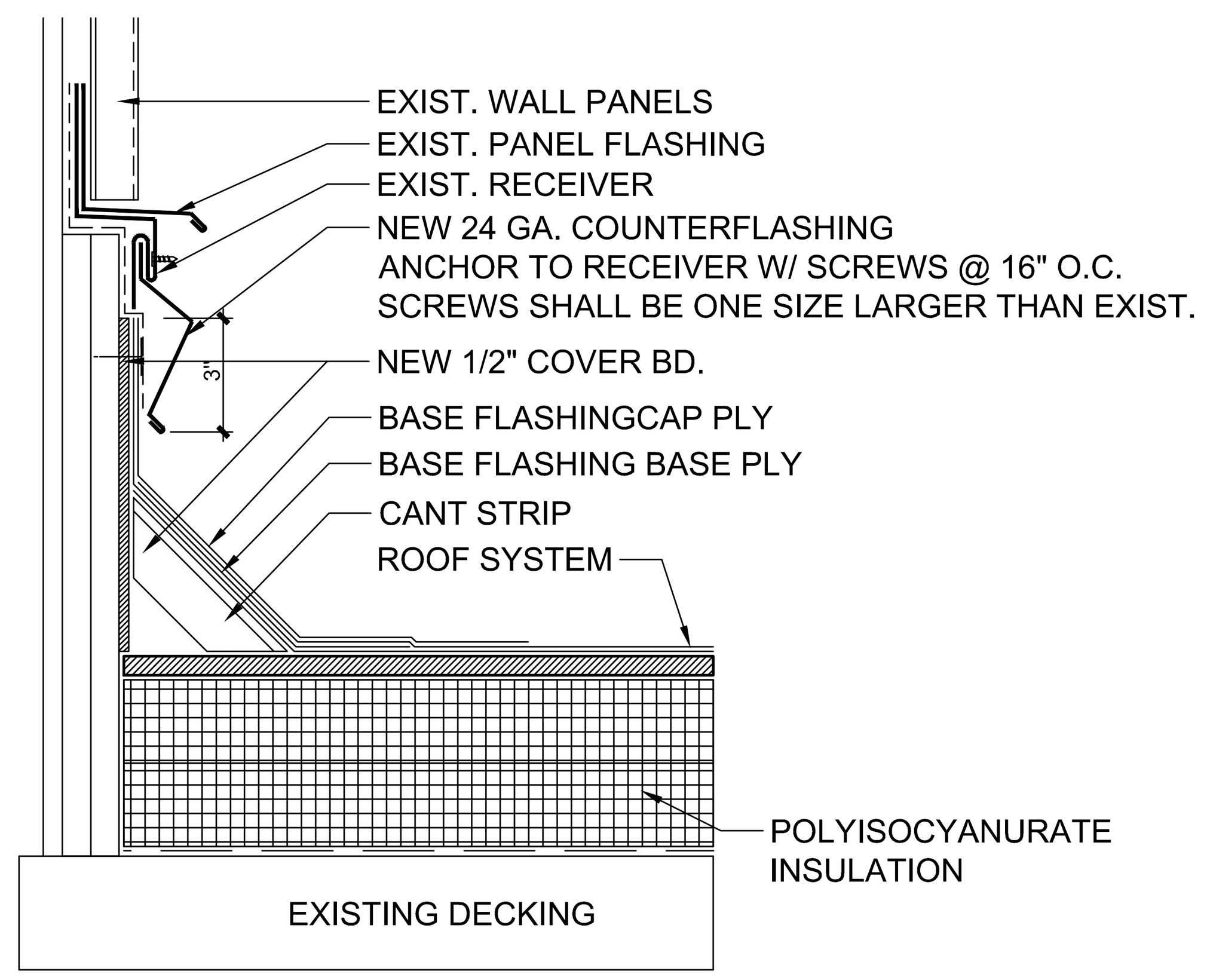


6 OVERFLOW SCUPPER DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

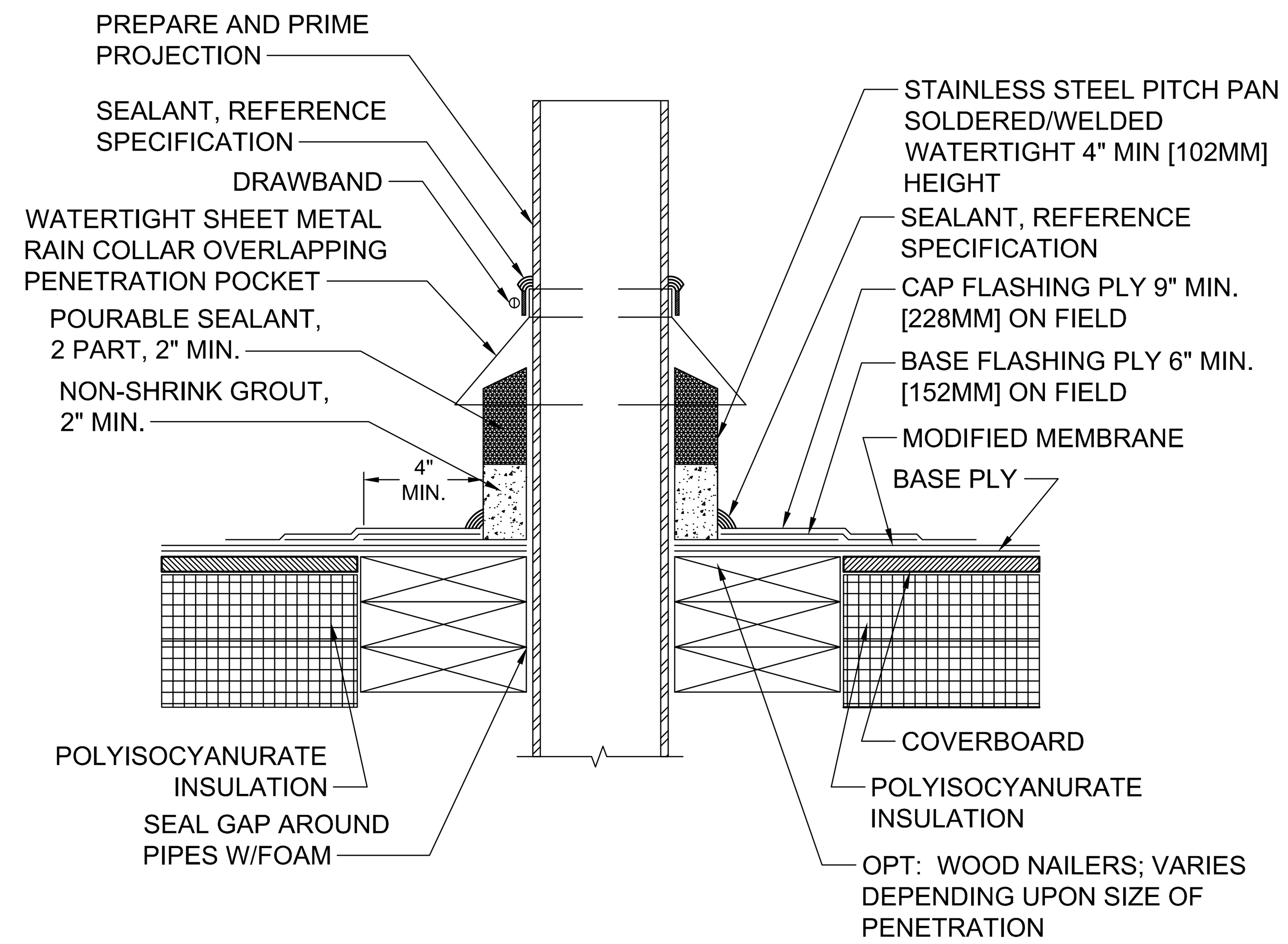
Details

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

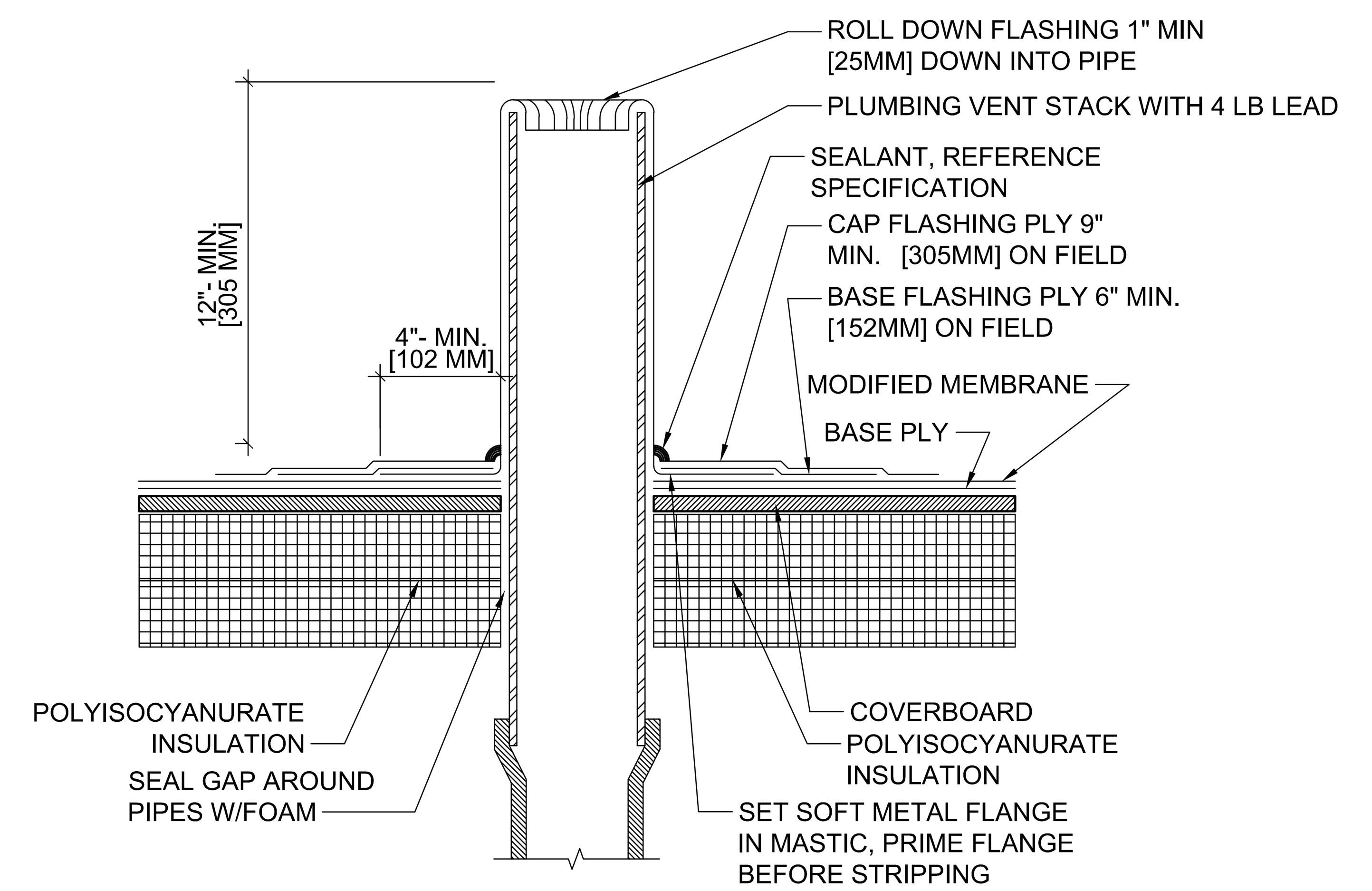
R7.0
DETAILS



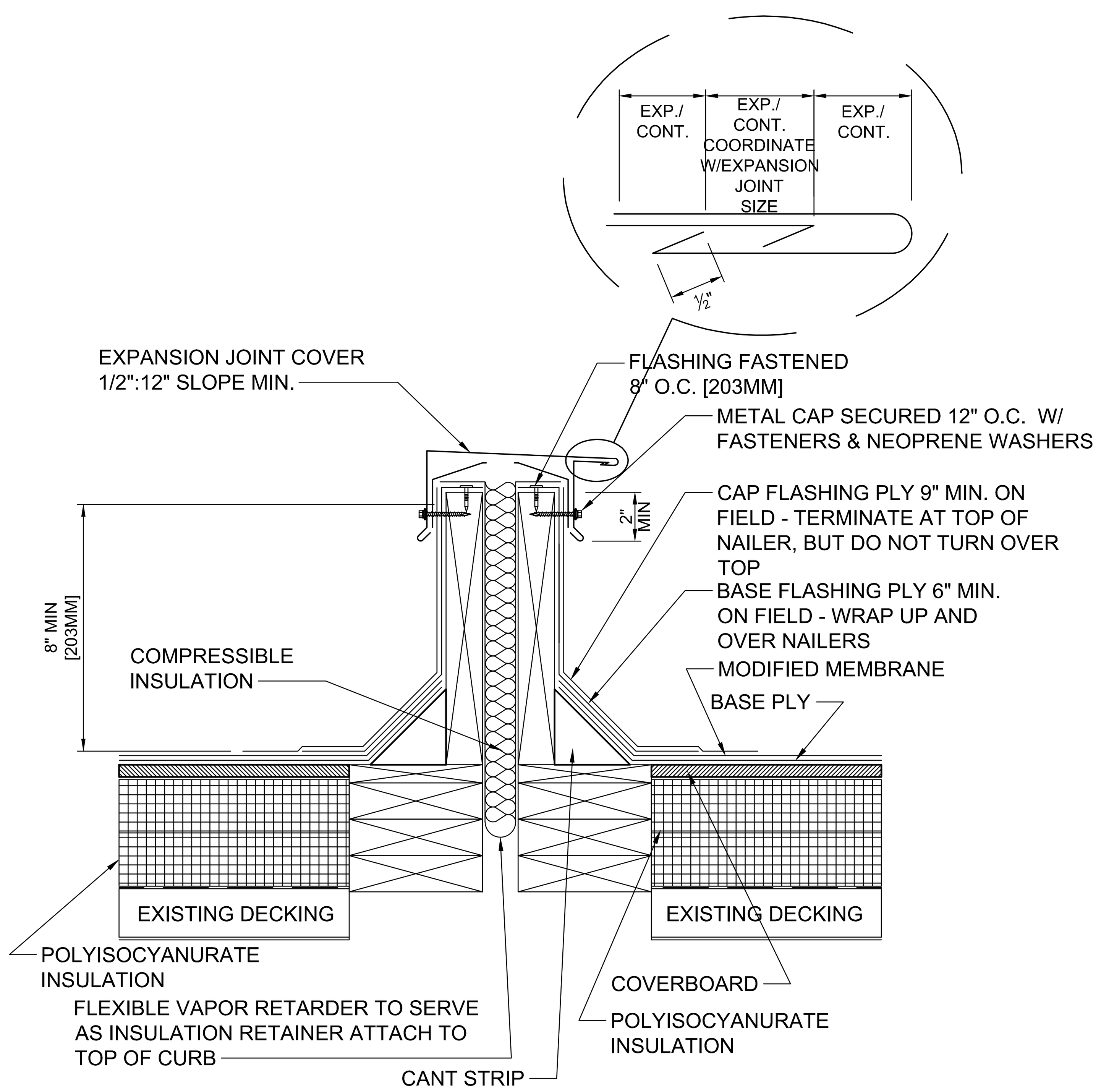
1 BASE FLASHING AT EXISTING WALL PANEL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



2 PITCH POCKET HARD PIPE DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

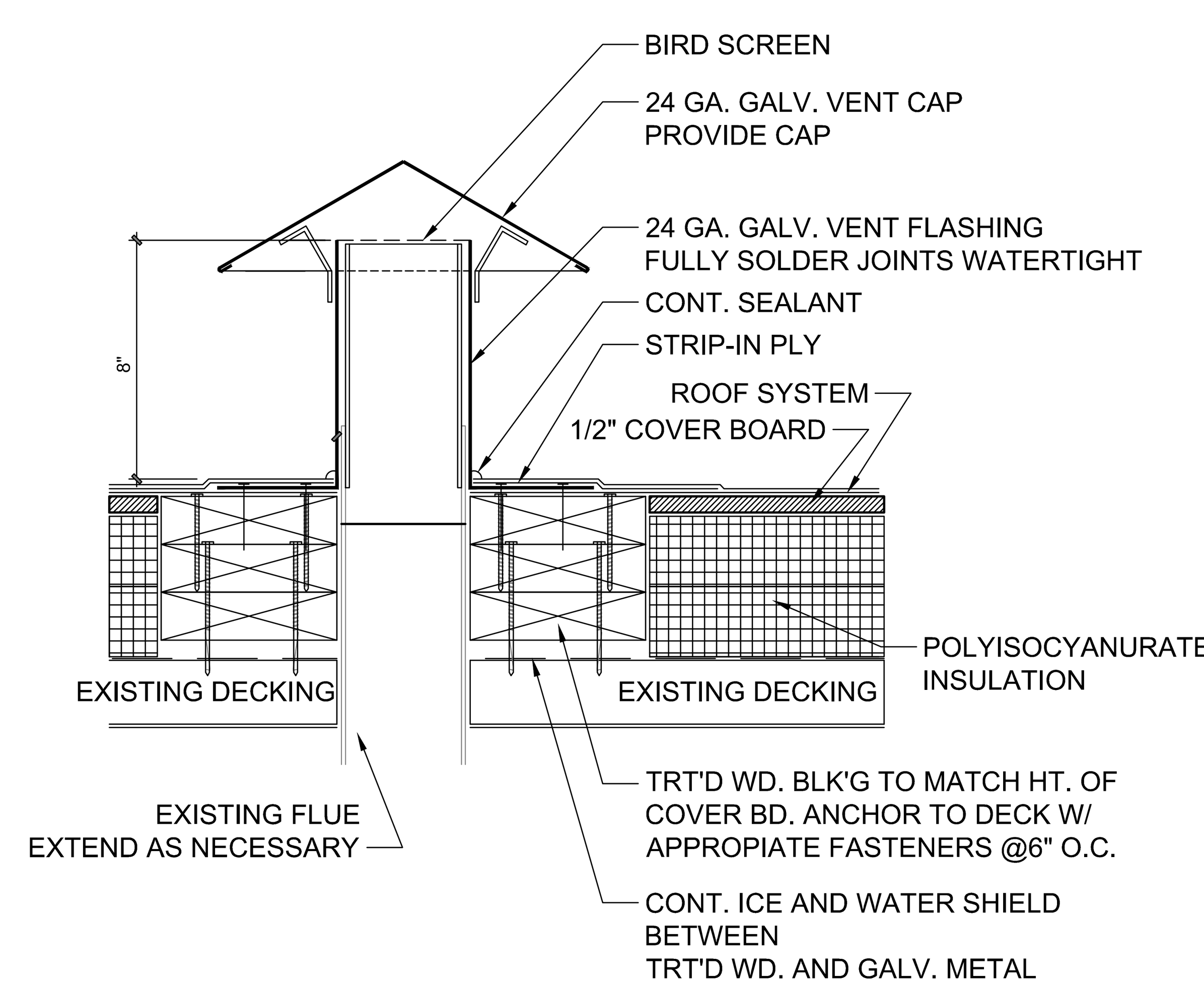


3 VENT STACK - TYPICAL
SCALE: 2-1/2" = 1'-0"

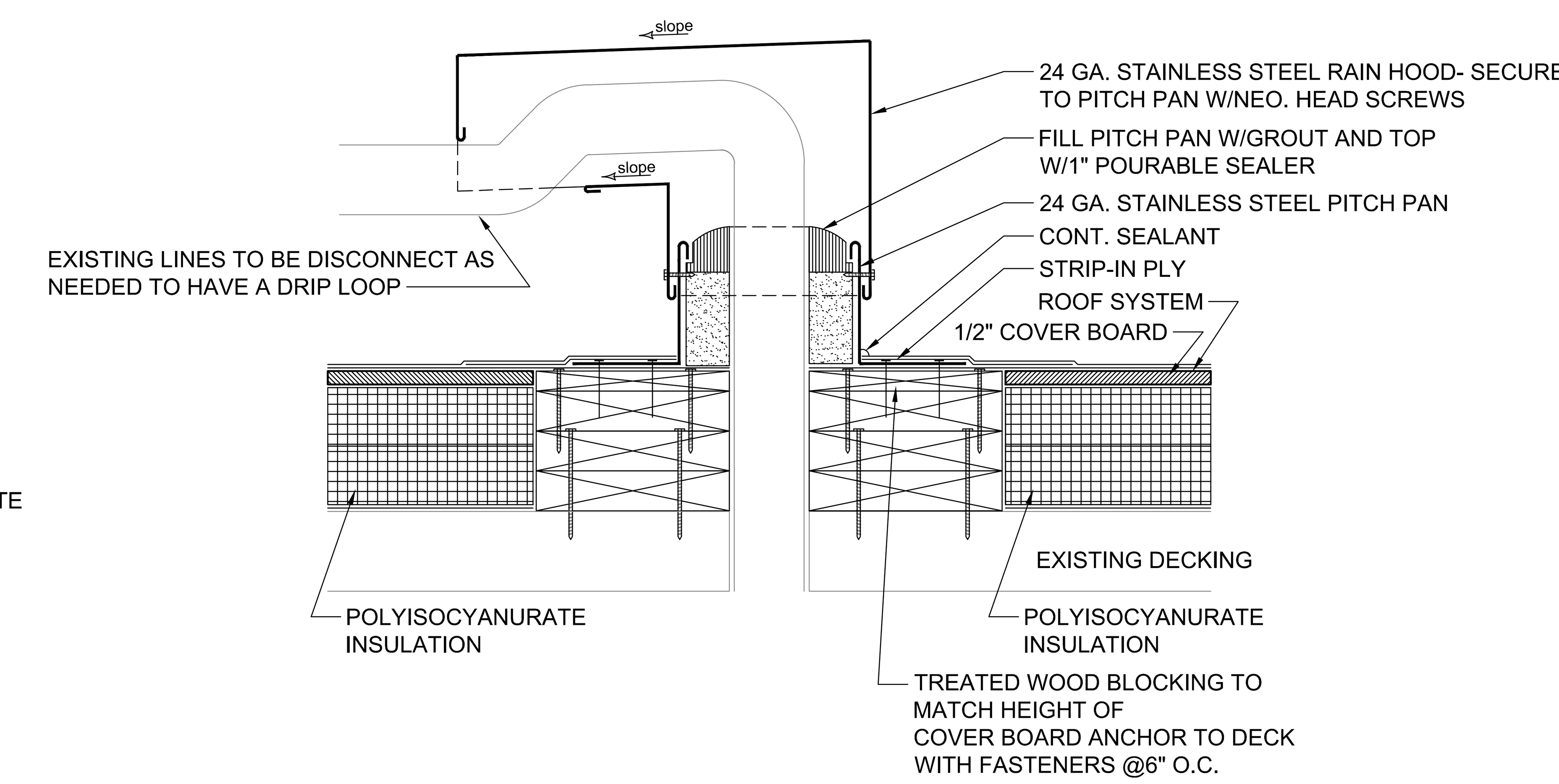


4 EXPANSION JOINT DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

NOTE:
1.PRIME VENT FLANGE, SET IN MASTIC AND NAIL AT 3" O.C. - STAGGERED



5 STAR VENT DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



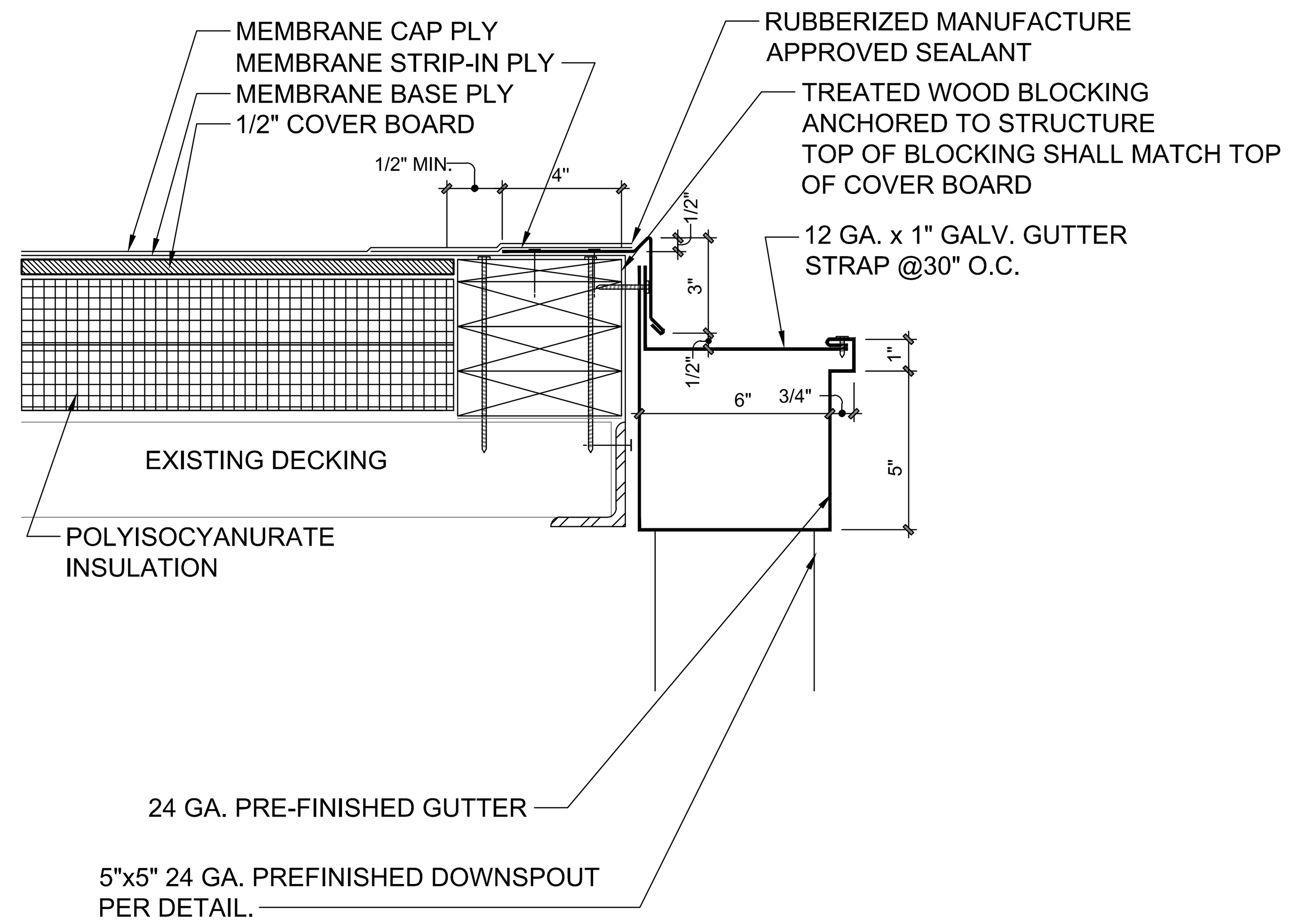
6 PIPE BOX PENETRATION DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

Details

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

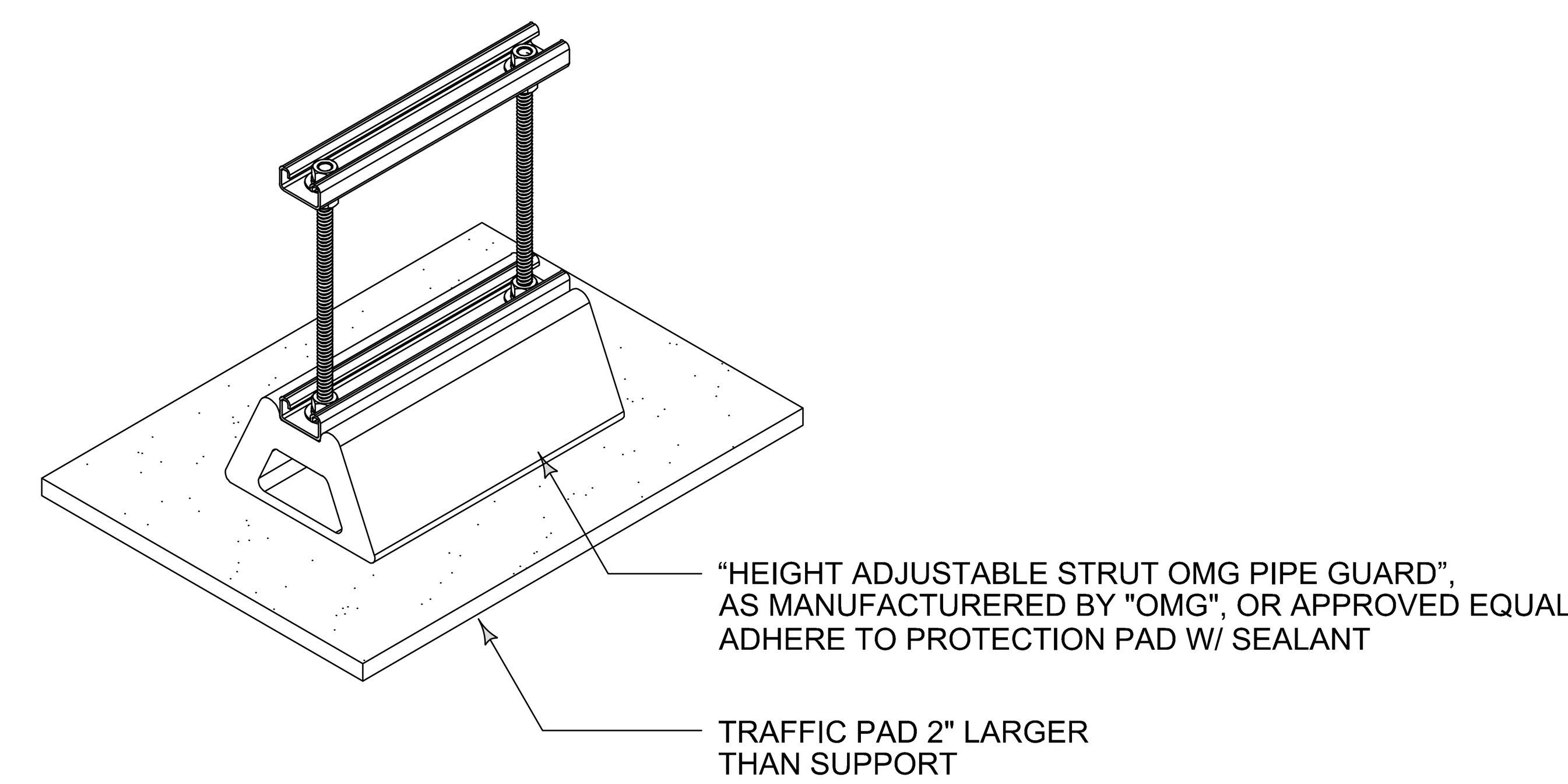
R8.0
DETAILS

NOTE: METAL EDGE SET IN ROOF CEMENT, NAILED 3" O.C. [76MM] STAGGERED, PRIME METAL FLANGE PRIOR TO STRIPPING

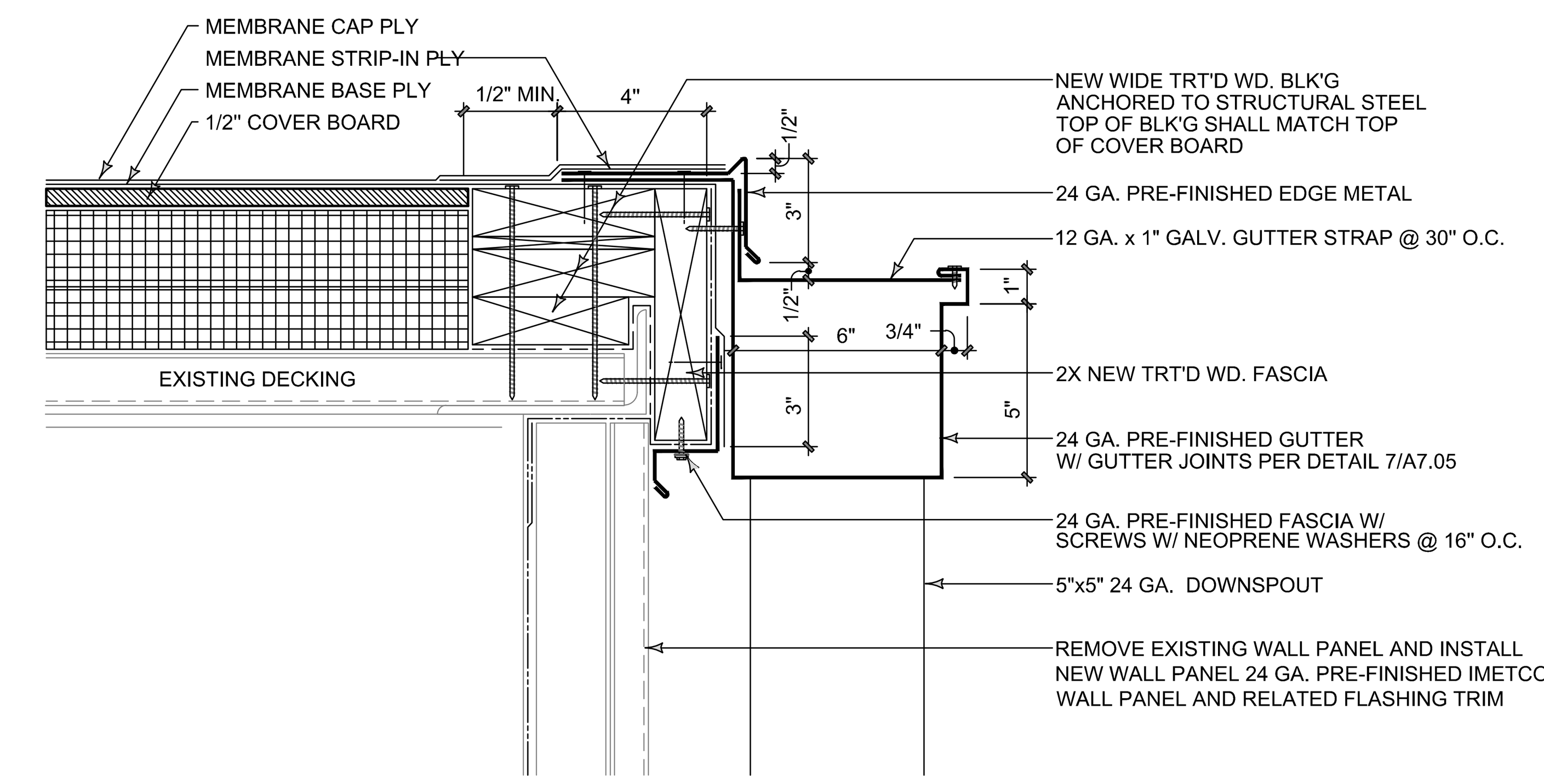


1 ROOF EDGE AT GUTTER DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

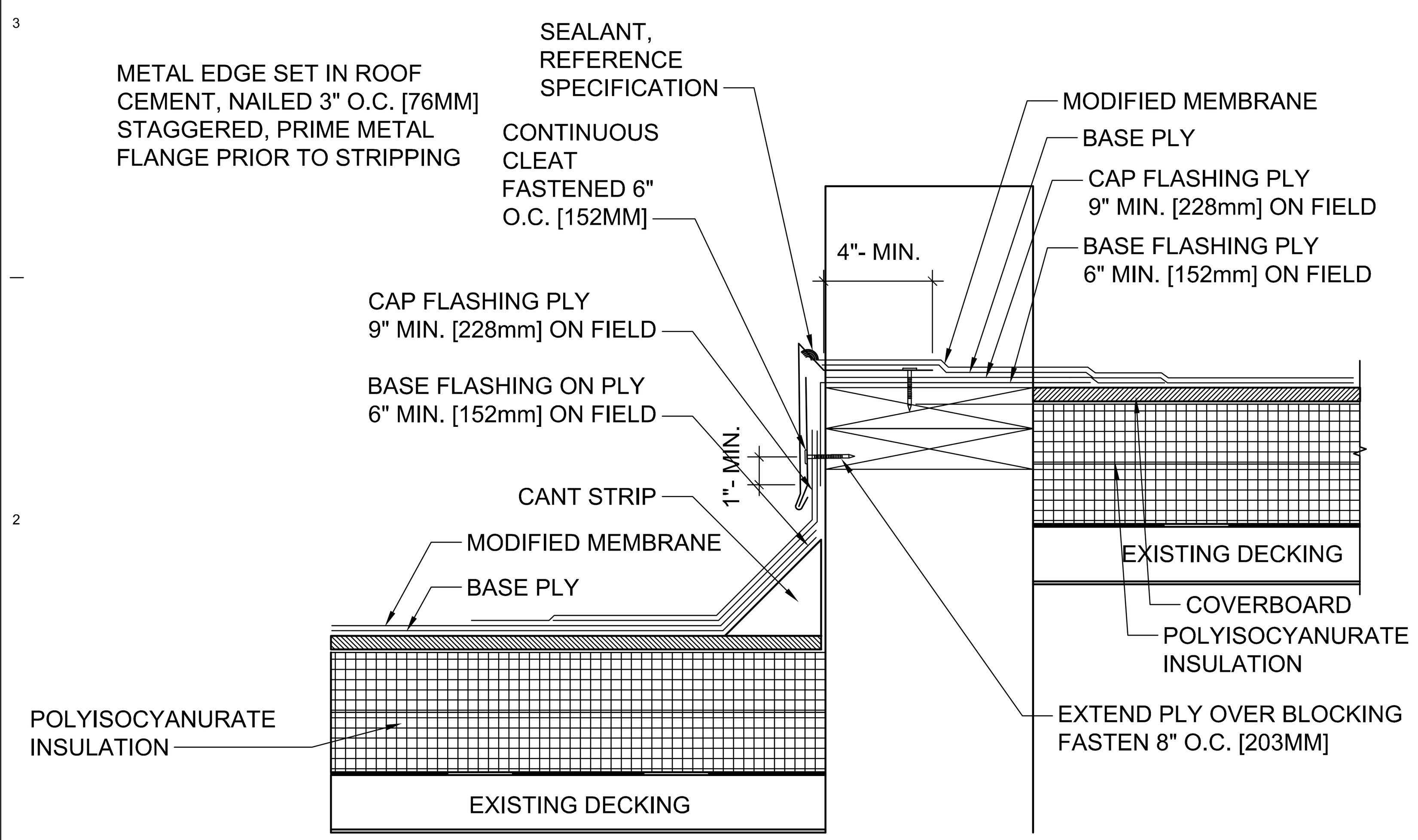
NOTE:
1.DISCONNECT, RAISE AND RECONNECT EXISTING CONDENSATE LINES, ETC. AS REQ'D TO ACCOMMODATE HEIGHT OF PIPE SUPPORT.



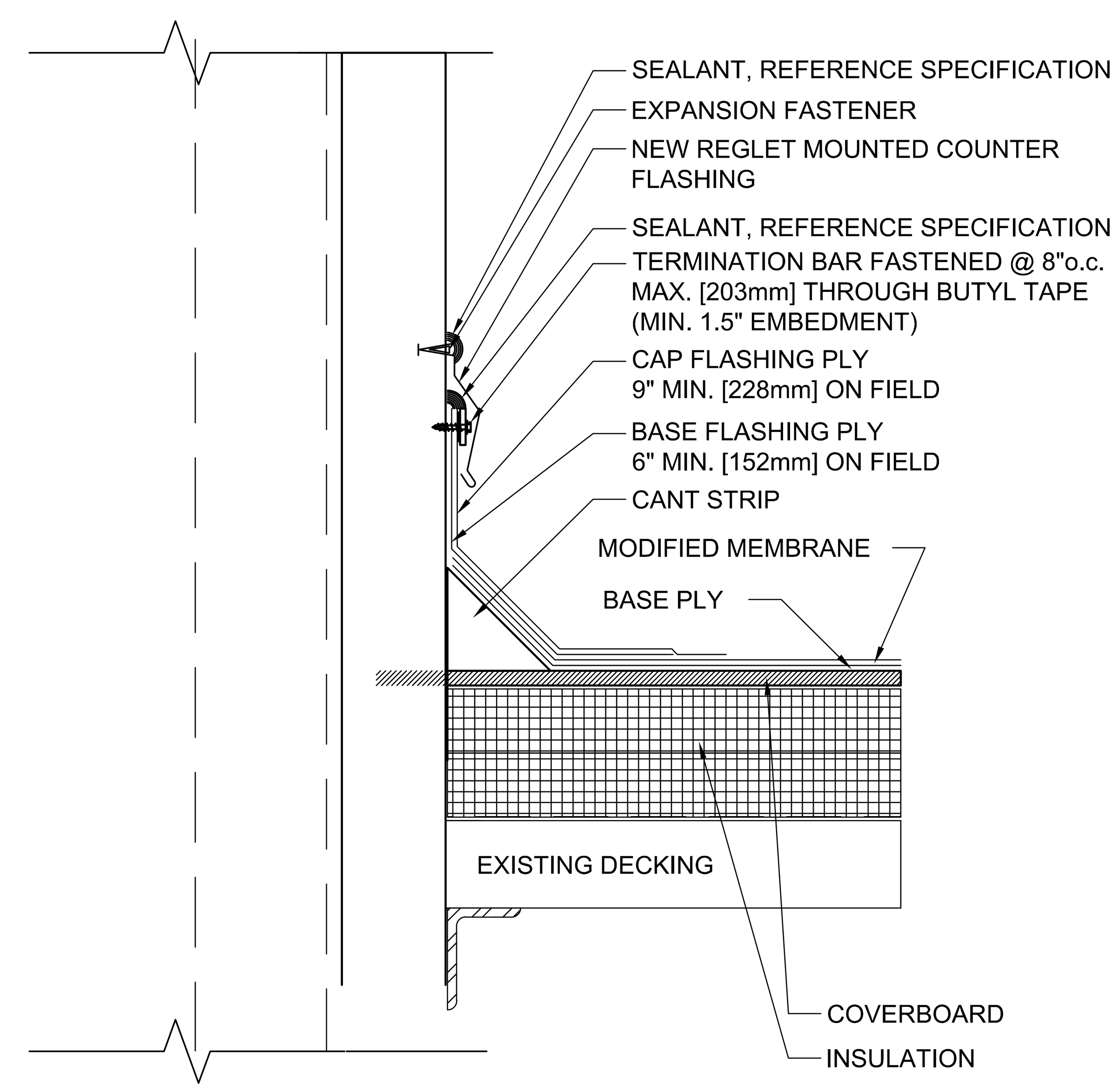
2 PIPE SUPPORT - ADJUSTABLE HEIGHT (TYPE "A")
SCALE: NTS



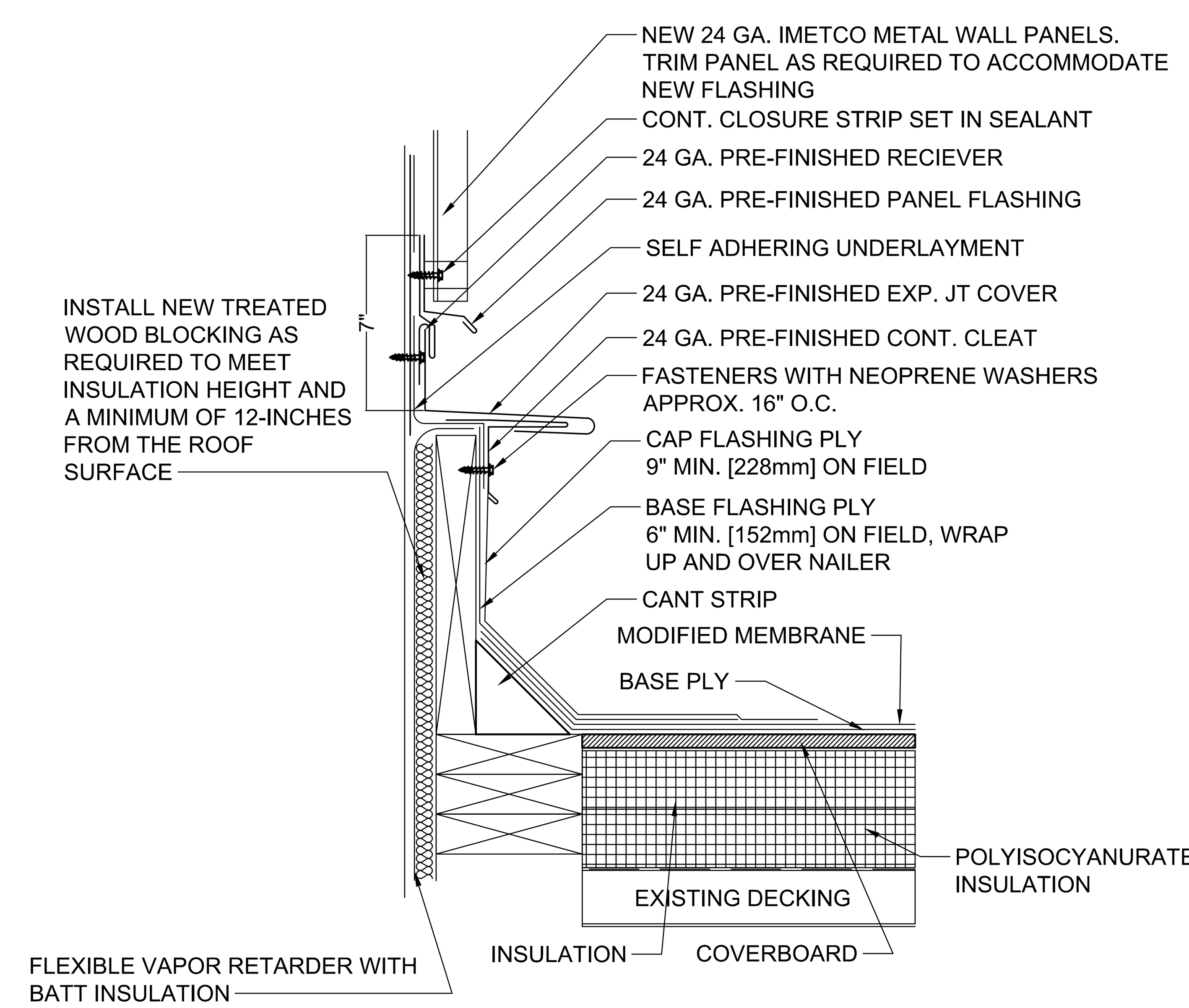
3 ROOF GUTTER WITH FACIA WITH NEW WALL PANEL - TYPICAL
SCALE: 2-1/2" = 1'-0"



4 UPPER ROOF TO HIGH ROOF DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



5 WALL FLASHING DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

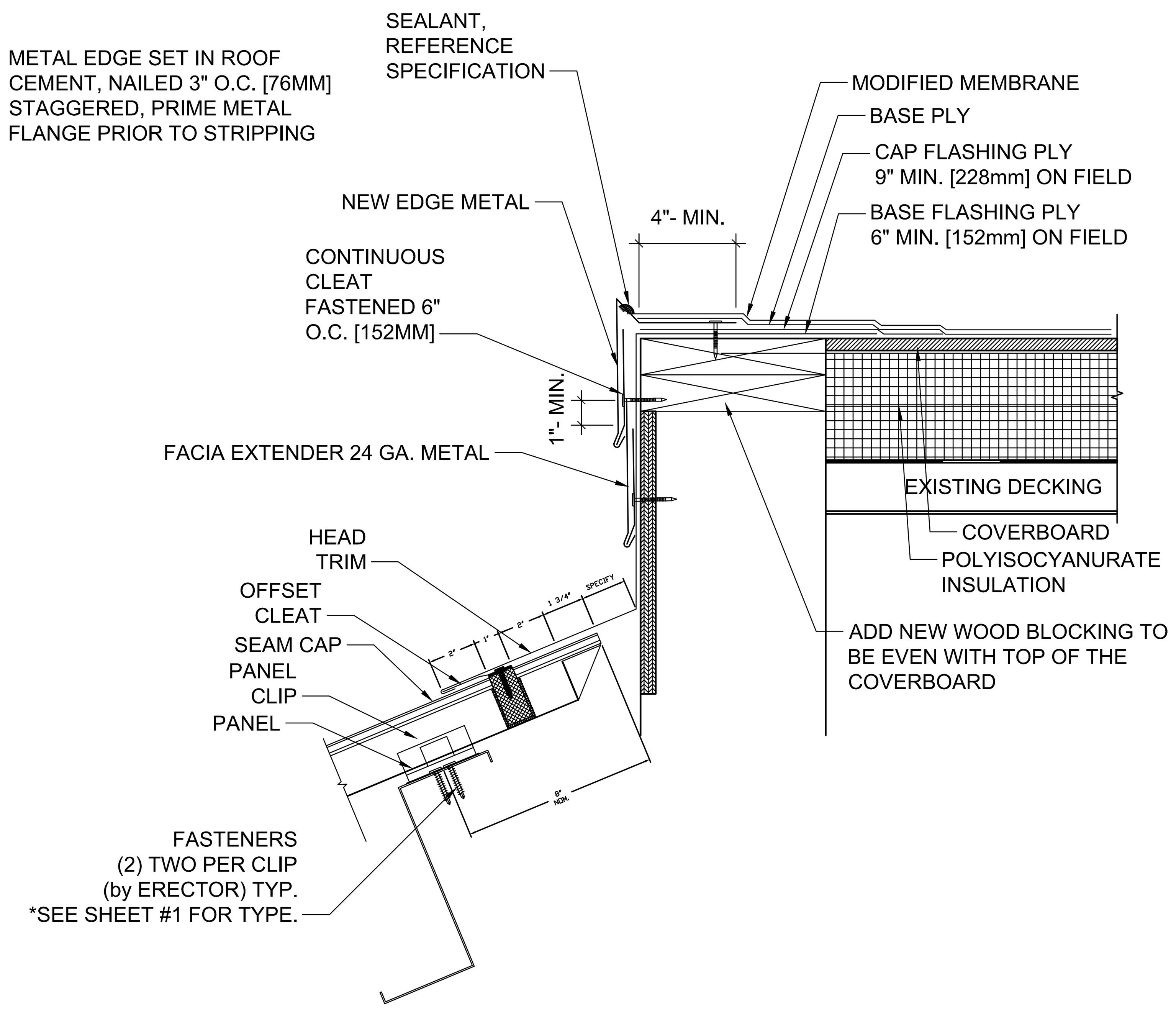


6 EXPANSION JOINT AT METAL WALL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

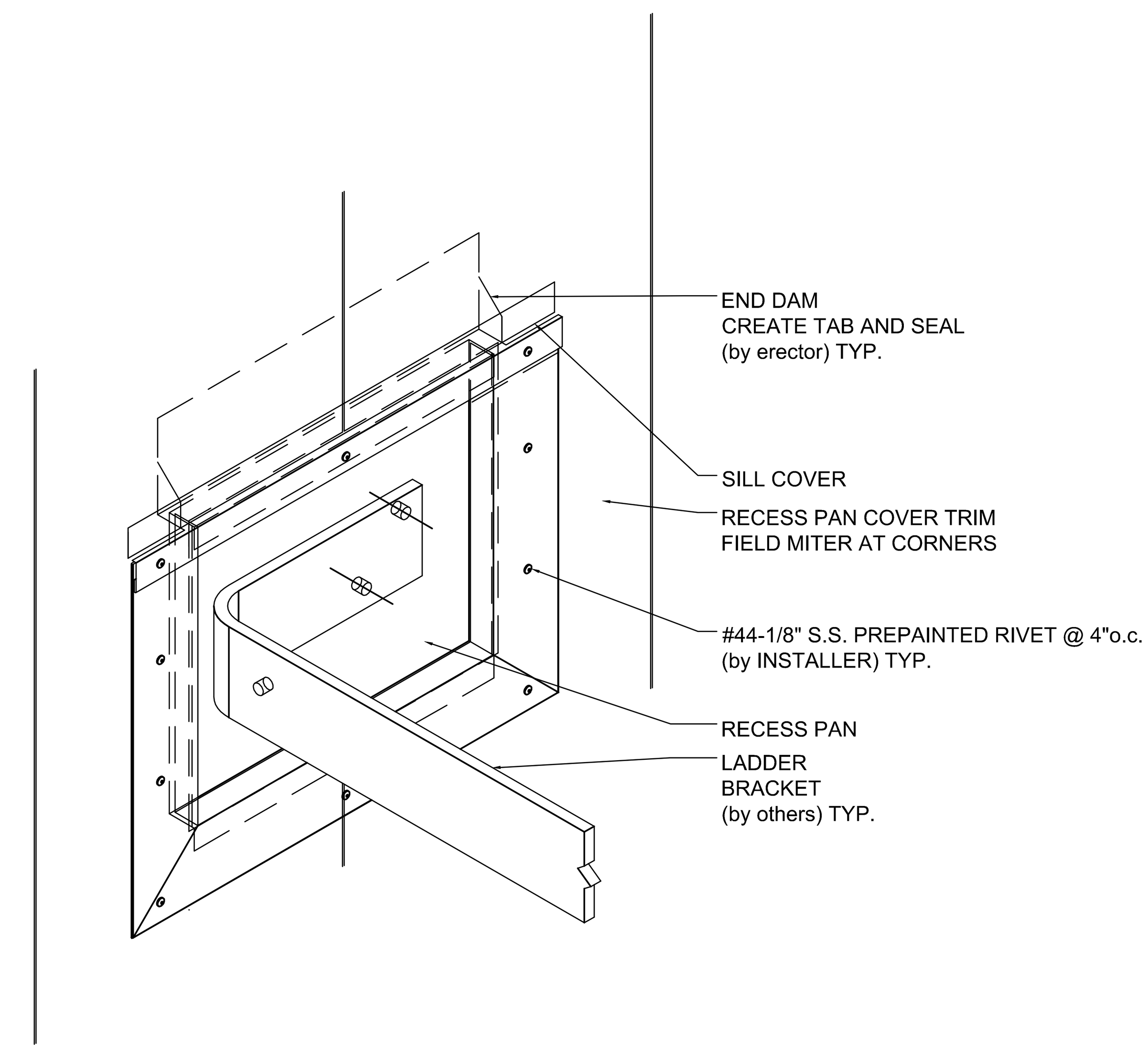
Details

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

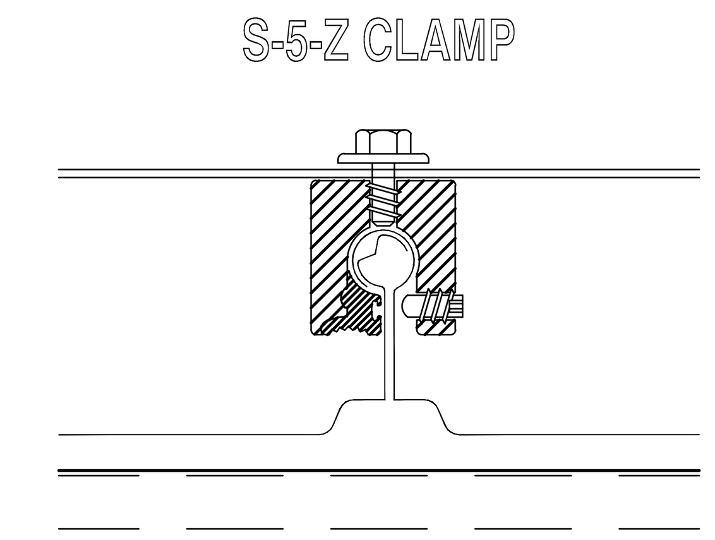
R9.0
DETAILS



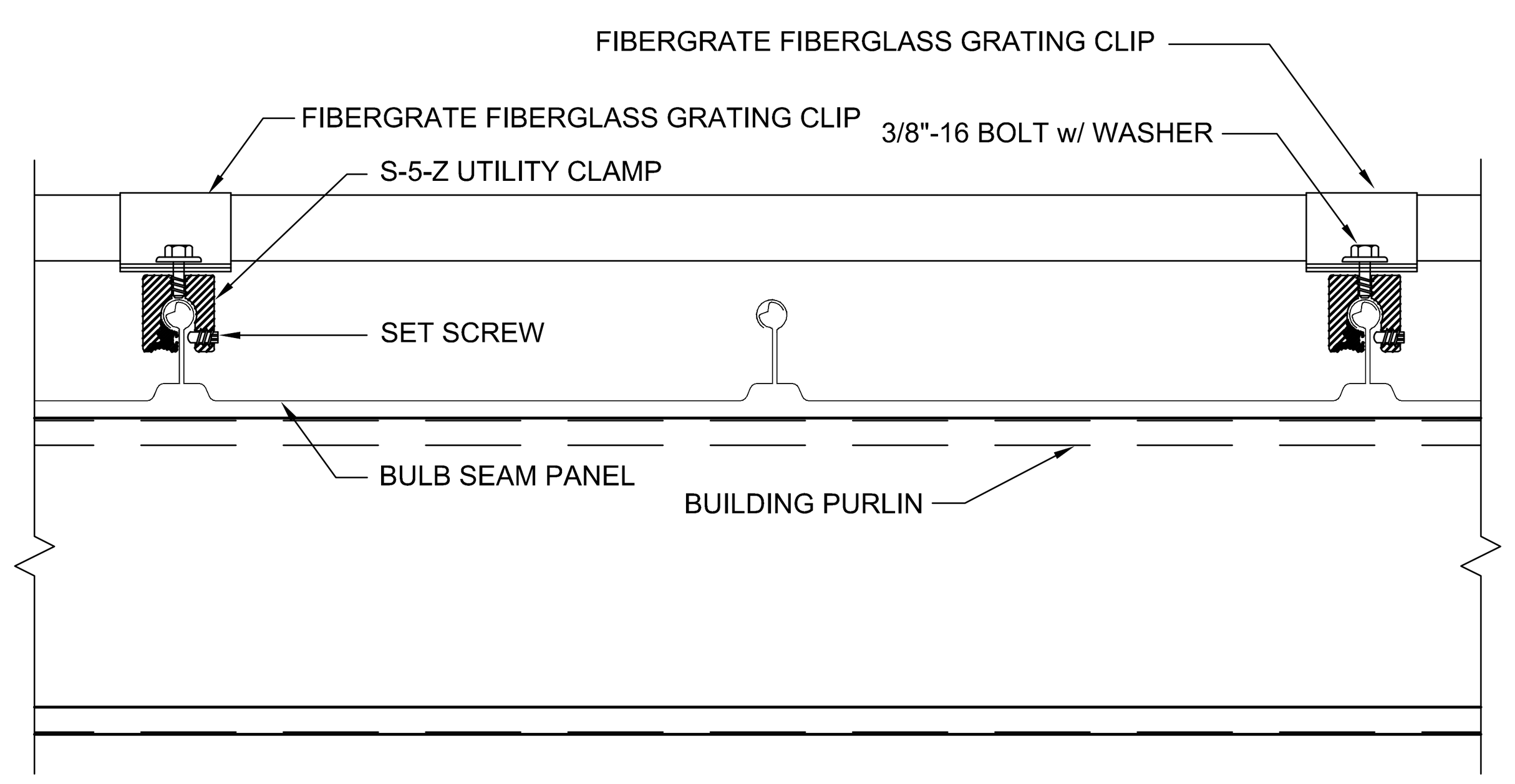
1 SHORT PARAPET WALL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



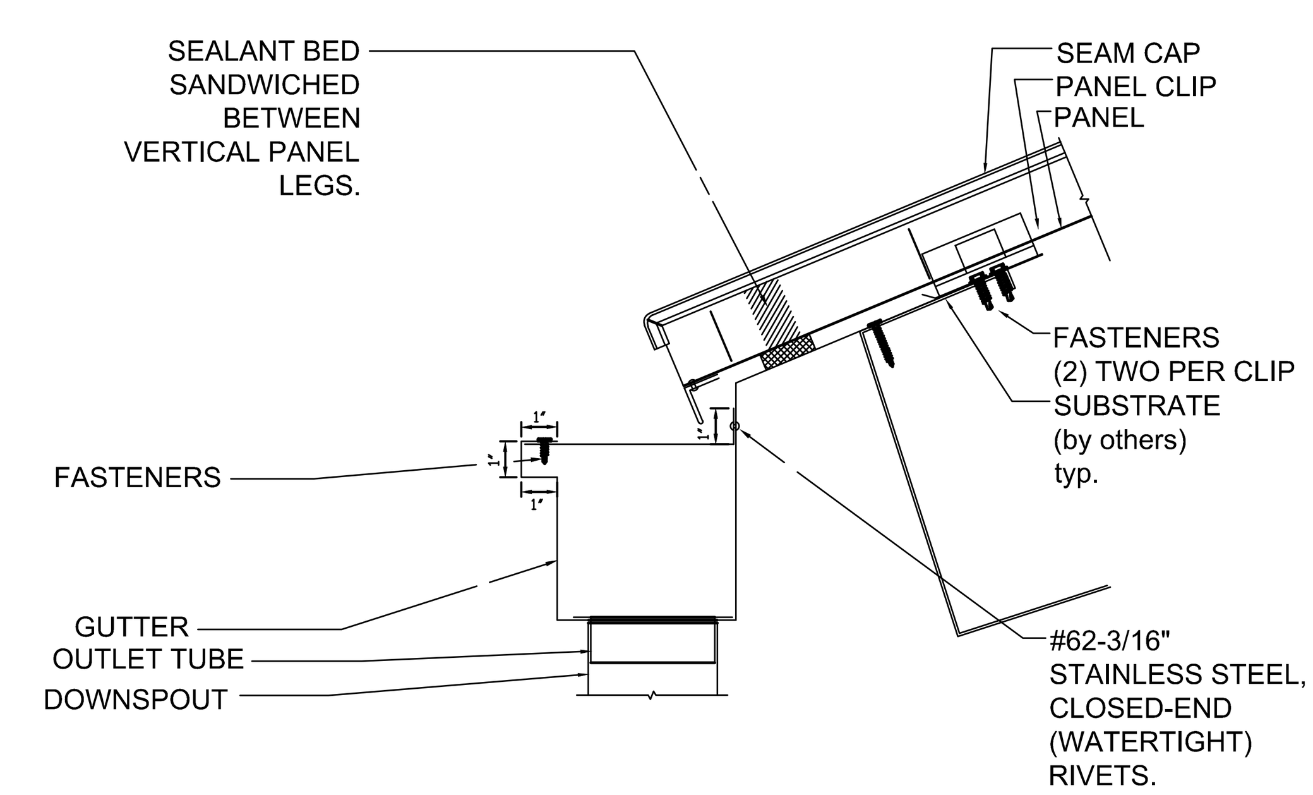
2 NEW ROOF LADDER CONNECTION AT WALL PANEL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



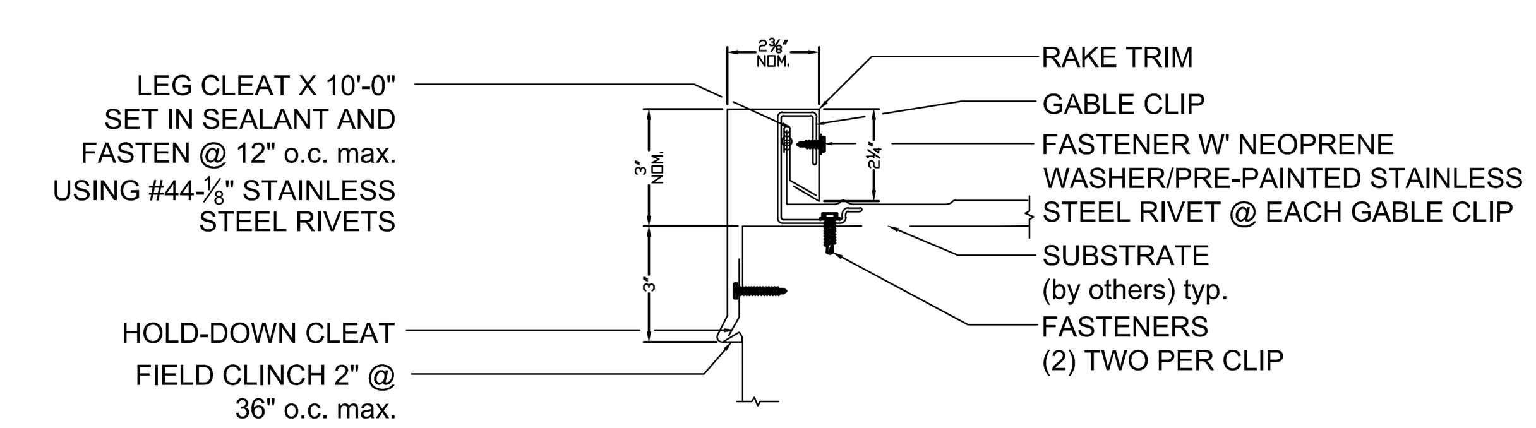
3 S-5 CLAMP DETAIL FOR FIBERGLASS GRATING - TYPICAL
SCALE: 2-1/2" = 1'-0"



4 FIBERGLASS GRATING DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"



5 GUTTER AT METAL ROOF PANEL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

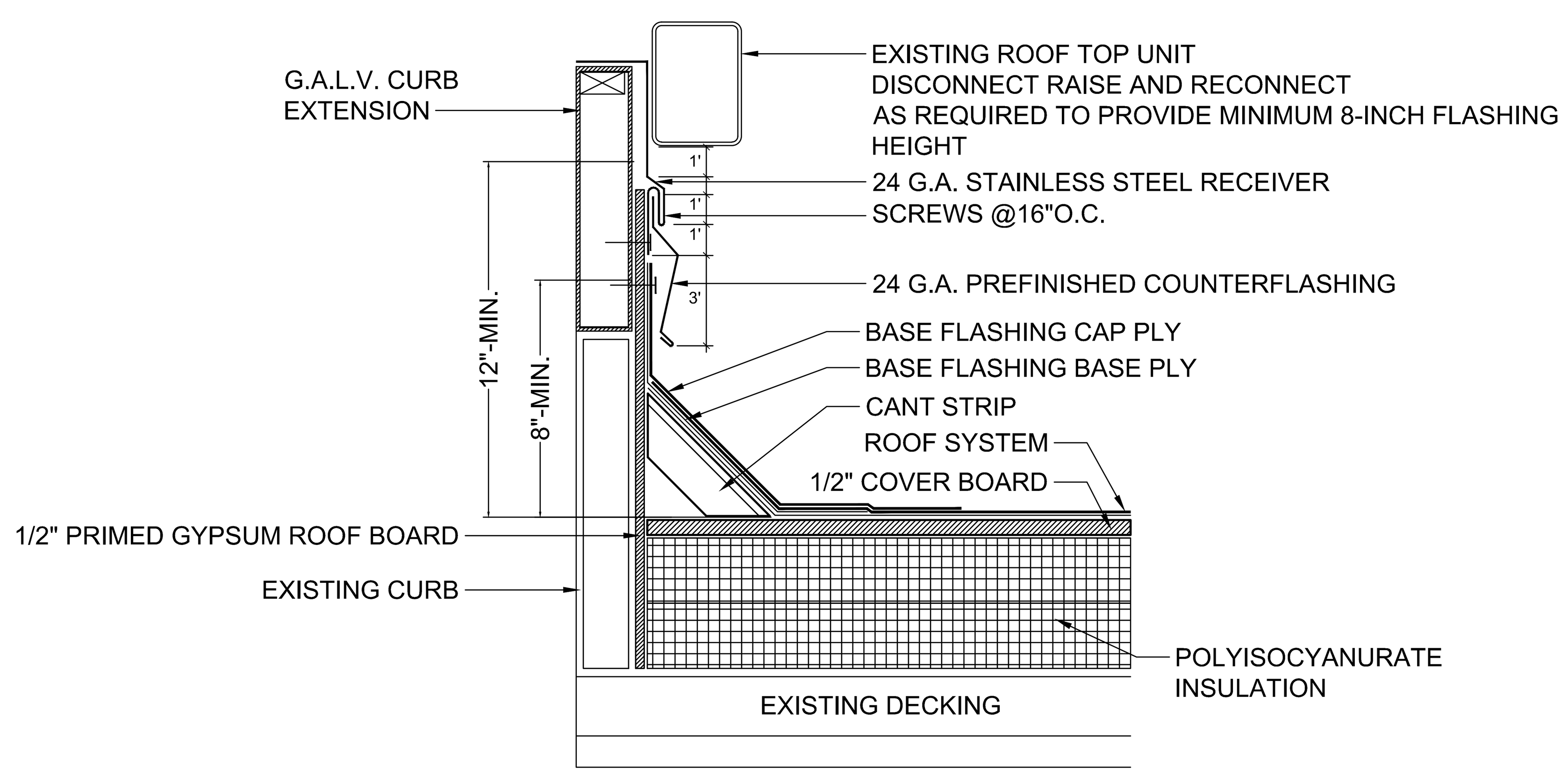


6 RAKE DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

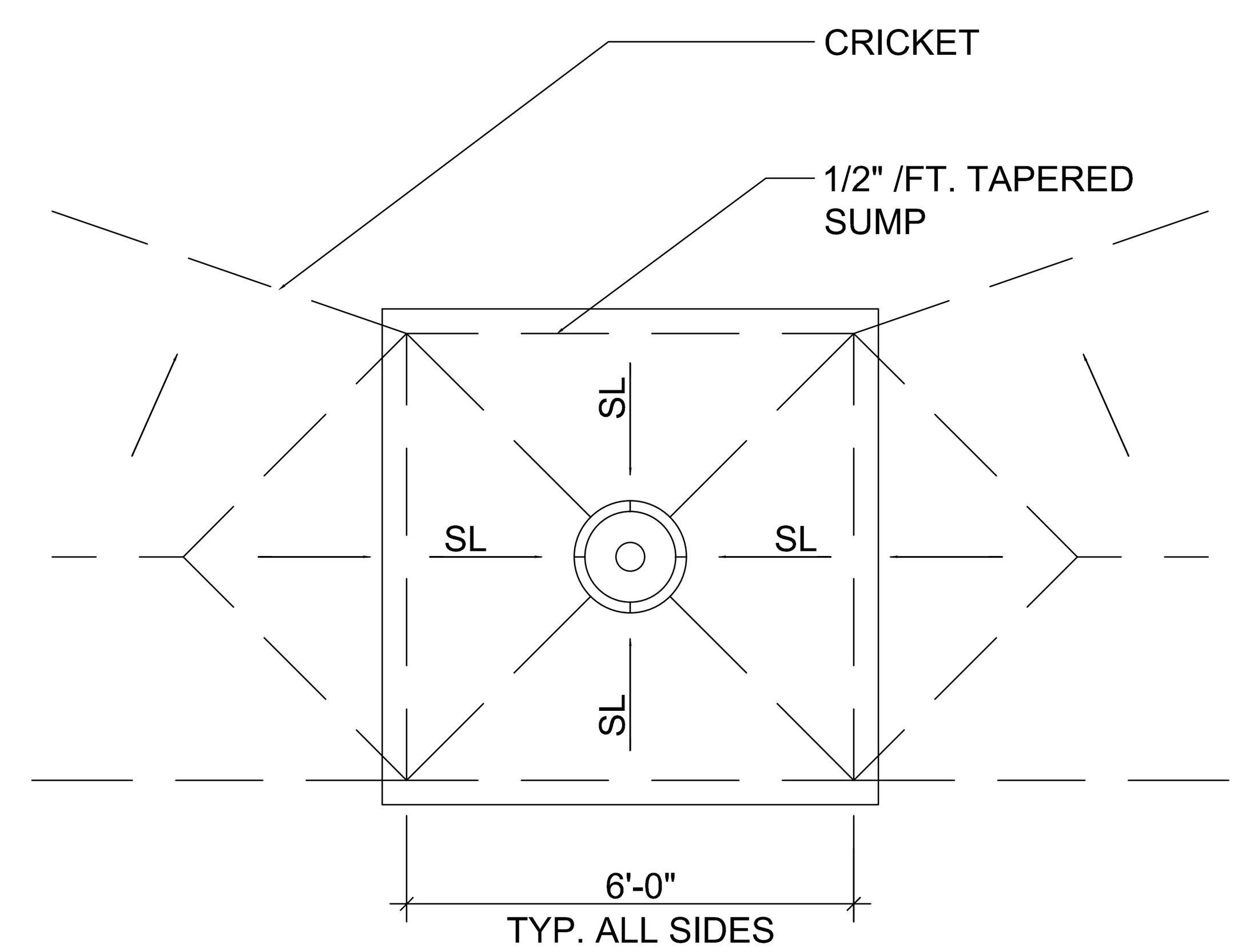
Details

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

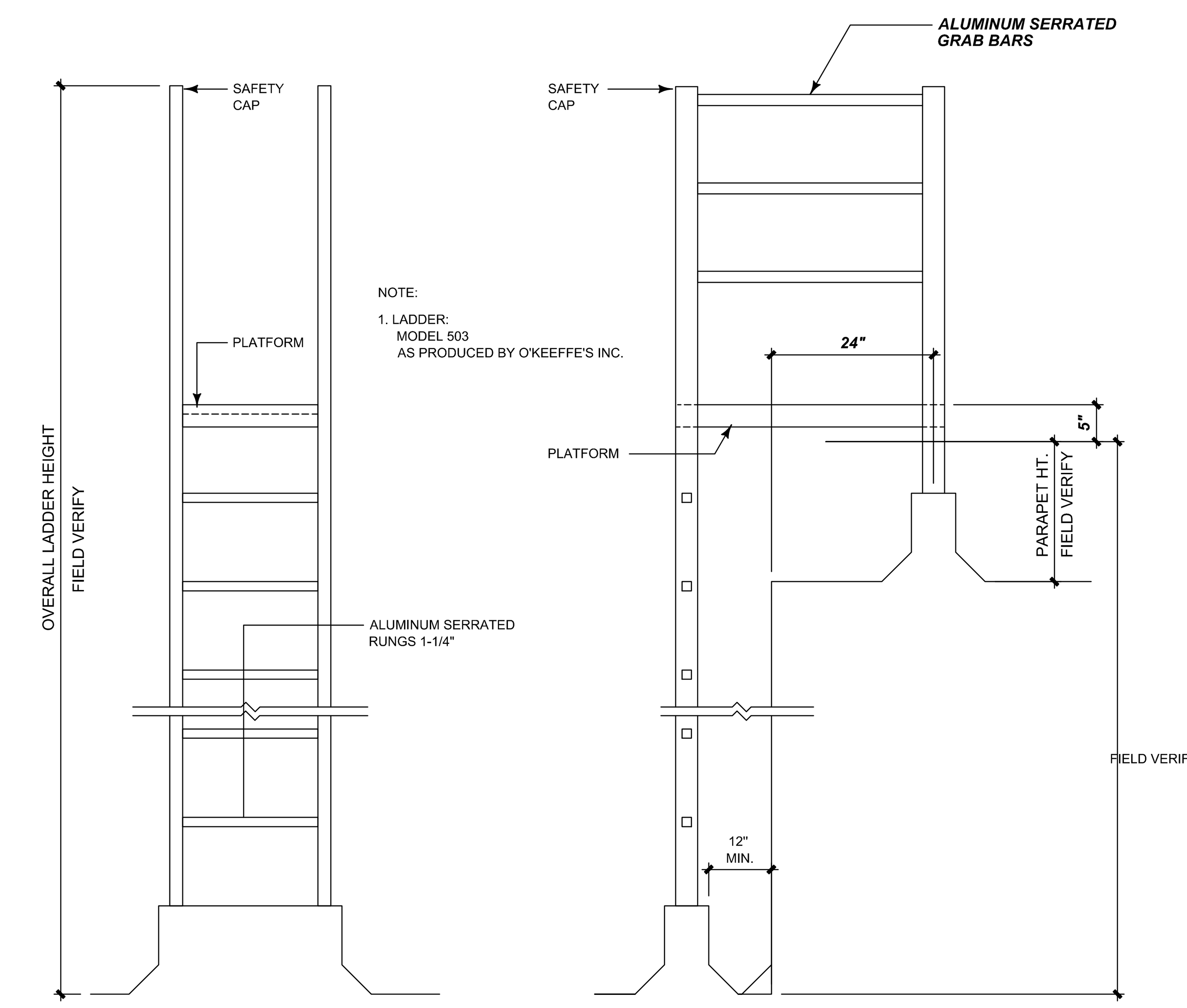
R10.0
DETAILS



1 SHORT PARAPET WALL DETAIL - TYPICAL
SCALE: 2-1/2" = 1'-0"

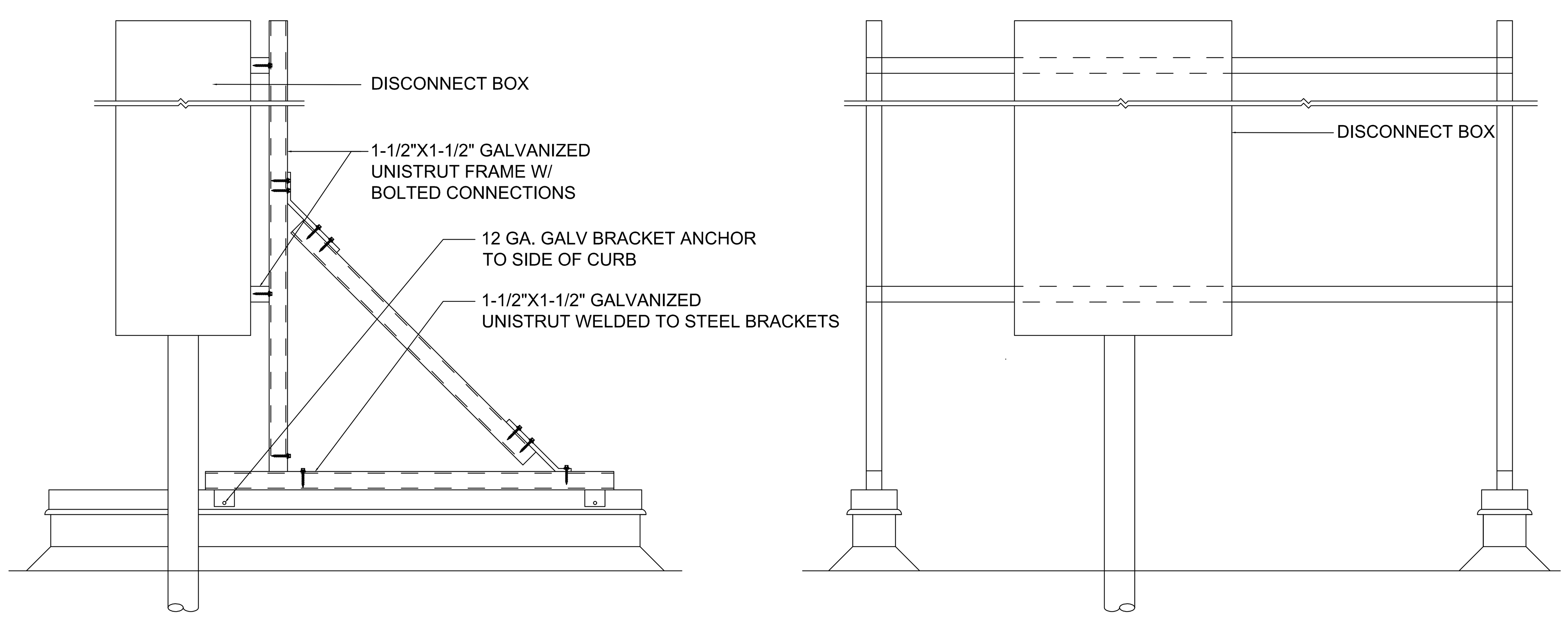


2 EQIPMENT RAIL DETAIL - TYPICAL
SCALE: NTS



3 HVAC CURB PRE-FAB EXTENSION DETAIL - TYPICAL
SCALE: NTS

NOTE:
1. EXISTING DISCONNECT SWITCH BOX SHALL REMAIN AT EXISTING ELEVATION. MODIFY EXISTING UNISTRUT RACK ASSEMBLY TO ACCOMMODATE CHANGES IN EQUIPMENT SUPPORT HEIGHTS.



4 EXHAUST FAN DETAIL - TYPICAL
SCALE: NTS

Details

BURNET COUNTY LIBRARY / BURNET COUNTY AGRI-LIFE BUILDING
100 E WASHINGTON ST, BURNET, TX 78611
607 N VANDERVEER, BURNET, TX 78611
Roof Replacement Project

R11.0
DETAILS