ADDENDUM

PROJECT:	Agricultural Center Roof Replacement	NO.:	02
		DATE OF ISSUANCE:	2/23/2024
OWNER:	Rowan County	ENGINEER:	REI Engineers
		REI PROJECT NO:	023CLT-163

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated 11/30/2023 as noted below.

This addendum consists of 1 page(s), the attached Specification Sections 00 41 13 Bid Form – Revision No. 2, 01 21 00 Allowances – Revision No. 1, 01 23 00 Alternates, and 07 41 13 Metal Roof Panels – Revision No. 1.

CHANGES TO BIDDING REQUIREMENTS:

1. 00 41 13 Bid Form-Revision No. 1; Replace with attached, 00 41 13 Bid Form – Revision No. 2

CHANGES TO SPECIFICATIONS:

2. 01 21 00 Allowances; Replace with attached, 01 21 00 Allowances – Revision No. 1

3. 01 23 00 Alternates; Add attached, 01 23 00 Alternates

4. 07 41 13 Metal Roof Panels; Replace with attached, 07 41 13 Metal Roof Panels – Revision No. 1

QUESTIONS/CLARIFICATIONS

5. Addendum No. 01; Change “Bidding Documents dated 7/14/2023” to read “Bidding Documents dated 11/30/2023”

6. I can’t find where any of the listed manufactures have a metallic color close to the color listed in the addendum (other than DMI). Do you want us to price a custom color to match this or a manufacturer’s standard color that is close? See attached Bid Form – Revision 2. Base bid shall be standard color selection, Alternate No. 1 will be Owner preferred alternate for Aged Copper Metallic by Sentriclad.

7. Can you please clarify is the full time superintendent needs to be a non working superintendent? Section 01 40 00 Quality Requirements, 1.6 Quality Assurance, Item O Installer Qualifications, Number 8 Superintendent, Sub letter a “whose primary responsibility is to supervise and direct the performance of the Work”. Specifications do not state he is non-working but his main responsibilities are as indicated above.

ALL OTHER REQUIREMENTS AND PROVISIONS OF THE BIDDING DOCUMENTS REMAIN UNCHANGED. ACKNOWLEDGE RECEIPT OF THIS ADDENDUM ON THE BID FORM. FAILURE TO DO SO MAY BE CAUSE FOR REJECTION OF THE BID.

END OF ADDENDUM

REI ENGINEERS

SECTION 00 41 13

BID FORM - REVISION 2

PART 1 GENERAL

1.1 PROJECT AND ITS PARTIES

A. TO:

1. Don Bringle
2. Rowan County
3. 130 W. Innes Street,
4. Salisbury, North Carolina28144

B. PROJECT:

1. Agricultural Center Roof Replacement
2. REI Project No. 023CLT-163

C. FROM:

1. Date: _____
2. Bidder: _____
3. Address: _____
4. Phone: _____ Email: _____
5. GC License #:_____ Classification:_____ Limitation: _____

1.2 BASE BID

A. The undersigned, as bidder, hereby declares that the only person or persons interested in this bid as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this bid or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The Bidder further declares that he has examined the site of the work and the contract documents relative thereto dated 11-27-2023 as prepared by REI Engineers, Inc., and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The Bidder proposes and agrees if this bid is accepted to contract with the Owner in the form of contract specified, to furnish all necessary materials, equipment, machinery, tools apparatus, means of transportation and labor necessary to complete the construction of the project with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the Contract Documents, for the sum of:

1. Words: _____
2. Figures: $_____._____

1.3 ALTERNATES:

A. The undersigned agrees to perform alternative work as described in Section 01 23 00 - Alternates for the sums stated below resulting in additions to or deductions from the base bid stated above. Additions and deductions shall include any modifications of the Work or additional work that may be reasonably included as part of the alternative work. All alternative work is to be completed within the same timeframe as the base bid work. All alternates must be filled out. A zero or no entry after any alternate indicates no cost change to include that Alternate. Alternates may be accepted at any time during the bid holding period. The undersigned acknowledges that failure to complete all information requested in this section may result in the rejection of this bid.

1. Owner Prefered Alternate No. 1: Provide metal roof system as specified in Section 07 41 13 in Aged Copper Metalic by SentriClad

   a. Words:_____

   b. Figures: $_____.___

   c. Select One: ___ Add or ___ Deduct

1.4 ALLOWANCES:

A. Include in the Base Bid the $20,000.00 Contingency Allowance.

B. Include in the Base Bid the following Quantity Allowances:

1. Replace 500 BF of Deteriorated Wood Blocking.

2. Replace 1,500 SF of Deteriorated Plywood.

1.5 UNIT PRICES:

A. Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes in the scope of the work all in accordance with the contract documents.

1. Replace Deteriorated Wood Blocking: $_____ per BF

2. Replace Deteriorated Plywood: $_____ per SF

1.6 MANUFACTURERS:

A. Base bid shall utilize roofing materials manufactured by _____. Only one manufacturer shall be listed. Provide Section 00 62 33 - Roof Manufacturer's Acknowledgment signed by manufacturer listed above and enclose with bid.

B. Base bid shall utilize roofing materials manufactured by _____. Only one manufacturer shall be listed. Provide Section 00 62 33 - Roof Manufacturer's Acknowledgment signed by manufacturer listed above and enclose with bid.

1.7 BID HOLDING TIME AND ACCEPTANCE:

A. The undersigned hereby agrees that this bid may not be revoked or withdrawn after the time set for the opening of bids but shall remain open during the bid holding period as specified in Section 00 21 13 - Instructions to Bidders.

1.8 SCHEDULE OF COMPLETION:

A. The undersigned understands that time is of the essence and agrees to the Contract Time and liquidated damages as indicated in General Conditions of the Contract for Construction and Supplementary Conditions apply to this Work. The undersigned hereby agrees to commence work on this project within 30 days following receipt of an Executed Agreement between the Owner and Contractor. Date of commencement will be established in a Notice to Proceed issued to the Contractor. Complete work under the Base Bid and all alternates accepted within 90 calendar days from the date of commencement. Applicable liquidated damages shall be as stated in the Supplementary Conditions.

1.9 ADDENDUM:

A. Addendum received and used in computing bid:

1. Addendum No. 1: _____

2. Addendum No. 2: _____

1.10 SUBCONTRACTORS:

A. Fill out all blanks on the list below listing all subcontractors. Identify work by the general, subcontractor or not applicable for each trade; utilize blank lines to list trades not provided. Do not list suppliers. All blanks must be filled in. Failure to do so may result in bid being declared non-responsive. If there is more than one subcontractor per trade identified below, list all. If no subcontractors are to be utilized, indicate by signing at the appropriate place at the bottom of the table.

1. Trade: _General_____ Contractor:_____

2. Trade: _Roofing_____ Contractor:_____

3. Trade: _Sheet Metal_____ Contractor:_____

4. Trade: _Waterproofing_____ Contractor:_____

5. Trade: _Mechanical_____ Contractor:_____

6. Trade: _Plumbing_____ Contractor:_____

7. Trade: _Electrical_____ Contractor:_____

8. Trade: _Concrete_____ Contractor:_____

9. Trade: _Waste Disposal_____ Contractor:_____

10. Trade: _____ Contractor:_____

11. Trade: _____ Contractor:_____

12. Trade: _____ Contractor:_____

13. We do not plan to use subcontractors: _____(Signed)

1.11 ENCLOSURES:

A. Provide the following enclosures with submitted bid:

1. Bid Bond

2. Section 00 43 39 - Minority, Woman, and Small Business Enterprises Submittals

a. MWSBE Identification Form

b. State of North Carolina Affidavit A - Listing of the Good Faith Effort or Affidavit B - Intent to Perofrm Contract with Own Workforce.

3. Roof Manufacturer's Acknowledgment for Manufacturer listed above.

1.12 SUBMITTED BY:

A. Contractor Name: _____

B. Authorized Signing Officer Name: _____

C. Authorized Signing Office Title: _____

D. Signature: _____

E. Respectfully submitted this _____ day of _____, 20____

1.13 NOTARIZED BY:

A. I, _____ (print name), a Notary Public for _____ County of _____ (State), do hereby certify that _____ (officer listed above) personally appeared before me this day and acknowledged the due execution of the foregoing instrument. Withness my hand and official seal, this _____ day of _____, 20 ___. My commission expires ____ of _____, 20 ___.

B. Signed: _____

(OFFICIAL SEAL)

END OF SECTION

SECTION 01 21 00

ALLOWANCES - REVISION 1

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Administrative and procedural requirements governing allowances.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections apply to this Section, including but not limited to:

1. Section 06 10 00 - Rough Carpentry

1.3 ABBREVIATIONS

A. Abbreviations for typical units of measurement:

1. Square Foot (SF)

2. Square Yard (SY)

3. Cubic Foot (CF)

4. Board Foot (BF)

5. Linear Foot (LF)

6. Each (EA)

7. Tonnage (TON)

1.4 CONTINGENCY ALLOWANCE

A. Include the specified contingency allowance in the base bid.

B. Credit unused portion remaining at the completion of the contract back to the Owner.

C. The Owner reserves the right to modify the contingency allowance prior to award of Contract.

1.5 QUANTITY ALLOWANCES

A. Include the specified quantity allowances in the base bid. Use the unit price submitted on the Bid Form to compute the quantity allowances. The quantities indicated on the Bid Form are estimated quantities only for the purpose of comparing bids. Compensation for the unit price bid made for the exact quantity of work performed under the unit price item. Deductive amounts of unit price work included in the Contract Sum are calculated at 100% of the quoted add unit price.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF ALLOWANCES

A. Contingency Allowance: Include a $20,000.00 contingency allowance in the base bid.

B. Quantity Allowances:

1. Replace 500 BF of Deteriorated Wood Blocking. Refer to Section 06 10 00 - Rough Carpentry.

2. Replace 1,500 SF of Deteriorated Plywood. Refer to Section 06 10 00 - Rough Carpentry.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Administrative and procedural requirements for alternates.

1.2 RELATED DOCUMENTS

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

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction or in the products, materials, equipment, systems or installation methods described in the Contract Documents.

1.4 ALTERNATES

A. Indicate on the Bid Form whether the alternate bid amount is to added to or deducted from the base bid in the event the alternate bid is accepted.

B. The Owner reserves the right to accept or reject any or all of the alternate bids.

C. Responsible for determining to his own satisfaction and for his own purposes the limits and extent of the work affected by the alternate bids and to make proper allowance therefore in the submission of alternate bid.

D. Include the cost of each alternate bid as specified in the technical specification sections and as described on the drawings. Perform work required by the alternate bids in accordance with applicable specifications and drawings of the trade section affected.

E. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate selected alternates into the Work. No other adjustments are made to the Contract Sum.

F. The Owner reserves the right to delay the acceptance of the alternate bids during the bid holding period prior to accepting the contract without a change in the dollar amount of the alternate bids.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Owner Prefered Alternate No. 1: Provide metal roof system as specified in Section 07 41 13 in Aged Copper Metalic by SentriClad

END OF SECTION

SECTION 07 41 13

METAL ROOF PANELS - REVISION 1

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide standing seam metal roof panel system.

1.2 RELATED SECTIONS

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

1. Section 06 10 00 - Rough Carpentry

2. Section 07 01 50 - Preparation for Reroofing

3. Section 07 22 16 - Roof Insulation

4. Section 07 62 00 - Sheet Metal Flashing and Trim

1.3 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; 2023.

B. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2022.

C. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM D523 - Standard Test Method for Specular Gloss; 2014 (Reapproved 2018).

F. ASTM D822/D822M - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings; 2013 (Reapproved 2018).

G. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2022.

H. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020.

I. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2023.

J. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity; 2015 (Reapproved 2020).

K. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.

L. ASTM E1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference; 1995 (Reapproved 2018).

M. ASTM E1680 - Standard Test Method for Rate of Air Leakage through Exterior Metal Roof Panel Systems; 2016 (Reapproved 2022).

N. FM 4470 - Examination Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction; 2022.

O. SSPC-SP 10 - Near-White Metal Wet Abrasive Blast Cleaning; 2015.

P. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.

Q. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

R. UL 1897 - Uplift Tests for Roof-Covering Systems; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.4 DEFINITIONS

A. Metal Roofing Panel System: Consists of metal roofing panels, fascia, clips, fasteners, trim, flashings and associated accessories which when assembled result in a watertight, wind resistant assembly meeting requirements specified herein, including the requirements to meet the specified Manufacturer's Guarantee.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide metal roof panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.

B. Submit Manufacturer's sealed engineering calculations, test reports and/or other applicable data certifying the proposed standing seam roofing system meets or exceeds the design criteria listed below.

1. Air Infiltration: Tested in accordance with ASTM E1680 when tested with a 6.24 PSF pressure differential.

2. Water Penetration: Meet or exceed ASTM E1646 when tested with a 6.24 psf pressure differential with no uncontrollable water leakage when five gallons per hour of water is sprayed per square foot of roof area.

3. Wind Design: Provide an approved roof assembly tested in accordance with FM 4470, UL 580 or UL 1897 to resist the design wind uplift pressures required by the Contract Drawings.

4. Thermal Movements: Provide metal roof panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

a. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

5. Structural Panel Deflection: Space framing members and clips supporting the standing seam roofing system to ensure a maximum deflection under applied live load of 20 psf not to exceed L/240 of the span.

6. Fire Testing: Meet ASTM E108 and UL 790 Class 1A.

1.6 SUBMITTALS

A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.

B. Manufacturer's Instructions: Latest edition of the Manufacturer's current material specifications and installation instructions.

C. Product Test Reports: Submit testing reports for the specified performance requirements. Submit the appropriate documentation to prove North Carolina Building Code design compliance.

D. Shop Drawings:

1. Submit shop drawings and erection details, approved by the Standing Seam Metal Roofing Manufacturer, and sealed by a structural engineer licensed in the State of the project. Do not proceed with work until Manufacturer Approved drawings have been submitted for review and acceptance.

2. Show methods of erection, framing details, roof and wall panel layout, sections and details, anticipated loads, clip spacing for each wind area or zone of the roofs, flashings, sealants, interfaces with materials not supplied and proposed identification of component parts and their finishes.

E. Engineering Calculations: Provide sealed manufacturer's engineering calculations demonstrating compliance with the performance requirements of this specification and applicable Codes.

1. Provide written certification, from an independent engineer, licensed in the State, indicating that the structure is capable of supporting additional loads imposed by the retrofit framing system. Provide stamped and sealed plans, by an engineer, licensed in the State, indicating the design for the retrofit metal roof assembly as compliant with specified design loads.

2. Provide manufacturer's calculations demonstrating holding strength of fasteners, to structural framing, in accordance with submitted test data, provided by fastener manufacturer, based on length of embedment and properties of materials.

F. Standard Colors: Submit the manufacturers' standard colors for selection by the Owner.

G. Manufacturer's Qualifications: Requirements for certification noted in Manufacturer's Qualifications under Quality Assurance and AISC (MAN) standards.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain metals panel through once source from a single manufacturer.

B. Manufacturer's Qualifications: Meet and provide written certification stating:

1. Regularly engaged in the fabrication of metal standing seam roof systems for at least 10 years, regardless of name change.

2. Maintains a certified installer program for its products and maintains up-to-date authorized roofing contractor list.

3. Written warranty covering durability, color and weathertightness of its roof system and include the insulation curbs and flashings from the roofing manufacturer.

4. Reviewed the project's environmental exposure for proximity to coastal environments, has provided the interpretation that the proximity to the salt and/or brackish water environments is acceptable, and will not make exclusions to the specified Guarantee based solely on the proximity to these exposures.

5. Provide the technical data, shop drawings and calculations specified herein.

6. Provide in-house inspection services.

7. Installer training program including the following:

   a. Experienced instructors with experience in the application of the Metal Roofing System.

   b. A formal syllabus for the classroom and hands-on training.

   c. Classroom instruction with review and thorough understanding of the specific product's technical manual.

   d. Hands-on mock-up instruction with a review and thorough understanding of the specific product's details.

   e. Required to take written and/or oral examinations to pass certification.

   f. Requirement for re-certification of training at a minimum of every five (5) years.

8. Certified the Contractor's personnel and has approved the Installer for the specified Metal Roofing System for the specified Guarantee.

9. Manufacturer's Inspection: The manufacturer's on-site technical representative employed by the manufacturer as a Technical Representative. Provide a minimum of one (1) on-site visit per month; attend the project start-up meeting, on-site for first two (2) start-up days, including observation of seaming of the first three (3) metal roof panels, and at pre-final or final inspection of the metal roofing system installation. Notify Engineer a minimum of forty-eight (48) hours prior to manufacturer's inspections. Copy Engineer on inspection report noting deficiencies within seven (7) days after each site visit.

10. Upon completion of the work and prior to final payment, conduct a final inspection in presence of the Contractor and Engineer. Record deficiencies in the work and document completed repairs. Final payment will not be certified until the manufacturer has given his certification/approval of the work and the required Guarantee has been reviewed by the Engineer.

C. Contractor's Qualifications:

1. Approved installer, certified by the Manufacturer before the beginning of the installation of the standing seam metal roof system.

2. On-site Foreman (provide name and date of training) is the person having received certification and training by the Manufacturer and has received specific training in the proper installation of the selected standing seam metal roof system.

3. The Manufacturer trained and certified Foreman present to supervise work during installation of standing seam roofing and associated materials.

4. No viable claims pending regarding negligent acts or defective workmanship on previously performed or current roofing projects involving the specified standing seam metal roofing system.

5. Provide a list of five projects listing the architect/engineers and/or building owners including individuals' names and telephone numbers for five standing seam metal roofing projects that have been in service for a minimum of two years.

6. Ensure the manufacturer provides the specified on-site technical visits and agrees to compensate the manufacturer as necessary for additional on-site visits required or deemed necessary by the Engineer to resolve deficiencies in the Contractor's workmanship.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Coordinate delivery with Engineer/Owner and occupants on site.

2. Deliver material in the manufacturer's original sealed and labeled shrouds and in quantities to allow continuity application.

3. Ensure metal roof system is delivered to the job site properly packaged to provide protection against transportation damage.

4. Inspect materials delivered to the project site. Reject materials damaged during shipping and do not install on the project.

B. Handling:

1. Exercise extreme care in unloading, storing and erecting metal roof system to prevent bending, warping, twisting and surface damage.

2. Handle materials to prevent scratches, dents, bending, twisting, warping and other damages.

3. Remove significantly scratched materials, and materials scratched through to the base steel from the project and replaced.

4. Remove dented, bent or damaged materials resulting in improper fit and detraction from intended aesthetics from the project and replaced.

C. Storage:

1. Store materials out of direct exposure to the elements or pallets or dunnage at least 4 inches above ground level. Place non-sweating tarpaulins to prevent moisture contamination. Factory shrouds and visqueen are not acceptable.

2. Prevent rain from entering bundle by covering with tarpaulin, making provision for air circulation between draped edges of tarpaulin and the ground. Prolonged Storage of sheets in a bundle is not recommended.

3. Protect materials from staining, dirt, dust or water marks. Clean stained materials before installation or replace.

4. Comply with fire prevention requirements for the storage of materials. Locate combustible storage sufficiently away from buildings and non-building structures to eliminate fire exposures. Protect storage of combustible insulation materials from open flame and fire exposures. Control project related ignition sources.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit assembly of metal roof panels according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify locations of roof framing and roof opening dimensions by field measurements before metal roof panel fabrication and indicate measurements on Shop Drawings. Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal roof panels without field measurements or allow for field-trimming of panels. Coordinate roof construction to ensure building dimensions, locations of structural members, and openings correspond to established dimensions.

1.10 WARRANTY

A. Provide Manufacturer's Warranty to the Owner upon completion of the project.

1. Weathertight Warranty: Submit a written warranty executed by Manufacturer agreeing to repair or replace metal roof panel assembly that fails to remain weathertight within the specified warranty period.

a. Warranty Period: 20 years from date of Substantial Completion.

b. Prorated Conditions: None.

c. Limitations of liability: No Dollar Limit (NDL)

d. Include weather tight performance of curbs, equipment supports, pipe portals and provided as part of this work.

e. Do not include "hold harmless" clause, nor limit liability of Contractor.

f. Warranty is subject to laws of North Carolina.

g. Venue to settle disputes is county of the project location.

h. Coating systems are not an approved warranty repair.

i. The following exclusions are not acceptable in the warranty terms, conditions and/or limitations:

1) If a Manufacturer Certified Installer was not present continuously during the installation of the Manufacturer's roof system.

2) Failure by the Roofing Contractor to correct deficiencies listed in the Manufacturer inspection reports.

3) If roof leaks are due to ventilators or light transmitting panels.

4) Failure to use long-life fasteners in exposed applications.

j. Include insulation, sub-framing, purlins, clips, fasteners provided as part of this work.

k. Warranty issuer must be the fabricator of the panels, not just the manufacturer of the equipment.

2. Finish Warranty: Provide manufacturer's written panel finish warranty against deterioration of factory applied finishes.

a. Warranty Period: Minimum period of thirty (30) years from date of Substantial Completion.

b. Prorated Conditions: None.

c. Limitations of liability: Not less than value of material and labor to replace.

d. Include weather tight performance of curbs, equipment supports, pipe portals and provided as part of this work.

e. Do not include "hold harmless" clause, nor limit liability of Contractor.

f. Warranty is subject to laws of North Carolina.

g. Venue to settle disputes is county of the project location.

h. Coating systems are not an approved warranty repair.

3. Contractor's Warranty:

a. Two Year Warranty: Manufacturer's Representative and Contractor's Representative will attend post construction field inspection no earlier than one month prior to the expiration date of the Contractor's Warranty. Submit a written report within seven (7) days of the site visit to the Engineer listing observations, conditions and recommended repairs or remedial action.

PART 2 PRODUCTS

2.1 MATERIALS

A. Standing Seam Metal Roof Panels:

1. Factory formed; no job formed panels allowed. Contractor cannot be the roll formed.

2. 16 inch wide, striated panel, nominal 2 inch high standing seam rib utilizing male and female rib configurations with factory applied hot-melt mastic or butyl sealant in female rib. Standing seam formed with the Manufacturer's electric seaming tool to produce a 90 degree rolled seam.

a. Construction Metal Products (CMP) Series 2500

b. DMI SL2016

c. MBCI BattenLok HS

d. McElroy Metal Maxima 2"

e. Metal Roofing Systems (MRS) System 2500

f. Sentrigard ML200

g. Engineer's Accepted Equivalent

B. Roof Panel Clips:

1. Standard Clip: UL Rated, sliding 22-gauge galvanized steel hook in combination with a double fastened 16-gauge galvanized steel base, both at Fy (min) = 33 ksi. Shop installed hot-melt butyl sealant on clip hook for continuity of seal at clip locat

C. Base Material:

1. Galvalume Panels: AZ50 Galvalume coated steel, meeting ASTM A792/A792M, minimum 24 ga., maximum 22 ga. where required for specified wind uplift resistance.

D. Metal Finish:

1. Manufacturer's smooth finish, pre-finished color coatings consisting of 70% Kynar 500 fluorocarbon (Polyvinylidene Fluoride PVF2) coating over a urethane primer on the finish side, with primer and a wash coat on the reverse in accordance with AAMA 2605 and ASTM D1005.

2. Color of finish for panels and associated trim selected by Owner from Manufacturer's standard color chart.

3. Meet or exceed the following:

a. Abrasion Resistance: Pass 67 liters of falling sand per mil thickness per ASTM D968.

b. Salt Spray Resistance: Samples diagonally scored and subjected to 5% at 95 degrees F, neutral salt spray per ASTM B117, then taped with Scotch #610 cellophane tape: 1000 hours coated steel, no blistering and no loss of adhesion greater than 1/8 from score line.

c. Chemical Resistance: No effect after 24 hour exposure of a 10% solution of hydrochloric acid, and 18-hour exposure to 20% sulfuric acid, per ASTM D1308, including exposure to 10% muriatic acid and nitric acid fumes.

d. Humidity Resistance: No blistering, cracking, peeling, loss of gloss or softening of the finish after 3000 hours aluminum 1000 hours coated steel, of exposure at 100% humidity at 95 degrees F, per Federal Test Method Standard 141, Method 6201 or ASTM D2247.

e. Chalking Resistance: No chalking greater than #8 rating, per ASTM D659 test procedure after a 3000-hour weatherometer test.

f. Color Change: Do not exceed 5 NBS units for finish coat color change per ASTM D822/D822M, ASTM G-23, and ASTM D2244 test procedure after 3000-hour weatherometer test.

g. Specular Gloss: As determined per ASTM D523 at a glossmeter angle of 60 degrees. 35 percent +/-5 specular reflectance.

E. Light Gauge Framing Components:

1. Provide bracing angles, cleats and back-up plates as indicated in Contract Drawings or required by metal roof panel manufacturer.

2. Conform to ASTM A446 18 gauge, 50 ksi or and ASTM A1011, 16 gauge, 55 ksi, as required by engineering calculations provided by the Manufacturer.

3. Protective shop primer coating conforming to FS TT-P-646 with base steel prepared in accordance with SSPC-SP 10.

F. Fasteners:

1. Fasteners associated with the roofing installation supplied by, and approved by, the metal roofing manufacturer.

a. Fastener length and threads and drill point as required for the metal and substrates being joined. Refer to fastener manufacturer and/or roofing manufacturer published literature. Indicate type of fastener on shop drawings.

b. Corrosion resistant, self-tapping/self-drilling fasteners, bolts, nuts, self-locking rivets and other suitable designed to withstand specified design loads.

c. Provide factory applied coating on the exposed fastener head and washer to match metal roof system color.

d. Provide neoprene-backed washers for exposed fasteners.

e. Position and space exposed fasteners in a true vertical and horizontal alignment. Use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the neoprene washer.

2. Exposed Fasteners:

a. Metal to wood: #12 stainless steel long life fastener, 5/16 inch HWH with bonded EPDM washer, factory painted head and washer to match metal color and length to penetrate substrate a minimum of 1-1/2 inches.

b. Metal to sheet metal: 1/4-14 x 7/8 inch long life fastener, corrosion resistant, self-drilling point, self-tapping, stainless steel 5/16" HWH with EPDM sealing washer; factory painted head and washer to match adjacent metal color.

c. Metal to light gauge steel: #12-14 x 1-1/4 inch long life fastener, corrosion resistant, self-drilling point, self-tapping, stainless steel 5/16" HWH with EPDM sealing washer; factory painted head and washer to match adjacent metal color.

3. Concealed Fasteners:

a. Metal to wood: #10-13 GP, 302 stainless steel, low profile pancake head with length to penetrate substrate a minimum of 1 inch.

b. Metal to light gauge steel: #12-14 x 1-1/4 inch DP3 corrosion resistant low-profile pancake head of length as required for three threads to penetrate steel substrate.

4. Light Gauge Framing Fasteners:

a. Slotted Rake Angle to Light Gauge Framing: 1/4-14 x 1-1/4 inch Shoulder Screw

b. Light Gauge Framing to Light Gauge Framing: #12-14 x 1 inch DP3, 5/16 inch HWH, self-drilling, carbon steel with corrosion resistant coating.

1) Blazer Self-Drilling Fastener

2) ITW Buildex #12-14 Tek 3

3) SFS #12-14 Impax SD3

c. Light Gauge Framing to Wood: #14-13 DP1, pancake head, self-drilling, carbon steel with epoxy coating, length to penetration wood a minimum of 1 inch.

1) Sentry Plus Five Roofing Screw

2) Concealor Pancake Head Screws

G. Self-Adhering Underlayment: 40-mil minimum thickness sheet, slip-resistant surfacing, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; suitable for high temperature applications up to 250 degrees. Acceptable products include:

1. Mid-States Asphalt Quik-Stick HT

2. Grace Ice and Water Shield HT

3. Carlisle WIP 300 HT

4. Petersen PAC-CLAD HT

H. Accessories: Manufactured, supplied and/or otherwise approved by the standing seam roofing Manufacturer.

I. Sheet Metal Flashings, Closures and Trim:

1. Provide sheet metal flashings, closures and trim fabricated from the specified pre-finished metal of the same gauge, finish and color as the roof panels.

a. Zee Closure

b. Headwall Flashing

c. Sidewall Flashing

d. Receiver Flashing

e. Counterflashing

f. Fascia Cover

g. Rake Flashing

h. Eave Closure

i. Drip Edge

j. Gutter

k. Downspouts

l. Ridge Cap

m. Hip Cap

n. Valley Flashing

2. Provide sheet metal cleats and attachment components of the same base material, one gauge thicker than the flashing or trim being secured:

a. Continuous Cleat

b. Valley Cleat

3. Gutter and downspout attachment components:

a. Provide air dried kynar paint or powder coat to match sheet metal finish color. Provide certification delivered to site with materials indicating method of finish

1) Externally Hung Gutter:

(a) Gutter Brackets: 1/4 inch x 2 inches

(b) Gutter Spacers: 1/16 inch x 1 inch

2) Downspout Hangers: 1/16 inch x 1 inch

J. Sealants:

1. Polyurethane Sealant: One-component elastomeric gun grade polyurethane sealant conforming to ASTM C920, Type S, Grade NS, Class 25, and use NT, M, A, G, or O as required by substrate conditions. Color to match adjacent materials.

2. Silicone Sealant: One-component, non-sag, neutral cure, low-modulus, UV resistant, high performance silicone sealant. Meet ASTM C920, Type S, Grade NS, Class 100, Use M, G, A or O. Color to match adjacent materials. Utilize where exposed.

3. Sealant Tape: 3/16-inch x 7/8-inch tri-bead, non-skinning butyl sealant tape. Utilize 2-1/2-inch wide by 3/16-inch thick triple-bead, non-skinning butyl sealant tape where indicated in Contract Drawings or required by metal roof panel manufacturer.

4. Butyl Sealant: Gun grade, non-skinning, non-hardening, flexible blend of butyl rubber and polyisobutylene sealant. Utilized where concealed between sheet metal sections, laps, etc.

K. Roof Curbs:

1. Manufacturers:

a. LM Curbs

b. KCC Manufacturing

c. Approved/Recommended by Standing Seam Roofing Manufacturer, compatible with standing seam roof and seam profile, and accepted by Engineer.

2. Fabrication:

a. Continuous welded connections to conform to standing seams for watertight fit, meeting specified requirements herein.

b. Fabricated of structural quality aluminum, minimum 0.080-inch-thick for mechanical equipment up to 1000 lbs., and 0.125-inch-thick for mechanical equipment between 1000 lbs. and 2000 lbs.

c. Factory primed and factory finished painted to match roof panels or clad with sheet metal to match the color of the metal roof panels.

d. Integral base plates and water diverter crickets. The upper flange of the curb minimum of 18 inches above the water diverter to allow for 6 inches of free area after the panel is lapped over the flange on the high side.

e. Designed to install under metal roof system on the high side, over metal roof system on the low side and seamed into roof panels along sides.

f. Minimum height of prefabricated curb 8 inches above the finished metal roof system.

g. Constructed to match the slope of the roof and provide a level top surface for mounting equipment.

h. Curb flanges constructed to match the configuration of the metal roof panels and seams.

i. Provide structural support necessary for the equipment and curb and allow for thermal movement of the curb with the roofing system.

j. Submit roof curb manufacturer's shop drawings including curb and framing to metal roof system manufacturer for review prior to fabrication.

k. Ensure standing seam metal roof system Manufacturer reviews and approves roof curb manufacturer's shop drawings for compatibility with metal roof system.

L. Prefabricated Roof Jacks:

1. Acceptable Manufacturers:

a. SFS - Intech

b. ITW Buildex

c. Approved/Recommended by Standing Seam Roofing Manufacturer, compatible with standing seam metal roofing system, and accepted by Engineer to meet specified requirements herein.

2. One-piece EPDM molded rubber boot having a serviceable temperature range of -65°F to 212°F for standard penetrations, and silicone molded rubber boot having a serviceable temperature range of -100°F to 437°F for high temperature applications

3. Pipe flashings resistant to ozone and ultraviolet rays.

4. Sealed aluminum flanged base ring.

2.2 FABRICATION

A. Roof panels and associated metal roofing components fabricated by, or provided by, a single-source manufacturer to fit together as a completed roofing assembly meeting the requirements specified herein.

B. Shop and field fabricate trim components meeting the roofing Manufacturers requirements for watertight fit.

C. Factory form roof panels by the specified Manufacturer, not job formed or formed on portable equipment in the Contractor's shop. In-line leveled prior to roll forming panel profile with fixed base equipment assuring highest level of quality control.

D. Roll formed in continuous lengths. No panel end laps between ridge and eave.

E. Fabricate trim, sheet metal flashing and accessories to fit secure and watertight at transitions and details. Replace items with improper fit.

F. Fabricate roof trim and sheet metal flashing from same specified finish same as roof panel.

G. Replace panels and components that result in completed installation being loose, bent or warped for proper fit.

H. Surface-applied sealants are not acceptable to finish poorly fabricated and poorly fitting components. Where components do not fit tight with overlapping metal joints and seams, replace materials to fit properly for overlapping, tight and secure fit.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect substrates and Work to verify the conditions are acceptable and complete.

B. Replace or repair unsatisfactory, wet or deteriorated roof substrates based on Quantity Allowances and Unit Prices.

C. Inspect metal roof panels and other components before installation. Repair or replace materials with scratches through the finish. Remove damaged and dented materials, and materials scratched through to the steel base material from the project.

D. Verify installation in accordance with approved shop drawings and manufacturer's instructions before beginning work including verifying secondary structural members and/or decking are satisfactory for metal roofing system.

E. Coordinate with metal roof system manufacturer to ensure that reduced clip spacing at eave, rake, ridge and corner areas are accommodated by framing spacing and/or substrate.

F. Inspect substrates and notify Engineer in writing of deficiencies observed effecting the installation and effecting the completed roofing system and associated components.

G. Inspect conditions at the walls. Replace deteriorated rough carpentry and resecure rough carpentry.

H. Inspect conditions at pipes, conduit, fans, stacks and curbs to determine conditions and work requirements necessary to disconnect services, remove equipment, reinstall equipment and install structural supports necessary to support the equipment and curbs. Provide electrical, plumbing, mechanical and other services necessary to relocate rooftop equipment and roof penetrations.

I. Commencement of work signifies acceptance of substrates. Correct defects in roofing work resulting from accepted substrates to Owner's satisfaction at no additional expense.

J. Reject and replace materials damaged during shipping, storage or handling.

K. Inspect storage conditions daily to ensure materials remain protected from damage, condensation, dew, rain or other contamination.

3.2 PREPARATION

A. Roof Substrate:

1. Dry and broom and/or vacuum clean of loose gravel, stone, dirt, dust, debris and foreign matter prior to installation of the roofing system. Do not use blowers unless accepted by the Engineer/Owner.

2. Remove free water and wet or damp debris from deck substrate surface before installing roofing system.

3. Verify wall substrates are in satisfactory condition before commencement of the Work.

B. Protection:

1. Protect the building and materials from exposure to weather related damages.

2. Protect building walls and other surfaces with canvas or suitable tarp wherever equipment or materials are taken up to or down from roof.

3. Protect building interiors using suitable methods required to prevent damage from roofing activities.

4. Dry-in the building daily to ensure the building remains watertight. Take necessary measures to protect the building from weather related exposures during the project.

5. Seal deck openings to prevent dust and debris from entering the building.

6. Protect building grounds, landscaping and exterior components and fixtures from damaged during construction activities. Repair damages to meet pre-construction conditions.

C. Coordination:

1. Coordinate work and associated work activities with the Engineer/Owner

2. Coordinate curb replacement and installation of curbs for fans and equipment with the Engineer/Owner in advance. Limit the scheduled outage of equipment to one day or less, and the schedule for outages in advance with the Engineer/Owner. Work on weekend or non-business hours as necessary to accommodate the Owner and occupancy.

3. Coordinate raising or relocating vent pipe/soil stack pipes with the Engineer/Owner.

4. Coordinate interior access and interior work with Engineer/Owner in advance. Do not proceed with interior work unless agreed upon by the Owner and occupants.

D. Roof Loading, Staging and Storage:

1. Evenly distribute loads of materials on roofs. Do not pre-load roofs with concentrated loads of materials that exceed the roof deck and structure's load bearing capacity.

2. Secure materials and equipment stored on the roof to prevent items from sliding or falling off of the roof.

3. Secure materials and equipment on the roof to prevent materials from being displaced by wind.

3.3 APPLICATION

A. General:

1. Allow for thermal movement, expansion and contraction, of sheet metal components. Install lengths of metal, fastening type and rate, metal joints, and connections to meet sheet metal industry recognized standards and published standards including those referenced herein.

2. Provide uniform sheet metal sections with corners, joints, and angles mitered, sealed and secured for tight fit.

3. Overlap, rivet and seal watertight counter flashing corners.

4. Hem sheet metal edges for strength and appearance.

5. Provide end closures fabricated to terminate each end of the detail for counterflashing, expansion joints and other applicable components. Conceal the adjacent substrates for watertight closures. Conform to the adjacent conditions and provide for a minimum 4-inch overlap.

6. Provide necessary cleats or stiffeners and other reinforcements as required to make sections rigid and substantial.

7. Fabricate, support, cleat, fasten and join sheet metal to prevent warping, "oil canning" and buckling. Adjust substrates, nailers, framing, etc. to ensure finished sheet metal is installed smooth.

8. Install sheet metal to prevent moisture from entering beyond the detail.

9. Provide sheet metal transition details with watertight redundancy including, but not limited to self-adhering underlayment membrane, concealed sealants, and metal joint back-up plates. Install, seal and lap secondary protection to ensure if the sheet metal detail fails to shed water, the secondary protection sheds limited moisture infiltration.

10. Do not allow dissimilar metals or other materials to make contact. Where dissimilar material is found in-place, prevent galvanic corrosion by a separation barrier approved by Manufacturer and accepted by Engineer.

11. Do not allow galvalume and galvanized steel and aluminum materials to be in contact with treated wood products. Provide a physical separation, including self-adhering underlayment to prevent contact.

12. Relocate plumbing vent pipes and vents to center of metal roof panels.

B. Self-Adhering Underlayment:

1. Starting at the low point of the roof, adhere underlayment in a shingle fashion with minimum 6 inch end laps and 3 inch side laps. Apply roof cement as required to penetrations and terminations to ensure a watertight condition.

C. Night Seals/Daily Tie-ins:

1. At end of day's work, or when precipitation is imminent, build a water cut-off at open edges and penetrations. Construct tie-ins to withstand extended periods of service, anticipated storms, precipitation and high winds.

2. Take necessary precautions during construction to prevent weather related exposures to the building and materials, roof leaks and other weather-related damages resulting from the work included in the project.

3. Replace building insulation, ceilings, plywood, decking, fixtures, etc. wetted or damaged during Construction.

4. Repair damages resulting from water that enters under the metal roofing and components, and water that enters the building in the work areas during construction.

D. Field-Cutting Pre-Finished Metal:

1. Prohibit the use of abrasive/grinding blades, circular saws and reciprocating saws. Prohibit cutting operation that grinds, rips and tears the metal.

2. Approved cutting tools for Galvalume and pre-finished steel include aviation snips, sheet metal hand shears, electric metal shears and electric nibblers.

E. Standing Seam Roof Panels:

1. General application in accordance with the Manufacturers published installation instructions.

2. Install roofing system and components with tools recommended by the roofing manufacturer.

3. Install panels plumb, level and straight with seams and ribs parallel, conforming to design and manufacturer's published instructions as indicated.

4. Provide continuous roof panels, with no joints or seams, except where specified.

5. Install metal roof system weathertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.

6. Provide concealed fastener/clips at panel attachment locations.

7. Provide exposed fasteners in trim components with pre-painted head and washer with EPDM-backed gasket for watertight seal. Fasteners of size and type for metal thickness and substrate material. Follow the fastener manufacturer's published requirements for fastener application and installation instructions.

8. Install roof clips to allow the completed roofing assembly to accommodate anticipated specified thermal movement.

F. Roof Panel Seams:

1. Seam roof panels with the specified Manufacturer's electric seaming tool, producing a 90-degree seam.

2. Ensure the roof panel is seamed per the Manufacturer's published instructions.

3. Ensure seam has factory-applied sealant in place prior to seaming.

4. Calibrate and service seaming tool by the roofing manufacturer or other approved seaming tool manufacturer/service center. Calibrate and adjsut seaming equipment for the metal gage, type and finish.

5. Provide true, straight and aligned seam without bending, warping or scratching through the panel finish.

6. Replace panels due to improper roof panel seaming results.

G. Squareness:

1. Aesthetics of completed roofing is of utmost importance.

2. Provide panels, framing, components and trim aligned true, straight and square.

3. Ensure installation and sequence is square for proper fit of components.

4. Do not exceed tolerance for squareness of 1:500 (1.92 inch per 100 ft).

5. Maintain modularity and alignment of roof panels to prevent roof panel "stair-stepping" or "fanning".

6. Utilize the Manufacturer's "spacer tools", "module makers" and/or measuring tape to maintain consistent roof panel coverage.

7. Check for squareness after installing no more than every five (5) panels to ensure the panels are laying-up square and remain true.

8. Complete installation of roofing and associated components for watertight fit, to accommodate concealed sealants where specified, and to allow for specified thermal movement.

9. Correct abrupt and sharp transitions in the substrate to prevent crimping, bending or poor fitting sheet metal components that result in oil canning.

10. Correct roofing, flashing and sheet metal components that do not meet the specified tolerances.

H. Roof components, flashings, closures and trim:

1. Fabricate and supply sheet metal flashings, trim and closure materials by the standing seam roofing Manufacturer, unless otherwise specified.

2. Roof details and flashings pre-approved by the Manufacturer for inclusion in specified warranty.

3. Install in accordance with Manufacturer's shop drawings, details and published requirements.

4. Install details with redundancy, including secondary metal flashing, concealed sealant and metal roof panel underlayment beneath details.

5. Provide uniform sheet metal sections with corners, joints and angles mitered, sealed and secured.

6. Hem (return) exposed edges for strength and appearance.

7. Fit sheet metal close and neat.

8. Provide cleats or stiffeners and other reinforcements to make sections rigid and substantial.

9. Fabricate, support, cleat, fasten and join sheet metal to prevent warping, oil canning, and buckling.

10. Sheet Metal Laps: Unless otherwise indicated notch and lap ends of adjoining sheet metal sections not less than 4 inches; apply sealant tape or two beads of butyl sealant between sections. Lap miters at corners a minimum of 1 inch and apply butyl sealant between laps. Rivet at 2 inches on center.

I. Zee Closure:

1. Provide between roof panel seams.

2. Set in sealant tape and secure with five fasteners per roof panel spaced in accordance with manufacturer's installation instructions.

3. Tab vertical leg of zee closure and turn onto vertical panel seams. Set tab in butyl sealant.

4. Secure to vertical panel seam with one fastener.

5. Seal edges of zee and tab to vertical seam with sealant.

J. Headwall Flashing:

1. Lock back-up plate to panel end along headwall.

2. Secure back-up plate to structure.

3. Provide 3 inch long sealant tape along top of female panel seam before male side of next roof panel is installed.

4. Provide zee closure as specified above.

5. Provide sealant tape along top of zee closure.

6. Provide ridge vent secured at 6 inches on center into zee closure. Do not install fasteners through panel seams.

7. Lap adjoining sections of ridge vent not less than 1 inch and provide butyl sealant between sections.

8. Provide sealant tape along top of ridge vent.

9. Provide headwall flashing secured at 6 inches on center through sealant tape. Do not install fasteners through panel seams.

10. Lap adjoining sections or ridge cap a minimum of 4 inches and provide two beads of butyl sealant between sheet metal laps.

11. Provide sealant tape behind top termination of headwall flashing and secure to wall substrate at 12 inches on center.

K. Sidewall Flashing:

1. Provide slotted angle along sidewall.

2. At beginning roof panel, but panel to slotted angle and allow horizontal flange of seam to extend past angle. At ending panel, turn roof panel up slotted angle and back 1" minimum to provide horizontal flange for securement.

3. Provide sealant tape along roof panel flange.

4. Fabricate sidewall flashing as indicated in Contract Drawings in 10 foot lengths.

5. Secure sidewall flashing to roof panel through sealant tape at 6 inches on center.

6. Lap sidewall flashing seams in shingle fashion with minimum 6 inch overlap and provide three beads of butyl sealant between sheet metal laps.

7. Provide sealant tape behind top termination of sidewall flashing and secure to wall substrate at 12 inches on center.

L. Receiver Flashing:

1. Fabricate receiver flashing as shown in detail drawings in 10 foot lengths.

2. Install receiver flashing surface mounted at 12 inches on center. If receiver flashing is located within Corner (Zone 3) secure at 6 inches on center maximum.

3. Install sealant properly tooled to ensure adhesion and slope to shed water in saw-cut reglet.

M. Counterflashing:

1. Fabricate counterflashing as shown in detail drawings in 10 foot lengths.

2. Install counterflashing as indicated in detail drawings and secure to receiver flashing 12 inches on center. If counter flashing is located within Corner (Zone 3) secure at 6 inches on center maximum.

3. Stagger receiver anchors with counter flashing fasteners.

4. Extend counter flashing a minimum of 1.5 inches below metal roof panel flashing termination.

N. Fascia Cover:

1. Provide fascia cover secured at 12 inches on center where indicated in detail drawings.

2. Lock fascia cover onto continuous cleat if present and hand tong metal edge onto continuous cleat.

O. Rake Flashing:

1. Provide slotted rake angle along rake edge.

2. At beginning roof panel, but panel to rake angle and allow horizontal flange of seam to extend past angle. At ending panel, turn roof panel up rake angle and back 1" minimum to provide horizontal flange for securement.

3. Provide sealant tape along roof panel flange.

4. Fabricate rake flashing and continuous cleat as shown in detail drawings in 8 foot or 10 foot lengths.

5. Install a continuous cleat as indicated in detail drawings fastened to substrate 6 inches on center. Locate fasteners no greater than 1-3/4 inch from the break at the bottom hem.

6. Lock rake flashing onto continuous cleat crimp as shown.

7. Hand tong metal edge onto continuous cleat.

8. Secure rake flashing to roof panel through sealant tape at 6 inches on center.

9. Lap rake flashing seams in shingle fashion with minimum 6 inch overlap and provide three beads of butyl sealant between sheet metal laps.

P. Eave Closure:

1. Fabricate eave closure as shown in detail drawings in 10 foot lengths.

2. Provide sealant tape below closure and secure closure at 12 inches on center along line of tape.

3. Lap seams with minium 4 inch overlap and provide two beads of butyl selant between sheet metal laps.

Q. Drip Edge:

1. Provide eave cleat (offset 3/8 inch) secured to structure at 6 inches on center.

2. Provide drip edge secured to offset cleat at 6 inches on center. Set drip edge in butyl sealant and locate fasteners through sealant.

3. Lap seams with minium 4 inch overlap and provide two beads of butyl selant between sheet metal laps.

4. Field notch roof panel legs and bend pan to form open hem to lock onto drip edge. Install to accommodate thermal movement.

R. Ridge:

1. Lock back-up plate to panel end along both sides of ridge.

2. Secure back-up plate (offset 3/8 inch) to structure.

3. Provide 3 inch long sealant tape along top of female panel seam before male side of next roof panel is installed.

4. Provide zee closure as specified above.

5. Provide sealant tape along top of zee closure.

6. Provide ridge vent secured at 6 inches on center into zee closure. Do not install fasteners through panel seams.

7. Lap adjoining sections of ridge vent not less than 1 inch and provide butyl sealant between sections.

8. Provide sealant tape along top of ridge vent.

9. Provide ridge cap secured at 6 inches on center through sealant tape. Do not install fasteners through panel seams.

10. Lap adjoining sections of ridge cap a minimum of 4 inches and provide two beads of butyl sealant between sheet metal laps.

S. Hip:

1. Lock back-up plate to panel end along both sides of hip.

2. Secure back-up plate to structure.

3. Provide 3 inch long sealant tape along top of female panel seam before male side of next roof panel is installed.

4. Provide zee closure as specified above.

5. Provide sealant tape along top of zee closure.

6. Provide hip cap secured at 6 inches on center through sealant tape. Do not install fasteners through panel seams.

7. Lap adjoining sections or hip cap a minimum of 4 inches and provide two beads of butyl sealant between sheet metal laps.

T. Gutters:

1. Fabricate to profile shown in Contract Drawings.

2. Formed in 10 foot lengths. Joints in gutters lapped a minimum of 1 inch, riveted 1 inch on center. Install butyl sealant between gutter sections and silicone sealant at exposed inside edge and on rivets. Lap joints in the direction of water flow if possible.

3. Provide butt type expansion joints in gutters at spacing appropriate for the type material used to fabricate gutters. Refer to SMACNA Manual Figure 1-7. Maximum length of gutters 50 feet.

4. Provide downspout outlets in downspout locations. Refer to SMACNA Manual Figure 1-33B. Gutter outlet tubes tabbed a minimum of 1 inch, set in a bead of butyl sealant and secured to gutter with a minimum of two rivets per tab.

5. Attachment: Space brackets and spacers 36 inches on center, staggered. Rivet spacers to both sides of the gutter only. Secure brackets to wood blocking with two stainless steel fasteners.

6. Hang gutters level.

U. Downspouts:

1. Fabricate downspouts in 10 foot lengths. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-32B.

2. Tie into below grade storm drainage system or if no below grade system is present, kick-out above grade onto concrete splash blocks. Fill in soil to provide slope away from building.

3. Provide square to round transition to tie into below grade storm drainage system.

4. Secure to the structure with two-piece hangers spaced no more than 8 feet apart with a minimum of two hangers per downspout with a hanger located within 12 inches from bottom. Prime and paint hangers to match downspouts. Refer to SMACNA Architectural Sheet Metal Manual Figure 1-35H.

5. Fashion downspouts to run back to (at overhangs) and parallel to the facility walls.

6. Provide discharge elbow at the base of downspout where it kicks out onto splash pan or splash block.

7. Where downspouts discharge onto lower adjacent roof areas, provide splash pans at discharge as specified below.

V. Fasteners:

1. Install fasteners as specified, detailed and as published and designed by the fastener manufacturer for the materials being joined.

2. Consult and follow the fastener manufacturer's published literature for proper preparation and installation.

3. Properly seat fasteners, do not over drive or under drive. Do not bend, dent or warp sheet metal during fastener installation.

4. Pre-drill substrates where required to properly install fasteners.

5. Replace improperly driven/installed fasteners with properly sized fastener for each application.

6. Rivets: #44 stainless steel rivets with stainless steel mandrel with factory painted head to match adjacent sheet metal. Length of rivet to properly fasten particular sheet metal components.

W. Sealants:

1. Seal sheet metal joints and junctures between sheet metal and adjacent substrates with specified, compatible sealants.

2. Clean sheet metal and adjacent substrates free of dust, debris and incompatible coatings.

3. Prime and preare sheet metal and adjacent substrates s to meet sealant manufacturers' published literature and recommendations.

4. Inspect sheet metal joints before sealant application. Fasten and/or tightly fit joints to prevent sealed joints from buckling or opening.

5. Ensure environmental conditions area dry and precipitation is not anticipated during, or no less than 24 hours after, sealant application. Follow sealant manufacturers' published literature regarding environmental conditions.

6. Apply and tool sealant as indicated and recommended in sealant manufacturers' published literature.

X. Roof Curbs:

1. Ensure curbs fit accurately to roofing system and equipment. Replace improperly fabricated, sized and installed curbs with properly sized curbs for accurate fit.

2. Comply with metal roof system manufacturer's shop drawings, instructions and recommendations for installation of roof curbs. Refer to metal roof system manufacturer's standard installation details. Anchor curbs securely in place with provisions for thermal and structural movement.

3. Ensure dimensions of curbs and supports fit the rooftop equipment and conform to the metal roofing system for accurate and watertight fit to accommodate thermally induced panel movement.

4. Protect equipment and building from damages during construction.

5. Install materials and components supplied by curb manufacturer to support the equipment and curb, and allow for thermal movement of roofing panels.

6. Install and seal curb and seam caps for a permanent watertight detail without relying on exterior applied sealants.

7. Install equipment on the curbs, secure and seal watertight. Ensure equipment operates to Engineer/Owners satisfaction upon completion of work.

8. Inaccurate installation and poor fit between curb and roofing panels is not acceptable; replace or reinstall improper curbs.

9. Provide PVC condensate drain lines for HVAC units secured to the standing seam with compatible hardware and extend down to the gutter along the roof edge.

Y. Prefabricated Roof Jacks:

1. Move/relocate and re-secure pipe penetrations that touch roof panel standing seams to ensure the pipe and roof jack are installed in the flat of the panel pan without touching the vertical seam

2. Refer to referenced standards and applicable State Plumbing Code.

3. Reinstall to ensure the vent pipes or penetrations are operational to pre-construction function.

4. Seal vent pipes airtight at joints and connections.

5. Ensure roof jack installation without damages or exposure to building interior to weather exposure.

3.4 CLEAN UP

A. Dispose of excess materials and remove debris from site. Maintain construction related debris in approved disposal containers.

B. Clean work in accordance with manufacturer's recommendations.

C. Protect work against damage until final acceptance. Replace or repair, to the satisfaction of the Owner, work that becomes damaged prior to final acceptance.

D. Touch up minor scratches and abrasions with touch up paint supplied by the metal roof system manufacturer. Minor scratches are considered scratches that extend into the finish only, not down to the base metal:

1. Scratches that extend into the paint finish only and not down to the base metal.

2. Scratches that do not extend more than 4 inches in length.

3. Where no more than 2 scratches in lengths of less than 4 inches are present in a 1 sf area of a metal roof panel.

E. Replace significantly scratched metal panels.

1. Scratches that extend down to the base metal.

2. Scratches that extend more than 4 inches in length.

3. Where more than 2 scratches in lengths less than 4 inches are present in a 1 sf area of a metal roof panel.

4. Where touch up paint is visible when viewing the metal roof panels from a common pedestrian area from the ground as judged by the Owner and Engineer.

F. Do not allow panels or trim to come in contact with dissimilar metals including copper, lead or graphite. Control water run-off from dissimilar materials.

G. Remove metal dust and cut debris produced by cutting, drilling and fastening. Do not allow metal dust and cut debris to remain on pre-finished metal panels.

H. Prevent metal chips, shavings, etc. from staining the building, roof and associated fixtures and components. Remove rust stains.

I. Prevent damage during cleaning activities. Do not allow cleaning materials and methods to damage building, grounds, components or fixtures.

J. Ensure trash and debris, especially nails and shingles, are removed from the yard and grounds. Place nails, shingles, sharp sheet metal scraps and other construction related debris in suitable waste containers.

END OF SECTION