

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE 1 OF 36 PAGES
2. AMENDMENT/MODIFICATION NO. AMENDMENT NO. 0014		3. EFFECTIVE DATE 3/11/11	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable) 09-0168
6. ISSUED BY CODE		jsy	7. ADMINISTERED BY (If other than Item 6) CODE See Item 6	
Officer in Charge of Construction MCI-East 1005 Michael Road Camp Lejeune, NC 28547-2521				
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)			(X)	9A. AMENDMENT OF SOLICITATION NO. N40085-09-R-0168
			X	9B. DATED (SEE ITEM 11) 2/4/11
				10A. MODIFICATION OF CONTRACT/ORDER NO.
				10B. DATED (SEE ITEM 11)
CODE	FACILITY CODE			

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
(a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

**13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS.
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

09-0168, Building Repairs, AS-4200, MCAS, NR

SEE CONTINUATION SHEET

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR		16B. UNITED STATES OF AMERICA	
15C. DATE SIGNED		16C. DATE SIGNED	
(Signature of person authorized to sign)		(Signature of Contracting Officer)	

CONTINUATION SHEET

1. QUESTION: In regards to the roof, the plans call for removable panels to access the two ERV's for removal and replacement. We know that this has been common practice for the buildings with wood trusses and shingle roofs. However, in this case there doesn't appear to be details in the drawings on the metal roofing at these areas. The drawings show a number of structural details at these areas. The adjacent building appears to have a situation resembling a house dormer that is over the ERV. Is this acceptable for this situation?

1. ANSWER: Yes, it is acceptable for this situation however, is not the only method.

2. OMIT Specification Section 07 61 14.00-20 Standing Seam Roofing provided in amendment 0010 and **REPLACE** with Specification Section 07 41 13 Metal Aluminum Roof Panel (attached).

3. In Specification Section 07 41 13, Metal Aluminum Roof Panel (attached), **REVISE** the first sentence of Section 3.12.1, Manufacturer's Inspection, as follows: Ensure manufacturer's technical representative visits the site a minimum of three times per week based on a 5 day work week during the installation for purposes of reviewing materials installation practices and adequacy of work in place.

4. In Specification Section 07 41 13, Metal Aluminum Roof Panel (attached), **REVISE** number 5 under Section 3.12.1, Manufacturer's Inspection, as follows: The manufacturer must inspect the roof system annually and after any major storm for the life of the roof system and submit an annual inspection report to Public Works at Camp Lejeune.

SECTION 07 41 13

METAL ALUMINUM ROOF PANELS

05/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 341 (2005; Supp 2005) Seismic Provisions for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG03-3 (2002) Cold-Formed Steel Design Manual Set

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7-05 (2006; Errata 2007) Minimum Design Loads for Buildings and Other Structures

AMERICAN WELDING SOCIETY (AWS)

AWS A5.1/A5.1M (2004; Errata 2004) Carbon Steel Electrodes for Shielded Metal Arc Welding

AWS D1.1/D1.1M (2008; Errata 2009) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A 653/A 653M (2009a) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A 780 (2001; R 2006) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

ASTM B 117 (2009) Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM B 659 (1990e1; R 2008) Standard Guide for Measuring Thickness of Metallic and Inorganic Coatings

ASTM C 920 (2008) Standard Specification for Elastomeric Joint Sealants

ASTM D 1056 (2007) Standard Specification for Flexible Cellular Materials - Sponge or Expanded

Rubber

- ASTM D 1308 (2002; R 2007) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
- ASTM D 1654 (2008) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- ASTM D 1667 (2005) Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell)
- ASTM D 2244 (2007) Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
- ASTM D 2247 (2002) Testing Water Resistance of Coatings in 100% Relative Humidity
- ASTM D 2794 (1993; R 2004) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- ASTM D 3359 (2009; E 2010) Measuring Adhesion by Tape Test
- ASTM D 3363 (2005) Film Hardness by Pencil Test
- ASTM D 4214 (2007) Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films
- ASTM D 522 (1993a; R 2008) Mandrel Bend Test of Attached Organic Coatings
- ASTM D 523 (2008) Standard Test Method for Specular Gloss
- ASTM D 610 (2008) Evaluating Degree of Rusting on Painted Steel Surfaces
- ASTM D 714 (2002e1) Evaluating Degree of Blistering of Paints
- ASTM D 822 (2001; R 2006) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
- ASTM D 968 (2005e1) Abrasion Resistance of Organic Coatings by Falling Abrasive
- ASTM E 119 (2008a) Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E 136 (2009) Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C

- ASTM E 1592 (2005) Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
- ASTM E 2140 (2001) Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head
- ASTM E 84 (2009) Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM G 23 (1996) Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials
- FM GLOBAL (FM)
- FM 4471 (1995) Class I Panel Roofs
- METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)
- MBMA RSDM (2000) Metal Roofing Systems Design Manual
- NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)
- NAAMM AMP 500 (2006) Metal Finishes Manual
- NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
- NRCA 0405 (2001; R 2003, 5th Ed) Roofing and Waterproofing Manual
- NRCA ASMMRM (2006) Architectural Sheet Metal and Metal Roofing Manual
- SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
- SMACNA 1793 (2006) Architectural Sheet Metal Manual, Sixth Edition, Second Printing
- THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)
- SSPC Paint 12 (1982; E 2000) Paint Specification No. 12 Cold-Applied Asphalt Mastic (Extra Thick Film)
- UNDERWRITERS LABORATORIES (UL)
- UL 580 (2006) Tests for Uplift Resistance of Roof Assemblies

1.2 PERFORMANCE REQUIREMENTS

Steel panels and accessory components must conform to the following standards:

ASTM A 1008/A 1008M

ASTM A 123/A 123 M
ASTM A 36/A 36M
ASTM D 522 for applied coatings
UL Bld Mat Dir

- a. Hydrostatic-Head Resistance: No water penetration when tested according to [ASTM E 2140](#). Submit leakage test report upon completion of installation.
- b. Wind-Uplift Resistance: Provide roof panel assemblies that comply with the requirements of the roof systems and attachments in accordance with [ASTM E 1592](#) and [UL 580](#). Uplifting force due to wind action governs the design for panels. Submit wind uplift test report prior to commencing installation.

Roof systems and attachments are to resist the wind loads as determined by [ASCE 7-05](#) in pounds per square foot. Metal roof panels and component materials must also comply with the requirements in FM 4471 as part of a panel roofing system as listed in Factory Mutual Guide (FMG) "Approval Guide" for class I or noncombustible construction, as applicable. Identify all materials with FMG markings.

1.3 DEFINITIONS

Fabricated Roof Panel Assembly: Metal roof and liner panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories shop fabricated or field assembled for a complete weather-tight roofing system.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section [01 33 00](#)
SUBMITTAL PROCEDURES:

[SD-01 Preconstruction Submittals](#)

[Qualification of Manufacturer;](#)
[Qualification of Installer;](#)
[Qualifications for Welding](#)

[SD-02 Shop Drawings](#)

[Roofing Panels](#)
[Flashing and Accessories](#)
[Gutter/Downspout Assembly](#)

[SD-03 Product Data](#)

[Sustainable acquisition;](#)

Submit Manufacturer's catalog data for the following items:

[Coil Stock](#)
[Factory Color Finish;](#)
[Sub-girts and Formed Shapes](#)
[Closure Materials](#)

Insulation
Pressure Sensitive Tape;
Sealants and Caulking
Rated Wall Assembly
Galvanizing Repair Paint;
Enamel Repair Paint;
Aluminized Steel Repair Paint;
Accessories

SD-04 Samples

Submit as required each of the following samples:

Coil Stock; sample 12 inches long by the actual panel width

Roofing Panels; sample 12 inches long by actual panel width

Fasteners;

Metal Closure Strips; 10 inches long of each type

Insulation; approximately 8 by 11 inches

Manufacturer s color charts and chips

SD-05 Design Data

As applicable submit the following:

Wind design analysis

SD-06 Test Reports

Submit test reports for the following in accordance with the requirements in this section.

Leakage Tests

Fire Rating Test Report

Coatings and base metals of metal roofing test as specified and in various referenced standards in this section.

Factory Finish and Color Performance Requirements

Wind Uplift Test Report

SD-07 Certificates

Submit certificates for the following items showing conformance with referenced standards contained in this section:

Coil Stock;

Fasteners;

Galvanizing Repair Paint;

Enamel Repair Paint;

SD-08 Manufacturer's Instructions

Installation of Roof panel assemblies

SD-11 Closeout Submittals

Warranty
Information Form and Placard;
Manufacturer's field inspection reports;
Instructions; G

Government and/or Contractor Personnel; Include copies of **Material Safety Data Sheets**; G for maintenance/repair materials.

1.5 QUALITY ASSURANCE

1.5.1 Pre-roofing Conference

After submittals are received and approved but before roofing and associated work is performed, the Contractor shall hold a pre-roofing conference and shall notify Contracting Officer to attend to review the following:

a. The drawings and specifications:

Fabrication and Installation drawings for the following items are to indicate completely dimensioned structural frame and erection layouts, openings in roof, special framing details and construction details at corners, ridges, eaves, building intersections, curbs and flashing, location and type of mastic and metal filler strips, location and erection of flashing and gutter/downspout assembly:

Installation of Roof panel assemblies

Roofing Panels

Flashing and Accessories

Gutter/Downspout Assembly

Submit certification from **coil stock** manufacturer or supplier that the machinery used will form the provided coil stock without warping, waviness, or rippling that is not a part of the panel profile, and without damage, abrasion or marring of the finish coating.

Submit **manufacturer's color charts and chips**, approximately 4 by 4 inches, showing full range of colors, textures and patterns available for roof panels with **Factory Color Finish**.

Submit **Factory Finish and Color Performance Requirements** verified by an independent testing agency.

Submit a **wind design analysis** from the manufacturer including, but not limited to, wind speed, exposure category, co-efficient, importance factor, designate type of facility, negative pressures for each zone, methods and requirements of attachment. Include a roof plan delineating dimensions and attachment patterns for each zone. Prepare signed and sealed wind design analysis with a Licensed Project Engineer, in the geographic area where the construction will take place.

Wind Uplift Test Report

Fire Rating Test Report

b. Qualifications including:

Qualification of Manufacturer

Certify that the manufacturer of the metal roofing system meets requirements specified. Submit documentation verifying metal roof panel manufacturer has been in the business of manufacturing roof panels for a period of not less than 5 years.

Manufacturer must also provide engineering services by an authorized engineer, currently licensed in the geographic area of the project, with a minimum of five (5) years experience as an engineer knowledgeable in roof wind design analysis, protocols and procedures for MBMA RSDM, ASCE 7-05, UL 580, and FM 4471. Engineer must provide certified engineering calculations for the project conforming to the stated references.

Any material submitted must include a list of three (3) projects where the proposed material has been used in a similar roofing system as that which is specified and is located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least three (3) years old and be available for inspection by the Architect, Owner or Owner's Representative.

Qualification of Installer

Certify that the applicator meets requirements specified, and provide evidence that products used within this specification are manufactured in the United States.

Qualifications for Welding

Provide certification of welding procedures conforming to AWS A5.1/A5.1M and AWS D1.1/D1.1M

c. Submit procedure for on site inspection and acceptance of the roofing substrate and pertinent structural details relating to the roofing system, including; but not limited to:

Material Safety Data Sheets

Sub-girts and Formed Shapes

Closure Materials

Insulation

Pressure Sensitive Tape

Sealants and Caulking

Rated Wall Assembly

Galvanizing Repair Paint

Enamel Repair Paint

Aluminized Steel Repair Paint

Accessories

- d. Submit plan for coordination of the work of the various trades involved in providing the roofing system and other components secured to the roofing.

Include detailed application [instructions](#) and standard manufacturer drawings altered as required by these specifications. Explicitly identify in writing, differences between manufacturer's instructions and the specified requirements.

- e. Safety requirements
- f. Submit Manufacturer's data indicating percentage of recycle material in roofing panels to verify [sustainable acquisition](#) compliance.

The following shall also be reviewed at the pre-roofing conference:

a. Drawings, specifications, and submittals related to the roof work. Submit, as a minimum; sample profiles of roofing panels, with factory-applied color finish samples, flashing and accessories, gutter/downspout assembly samples; typical fasteners and pressure sensitive tape, sample gaskets and sealant/insulating compounds. Also include data and 1/2 pint sample of aluminum repair paint and technical data on coil stock and coil stock compatibility, and manufacturer's installation manual.

b. Roof system components installation.

c. Procedure for the roof manufacturer's technical representative's onsite inspection and acceptance of the roofing substrate, the name of the manufacturer's technical representatives, the frequency of the onsite visits, distribution of copies of the inspection reports from the manufacturer's technical representative. The manufacturer's roof inspector must be a full time employee of the manufacturer with no less than 5 years experience in inspecting the specified roof system. A signed letter by the president of the manufacturer must accompany the submittals attesting to the full time employ and tenure of the inspector.

d. Contractor's plan for coordination for the work of the various trades involved in providing the roofing system and other components secured to the roofing.

e. Quality control plan for the roof system installation.

f. Safety requirements.

Coordinate pre-roofing conference scheduling with the Contracting Officer. Attendance is mandatory for the Contractor, the Contracting Officer's designated personnel, personnel directly responsible for the installation of the metal roof system, flashing and sheet metal work, mechanical and electrical work, other trades interfacing with the roof work, and representative of the metal roofing manufacturer. Before beginning roofing work, provide a copy of meeting notes and action items to all attending parties. Note action items requiring resolution prior to start of roof

work.

1.5.2 Manufacturer's Technical Representative

Ensure the representative has authorization from manufacturer to approve field changes and is thoroughly familiar with the products and installations in the geographical area where construction will take place.

The manufacturer's technical representative must be thoroughly familiar with the products to be installed, installation requirements and practices, and with any special considerations in the geographical area of the project. The representative must perform field inspections and attend meetings as specified.

When the project is in progress, the roofing system manufacturer will provide the following:

1. Keep the Owner informed as to the progress and quality of the work as observed. Photographic Inspection Report to be turned in on a weekly basis to the Owner.
2. Provide job site inspections a minimum of three days a week.
3. Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
4. Confirm after completion that manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.
5. The roofing manufacturer must inspect the roof on an annual basis and submit an annual inspection report to Public Works at Camp Lejeune.
6. The manufacturer's inspector must be a full time employee of the manufacturer with a minimum 5 years experience inspecting the specified roof system. A signed copy to attest to the full time employ and tenure of the inspector by the president of the manufacturing company will accompany submittals.

1.5.3 Qualification of Manufacturer

Guarantee the metal roof panel system manufacturer possesses the following:

- a. A minimum of five years experience in manufacturing metal roof system and accessory products.
- b. Engineering services of an authorized engineer; currently licensed in the geographical area where construction will take place, having a minimum of five (5) years experience as an engineer knowledgeable in roof wind design analysis, protocols and procedures for the MBMA Metal Roofing System Design Manual; ASCE 7-05, UL 580 and FM FM 4471 wind design guide for metal roof systems. Engineer must provide certified engineering calculations for the project conforming to the stated references.
- c. Any material submitted must include a list of three (3) projects where the proposed material has been used in a similar roofing system as that which is specified and is located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least three (3) years old and be available for inspection by the Contracting Officer.

1.5.4 Qualification of Installation Contractor

Confirm that the installation contractor is approved and certified by the roofing panel manufacturer prior to beginning the installation of the metal roofing system. Metal roof system applicator must be approved, authorized, or licensed in writing by the roof panel manufacturer and have a minimum of five years experience as an approved, authorized, or licensed applicator with that manufacturer, approved at a level capable of providing the specified warranty. Supply the names, locations and client contact information of 5 manufacturer's roofing products submitted for this project within the previous three years.

1.5.5 Qualifications for Welding Work

Welding procedures must conform to AWS D1.2/D1.2M for aluminum. Operators are permitted to make only those types of weldments for which each is specifically qualified.

1.5.6 Single Source

Roofing panels, clips, closures, and other accessories must be standard products of the same manufacturer, and the most recent design of the manufacturer to operate as a complete system for the intended use.

1.5.7 Surface-Burning Characteristics

Provide metal roof panels having insulation core material with the following surface-burning characteristics as determined by testing identical products according to [ASTM E 84](#) by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: 25 or less.

Smoke-Developed Index: 450 or less.

1.5.8 Fire-Resistance Ratings

Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per [ASTM E 119](#) by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

Combustion Characteristics: [ASTM E 136](#).

1.5.9 Fabrication

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, dimensional and structural requirements conforming to [AISI SG03-3](#).

Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel as indicated in drawings.

Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a weather tight seal and prevent metal-to-metal contact, in a manner that will seal weather-tight and

minimize noise from movements within panel assembly.

Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in [SMACNA 1793](#) that apply to the design, dimensions, metal, and other characteristics of item indicated.

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.

End Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with [SMACNA 1793](#).

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

Fabricate cleats and attachment devices of size and metal thickness recommended by [SMACNA 1793](#) or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

1.5.10 Finishes

Comply with [NAAMM AMP 500](#) for recommendations for applying and designating finishes.

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 and variations.

1.6 DELIVERY, HANDLING, AND STORAGE

Deliver components, sheets, metal roof panels, and other manufactured items to prevent damage or deformation; package metal roof panels for protection during transportation and handling.

Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.

Stack metal roof panels on platforms or pallets, covered with suitable weather-tight and ventilated covering; store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

Protect foam-plastic insulation as follows:

- a. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
- b. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.7 PROJECT CONDITIONS

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.

Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication. Prior to the preparation of drawings and fabrication, verify location of roof framing, roof openings and penetrations, and any other special conditions. Indicate all special conditions and measurements of final shop drawings.

1.8 WARRANTY

Furnish the metal roof panel manufacturer's 30-year no dollar limit roof system materials and installation workmanship warranty, including flashing, components, trim, and accessories necessary for a watertight roof system construction. Make warranty directly to the Government, commencing at time of Government's acceptance of the roof work. The warranty must state that:

- a. If within the warranty period, the metal roof system, as installed for its intended use in the normal climatic and environmental conditions of the facility, becomes non-watertight, shows evidence of moisture intrusion within the assembly, displaces, corrodes, perforates, separates at the seams, or shows evidence of excessive weathering due to defective materials or installation workmanship, the repair or replacement of the defective and damaged materials of the metal roof system and correction of defective workmanship is the responsibility of the metal roof panel manufacturer. All costs associated with the repair or replacement work are the responsibility of the metal roof panel manufacturer. Conform galvanized repairs to **ASTM A 780**.
- b. If the manufacturer or his approved applicator fail to perform the repairs within 72 hours of notification, emergency temporary repairs performed by others does not void the warranty.
- c. If multiple roof systems are being installed, both the standing seam roof sections and low slope roof sections and coating will fall under a single manufacturer warranty.

1.8.1 Manufacturer's Finish Warranty

Provide a manufacturer's no-dollar-limit 20 year warranty for the roofing system. Issue the warranty directly to the Government at the date of Government acceptance. Warranting that the factory color finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of numerical rating of 8 when measured in accordance with ASTM D 4214; or fade or change colors in excess of 5 NBS units as measured in accordance with ASTM D 2244.

1.8.2 Metal Roof System Installer Warranty

Provide the "Contractors Five 5 Year No Penal Sum Warranty for Non-Structural Metal Roof System" attached at the end of this section. Provide a separate bond in an amount equal to the installed total material

and installation roofing system cost in favor of the Government covering the installer's warranty responsibilities effective throughout the Five 5 year warranty period.

Roof system installer warranty shall be that the roof system, as installed, is free from defects in installation workmanship, to include the roof panel installation, flashing, insulation, accessories, attachments, and sheet metal installation provided in this project and integral to a complete watertight roof system assembly. Issue warranty directly to the Government. Correction of defective workmanship and replacement of damaged or affected materials is the responsibility of the metal roof system installer. All costs associated with the repair or replacement work are the responsibility of the installer.

1.8.3 Continuance of Warranty

Repair or replacement work that becomes necessary within the warranty period must be approved, as required, and accomplished in a manner so as to restore the integrity of the roof system assembly and validity of the metal roof system manufacturer warranty for the remainder of the manufacturer warranty period.

1.9 CONFORMANCE AND COMPATIBILITY

Provide an entire roofing and flashing system in accordance with specified and indicated requirements, including wind resistance and seismic per [AISC 341](#) requirements. Perform any work not specifically addressed, or any deviation from specified requirements in general accordance with recommendations of the [MBMA RSDM](#), [NRCA 0405](#), the metal panel manufacturer's published recommendations and details, and compatible with surrounding components and construction. Submit any deviation from specified or indicated requirements to the Contracting Officer for approval prior to installation.

1.10 SCHEDULE

Some metric measurements in this section are based on mathematical conversion of English unit measurements, and not on metric measurement commonly agreed to by the manufacturers or other parties. The English units for the measurements shown are as follows:

<u>PRODUCTS</u>	<u>ENGLISH UNITS</u>
a. Sheet Aluminum	0.040 inch
b. Panels	12 inches
- vertical legs	2 inches
- stiffening ribs	4 inches
c. Screws	No. 14 No. 12
d. Bolts	1/4 inch
e. Studs	3/16 inch
f. Fasteners	1/2 inch One inch

<u>PRODUCTS</u>	<u>ENGLISH UNITS</u>
g. Rivets	1/16 inch 1/8 inch

PART 2 PRODUCTS

2.1 FABRICATION

Fabricate and finish metal roof panels and accessories on a factory stationary industrial type rolling mill to the greatest extent possible, per manufacturer's standard procedures and processes, and as necessary to fulfill indicated performance requirements. Comply with Indicated profiles, dimensional and structural requirements.

Provide panel profile, as indicated on drawings including major ribs and intermediate stiffening ribs for full length of panel. Fabricate panel side laps with factory installed captive gaskets providing a weather tight seal and preventing metal-to-metal contact, and minimizing noise from movements within the panel assembly.

2.1.1 Finishes

Finish quality and application processes must conform to the related standards specified within this section. Noticeable variations within the 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 any contrasting variations.

2.1.2 Accessories

Fabricate flashing and trim to comply with recommendations in SMACNA 1793 as applicable to the design, dimensions, metal, and other characteristics of the item indicated.

a. Form exposed sheet metal accessories which are free from excessive oil canning, buckling, and tool marks, and are true to line and levels indicated, with exposed edges folded back to form hems.

b. End Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.

c. Sealed Joints: Form non-expansion, but moveable joints in metal to accommodate elastomeric sealant to comply with SMACNA 1793.

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

e. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA or by metal roof panel manufacturer for application, but not less than the thickness of the metal being secured.

2.2 PANEL MATERIALS

2.2.1 Aluminum Sheet Panels

Roll-form aluminum roof panels to the specified profile, with .040 thickness and depth as indicated.

Material must be plumb and true, and within the tolerances listed:

- a. Aluminum sheet conforming to ASTM B 209, and AA ADM1.
- b. Individual panels to have continuous length sufficient to cover the entire length of any unbroken roof slope with no joints or seams and formed without warping, waviness, or ripples that are not a part of the panel profile and free from damage to the finish coating system.
- c. Provide panels with unlimited thermal expansion and contraction.
 - i. Profile to be 2 3/8" high seam at 16" o.c.; Mechanically seamed "T" seam; continuous length, no splicing; Concealed 16 GA stainless steel one piece clip not to come in any contact with seam sealant.
 - ii. Performance and Testing
- d. ASTM E1680: Static pressure air infiltration (roof panels):
 1. Pressure Leakage Rate:
 - a. 1.57 PSF 0.0054 cfm/sq.ft.
 - b. 6.24 PSF 0.0054 cfm/sq.ft.
 - c. 20.0 PSF 0.0027 cfm/sq.ft.
- e. ASTM E1646: Static pressure water infiltration (roof panels):
 1. Pressure Result:
 - a. 5 Gal. /Hr. per S.F. and Static No Leakage
 - b. Pressure of 20.0 Psf for 15 minutes
- f. Capacities for gauge, span or loading other than those tested may be determined by interpolation of test results within the range of test data. Extrapolations for conditions outside test range are not acceptable.
- g. Water penetration (dynamic pressure): No water penetration, other than condensation, when exposed to dynamic rain and 70 mph wind velocities for not less than five minutes duration, when tested in accord with principles of AAMA 501.1.
- h. Wind and wind driven rain resistance: No water penetration or panel movement when exposed to 110 mph wind velocities when tested in accordance with TAS 100.
- i. The installed roof system assembly shall show that it can resist the calculated roof pressure in section 1.11.B in accordance with the test results of TAS 125.
- j. Water penetration in low slope applications: No water penetration or panel movement when subject to 6" head of water for 6 hrs when tested in accordance with the ASTM E2140 and when subject to 6" head of water for 7 days when tested in accordance with the TAS 114 appendix G.
- k. Panel/Cap configuration must have a total of four (4) layers of aluminum surrounding anchor clip for prevention of water infiltration and increased system strength designed to limit potential for panel blow-off.
 1. Profile of panel shall have mesa's every two (2) inches on center continuous throughout panel which are a minimum of one and one-half (1-1/2) inches wide.

m. Seam must be two and three-eighths (2-3/8) inches minimum height for added upward pressures and aesthetic appeal. Seam shall have continuous anchor reveals to allow anchor clips to resist positive and negative loading and allow unlimited expansion and contraction of panels due to thermal changes. Integral (not mechanically sealed) seams are unacceptable.

n. Seam cap: Snap-on cap shall be a minimum of 1" wide "T" shaped of continuous length up to forty-five (45) feet according to job conditions and field seamed by means of manufacturer's standard seaming machine.

1. Cap shall be designed to receive two (2) beads of continuous hot applied gasketing sealant, which will be applied independent of anchor clip, to allow unlimited thermal movement of panel without damage to cap sealant.

2. Sealant shall be a SIS (Styrene-Isoprene-Styrene) block copolymer type thermoplastic rubber adhesive, non-fatigue water barrier.

o. Stiffening ribs: Located in flat of panel to minimize oil canning and telegraphing of structural members.

p. Replace ability: Panels shall be of a symmetrical design with snap on, mechanically seamed cap configuration such that individual panels may be removable for replacement without removing adjacent panels.

q. Panel ends shall be panned at ridge, headwall, and hip conditions, or where applicable.

r. Panel length: Full length without joints, including bends.

2.2.2 Finish

All panels are to receive a factory-applied Kynar 500/Hylar 5000 finish consisting of a baked-on top-coat with a manufacturer's recommended prime coat conforming to the following:

- a. Metal Preparation: All metal is to have the surfaces carefully prepared for painting on a continuous process coil coating line by alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with acid rinse, and thorough drying.
- b. Prime Coating: Apply a base coat of epoxy paint, specifically formulated to interact with the top-coat, to the prepared surfaces by roll coating to a dry film thickness of 0.20 plus 0.05 mils. Ensure the prime coat is oven cured prior to application of finish coat.
- c. Exterior Finish Coating: Apply the finish coating over the primer by roll coating to dry film thickness of 0.80 plus 5 mils (3.80 plus 0.50 mils for Vinyl Plastisol) for a total dry film thickness of 1.00 plus 0.10 mils (4.00 plus 0.10 mils for Vinyl Plastisol). Ensure the finish coat is oven-cured.
- d. Interior Finish Coating: Apply a wash-coat on the reverse side over the primer by roll coating to a dry film thickness of 0.30 plus 0.05 mils for a total dry film thickness of 0.50 plus 0.10 mils. Wash-coat must be oven-cured.

- e. Color: The exterior finish shall be a green, typically referred to as "hunter green" or "forest green", that meets the Air Station color requirements. Note that color of standing seam roof, metal wall panels, soffit panels, insulated architectural window panels, and any other similar metal panels must all match.
- f. Physical Properties: Provide coating conforming to the industry and manufacturer s standard performance criteria as listed by the following certified [test reports](#):

Chalking: [ASTM D 4214](#)

Coating Thickness: [ASTM B 659](#)

Color Change and Conformity: [ASTM D 2244](#)

Weatherometer: [ASTM G 23](#) and [ASTM D 822](#)

Humidity: [ASTM D 2247](#) and [ASTM D 714](#)

Salt Spray: [ASTM B 117](#)

Chemical Pollution: [ASTM D 1308](#)

Gloss at 60 and 85 degrees F: [ASTM D 523](#)

Pencil Hardness: [ASTM D 3363](#)

Reverse Impact: [ASTM D 2794](#)

Flexibility: [ASTM D 522](#)

Formability: [ASTM D 522](#)

Abrasion: [ASTM D 968](#)

Flame Spread: [ASTM E 84](#)

Adhesion: [ASTM D 3359](#)

Creepage: [ASTM D 1654](#)

Cyclic Corrosion Test: [ASTM D 5984](#)

Oxidation: [ASTM D 610](#)

Finished roof surfaces to have a specular gloss value of 30 plus or minus 5 at an angle of 60 degrees when measured in accordance with ASTM D 523.

2.3 MISCELLANEOUS METAL FRAMING

2.3.1 General

Cold-formed metallic-coated steel sheet conforming to [AISI SG03-3](#) and [ASTM A 653/A 653M](#) and AISI/COS/NASPEC and specified in Section 05 40 00 COLD-FORMED METAL FRAMING unless other wise indicated.

2.3.2 Fasteners for Miscellaneous Metal Framing

Type, 305 stainless steel corrosion resistant, of size and sufficient length to penetrate the supporting member a minimum of 1 inch with other properties required to fasten miscellaneous metal framing members to substrates in accordance with the roof panel manufacturer's and ASCE 7-05 requirements.

2.4 FASTENERS

2.4.1 General

Corrosion resistant stainless steel of size and sufficient length to penetrate the supporting member a minimum of 1 inch with other properties required to fasten miscellaneous metal framing members to substrates in accordance with the roof panel manufacturer's and ASCE 7-05 requirements.

2.4.2 Exposed Fasteners

Provide corrosion resistant stainless steel, or nylon capped, steel compatible, exposed fasteners with the sheet panel or flashing and of a type and size recommended by the manufacturer to meet the performance requirements and design loads. Provide manufacturer's standard fasteners for accessories. Provide an integral metal washer matching the color of attached material with compressible sealing EPDM gasket approximately 3/32 inch thick.

2.4.3 Screws

Provide corrosion resistant stainless steel screws of the type and size recommended by the manufacturer to meet the performance requirements.

2.4.4 Rivets

Provide closed-end type rivets, made of corrosion resistant stainless steel where watertight connections are required.

2.4.5 Attachment Clips

Provide stainless steel, series 300 clips. Size, shape, thickness and capacity must meet the thickness and design load criteria specified. THE CLIPS MUST BE ONE PIECE CLIPS AND ALLOW FOR UNLIMITED THERMAL MOVEMENT.

2.4.6 Electrodes for Manual, Shielded Metal Arc Welding

Electrodes for manual, shielded metal arc welding must meet the requirements for AWS D1.1/D1.1M, and be covered, mild-steel electrodes conforming to AWS A5.1/A5.1M.

2.5 ACCESSORIES

2.5.1 General

Provide only accessories which are compatible with the metal roof panels. Sheet metal flashing, trim, metal closure strips, caps and similar metal accessories can not be less than the minimum thickness specified for the roof panels. Exposed metal accessories/finishes to match the panels furnished, except as otherwise indicated. Provide molded foam rib, ridge and other closure strips which are non-absorbent closed-cell or solid-cell

synthetic rubber or pre-molded neoprene to match configuration of the panels and not absorb or retain water.

2.5.2 Rubber Closure Strips

Closed-cell, expanded cellular rubber conforming to [ASTM D 1056](#) and [ASTM D 1667](#); extruded or molded to the configuration of the specified roof panel and in lengths supplied by the roof panel manufacturer.

2.5.3 Metal Closure Strips

Factory fabricated aluminum closure strips to be the same thickness, gauge, color, finish and profile of the specified roof panel.

2.5.4 Subgirts for Retrofit

Provide bar subgirts 1-1/2 by 1/8 inch galvanized steel with slotted holes for welding to end of impaling clip spikes.

2.5.5 Joint Sealants

2.5.5.1 Sealants

Provide an approved gun type sealant for use in hand- or air-pressure caulking guns at temperatures above [40 degrees F](#) (or frost-free application at temperatures above [10 degrees F](#) with minimum solid content of 85 percent of the total volume. Provide sealant that has a tough, durable dry surface skin which permits it to remain soft and pliable underneath, providing a weather-tight joint. No migratory staining is permitted on painted or unpainted metal, stone, glass, vinyl, or wood.

Prime all joints to receive sealants with a compatible one-component or two-component primer as recommended by the roof panel manufacturer.

- a. Shop Applied Caulking: An approved gun grade, non-sag one component polysulfide or silicone conforming to [ASTM C 792](#) and [ASTM C 920](#), Type II, with a curing time to ensure the sealant's plasticity at the time of field erection. Color to match panel color.
- b. Field Applied Caulking: An approved gun grade, non-sag one component polysulfide or two-component polyurethane with an initial maximum Shore A durometer hardness of 25, conforming to [ASTM C 920](#), Type II. Match color to panel colors.
- c. Tape Sealant: Pressure sensitive, 100% solid with a release paper backing; permanently elastic, non-sagging, non-toxic and non-staining as approved by the roof panel manufacturer.

2.6 SHEET METAL FLASHING AND TRIM

2.6.1 Fabrication, General

Custom fabricate sheet metal flashing and trim to comply with recommendations in [SMACNA 1793](#) that apply to the design, dimensions, metal and other characteristics of the items indicated. Shop fabricate items where practicable. Obtain and verify field measurements for accurate fit prior to shop fabrication. Fabricate flashing and trim without excessive oil canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

2.6.2 Roof Drainage Sheet Metal Fabrications

- a. Gutters: Fabricate to cross section indicated, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required. Fabricate in minimum 96-inch long sections. Fabricate expansion joints and accessories from same metal as gutters, unless otherwise indicated.
- b. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts and anchors.

2.7 REPAIR OF FINISH PROTECTION

Provide repair paint for color finish enameled roofing that is compatible with the paint of the same formula and color as the specified finish furnished by the roofing manufacturer.

2.8 UNDERLAYMENTS

Provide self-adhering modified bitumen membrane underlaymetn material in compliance with ASTM D 1970 suitable for use as underlayment for metal roofing. Use membrane resistant to cyclical elevated temperatures for extended period of time hin high heat service conditions. Provide membrane with integral non-tacking top surface of polyethylene film or other surface material to serve as separator between bituminous material and metal products to be applied to above.

Product: 60 Mil SBR Modified, self adhering, fiberglass reinforced underlayment. Must be manufactured by the manufacturer of the standing seam metal panel system.

PART 3 EXECUTION

3.1 EXAMINATION

Contracting Officer may request verification and certification testing of coatings and base metals of metal roofing prior to installation.

- 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. Ensure surfaces are suitable, dry and free of defects and projections which might affect the installation.
- 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, UL, ASTM, ASCE 7-05 and as required for the geographical area where construction will take place.
- 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. Submit to the Contracting Officer a 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. Miscellaneous Framing: Install sub-purlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.

3.3 ROOF PANEL INSTALLATION

Provide roof panels of full length from eave to ridge or eave to wall as indicated, unless otherwise indicated or restricted by shipping limitations. Anchor roof panels and other components of the Work securely in place, with provisions for thermal and structural movement in accordance with [NRCA ASMMRM](#).

Roof Panels: Use stainless-steel fasteners for exterior surfaces and interior surfaces.

Anchor Clips: Anchor metal roof panels and other components of the work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating conforming to [SSPC Paint 12](#), by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

Erect roofing system in accordance with the approved erection drawings, the printed instructions and safety precautions of the manufacturer.

Do not subject sheets to overloading, abuse, or undue impact. Do not apply bent, chipped, or defective sheets.

Erect sheets true and plumb and in exact alignment with the horizontal and vertical edges of the building, securely anchored, and with the indicated rake, eave, and curb overhang.

Allow for thermal movement of the roofing, movement of the building structure, and provide permanent freedom from noise due to wind pressure.

Field cutting metal roof panels by torch is not permitted.

Lay roofing sheets with corrugations in the direction of the roof slope. End laps of exterior roofing can not be less than 8 inches; the side laps of standard exterior corrugated sheets can not be not less than 2-1/2 corrugations.

Do not permit storage, walking, wheeling, and trucking directly on applied roofing materials. Provide temporary walkways, runways, and platforms of smooth clean boards or planks as necessary to avoid damage to the installed roofing materials, and to distribute weight to conform to the indicated live load limits of roof construction.

3.4 FASTENER INSTALLATION

Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

3.5 UNDERLAYMENT INSTALLATION

Install underlayment according to roof panel manufacturer's written recommendations and recommendaion in NRCA "The NRCA Roofing and Waterproofing Manual". Provide starting from the eave and up a minimum of 3 feet up the roof slope. Install around the entire perimeter of the building, including up rake edges.

Single Layer Felt Underlayment for a Standard Slope Roof Deck

Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses a minimum of 72 inches. Fasten with felt underlayment roofing nails.

Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of fel tover self-adhering sheet underlayment not less than 3 inches in a direction to shed water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

Self-adhering Sheet Underlayment

Install self-adhering sheet underlayment; wrinkle free on roof deck. Comply with low-temperature installation restrictions of manufacturer where applicable. Install at locations indicated on project drawings, lapped in a direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not elss than 6 inches staggered 34 inches between courses. Roll laps with roller. Cover underlayment within seven days.

3.6 INSULATION INSTALLATION

If insulation is indicated in drawings, install insulation concurrently with metal roof panel installation, in thickness indicated, to cover entire roof, according to manufacturer's written instructions.

3.7 PROTECTION OF APPLIED MATERIALS

Do not permit storing, walking, wheeling, and trucking directly on applied roofing/insulation materials. Provide temporary walkways, runways, and platforms of smooth clean boards or planks as necessary to avoid damage to applied roofing/insulation materials, and to distribute weight to conform

to indicated live load limits of roof construction.

3.8 FLASHING, TRIM AND CLOSURE INSTALLATION

3.8.1 General Requirements

Comply with performance requirements, manufacturer's written installation instructions, and [SMACNA 1793](#). Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

Install sheet metalwork to form weather-tight construction without waves, warps, buckles, fastening stresses or distortion, and allow for expansion and contraction. Perform cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades by sheet metal mechanics.

3.8.2 Metal Flashing

Install metal flashing at building corners, rakes and eaves, junctions between metal siding and roofing, valleys and changes of slope or direction in metal roofing, and building expansion joints and gutters.

Provide exposed metal flashing that is the same material, color, and finish as the specified metal roofing.

Fasten flashing at not more than [8 inches](#) on center for roofs, except where flashing are held in place by the same screws that secure covering sheets.

Furnish flashing in at least [8-foot](#) lengths. Provide exposed flashing that has [one inch](#) locked and blind-soldered end joints, and expansion joints at intervals of not more than [16 feet](#).

Bed exposed flashing and flashing subject to rain penetration in the specified joint sealant.

Isolate flashing which is in contact with dissimilar metals by means of the specified asphalt mastic material to prevent electrolytic deterioration.

Form drips to the profile indicated, with the edge folded back [1/2 inch](#) to form a reinforced drip edge.

3.8.3 Closures

Install metal closure strips at open ends of metal ridge rolls; open ends of corrugated or ribbed pattern roofs, and at intersection of wall and roof unless open ends are concealed with formed eave flashing; rake of metal roof unless open end has a formed flashing member; and in other required areas.

Install mastic closure strips at intersection of the wall with metal roofing; top and bottom of metal siding; heads of wall openings; and in other required locations.

3.9 WORKMANSHIP

Ensure lines, arises, and angles are sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a [1/2 inch](#) hem on the concealed side. Ensure that sheet

metal that is exposed to the weather is watertight with provisions for expansion and contraction.

Ensure surfaces that are to receive sheet metal are plumb and true, clean, even, smooth, dry, and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of [SMACNA 1793](#). Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight.

3.10 ACCEPTANCE PROVISIONS

3.10.1 Erection Tolerances

Erect metal roofing straight and true with plumb vertical lines correctly lapped and secured in accordance with the manufacturer's written instructions. Do not vary horizontal lines more than [1/8 inch in 40 feet](#).

3.10.2 [Leakage Tests](#)

Finished application of metal roofing is subject to inspection and test for leakage by the Contracting Officer. Conduct inspections and tests without cost to the Government.

Perform inspections and tests promptly after erection to permit correction of defects and the removal and replacement of defective materials.

3.10.3 Repairs to Finish

Repair scratches, abrasions, and minor surface defects of finish with the specified repair materials. Ensure finished repaired surfaces are uniform and free from variations of color and surface texture.

Immediately remove and replace repaired metal surfaces that are not acceptable to the project requirements with new material. Repaired metal surfaces that are not acceptable to the project requirements are to be immediately removed and replaced with new material.

3.10.4 Paint-Finish Metal Roofing

Test paint-finish metal roofing for color stability by the Contracting Officer during the manufacturer's specified guarantee period.

Remove and replace panels that indicate color changes, fading, or surface degradation, determined by visual examination, with new panels at no expense to the Government.

New panels are subject to the specified tests for an additional year from the date of their installation.

3.11 CLEAN-UP AND DISPOSAL

Clean all exposed sheet metal work at completion of installation. Remove metal shavings, filings, nails, bolts, and wires from roofs. Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean. Ensure exposed metal surfaces are free of dents, creases, waves, scratch marks, solder or weld marks, and damage to the finish coating.

Collect and place scrap/waste materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site; transport demolished materials from government property and legally dispose of them.

3.12 FIELD QUALITY CONTROL

3.12.1 Manufacturer's Inspection

Ensure manufacturer's technical representative visits the site a minimum of three times during the installation for purposes of reviewing materials installation practices and adequacy of work in place. Make inspections during the first 20 squares of roof panel installation, at mid-point of the installation, and at substantial completion, at a minimum. After each inspection, submit a report, signed by the manufacturer's technical representative to the Contracting Officer within 3 working days. Note in the report overall quality of work, deficiencies and any other concerns, and recommended corrective action.

When the project is in progress, the roofing system manufacturer will provide the following:

1. Keep the Contracting Officer informed as to the progress and quality of the work as observed. Photographic Inspection Report to be turned in on a weekly basis to the Owner.
2. Provide job site inspections a minimum of three days a week.
3. Report to the DContracting Officer in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
4. Confirm after completion that manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.
5. The roofing manufacturer must inspect the roof on an annual basis and submit an annual inspection report to Public Works at Camp Lejeune.
6. The manufacturer's inspector must be a full time employee of the manufacturer with a minimum 5 years experience inspecting the specified roof system. A signed copy to attest to the full time employ and tenure of the inspector by the president of the manufacturing company will accompany submittals.

Submit three signed copies of the [manufacturer's field inspection reports](#) to the Contracting Officer within one week of substantial completion.

3.13 INFORMATION FORM AND PLACARD

For each roof, furnish a typewritten information card for facility records and a card laminated in plastic and framed for interior display at roof access point, or a photoengraved 0.032 inch thick aluminum card for exterior display. [Format as directed in paragraph titled "Form One"](#).

Provide an information card 8 1/2 by 11 inches minimum, identifying the facility name and number; location; contract number; approximate roof area; detailed roof system description, including deck type, roof panel manufacturer and product name, type underlayment(s), date of completion; installing contractor identification and contact information; manufacturer warranty expiration, warranty reference number, and contact information. Install a card at each interior roof top access point as directed by the Contracting Officer and provide a paper copy to the Contracting Officer.

3.14 FORM ONE

CONTRACTOR'S TWENTY (20) YEAR NO PENAL SUM WARRANTY
FOR
NON-STRUCTURAL METAL ROOF SYSTEM

FACILITY
DESCRIPTION: _____
BUILDING
NUMBER: _____
CORPS OF ENGINEERS CONTRACT
NUMBER: _____

CONTRACTOR
CONTRACTOR: _____
ADDRESS: _____
POINT OF
CONTACT: _____
TELEPHONE
NUMBER: _____

OWNER
OWNER: _____
ADDRESS: _____
POINT OF
CONTACT: _____
TELEPHONE
NUMBER: _____

CONSTRUCTION AGENT

CONSTRUCTION
AGENT: _____
ADDRESS: _____
POINT OF
CONTACT: _____
TELEPHONE
NUMBER: _____

CONTRACTOR'S TWENTY (20) YEAR NO PENAL SUM WARRANTY
FOR
NON-STRUCTURAL METAL ROOF SYSTEM
(continued)

THE NON-STRUCTURAL METAL ROOF SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRRANTED BY _____ FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE NON-STRUCTURAL METAL ROOFING SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: THE METAL ROOF PANELS, FASTENERS, CONNECTORS, ROOF SECUREMENT COMPONENTS, AND ASSEMBLIES TESTED AND APPROVED IN ACCORDANCE WITH UL 580. IN ADDITION, THE SYSTEM PANEL FINISHES, SLIP SHEET, INSULATION, VAPOR RETARDER, ALL ACCESSORIES, COMPONENTS, AND TRIM AND ALL CONNECTIONS ARE INCLUDED. THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS. CURBS, SKYLIGHTS; INTERIOR OR EXTERIOR GUTTERS AND DOWNSPOUTS; EAVES, RIDGE, HIP, VALLEY, RAKE, GABLE, WALL, OR OTHER ROOF SYSTEM FLASHING INSTALLED AND ANY OTHER COMPONENTS SPECIFIED WITHIN THIS CONTRACT TO PROVIDE A WEATHERTIGHT ROOF SYSTEM; AND ITEMS SPECIFIED IN OTHER SECITONS OF THE SPECIFICATIONS THAT ARE PART OF THE NON-STRUCTURAL METAL ROOFING SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE NON-STRUCTURAL METAL ROOF SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

(Company President) (Date)

CONTRACTOR'S TWENTY (20) YEAR NO PENAL SUM WARRANTY
FOR
NON-STRUCTURAL METAL ROOFING SYSTEM
(continued)

THE CONTRACTOR MUST SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURERE AND/OR INSTALLER OF THE NON-STRUCTURAL METAL ROOFING SYSTEM. SUBMIT ALONG WITHTHE CONTRACOTR'S WARRANTY. HOWEVER, THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINTED IN THE SPECIFICATIONS AND IS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).
2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.
3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF TH BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.
4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDARIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.
5. FAILURE OF ANY PART OF THE NON-STRUCTURAL METAL ROOF UE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN MUST INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.
6. THIS WARRANTY APPLIES TO THE NON-STRUCTURAL METAL ROOFNG SYSTEM . IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THEBUILDING INTERIOR OR CONTENTS WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.
7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WIHTOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

CONTRACTOR'S TWENTY (20) YEAR NO PENAL SUM WARRANTY
FOR
NON-STRUCTURAL METAL ROOFING SYSTEM
(continued)

**REPORTS OF LEAKS AND ROOF SYSTEM DEFICIENCIES MUST BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. INITIATE EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS IMMEDIATELY; SUBMIT A WRITTEN PLAN FOR APPROVAL TO REPAIR OR REPLACE THIS ROOF SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. COMMENCE ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE NON-STRUCTURAL METAL ROOF SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES MUST CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON IS THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., WILL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT MUST PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

POST A FRAMED COPY OF THIS WARRANTY IN THE MECHANICAL ROOM, PROVIDE COPY FOR CONTRACTING OFFICER, AND POST IN OTHER LOCATIONS AS DIRECTED SUITABLE TO REMAIN DURING THE ENTIRE WARRANTY PERIOD. OTHER LOCATIONS SHALL INCLUDE AS A MINIMUM ONE POSTED AT EACH ATTIC TO ROOF ACCESS HATCH.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.
N40085-09-B-0168

TITLE AND LOCATION
AS4200 Building Repair, MCB, CLNC

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVTOR CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH
		07 41 13	SD-01 Preconstruction Submittals														
			Qualification of Manufacturer	1.5.1													
			Qualification of Manufacturer	1.5.3													
			Qualification of Installer	1.5.1													
			Qualifications for Welding	1.5.1													
			SD-02 Shop Drawings														
			Roofing Panels	1.5.1													
			Flashing and Accessories	1.5.1													
			Gutter/Downspout Assembly	1.5.1													
			SD-03 Product Data														
			Sustainable acquisition	1.5.1													
			Coil Stock	1.5.1													
			Factory Color Finish	1.5.1													
			Sub-girts and Formed Shapes	1.5.1													
			Closure Materials	1.5.1													
			Insulation	1.5.1													
			Pressure Sensitive Tape	1.5.1													
			Sealants and Caulking	1.5.1													
			Rated Wall Assembly	1.5.1													
			Galvanizing Repair Paint	1.5.1													
			Enamel Repair Paint	1.5.1													
			Aluminized Steel Repair Paint	1.5.1													
			Accessories	1.5.1													
			SD-04 Samples														
			Coil Stock	1.5.1													
			Roofing Panels	1.5.1													

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ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT OR CLASSIFICATION REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH
		07 41 13	Fasteners	2.3.2													
			Metal Closure Strips	2.5.1													
			Insulation	1.5.1													
			Manufacturer s color charts and chips	1.5.1													
			SD-05 Design Data														
			Wind design analysis	1.5.1													
			SD-06 Test Reports														
			test reports	2.2.2													
			Leakage Tests	3.10.2													
			Fire Rating Test Report	1.5.1													
			Coatings and base metals of metal roofing	3.1													
			Factory Finish and Color Performance Requirements	1.5.1													
			Wind Uplift Test Report	1.5.1													
			SD-07 Certificates														
			Coil Stock	1.5.1													
			Fasteners	2.3.2													
			Galvanizing Repair Paint	1.5.1													
			Enamel Repair Paint	1.5.1													
			SD-08 Manufacturer's Instructions														
			Installation of Roof panel assemblies	1.5.1													
			SD-11 Closeout Submittals														
			Warranty	1.8													

