#### SECTION 07 61 13

**STANDING SEAM SHEET METAL ROOFING**

#### BASED ON DFD MASTER SPECIFICATION DATED (02/06/17)

**Note to Specifier:**

**Read the first paragraph after this statement, before proceeding.**

**Obtain and read the most current version of the DOA-DFD “Minimum Design Guidelines for Roofing and Waterproofing Systems”. Note the revision date at the title.**

This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add materials, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.

Recent changes in the specification are associated with the date by the title, identified by the ‘color green’. DO NOT DELETE THE DATE. Obtain the most current specification section for each project. Pay special attention to all ’Notes to Specifier’ identified in color of ‘dark red’ in italic typeface. Roof system options are also identified within [brackets] by the ‘color blue’. This language may be used or deleted as required by the scope of project. This section should be reviewed carefully as it has language for both new construction and re-roofing.

DFD Standard Roofing Details for various roof systems including HVAC and Electrical runs, curbs and support, louver, door and windows and State of Wisconsin Guarantee Forms are located on the DFD Website with the Master Roofing Specification.

part 1 - GENERAL

Scope

The work under this section includes all labor, material, equipment and related services necessary to install standing seam metal roof [and wall panels] and associated system components including metal flashing, all roof related construction.

PART 1 - GENERAL

 Scope

 Related Work

 Reference Standards

 Guarantee and Warranties

 Quality Assurance

 Product Delivery, Storage and Handling

 Submittals - Technical and Other Documents

 Submittals – Final Documents Required Upon Completion of the Work

 Site Conditions

PART 2 – PRODUCTS

 System Description

 Sheet Metal Materials

 Accessories

PART 3 - EXECUTION

 Examination and Preparation

 Fabrication

 Workmanship

 Installation

 Cleaning

RELATED WORK

Applicable provisions of Division 1 shall govern work under this Section. The Contractor shall consult these provisions in detail prior to proceeding with work.

[05 31 00] – Steel Decking

[06 10 53 – Miscellaneous Rough Carpentry]

[00 00 00] – Structural Steel

[00 00 00] – Steel Joist

[00 00 00] – Flashing and Sheet Metal

[00 00 00 Associated Specific Roof System]

[26 41 00 – Facility Lightning Protection]

**Note to Specifier:**

“Lightning Protection Systems” that must be removed, altered, interrupted or disabled to perform the new work must be upgraded at the roof level. The Contractors qualified lightning protection system Installer shall submit a written statement that the roof level portion of the installation would\* qualify for a UL “Master Label”.

In the event that the Contractor wishes to make improvements in materials and/or techniques, or is required to make improvements by the membrane supplier in order to obtain guarantees/warranties, he shall make written request stating in full the nature of the proposed changes and stating that the changes, if approved, will be accomplished at no additional cost to contract.

**REFERENCE Standards**

[AA - Aluminum Association.]

AISI – American Iron and Steel Institute.

[ASTM - American Society for Testing and Materials.]

[CDA 110 - Copper Development Association (CDA).]

[ASTM A361 ‑ Steel Sheet, Zinc‑Coated (Galvanized) by the Hot‑Dip Process for Roofing and Siding.]

[ASTM A446 ‑ Steel Sheet, Zinc-Coated, (Galvanized) by the Hot‑Dip Process, Structural (Physical) Quality.]

[ASTM A525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.]

[ASTM A653: Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvanized) by the Hot-Dip Process]

[ASTM A792 - General Requirements for Aluminum-Zinc Coated Sheet.]

[ASTM B137: Test Method for Measurement of Coating Mass Per Unit Area of Anodically Coated Aluminum.]

[ASTM B209: Specification for Aluminum and Aluminum-Alloy Sheet and Plate.]

[ASTM B370: Specification for Copper Sheet and Strip for Building Construction.]

[ASTM C920 – Elastomeric Joint Sealants.]

[ASTM D226 ‑ Asphalt‑Saturated Organic Felt Used in Roofing and Waterproofing.]

ASTM D1056 - Specification for Flexible Cellular Materials.

[ASTM D2244 – Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.]

[ASTM D4214 – Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.]

[FS TT-S-00230C ‑ Federal Specification.]

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

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

**Note to Specifier:**

When specifying prefinished sheet metal, include the following “Guarantee” article.

**GUARANTEE and warranties**

State of Wisconsin Roof System Guarantee: Provide written [**ten (10) year] [twenty (20) year]** guarantee warranting all roofing and flashing required under contract, to be watertight and free from defects in materials or workmanship for period of time, as stipulated in guarantee form.

Contractor shall perform a minimum of two (2) roof system inspections during the term of this guarantee. The first inspection shall be approximately two (2) years after installation date on the state guarantee and final inspection performed five (5) [5 years minimum] years after installation date on the state guarantee. Contact the Agency Contact to arrange for a site visit date. Agency Contact will accompany the Contractor. Submit written inspection reports, e-mailed to Owner (DFD Project Manager) and Agency Contact immediately after inspection is performed and prior to guarantee expiration.

It is recommended that the Contractor take digital photos of the finished work for their files and future reference.

A copy of the required State of Wisconsin Roof System Guarantee form shall be bound herein located at the end of this Section and may be acquired at the following State website; doa.wi.gov/DFD

**Contractor and all sub-contractors shall review the guarantee and requirements of this Section prior to providing a quote for the Work required by this Section.**

**Note to Specifier:**

The following shall apply for existing roof systems covered by State guarantee or metal panel manufacturer warranties.

**Note to Specifier:**

DFD Re-Roofing Project Manager and the metal panel manufacturer must be notified of intent to penetrate the existing guaranteed and/or warranted roof system prior to approval of final bid documents. DFD shall provide information concerning the original approved roof system Contractor(s), existing guarantees & warranties. If required, the manufacture shall provide alternate approved Contractor information when original Contractor is not available. This information shall be included within the bid documents allowing the State to maintain the existing State Guarantee and/or various manufacturer warranties through their expiration dates.

**Example:** Where a state guarantee is relevant the Contractor shall be included in bid document. When the state guarantee has expired the metal panel supplier shall be included in the bid documents to avoid losing the warranty.

**Note to Specifier:**

The following shall apply for existing roof systems no longer covered by State guarantee or manufacturer warranties.

**Note to Specifier:**

At minimum, request and insert a one (1) year or two (2) year State guarantee for all new construction projects and remodel projects including mechanical and electrical new work including penetrations or abandonment of existing roof penetrations that require minor roof system repair, minor replacement and/or new roofing material installed into a portion of the existing roof system to seam into the existing roof system metal panel to achieve a watertight condition.

The Contractors Performance-Payment Bond is only required to apply to this trade section during the construction period and the first year of the guarantee period. Said Bond shall not apply to any extended guarantee period beyond the first year. Such extended guarantees are limited to the applicable Contractor and manufacturer as herein specified.

Panel Manufacturer’s Finish Warranty: Provide the sheet metal panel manufacturer’s standard pre-finished panel twenty (20) year warranty against material defects, corrosion and finish degradation stating at a minimum that the metal finish will not chalk in excess of an eight (8) rating, or fade in excess of a five (5) rating, when tested in accordance with ASTM D2244 and ASTM D4214.

Panel Manufacturer’s Weather tightness Warranty: Provide the sheet metal panel manufacturer’s standard no-dollar limit 20 year warranty against defects that result in leaks.

Ice Dam and Underlayment Manufacturer’s Warranty: Provide Manufacturer’s minimum twenty (20) year warranty against product defect that result in leaks.

The following information shall be included on all guarantee and warranty documents:

State of Wisconsin (Owner), Agency, city or township, street address where work was performed, building name, Owner Project number, Owner (DOA) building number, all roof areas involved and total sq. ft. area of all roof areas.

**QUALITY ASSURANCE**

AISI CF00-01, “A Design Guide for Standing Seam Roof Panels,” American Iron and Steel Institute, 2000.

AISI CF97-01, “A Guide for Designing with Standing Seam Roof Panels,” American Iron and Steel Institute, 1997.

ASTM A653, “Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process,” American Society for Testing and Materials, 1998.

ASTM E1592, “Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference,” American Society for Testing and Materials, 1995.

ASTM E1646, “Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference,” American Society for Testing and Materials, 1995.

ASTM E1680, “Test Method for Rate of Air Leakage through Exterior Metal Roof Panels Systems,” American Society for Testing and Materials, 1995.

UL 580, “Tests for Uplift Resistance of Roof Assemblies,” Underwriter’s Laboratories, Inc., 1994.

Refer to “Submittals - Technical and Other Documents” for number of submittal required.

Manufacturer shall have had at least ten (10) years experience in architectural roofing, and the roof panel itself shall have been in use for at least ten (10) years. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.

Manufacturer and persons performing panel forming shall demonstrate past experience with examples of projects of similar type and exposure.

Personal forming panels shall demonstrate past experience with examples of projects of similar type and exposure.

In the event that the Contractor wishes to make improvements in materials and/or techniques, or is required to make improvements by his material manufacturer in order to obtain guarantees/warranties, he shall make written request stating in full the nature of the proposed changes and stating that the changes, if approved, will be accomplished at no increase in cost.

Contractor shall be recognized by the manufacturer of the sheet metal as an “approved” or “authorized” applicator. The Contractor shall be a company specializing in sheet metal roof installations with a minimum of five (5) years documented experience in retrofit work and a minimum of three (3) projects of similar size and scope of the work specified in this section that have been in installed for a minimum of four (4) years with satisfactory roof system performance.

The Contractor shall be authorized by the panel manufacturer, and the actual work shall be supervised by personnel trained by the manufacturer in proper application of the product. The Contractor shall have capability for preparation of shop details and fabrication of all flashings not furnished by the panel manufacturer.

Roofing Contractor shall notify the panel roof system manufacturer in writing of their intent to obtain all system material and send application for the warranty for work required herein. Letterhead documentation shall be sent to the panel roof system manufacturer and include a current date, indicate the Owner Project Number, bid document technical Section(s), indicate in full the composition of roof system to be install per bid documents and be signed by the Roofing Contractor Representative.

Panel roof system manufacturer shall provide Roofing Contractor with a current date written documentation reply stating the receipt of Contractor request including warranty application and statement that the Roofing Contractor is an ”approved and authorized Contractor applicator” in good standing, for the work specified herein. A copy of this letterhead documentation shall be submitted to Owner at the preconstruction meeting. Such document shall include a current date, acknowledgement the Owner Project Number, bid document technical Section(s), include the roofing Contractor business name, certification status, year of issue and duration of such status.

**SITE VISIT:** Roofing Contractor shall notify panel roof system manufacturer representative of start date and arrange for the representative to meet with the on-site foreman on the 1st or 2nd day after start of the Work. Notify the Agency Contact concerning the representative visit so the Agency Contact may be present. A minimum of 1 visit is required.

Changes or variations to the panel roof system composition as required herein shall be approved by the Owner, in writing. Changes provided by the Contractor without Owner written approved shall be cause for rejection of the Work in its entirety.

Roofing Contractor on-site Foreman shall be approved by the panel roof system manufacturer and shall remain on-site throughout the duration of the project.

Contractor workers employed on this project shall be recognized by the supplier of the panel roof system manufacturer as “approved” or “authorized” applicator(s) and within the past two (2) years, the worker shall be able to document the successful completion of a minimum of three (3) projects of similar size and/or scope of the Work as specified in this Section.

All sheet metal panel roofers by trade, and employed on this project shall have a certificate of successful completion of training for the system to be installed. Undocumented roofers shall not be allowed to perform the work required herein pertaining to the physical placement/installation of any and all of the panel roof system components specified herein.

Metal panel roof system supplier certificate of successful completion of training for each roofer employed on this project shall be submitted to Owner. Document shall be up to date, indicate worker name, certification status, year of issue and duration of such status.

Contractor shall provide a list of all workers to be employed on this project. The list shall indicate each of the workers by name and their construction trade including the Project foreman and Contractor main office contact person.

List shall include after-hour/weekend emergency phone contact personal and their office and cell phone numbers, for use in case of emergency situations.

Labors, or other non-roofer trade employees shall not be allowed to perform the actual installation of any part of the panel roof system manufacturer warranted roof system required by this Section without manufacturer documentation of proper training, as required herein.

**Note to Specifier:**

For Projects with AE, Agency or Owner over-site, Roofing Contractor MUST submit the specified amount of membrane supplier’s current paper-print installation and detail manual.

Contractor shall obtain and provide Owner with the panel roof system manufacturer most current dated three (3) ring or spiral bound installation and detail manual.

Contractor shall perform work required using details provided within the specifications, on the drawings or as required by the metal roof system supplier for a proper watertight installation and to allow issuance of warranties required herein.

All system components not specifically identified herein but required by the panel roof system manufacturer or the roof system installed by the Work required in the Project Manual shall be provided and included in the panel roof system manufacturer watertight warranty as required herein. System components required by the Work in the Project Manual but otherwise not warranted by the panel roof system manufacturer shall be upgraded to be panel roof system manufacturer specific products at the time of bid such that they are covered by the warranty required herein.

Provide all equipment recommended by the panel roof system manufacturer for proper installation of the materials specified.

Roofing installations shall comply with fire resistive rating as defined in the Wisconsin Administrative Code. Required rating on these roofs: U.L. Class A.

It is the responsibility of the General Prime Contractor to obtain the services of competent licensed sub-contractor’s to perform the Work associated with these bid documents.

Electrician Contractor: For removal and reinstallation of roof curb-mounted exhaust fans and associated covers, ventilators, electrical equipment associated wiring connections at the unit(s) as required to perform the Work.

Agency is responsible for disconnect where wiring must be pulled or cut and conduits relocated to allow installation of the new roof system.

Plumber Contractor: To re-lead drain pipe, repair and/or reset the roof drain bowls to interior piping as required to perform the Work required on this project.

Mechanical Contractor: For removal of belt, chain driven and/or electrical exhaust fans and associated flex connection and duct runs/piping and its associated roof curb penetration.

The Contractor shall raise all existing mechanical and electrical trades’ roof system penetrations to a minimum height above the roof system of 8”.

Contractor shall notify the Agency Contact 24 hours in advance of all Electrical, Plumbing and Mechanical disconnections.

**Note to Specifier, Used for Existing Conditions:**

Lightning Protection Contractor: For removal, re-installation, replacement of broken components and written verification as stated in specification section 26 41 00 of existing cabling, lightning rods, associated products and proper anchoring, fastening and/or adherence of all of cabling and rods and/or rod base plates. Verify that this installation does not interfere with the proper installation of the roofing metal flashing and its clip/cleat fastening point. The lightning protection system rods shall not be installed nor fastened to any horizontal portion of the roof system metal flashing or coping.

It is the responsibility of the Agency to perform inspection of the roof areas to be replaced by this project and to provide the following services:

Agency is responsible for the following: Existing Electrical, Plumbing and Mechanical installations and associated equipment pipe and duct runs shall be identified/verified by the State Agency as in use or be spray painted in ORANGE by the Agency if they are abandoned or shall be abandoned and shall be removed by this roofing Contractor, and verify that the electrical run is terminated, prior to start of work by Contractor. Electrical conduct runs lying directly on the existing roof membrane, or fastened to perimeter wall or metal flashing or coping shall be relocated by the Agency prior to start of work.

**PRODUCT DELIVERY, STORAGE AND HANDLING**

Make no deliveries to the project site until ready to install or approved storage is provided. The State will not accept delivery nor will the State be responsible for any materials or equipment stored on the premises.

Deliver materials in original unopened containers of packaging clearly labeled with manufacturer’s name, brand name, instructions for use, all identifying numbers and U.L. labels.

Deliver materials in sufficient quantity to allow continuity of work.

Materials used on the job must be stored in such a manner as not to create a nuisance or hazard.

Store materials on clean, raised platforms, with breathable, weather protective covering when stored outdoors. Provide continuous protection from materials against weathering and moisture absorption.

Factory applied "shrink-wrapping" is not considered to be an acceptable weather protective covering. Improper storage practices will be grounds for rejection of questionable materials.

Store flammable products away from spark or open flame.

Store primers, coatings, sealants and similar materials between 60 degrees and 80 degrees Fahrenheit.

Contaminated and Damaged Materials: Remove damaged or contaminated materials from site.

DO NOT store materials in a manner which will overload any portion of the building.

Handle all materials in a manner which will not damage the material. All damaged materials shall be removed from project site.

Select and operate material handling equipment and store materials as not to damage existing construction or applied roofing, and without overloading the building structural system.

**SUBMITTALS - TECHNICAL AND OTHER DOCUMENTS**

**At the preconstruction meeting and prior to start of work,** **submit the following for approval by Owner.**

Prior to the start of any work, all of the following submittals as required herein, shall be brought to the pre-construction meeting in the amount specified, for review and approval by DFD Project Manager.

The following information shall be included on all submitted documents:

Agency/Location/Address where work is performed obtained from the Agency Contact listed to include Building Name, Bldg. State Number, Roof Areas, DFD Project Number and total sq. ft. of all roof areas.

METAL PANEL MANUFACTURER WARRANTY ACKNOWLEDGEMENT

Upon receiving the Contract Offer from the Owner, Contractor shall immediately notify the panel manufacturer of intent to purchase the product and to obtain the warranty as specified by this Section.

All products installed in this roof system shall be compatible with all system components. All products installed shall be provided by the metal manufacturer and approved by the metal manufacturer to assure the issuance of the watertight warranty required herein.

Other products, not manufacturered, labeled or supplied by the metal manufacturer, but specified herein to be a part of the warranted roof system, shall be specifically identified and approved by the metal manufacturer required to provide the watertight system warranty specified herein.

Products installed but not approved in writing by the manufacturer and in turn by the AE shall be cause for rejection of that specific work and all work accomplished over that work and all products involved shall be removed and replaced at no additional cost to the contract.

**Submit**: Three (3) copies of the Contractors dated notification letter sent to the panel roof system manufacturer

**Submit:** Three (3) copies, on panel roof system manufacturer letterhead, stating acknowledgement of such notice and agreement to provide the warranty required by this Section. The letterhead acknowledgement shall include the date such letter was issued, Owner Project title, Project number, Section number(s), panel roof system manufacturer representative signature and be addressed to the Roofing Contractor.

CONTRACTOR AND WORKER QUALIFICATION

**Submit:** Three (3) copies of the panel roof system manufacturer current written documentation stating the Contractor is an ”approved Contractor applicator” in good standing, for the work specified herein shall to be submitted to Owner at the preconstruction meeting. Document shall be up to date, indicate Contractor name, certification status, year of issue and duration of such status.

**Submit:** Three (3) copies of the panel roof system manufacturer certificate of successful completion (If available from panel roof system manufacturer) of training for each roofer employed on this project shall be submitted to Owner at the preconstruction meeting. Document shall be up to date, indicate worker name, certification status, year of issue and duration of such status.

**Submit:** Three (3) copies of a list of all workers to be employed on this project. The list shall indicate each workers name and trade. Project supervisor and main contact person shall be identified. (See Quality Assurance herein)

MEMBRANE SUPPLIER INSTALLATION INSTRUCTIONS

**Contractor shall submit specified amount of manufacturer’s current paper-print installation and detail manual to be used for on-site inspection/verification of work performed.**

**Submit:** One (1) copy of the membrane suppliers most current version, complete edition paper-copy installation and detail 3-ring or spiral bound manual. Partial submittals taken from within the bound manual are not acceptable.

EMERGENCY AND OFFICE CONTACT PHONE LIST

**Submit:** Three (3) copies of the Contractor’s office superintendent and job foreman daytime, after hours and weekend office and cell phone numbers to be given to the Agency Contact at the pre-installation meeting.

MATERIAL LIST

**Submit:** Three (3) copies of a list of all materials intended for use on the project, to include roofer and all other sub-contractor composite system materials, starting at the roof deck and identified by manufacturer's name, size, thickness, type or grade. List shall be submitted on Roofing Contractor's letterhead stationery. Submit product data sheets as required.

Contractor shall state the following on the material list submittal: **“New products installed on this project do not contain asbestos”.**

SHOP DRAWINGS:

**Submit:** Three (3) copies of panel manufacturer shoip drawings with details of all project conditions, roof plan with panel layout, clip spacing, location of fixed points and expansion and contraction allowances.

Shop drawings indicating, material profile, dimensions, jointing pattern, jointing details, fastening methods, installation details, etc.;

Edge details at eaves and rakes, soffit, fascia, gutters, downspout (and their connections.)

Other pertinent details such as ridge, flashings, counterflashings, etc.

The following material samples:

Panels: One piece, full width, 12" long of each type to be used.

Accessories: One each of each anchor clip, roll formed part or press formed or molded closure.

A flat sample 6" x 6" of material for fabrication of any custom formed profile, such as hip, ridge and rake caps.

Fasteners: Two samples of each type to be used, identified as to use.

Sealant and seal tape: One sample at least 8 oz., with descriptive data.

CERTIFICATION: Provide three (3) copies of current proof of manufacturer certification for the product to be installed on the project and submit such dated certification status to DFD along with the product submittal package.

METAL PANEL COLOR CHART: Provide one (1) original color chart shall be delivered to the Agency Representative at the preconstruction meeting. Contact the Agency Representative listed on page B-1 of this specification for delivery address. Agency Representative shall select the color at the meeting or notify the DFD Project Manager and Contractor afterward via e-mail as to the color selected.

[SNOW GUARDS:

Shop Drawings: Show locations of snow guards on roof and attachment spacing.

Product Data: Include product description and installation instructions. Provide samples of clamps and 24 inch long cross member samples including color-matched metal strip, splice connector, and other hardware.]

RECYCLED MATERIALS:

**Submit:** Three (3) copies of a materials recycle plan to Owner for review. Include recycle business name, address, contact, and phone number where all recycled roofing material removed by this project will be delivered.

**Note to Specifier:**

When removing an existing roof where existing materials might contain asbestos, insert the following paragraph(s).

[ASBESTOS TESTING

**Submit:** Three (3) copies of test results including a drawing indicating location where tests samples are taken. Contractor replacing the roof system is required to take a minimum of two (2) samples of existing roof system(s) components encountered starting at the roof deck including existing vapor retarder, to be sent to a testing lab. Take two (2) sample at each dissimilair roof area. Additional samples are required where roof areas are not of the same roof system or installation period. Each test result shall properly identify the Owner Project No., project location, bldg. name, bldg. number & roof area/location where the test sample was taken. Test lab and associated removal and disposal charges shall be the responsibility of the Contractor at no additional cost the project.

A Contractor owner or employee shall have taken the exterior asbestos supervisor course and possess current documentation that they are an ‘Exterior Asbestos Supervisor’ able to take existing roof system samples as required to be tested for possible asbestos contamination.

All workers removing asbestos must be certified to perform the work.

ASBESTOS – POSITIVE RESULTS

**Submit:** Three (3) copies of the necessary regulatory notifications for asbestos removal or three (3) copies of core sample test results indicating the roofing materials slated for removal do not contain asbestos. (Refer to General Requirements Article “HAZARDOUS SUBSTANCES – ASBESTOS, LEAD AND POLYCHLORINATED BIPHENYLS (PCB’S)” for additional information.)

**Test lab results must be submitted prior to start of work]**

**Submit:** Three (3) copies of current proof of manufacturer certification for the product to be installed on the project and submit such dated certification status to DFD along with the product submittal package.

**Submit:** One (1) original metal panel color chart shall be delivered to the Agency Representative at the preconstruction meeting. Contact the Agency Representative listed on page B-1 of this specification for delivery address. Agency Representative shall select the color at the meeting or notify the DFD Project Manager and Contractor afterward via e-mail as to the color selected.

**Submit:** Three (3) sets of shop drawings showing locations of snow guards on roof and attachment spacing.

Product Data: Include product description and installation instructions to include samples of clamps, 24 inch long cross member samples including color-matched metal strip, splice connector, and other hardware.

SAFETY REPORT

**Submit:** One (1) copy of a written report to be given to the Agency Representative at the preconstruction meeting, describing in detail the Contractors implementation of specific OSHA regulations, Contractor’s worker safety program methods/means, roof perimeter safety and identification of the “watch person” required at all roof levels. Identify fire extinguisher and their locations, all equipment/operators on roof/ground in setup/storage area and travel routes used while performing the work.

MSDS DATA:

**Submit:** One (1) copy of all MSDS paperwork for each products used on this project to be given to the Agency Representative at the preconstruction meeting.

Contractor shall maintain the following at the Project site throughout construction. One (1) copy of the specifications, drawings, addenda, value enhancement, change order and all approved submittals at the project site throughout construction.

One (1) copy of the latest version of the manufacturer handbook including details and technical information concerning application techniques for all primary roofing system materials required by the work.

One (1) copy of the Material Safety Data Sheets (MSDS) manual for all materials used on this project.

**SUBMITTALS – FINAL DOCUMENTS REQUIRED UPON COMPLETION OF THE WORK:**

**Prior to final payment, submit the following to Owner as one (1) package including a cover page listing all documents sent:**

The following information shall be included on all guarantees, warranty and other submittal documents:

Agency, city or township, street address where work was performed, building name, Owner Project number, Owner (DOA) building #, all roof areas involved and total sq. ft. of all roof areas.

**Note to Specifier;**

Require Contractor to take digital photo records, as required.

DIGITAL PHOTOS:

**Submit:** One (1) copy of a CD with all photos taken.

Provide digital camera photos throughout the project as required by these specifications and/or requested by Owner.Contractor shall take multiple digital camera photos of the following to be submitted electronically, via e-mail to Owner. **Cell phone photos are not acceptable.**

Contractor shall take and submit digital camera photos’ of the various difficult watertight locations and mechanical fastening that will be hidden from view or otherwise concealed beneath the completed work. Multiple photos shall be taken of the entire installation starting at the roof deck and continuing throughout the roof system installation as it progresses in layers, as required per specification

Contractor shall take and submit digital camera photos of all changes to the scope of work to include existing conditions as the work takes place in its various stages of demolition and of the new Work as it takes place throughout its various stages.

Provide digital camera photos of the completed work. Photos shall include the various metal flashing details, transitions and penetration height changes and in general an over-all view of the field of all roof areas. Photos shall be identified by the roof area where photos are taken.

[RECYCLED MATERIALS

**Submit:** Three (3) copies of a completed material recycle plan to Owner for review. Include recycle business name, address, contact, and phone number where all recycled roofing material removed by this project will be delivered.

Upon completion, Contractor shall submit a final summary of the progress reports, including the percentage of recycled waste (weight or volume) to the quantity of waste that would have been otherwise land filled.

Submit recycler receipt for all deliveries showing all received product their weight and % calculation as described in GENERAL REQUIREMENTS, Article 38.

Submit a final summary of the progress reports, including the percentage of recycled waste (weight or volume) to the quantity of waste that would have been otherwise land filled.

Submit recycler receipt for all deliveries showing all received product their weight and % calculation.

Material kept for reuse and delivered to the Contractor’s property or given away at the site by the Contractor shall be identified as well. The total sq. ft. bulk sum of all material shall be recorded and submitted.

**Note to Specifier;**

Delete the following waste manifest requirement where BUR system or vapor retarder are not involved in existing roof system removal.

[WASTE MANIFEST:

**Submit:** Two (2) copies of the Waste Manifest Records to DFD Project Manager if required in accordance with General Requirements Article “HAZARDOUS SUBSTANCES – ASBESTOS, LEAD AND POLYCHLORINATED BIPHENYLS (PCB’S)”.]

Certification: Installer's certification that snow guard system was installed in accordance with manufacturer's instructions and accepted Shop Drawings.

STATE OF WISCONSIN ROOF GUARANTEE:

Submit one (1) original guarantee as required herein. (Refer to GUARANTEE article in Part 1 of this Section).

METAL PANEL ROOF WARRANTY

**Submit:** One (1) of the original membrane suppliers warranty of all membrane warranties required herein. (Refer to GUARANTEE article in Part 1 of this Section).

[LIGHTNING PROTECTION CERTIFICATION**:**

**Submit:** One (1) original document of all testing required by Specification Section 26 41 00.1).]

SETTLEMENT CERTIFICATE [AND WAGE RATE AFFIDAVIT]:

**Submit:** One (1) copy of each document.

The following information shall be included on all submittal documents.

Agency/Location/Address where work is performed to include the Building Name, Bldg. State Number, Roof Areas, Owner Project Number and total sq. ft. of all roof areas.

**SITE CONDITIONS**

Apply roofing in dry weather. All roofing materials installed during rain shall be removed and replaced with dry materials at Contractor's expense.

DO NOT apply roofing unless authorized by the [Architect/Engineer] when the working hours ambient temperature is below 32 degrees Fahrenheit. Under no circumstances will any seaming, flashing or adhesive activities be allowed when the ambient temperature is below 20 degrees Fahrenheit, or the wind chill factor is below 0 degrees Fahrenheit.

Existing materials designated to remain, which are damaged or defaced as a result of the work shall be replaced at Contractor's expense to like new condition.

[Reinstall] [Install] all rooftop mounted equipment in a watertight manner and repair any damage to sheet metal or other components related to connection and protection of the roof system.

Protection of surfaces:

Take every precaution to prevent water leakage, or debris falling into the building interior, or other such occurrences. Contractor is responsible for any damage to the building interior, or contents, during [reroofing] [construction].

Provide special protection or avoid heavy traffic on completed work. Temporary walkways and work platforms shall be provided as necessary.

[Wall surfaces shall be protected with tarpaulins or other suitable cover to prevent damage, staining or discoloration that might result from operations such as removal, disposal, replacement or removing of equipment or materials to the roof surface. Windows, doorways, docks, walkways, etc. may require special protection measures.]

[Provide 3-sided enclosures at all building entry areas to allow access to the building during demolition and construction activity. Minimum enclosure construction requirements are as follows;

Building entry enclosure shall start at a minimum of 10’-0” beyond the building eave or edge slide-off and/or drop-off area.

Over-head: ¾” CDX plywood mechanically fastened or secured to minimum of 4 wood scaffolding planks securely fastened over properly braced walk-through steel scaffolding.

Side: ¾” CDX plywood mechanically fastened or secured to each side of the walk-through steel scaffolding to provide complete enclosure.]

[Removal and disposal of materials:

All materials to be disposed of shall be loaded directly into trucks by means that will prevent damage to existing or new surfaces and to control pollution. Free-fall of debris from heights over 15’ will not be allowed.]

The Contractor is responsible for any charges, such as landfill fees, incurred for disposal of materials.

PART 2 - PRODUCTS

**SYSTEMS DESCRIPTION**

New roofing system shall be prefinished sheet metal, with minimum 1-1/2” [2-0”] standing-seams. Panels shall be approximately [other] [16”] [18”] in width with intermediate stiffener ribs. Panel seams shall be mechanically rolled to form a double-lock. Fasteners shall be concealed.

Clip-over, or pressure caps installations are not acceptable standing seam metal panel applications.

System shall carry an Underwriters Laboratories (UL) Class 90 wind uplift rating.

All products used in this installation shall be compatible with materials used in Section(s) **[insert appropriate roofing specification section number(s)].**

**SHEET METAL MATERIALS**

Roof panels shall have a [1-1/2”] [2-0”] high vertical leg double lock standing seam.

Roof panel seam shall have a thermally-applied in-seam sealant.

[Wall panel:] [Same as roof panels].

[Provide tapered panels as necessary to match existing panel layout.]

Roof Panel Anchor Clips: Manufacturers standard clip that allows for required thermal movement.

Prefinished Galvanized: ASTM A653, G-90; [22] [26] 24 gauge galvanized steel coated with a minimum 70% Kynar (Kynar 500) flouropolymer resin of 0.9-1.1 mil total dry film thickness and primed on the reverse side a wash coat of 0.3-0.4 mil dry film thickness; Roof Panels, Associated Metal Flashings, [Gutters and Downspouts]. Color to be chosen from the manufacturer's standard [custom] color selection at the preconstruction meeting. Texture shall be smooth [embossed].

**Note to Specifier:**

Backer-rod would be a value improvement option to place under the metal pans as they are being installed, at the mid point of the pan width, top to bottom of the run, to help prevent possible movement canning thereby improving the esthetic appearance and value of the roof system.

[5/8” closed cell backer-rod ]

Galvanized: ASTM A653, G-90; galvanized steel. Thickness as follows:

22 gauge for continuous cleats.

[24 gauge for pourable sealer pans, sleeves and hoods.]

[24] [26] gauge roof panels.

[Aluminum: ASTM B209, Series 3000, Temper H-14; [0.032”] [0.040”] [0.050”] [mill finished] [clear anodized] [prefinished] aluminum [coated with a minimum 70% Kynar (Kynar 500) flouropolymer resin of 0.9-1.1 mil total dry film thickness and primed on the reverse side a wash coat of 0.3-0.4 mil dry film thickness. Color to be chosen from the manufacturer's [standard] [custom] color selection at the preconstruction meeting. Texture shall be [smooth] [embossed].

**Note to Specifier: Typically, 0.040” material is used on most State projects.**

[Stainless Steel: AISI, Type 304, No. [2B] [2D]; [26] [28] gauge stainless steel.]

[Copper: ASTM B370, Temper H00; [16] [20] oz. copper sheet.

**Note to Specifier: Cleats shall be formed from 20 oz. material, most other profiles from 16 oz.**

[Lead-Coated Copper: ASTM B101, Temper H00; [16] [20] oz. lead-coated copper sheet**.**

**Note to Specifier: Cleats shall be formed from 20 oz. material, most other profiles from 16 oz.**

[TCS: ASTM A308, Coating minimum LT40; [26] [28] gauge terne-coated stainless steel.]

**ACCESSORIES**

Anchor Clips: Non-magnetic stainless steel or aluminum coated with nylon to minimize wear from thermal movement. Fasteners in support and screws installed in clips shall be fully recessed so that no sharp edges come in contact with the roof material. Clip shall allow for adequate thermal expansion and contraction of the panels system.

[Thermal Barrier: 5/8” [other] thick Fiberglass faced gypsum board with non-asphaltic coating. Non-structural, glass mat-faced roof board featuring a non-combustible, water-resistant and silicone-treated gypsum core panel and non-asphaltic coating ASTM C1177. UL and FM. DensDeck Prime or acceptable equal.

Mechanical Fasteners for Attaching Thermal Barrier to Steel Decks: #12 (.235” thread diameter) coated screw and three (3) inch galvalum distribution plate. Fasteners and plates shall meet FM # 4470 crteria. Steel deck fastener to be at least 3/4" longer than thermal barrier thickness. Fastener to penetrate top flange and not extend below bottom flange of steel decks.

Butyl Sealant Tape: 3/16 x 7/8” mini-triple bead butyl rubber tape designed for sealing metal roofs. Schnee-Morehead SM5227 Tacky Tape or as acceptable to roof panel manufacturer.

Butyl Sealant (Gun Grade): Non-skinning, non-sag gun grade butyl sealant designed for standing seam metal roofs. Sika Sikalastomer 511, Tremco TremPro JS-773 or as acceptable to roof panel manufacturer.

Expandable Sealant Tape: Self Adhering open-cell plyurethane foam impregnated with a water based acrylic-modified asphalt emulsion. Designed to seal out moisture on metal roofs. Size to obtain a maximum of 80% compression form fully expanded size. Emseal “AST Hi-Acrylic”]

[Vent Baffle Material: Flexible three-dimensional matting manufactured from a non-woven polyester fiber material with no backing or fabric covering.]

Pipe Flashing: EPDM boot bonded to aluminum base with manufacturers 20 year warranty. Buildex Decktite or as acceptable to roof panel manufacturer.

Pipe Stabilizer: Polycarbonate stabilizer arm designed to break apart snow slides and secure pipe upright and intact. Vent Protect “Vent Protect”

[Snow Guards: “ColorGard” snow guard with non-penetrating S-5 clamp attachment and roof panel color insert. Provide bar clip with rubber foot to break-up snow slides. ColorGard or acceptable equal.]

Clamps:

Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.

Clamp model: No. [S-5-U.] [S-5-T.] [S-5-Z.] [S-5-E.] [S-5-K.] [S-5-R.] [S-5-T2.]

Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch diameter, with round nose point.

Attachment bolts: 300 Series stainless steel, 18-8 alloy, 10 mm diameter, with flat washers.

Cross Members:

Manufactured from 6061-T6 alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.

Receptacle in face to receive color-matched metal strips.

Provide splice connectors ensuring alignment and structural continuity at end joints.

Color Strips: Same material and finish as roof panels; obtained from roof panel manufacturer.

Snow and Ice Clips: Aluminum, with rubber foot, minimum 3 inches wide.]

Fasteners: Any exposed fasteners shall be factory-colored to match metal. Where not specified, size fasteners to suit conditions.

Metal to Metal: #10 x 3/4" self-drilling, self tapping stainless steel sheet metal screws with pan or hex heads. [3/16” diameter blind copper rivets] [1/8” diameter color-matched pop rivets.]

For weathertightness, screws shall have separate washers with hot bonded neoprene faces, and pop-rivets shall be set in wet sealant.

Metal to Wood: Zinc-coated lag-type fasteners of size and length to suit conditions.

Metal to Wood, at exposed locations: #10 x 1-1/2" stainless steel screws with metal capped neoprene or PVC washers.

[*Other* Metal to Wood (concealed locations): 1-3/4" hot-dipped galvanized roofing nails.]

Metal to Concrete or Masonry: Hardened, self-tapping screw type fasteners.

[Metal to Concrete or Masonry: Zinc-alloy expansion shields with hardened steel pins.]

[Copper to Wood (concealed locations): 1-3/4" copper roofing nails.]

Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, M, G, A or O; FS TT-S-00230C, Type II, Class A; one-part polyurethane base, elastomeric joint sealing compound such as Sika Chemicals "Sikaflex 1a", Sonneborn-Contech "Sonolastic NP1" or Tremco "Vulkem 116" or “Dymonic".

Compression Type Metal to Metal Joints: Butyl type sealant or tape recommended by the panel system manufacturer.

Metal to Other Surfaces (Masonry, etc.): FS TT-S-00230C, Type II, Class A; one part polyurethane base, elastomeric sealant such as Sika Chemicals "Sikaflex 1a", Sonneborn-Contech "Sonolastic NP1", Mameco International "Vullcum 116" or Tremco "Dymonic".

Synthetic Underlayment: equal to ‘Titanium’ UDL 50 or ‘Sharkskin Ultra’.

[Rosin Paper: Unsaturated rosin sized building paper, minimum 4 lbs./square.]

[Underlayment: ASTM D226, No. 30 asphalt saturated roofing felt.]

[Plastic Cement: ASTM D4586.]

[Ice Dam Flashing: By same manufacturer as synthetic underlayment ‘Titanium PSU 30’ or ‘Sharkskin SA’.]

[Flexible Flashing: 0.045" EPDM or 0.020" vinyl.]

[Solder: ASTM B32; 50% pig lead - 50% block tin.]

[Flux: Muriatic acid killed with zinc, or an approved brand of commercial soldering flux.]

Other products, not specifically described, but required for a complete and proper installation of the work in this section shall be selected by the Contractor subject to the approval of Architect/Engineer.

part 3 - EXECUTION

Refer to the drawings included with these specifications.

Fabricate and install all material in accordance with the latest edition of SMACNA, the best-accepted practices of the industry and these specifications.

**EXAMINATION AND PREPARATION**

Inspect existing roof to verify surface dry and free of snow or ice, free of depressions, waves, or unused projections.

Bring to the Project Representative’s attention any conditions detrimental to the proper and timely completion of the work. Do not proceed until any unsatisfactory conditions have been corrected.

Beginning of installation means acceptance of existing conditions.

Field measure site conditions and submit all shop drawings for approval prior to fabricating work.

Contractor shall obtain and use profile seamer as recommended by the roof panel manufacturer

Relocated pipes that will occur within four (4) inches of a seam.

**fabrication**

Fabricate new sections as detailed. Form sections true to shape, accurate in size, square and free from distortion or defects. Do not “punch” metal at brake points.

Unless detailed otherwise, hem exposed edges on underside 1/2"; fabricate vertical faces with bottom edge formed outward 3/4" at 45 degrees and hemmed to form drip.

Outside corners shall be prefabricated such that the outside face of section is broken at corner; seam at corner is unacceptable. Miter and seam top of outside and inside corners using rivets and specified polyurethane or manufacturer recommended and approved sealant. Corner pieces shall be a minimum of 18” in length, in both directions from the corner.

*[For copper* Provide soldered seams at inside and outside corners [and transition between coping and expansion joint cover]. Outside corners shall be prefabricated with outside face of section broken at corner; seam at corner is unacceptable and will be cause for rejection of the work. Pieces shall be a minimum of 18” in length, in both directions from the corner.]

[For [pitch] [pourable sealer] pans and sleeves, rivet and solder seams and corners.]

**WORKMANSHIP**

Make all work weather and watertight throughout; provide allowances for material expansion and contraction.

**Note:** Oil canning is an aesthetic issue that can be the result of panel forming and installation. As such, oil canning will be cause for rejection of installed work.

All valley and valley edge/fascia installations shall be recorded from deck to finish by taking digital photo’s of the installation as each product is applied over the preceding product. Digital photos shall be properly identified as to their location on the roof and sent to the DFD Project Manager electronically.

Contractors workers shall carry a container or apron to deposit all metal cut offs, droppings or other debris created by the work. Waste shall not be dropped to the roof and ground.

Sections shall be uniform, accurately fitted so as to line up straight and true and rigidly secured in place, without kinks or buckles. Joints at corners and angles shall be smooth, tight and neatly mitered and seamed.

Unless detailed otherwise, lap all vertical joints between adjacent sections a minimum of 2".

Where metal is hooked to a continuous cleat, crimp metal to cleat along entire length.

[Soldering:

[Rivet pieces prior to soldering.]

Soldering shall be done with heavy soldering coppers of blunt design, properly tinned before using. Coppers shall weigh not less than 10 pounds per pair. Use of a gas torch is not allowed.

Follow manufacturer's recommendations for cleaning, tinning and soldering metal. [Tin edges of copper before soldering.] [Wire brush all edges of lead-coated copper to a bright shine before soldering.]

Soldering shall be done slowly to heat sheet metal thoroughly and to sweat solder completely through full width of seam. Whenever possible, soldering shall be done in flat position; seams on slopes shall be soldered a second time.

Clean all flux from metal after soldering is completed.]

**Installation**

[Install wood blocking as indicated on drawings and as per Section 06 10 53.]

[Install batt type insulation as indicated on drawings.]

**[Thermal Barrier:**

On metal decks, mechanically fasten a thermal barrier layer to the metal deck at the rate of one fastener per two (2) square feet. All continuous joints shall be parallel to deck ribs with other joints staggered. Thermal Barrier shall bear a minimum of 1-1/2" on steel deck flanges. Fastener shall penetrate upper flange of metal deck and not extend below bottom flange.

Lay with long joints continuous short joints staggered.

No more thermal barrier shall be laid in a day than can be covered with roofing that same day. Tie offs and offsets shall be staggered a minimum of 12" at the base, fill and overlay layers.

Press units against walls, adjoining units, wood blocking, etc., to form tight closed joints. Cut insulation to fit neatly around each projection through roof. Maximum joint opening and elevation difference shall be 1/8".]

**Ice Dam Flashing Membrane and Underlayment:**

Self-Adhering Ice & Water Backup Protection Membrane:

If weather is below 400F, store material for a minimum of 24 hours above 600F prior to installation. Use product within one hour of removal from heated storage. If material does not sufficiently seal contractor may be require to provide supplemental hot air during installation to enhance adhesion.

Install over entire area per specifications and in accordance with the manufacturer's additional detailed instructions, directly to the thermal barrier substrate.

Prime thermal barrier if required by manufacturer.

Digital Photos: Contractor shall take multiple digital photos of all locations showing all phases of the watertight work required, identify all digital photos per each location and send digital photos to the DFD Project Manager at end of the project construction phase and prior to final payment.

Photos shall be taken at all phases of the valley installation and especially the edge terminations to show water tightness, at all valleys.

Deck Penetrations: Over deck, one (1) course wide around all penetration in the field of the roof including curbs, plumbing, mechanical or electrical piping, dormers, other vertical field or roof installations. One (1) course width at all roof to wall locations or other vertical installations. Membrane shall turn up onto all vertical penetrations 4” minimum.

Underlayment shall be installed per manufacturer’s printed instructions. Overlap 4 inch minimum horizontal laps and 12 inch minimum vertical laps.

Prior to membrane installation, sweep the entire roof deck to remove loose nails, fasteners, wood dust/particles and other debris and verify that all nails or other fasteners in decking are flush to deck substrate.

[Self-Adhering Ice & Water Backup Protection Membrane: Install per specifications and in accordance with the manufacturer's additional detailed instructions, directly to the deck substrate as follows:

Eave Edge: Over deck, starting at 1-1/2” beyond the eave and rake edge, up slope a minimum of 5'-0” (two (2) courses) from the roof eave, or more, to achieve a minimum of no-less than a 3’-0” width deck coverage up the slope beyond the exterior finished (heated area) wall of the building.

Continue through valley areas to be a minimum of 2’-0” beyond centerline of valley onto the opposite slope, both directions.

Rake Edge: Over deck, starting at 0’-6” minimum lap onto the eave edge self-adhering ice & water backup protection membrane application and 1-1/2” beyond the rake edge and adhered to fascia, up slope and over the ridge onto the opposite side slope, 0’-6” minimum.

Deck Penetrations: Over deck, one (1) course wide around all penetration in the field of the roof including curbs, plumbing, mechanical or electrical piping, dormers, other vertical field or roof installations. One (1) course width at all roof to wall locations or other vertical installations. Membrane shall turn up onto all vertical penetrations 4” minimum.

Valley: Over deck, two (2) courses wide up the valley, 1st course side lapped 0’-6” minimum beyond centerline of valley onto the opposite slope decking, 2nd course side lapped 0‘-4” minimum onto 1st course membrane application and both course shall continue up slope over the ridge onto the opposite slope, intersecting roof slope or up intersecting wall 1’-0” minimum to achieve watertight installation.

Fill in voids in decking at valley deck material butt joints prior to membrane installation to achieve a true, tight void less surface.

Valleys over 20’ in length shall receive two (2) additional course width installations, side lapped 0‘-4” minimum onto previous course membrane, continuing up slope and terminating at a point half the length of the valley run.

Membrane shall be cut, lapped and properly adhered and lapped minimum of 2” onto fascia at bottom of valley/deck to provide a void-less and complete watertight closure.]

**[Valley Metal Flashing, Per Section 07 63 00:**

Valley metal shall be installed over self-adhering ice & water backup protection membrane and starter piece shall continue across edge metal flashing. Field hem eave-end of valley metal flashing a minimum 3/4”. Install and slide starter valley metal flashing into place with hemmed edge fit over eave edge-metal flashing.

Eave Termination: valley membrane and metal flashing terminations shall be installed without voids and be watertight.

Digital Photos: Contractor shall take multiple digital photos of a step by step installation of the valley products and especially of all end-of-valley locations showing all phases of the watertight work required. Identify all digital photos as to location on the roof and send all digital photos to the DFD Project Manager at end of the project construction phase and prior to final payment.]

**Metal Roof System Fabrication:**

Panels shall be fabricated in full lengths from ridge to eave without end laps. Panels shall be 16" wide with concealed anchors that resist wind uplift yet permit expansion and contraction with temperature changes. Two intermediate stiffener ribs shall be located in the flat pan to minimize oil-canning and telegraphing of structural members.

Standing seams shall be a minimum of 2” high. Ribs shall be securely locked over anchor clips with a field operated roll-forming tool.

Insofar as possible, attachment screws shall be eliminated in favor of concealed cleats or clips.

**Workmanship**:

All work shall be installed in accord with the approved shop details under direct supervision of an experienced sheet metal craftsman. Attachments and joints shall allow for expansion and contraction from temperature changes without distortion or elongation of fastener holes. Flashing shall be installed in strict accord with the recommended practice in the AA, NRCA and SMACNA architectural sheet metal manuals: without fasteners in end laps and isolated from dissimilar materials.

Completed work shall be plumb and true, free of scrapes and dents. Panel ribs shall be on the module indicated in the contract drawings within the tolerance allowed by the actual construction dimension. Excess sealant shall be removed and touch-up paint applied to any areas where paint scrapes occur. Any panels, which are badly damaged and in the judgement of the architect cannot be repaired shall be removed and replaced.

Form ridge caps of sheets not exceeding 10 feet in length. Lap joints 6 inches.

**Metal Roof Panel Installation:**

Install roof panels symmetrical across individual roof area.

At time of installation confirm expansion and contraction allowances with A/E

Provide first clip a maximum of [16] 18 inches up from eave and down from upper termination.

[OPTION: Provide 5/8” closed cell backer-rod secured to substrate such that the backer-rod is at mid point of each panel to be placed and runs continuous the full length of the panel.]

Provide intermediate clips a maximum of 36 inches on center in the field of the roof and 12 inches on center along an eight (8) foot perimeter of each individual roof area.

Panel fixed point on all areas shall be the high side of each area.

Total panel expansion/contraction allowance shall be 3/4 inch. Set points of clips and panel overlaps at eave shall be determined at time of installation.

Fold tab ends of panel seams over the end of the seam. Always fold tab to the inside of the seam.

Apply supplemental sealants as required by drawings and manufacturer.

Mechanically seam all metal panel seams.

**Flashing and Counterflashings:**

Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Seal all joints watertight.

Counterflashing shall be creased longitudinally just enough to provide a spring action that will hold bottom edge firmly against base flashing. Notch and lap all joints a minimum of three (3) inches.

Install appropriate flashings at all exhausts, vents and penetrations not specifically called out but required.

**Counter Flashing Inserted Into Reglet:**

Provide new reglet into an existing masonry joint. Reglet shall be 1½ inches deep by full joint width. Clean joint of dust and loose masonry when finished.

Make up straight runs using 8'-0" or 10'-0" long sheets. Counter flashing shall be creased longitudinally just enough to provide a spring action that will hold bottom edge firmly against roof flashing.

Form counter flashing with a back leg 1/4 inch longer than joint width, bent upwards 120 degrees. Provide 1½ inches between back leg and counter flashing leg brake points.

Unless otherwise noted, counter flashing shall be run in a straight line and shall lap top of flashing by a minimum of three (3) inches.

Counter flashing shall be notched and lapped 1-1/2 inches at inside corners. At joints, remove hem 1½" and taper cut drip on underlying piece, lap joints 1½". Outside corners shall be notched and seamed.

Notch and lap counter flashing 1-1/2 inches.

Insert new counter flashing and hold with lead wedges 8" o.c., or lead expansion fasteners 12" o.c. Wedges and/or expansion fasteners shall be fully inserted into reglet. Fill and seal reglet with caulking, force sealant into all voids and tool joint when finished.

**Counter Flashing Attached to an Existing Receiver:**

Make up straight runs using 8'-0" or 10'-0" long sheets. Counter flashing shall be creased longitudinally just enough to provide a spring action that will hold bottom edge firmly against roof flashing.

Unless otherwise noted, counter flashing shall be run in a straight line and shall lap top of flashing by a minimum of three (3) inches.

Counter flashing shall be notched and lapped 1-1/2 inches at inside corners. At joints, remove hem 1½" and taper cut drip on underlying piece, lap joints 1½". Outside corners shall be notched and seamed.

Fasten counter flashing to receiver with stainless steel sheet metal screws 30 inches o.c. maximum. Do not fasten through joints, stagger joints between counter flashing and receiver.

**Roof Edges (Eaves and Rakes):**

Fabricate roof edge from 8’-0” or 10’-0” long sheets with a six (6) inch roof flange.

Notch and lap pieces three (3) inches. Start at eave and work up rake. Notch and seam corners.

Fasten edge six (6) inches o.c.

**Standing Seam Roof and Fascia Panels:**

Standing seam roof panels shall be formed from 0.040 prefinished aluminum. Width of finished pan shall match width of overlaying roof panel with a finished seam height of one inch.

Secure each panel with 0.032 aluminum cleats 12 inches o.c., minimum of two (2) cleats per panel. Cleats shall be two (2) inches wide with one end locked into standing seam and other end fastened with two (2) copper nails or stainless steel screws to substrate and tab folded back over heads.

Standing Seam: Standing seams shall finish one inch high with seams. One side edge shall be bent up 1-1/2 inches and the opposite side 1-3/4 inches. First fold shall be single fold 1/4 inch wide; second fold shall be 1/2 inch wide. Locked portions of standing seam shall be five (5) plies in thickness.

**Soffit Panels:**

Provide soffit panels where shown on drawings.

Secure soffit panels in place

.

Provide trim as required around recessed windoe openings.

**[Gutter:** ***(External.)***

[Fabricate new [indicate size] gutter to conform to profile of existing brackets.]

Provide [24 gauge prefinished steel] [aluminum gauge 0.032”seamless] gutter and new hangers [per manufacturer specifications.]

[Provide expansion joints as detailed where indicated on the roof plan.]

Temporarily hang gutters from fascia using roofing nails through the top of the back leg only @ 12" O.C. Install hanger straps @ 24” O.C. and secure to fascia with two stainless screws as detailed. Gutters shall have a net positive slope of 1/8" per foot between the high point and downspouts.]

**[Downspouts:**

Install downspouts and associated elbows [in locations shown on the roof plan] [at existing locations] as follows:

Downspouts shall be [3” x 5” closed] [4” x 6” closed] [open style] [3” x 5” open] [ 4” round] [5” round] [other].

Gutter outlets shall extend into downspout a minimum of 3”. Upper end of outlet tube shall be flanged ½” and riveted and [soldered] [sealed] to inside of gutter. Provide removable strainers at all outlets.

Fasten downspouts with hangers at eight (8) feet O.C. Install an additional hanger one foot from the top and bottom, and within one foot of all elbows.

Downspouts shall have elbows and splash blocks at the bottom to divert water away from the building foundation.

Mount downspout a minimum of 1” off all surfaces]

**[Metal Roof Systems Valley:**

Valley metal to be prefinished, panel guage as specified, minimum 18” wide stock.

Fabricate valley metal [with a one inch high inverted “V” down the center for open-style valleys. [of flat stock.]

Fasten valley metal sections along top edge only. Lap sheets a minimum of 8” and seal seams with two (2) beads of sealant. Notch ¾” lock seams on underlying sheet to facilitate laps.

Apply [ice protection membrane and] felt underlayment in accordance with Section [07 63 00] [07 31 13] [07 31 29].

Secure sections to deck with 2” wide by 3” long cleats with ¾” hook on one end. Hook cleats into valley seam @ 24” O.C. and secure to deck with two (2) nails; fold tab over nail heads.

3/4” single-lock seams along the sides on metal roof systems.

Provide complete moch-up of valley installation including all membranes reuired.]

**[Snow Guards:**

Prior to beginning installation, verify that:

Panel seaming is complete.

Panel attachment is sufficient to withstand loads applied by snow guard system.

Installation will not impede roof drainage.

Clean areas to receive attachments; remove loose and foreign matter that could interfere with installation or performance.

Install system in accordance with manufacturer's instructions and approved Shop Drawings.

Place clamps at maximum 32 inches on center or as required by in-service loads.

Place clamps in straight, aligned rows. On tapered panels stagger clamp assembly.

Place both set screws on same side of clamp.

Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.

Insert color-matched metal strips into cross members, staggering strips to cover cross member joints.

Attach cross members to clamps; tighten bolts to manufacturer's recommended torque.

Install splice connectors at cross member end joints.

Do not cantilever cross members more than 3 inches beyond last clamp at ends.

Install one SnoClip per panel between panel seams.

Snow dams shall be mechanically fastened on standing seam of metal panel.

Pipe/penetration brace devises shall be mechanically fastened to the standing seam of the metal panel.

Adhered or mechanically fastened snow dams or pipe/penetration braces meant to be applied to the metal pan are not acceptable.

Install metal snow dams as indicated on drawings and per manufacture’s instructions.]

**[Wall panel:**

Provide wall panels where shown [over self adhering underlayment.]

Fabricate and secure wall panels [similar] [per details] to roof panels.]

**Miscellaneous:**

[Contractor shall remove and reinstall existing lighting protection, antennas or other roof or wall mounted equipment as necessary for proper installation.]

Install appropriate flashings at all exhausts, vents and penetrations not specifically called out but required.

Secure [remount] all rooftop equipment. Use threaded fasteners.

**CLEANING**

The work areas including the roof and ground below shall be inspected on a daily basis for waste/droppings.

Properly dispose of all cut offs, droppings and other debris on a daily basis to avoid damage or injury to others and/or owners property.

\*\*\* END OF SECTION \*\*\*