



EM Craftsman™ Series Metal Roof Panel

EXCEPTIONAL® Metals' EM Craftsman™ Series is a snap-on batten roof system, available in narrow, wide and high profiles: small (SB) and high batten (HB). EM Craftsman™ Series is a water shedding system that can be used for roofs and fascias only when installed over a water-proofed solid substructure. EM Craftsman™ Series design makes complicated building transitions simple without the necessity of flashings. Slope changes from roof-to-fascia-to-soffit can be made with one continuous pan and batten.

EXCEPTIONAL Metals, partnered with MBCI® to manufacture metal panels with the most technologically advanced manufacturing line in the United States. Our metal panel colors and applied finishes allow for a multitude of design opportunities. EXCEPTIONAL Metals offers a full array of accessories, including ventilators, light transmitting panels, louvers, fasteners, touch-up paint and more. In addition, we have a large selection of coils and flat sheets in various widths and gauges. EXCEPTIONAL Metals offers a wide array of standard trim and flashings for each of its metal roof and wall panel systems. Trim and flashings are available in the same gauge and finish as the metal roof and wall panels, also EXCEPTIONAL Metals has the capability to make most custom trim profiles required for special design conditions.

Whether you're an architect looking for the best design solution, a contractor in need of efficient materials that are easy to install or a building owner looking to save money on energy and maintenance costs, our panels make the difference. Consult your local EXCEPTIONAL Metals sales representative for design assistance. Visit www.exceptionalmetals.com for a list of EXCEPTIONAL Metals office locations and contacts.

SECTION 07 41 13 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 DESCRIPTION

A. General

1. Furnish all labor, material, tools, equipment and services for all performed roofing as indicated in accord with provisions of Contract Documents.
2. Completely coordinate with work of all other trades.
3. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
4. See Division 1 for General Requirements.

B. Related work specified elsewhere:

1. Structural steel: Section 05100.
2. Steel joists: Section 05200 or 05400.
3. Flashing and sheet metal: Section 07600.

1.2 QUALITY ASSURANCE

A. Applicable Standards:

1. SMACNA: "Architectural Sheet Metal Manual," Sheet Metal and Air Conditioning Contractors National Association Inc.
2. LSGI: "Light Gage Structural Institute"
3. AISC: "Steel Construction Manual," American Institute of Steel Construction
4. AISI: "Cold Form Steel Design Manual," American Iron and Steel Institute
5. UL580: "Tests for Uplift Resistance of Roof Assemblies," Underwriters Laboratories, Inc.
6. ASTM E1592-95: "Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference," American Society for Testing and Materials
7. UL2218: Class 4 Impact Resistance Rating
8. Dade County (Florida) Acceptance Report Number 01-0221.02. (EM Craftsman™ SB Only)
9. ASTM E 283-84: "Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen", American Society for Testing and Materials.

NOTICE: Contact EXCEPTIONAL Metals for the proper combination of panel gauge, clip type, clip spacing and substructure to achieve a UL-90 rated system.

10. ASTM E 331-83: "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference", American Society for Testing and Materials. ASTM A 792-83-AZ50 (Painted) & ASTM A792-83-AZ55 (Bare Galvalume Plus®): "Specifications for Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process, General Requirements (Galvalume®)", American Society for Testing and Materials
11. ASTM E 408-71: Standard Test Method for Total Normal Emittance of Surfaces Using Inspection- Meter Techniques. (ENERGY STAR® for Roof Products).
12. ASTM E 903-96 Standard Test Method for Solar Absorptance, Using Integrating Spheres. (ENERGY STAR® for Roof Products)

- B. Manufacturer's Qualifications:
1. Manufacturer has a minimum of five years' experience in manufacturing metal roof systems of this nature. Panels specified in this section shall be produced in a factory environment (not with portable roll former with fixed-base roll forming equipment) and in line leveling assuring the highest level of quality control. A letter from the manufacturer certifying compliance will accompany the product material submittals.
- C. Installation Contractor's Qualifications:
1. Installation contractor shall be an approved installer, certified by the manufacturer before the beginning of the installation of the metal roof system, specifically for EXCEPTIONAL Metals' EM Craftsman™ metal roof system, certification by manufacturer must include the following:
 - a. Maintain \$250,000 minimum general liability insurance coverage.
 - b. Maintain statutory limits on worker's compensation coverage as mandated by law.
 - c. Have no viable claims pending regarding negligent acts or defective workmanship on previously performed or current projects.
 - d. Has not filed for protection from creditors under any state or federal insolvency or debtor relief status or codes.
 - e. Project foreman is the person having received certification by the manufacturer's specific training in the proper installation of the selected metal roof system and will be present to supervise whenever material is being installed. Specific certified installer program shall include the following:
 1. The instructor must have a minimum of 10 years' experience in the application of metal roof systems.
 2. A formal syllabus for the classroom and hands-on training.
 3. Classroom instruction with review and thorough understanding of the specific product's technical manual.
 4. Hands-on mock-up instruction with a review and thorough understand of the specific product's details.
 5. The installation contractor must pass a written and oral exam.
 - f. Provide five references form five different architects or building owners for projects that have been in service for a minimum of two years, stating satisfactory performance by the installation contractor.
 - g. Provide certification letter that installation contractor has a minimum of three years of metal product installation experience immediately preceding the date upon which work is to commence,
- D. Pre-Installation Conference
1. Prior to installation of roofing system, conduct a pre-installation conference at the project site.
 2. Attendance: Owner, Architect, Contractor, Project Superintendent, and Certified Installer.
 3. Agenda:
 - a. Roofing details and agenda
 - b. Critical work sequencing and review of phasing plan
 - c. Inspection sequencing

1.3 SYSTEM PERFORMANCE REQUIRMENTS

- A. Performance Testing
1. Metal roof system must be tested in accordance with Underwriters Laboratories, Inc. (UL) Test Method 580 "Tests for Uplift Resistance of Roof Assemblies"
 2. Metal roof system must be installed in accordance with UL Construction Method 280 or 310 (Small Batten). See the current UL Roofing Materials and Systems Directory for requirements of each Construction Method.

3. Panel clip spacing will not exceed spacing specific in the UL Constriction Method and must be designed to meet requirements of specified building codes and design loads.
4. Metal roof system must be tested in accordance with ASTM E 1592-95 for negative loading. Determine panel bending and clip-to-panel strength by testing in accordance with ASTM E 1592-95 procedures. Capacity for gauge, span or loading other than those tested may be determined by interpolating between test values only.
5. [# Small Batten or High Batten Only] Metal roof system must be tested in accordance with ASTM E 283-84 "Standard Test Method for Air Infiltration" with a uniform static air pressure differential of 4 psf. The resulting air infiltration leakage rate will be a minimum of [(16.5" Small Batten or High Batten)-(0.035 cfm/sq ft.) or (12" Small Batten or High Batten)-(0.048 cfm/sq ft.)]
6. [# Small Batten or High Batten only] Metal roof system must be tested in accordance with ASTM E 331-83 "Standard Test Method for Water Penetration" with a uniform static air pressure differential of 4 psf. The resulting water penetration rate will be no uncontrollable water leakage when five gallons of water per hour in sprayed per square foot of roof area (five gallons per hour equates to 8 inches of rainfall per hour).
7. Metal Roof Panels shall be high reflectance and high emittance in accordance with ENERGY STAR®. Initial Reflectance (Galvalume® Only) shall be at least 0.68 with tested with ASTM E-903. The three years aged reflectance shall be at least 0.57, when tested in accordance with ASTM E-1918 (Measured As Solar Reflectivity, Not Visible Reflectance).

1.4 DESIGN REQUIREMENTS

A. Roof Design Loads

1. Design criteria shall be in accordance with the most current version of [choose one: MBMA, SBCCI, UBC, BOCA, ASCE, IBC or an applicable national or local building code.]
2. Dead Loads
 - a. The dead load shall be the weight of the SSMR system. Collateral loads, such as sprinklers, mechanical and electrical systems, and ceilings shall not be attached to the panels.
3. Live Loads
 - a. The panels and concealed anchor clips shall be capable of supporting a minimum uniform live load to 20 psf.
4. Roof Snow Loads
 - a. The design roof snow loads shall be as shown on the contract drawings.
5. Wind Loads
 - a. The design wind uplift pressure for the roof system shall be as shown on the contract drawings. The design uplift force for each connection assembly shall be that pressure given for the area under consideration, multiplied by the tributary load area of the connection assembly. The safety factor listed below shall be applied to the design force and compared against the ultimate capacity. Prying shall be considered when calculating fastener design loads.
 - aa. Single fastener in each connection:3.00
 - bb. Two or more fasteners in each connection:2.25
6. Thermal Loads
 - a. Roof panels shall be free to move in response to the expansion and contraction forces resulting from a total temperature range of [# choose temperature differential based on Max. and Min. for specific area IAW MBMA Climatological Data] degrees F during the life of the structure.

B. Framing Members Supporting the SSMR System

1. Any additions/revisions to framing members supporting the SSMR system to accommodate the manufacturer/fabricator's design shall be the Contractor's responsibility and shall be submitted for review and approval. New or revised framing members and their connections shall be designed in accordance with [AISC] [AISI]

[X-SJI-X] [X-LGSI-X]. Maximum deflection under applied live load, snow or wind load shall not exceed [# choose one: L/180, L/240] span of length.

1.5 SUBMITTALS

A. Shop Drawings:

1. Submit complete shop drawings and erection details, approved by the metal roofing manufacturer, to the architect (owner) for review. Do not proceed with the manufacture of roofing materials prior to review of shop drawings and field verification of all dimensions. Do not use drawings prepared by the architect (owner) for shop or erection drawings.
2. Shop drawings show methods of erections, roof and wall panel layout, sections and details, anticipated loads, flashings, sealants, interfaces with all materials not supplied and proposed identification of component parts and their finishes.

B. Performance Tests:

1. Submit certified test results by a recognized testing laboratory or manufacturer's lab (witnessed by a professional engineer) in accordance with specified test methods for each panel system.

C. Calculations:

1. Submit engineering calculations defining all cladding loads for all roof areas based on design criteria listed in Para 1.4 Design Requirements, allowable clip loads and required number of fasteners to secure the panel clips to the designated substructure.
2. Compute uplift loads on clip fasteners with full recognition of prying forces and eccentric clip loading.
3. Calculate holding strength of fasteners in accordance with submitted test data provided by the fastener manufacturer based on length of embedment and properties of materials.
4. Submit thermal calculations and details of floating clip, flashing attachments, and accessories certifying the free movement in response to the expansion/contraction forces resulting from a total temperature differential of 110 degrees F.

D. Samples:

1. Submit samples and color chips for all proposed finishes.
 - a. Submit one 8-inch long sample of panel, including clips.
 - b. Submit two 3 inches x 5 inches color chip samples in color selected by the architect (owner).

E. Warranties

Metal roof system manufacturer shall submit a specimen copy of the warranty upon final acceptance of the project. Provide one of the following warranties:

1. Finish:
 - a. Covering bare metal against rupture, structural failure and perforation due to normal atmospheric exposure for a period of 20 years.
 - b. Covering panel finished against cracking, checking, blistering, peeling, flaking, chipping, chalking and fading for a period of twenty (20) years.
2. Weathertightness:

Metal roofing system manufacturer shall submit a specimen copy of manufacturer's Weathertightness Warranty, including evidence of application for warranty and manufacturer's acceptance of the applicator and warranty conditions.

(# choose one):

- a. Single Source Warranty (High Batten Only)
- b. Standard Warranty (High Batten Only)

F. Test Reports:

1. Submit Test Reports showing that metal panels have been tested in accordance with the Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference of ASTM E 1592-95.
2. Submit Test Reports showing that metal panels meet the air infiltration requirements of ASTM E-283-84 "Standard Test Method for Air Infiltration" with a uniform static air pressure differential of 4 psf. The resulting air infiltration leakage rate will be a minimum [16" Small Batten or High Batten-0.035 cfm/sq ft or 12" Small Batten or High Batten-0.048 cfm/sq ft.]
3. Submit Test Reports showing that metal panels meet the water penetration requirements of ASTM E 331-83 "Standard Test Method for Water Penetration" with a uniform static air pressure differential of 4 psf. The resulting water penetration rate will be no uncontrollable water leakage when five gallons of water per hour is sprayed per square foot of roof area (five gallons per hour equated to 8 inches of rainfall per hour).
4. Submit "Dade County Acceptance Reports" showing that metal panels meet the Dade County Building Code requirements.

G. Metal Roof System Fabrication Certification:

1. Submit a letter from the metal roof system manufacturer certifying the EM Craftsman™ panels have been produced in a factory environment (not job site roll formed) with fixed-base roll forming equipment and in line leveling.

H. Certified Installers Qualifications:

1. Submit certificate from manufacturer's certifying that installer of the metal roof system has met all of the criteria outlined in "1.02 C. Installer's qualifications" and is an authorized installer certified by the manufacturer.
2. Submit formal syllabus for the classroom and hands-on training.
3. Submit five references from five different architects or building owners for projects that have been in service for a minimum of two years, stating satisfactory performance by the installation contractor.

1.6 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Delivery:

1. Deliver metal roof system to job site properly packaged to provide protection against transportation damage.

B. Handling:

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

C. Storage:

1. Store bundled sheets off the ground sufficiently high enough to allow air circulation beneath the bundle to prevent rising water from entering bundle. Slightly elevate one end of the bundle. Prevent rain from entering bundle by covering with tarpaulin, making provision for air circulation between draped edges of tarpaulin and the ground. Prolonged Storage of sheets in a bundle is not recommended. If conditions do not permit immediate erection, extra care should be taken to protect sheets from staining or watermarks.

1.7 WEATHERTIGHTNESS WARRANTY

- A. The Contractor shall provide to the Owner, a Standard warranty signed by the roofing manufacturer of the EM Craftsman™ High Batten Standing Seam Roof System as outlined below:

(#Choose Single Source or Standard Elite Section)

B. Single Source Warranty:

Single Source Warranties require a certified installer on site at all times.

1. For a period of [#choose one: twenty (20), fifteen (15), ten (10) or five (5)] years from the date of substantial completion, the roofing manufacturer WARRANTS to the Building Owner ("Owner"): to furnish roof panels, flashing and related items used to fasten the roof panels and flashing including roof jack and curb attachments to the roof structure, will not allow intrusion of water from the exterior of the roofing manufacturer's Roof System into the building envelope when exposed to ordinary weather conditions or ordinary wear and usage. The Date of the substantial completion is the date that is certified by the Architect, Owner or Owner's Representative, when the roofing manufacturer's Roofing System is completed and accepted by or on behalf of the Owner.
2. Manufacturer's Field Service
 - a. During installation, provide for two-on-site inspections of roof application by qualified technical representative of the roofing manufacturer.
 - b. Upon completion of installation, provide final inspection by a technical representative of roofing manufacturer to confirm that roofing system has been installed in accordance with manufacturer's requirements.
 - c. The roofing manufacturer shall have the SOLE AND EXCLUSIVE obligation for all warranty work commencing on the date of substantial completion and under all circumstances terminated on the [# insert appropriate number of years] year anniversary of the date certified as Substantial Completion of the roofing manufacturer's Roof System. During the period in which the roofing manufacturer has any warranty obligation, the roofing manufacturer shall take appropriate actions necessary to cause the non-performing portions of the Roof System to perform their proper functions.
3. Roofing Manufacturer's Liability
The total liability of the roofing manufacturer under Single Source Warranty is (# choose one)
 - a. Single Source I: limited solely to two (2) times the cost of the roofing manufacturer's Roof System as invoiced to the roofing manufacturer's customer.
 - b. Single Source II: limited solely to four (4) times the cost of the roofing manufacturer's Roof System as invoiced to the roofing manufacturer's customer.
 - c. Single Source II: no dollar limit of the manufacturer's Roof System as invoiced to the roofing manufacturer's customer.

C. Standard Warranty:

1. For a period of [#choose one: twenty (20), fifteen (15), ten (10) or five (5)] years from the date of substantial completion, the roofing manufacturer WARRANTS to the Building Owner ("Owner"): that the roofing manufacturer's furnished roof panels, flashing, and related items used to fasten the roof panels and the flashing to the roof structure ("Roof System") will not allow intrusion of water from the exterior of the roofing manufacturer's Roof System into the building envelope when exposed to ordinary weather conditions or ordinary wear and usage. The Date of the substantial completion is the date that is certified by the Architect, Owner or Owner's Representative, when the roofing manufacturer's Roofing System is completed and accepted by or on behalf of the Owner.
2. The Roofing Installer shall have the SOLE AND EXCLUSIVE obligation for all warranty work commencing on the date of substantial completion up to and until the roof system have performed leak free for twenty four (24) consecutive months and under all circumstances terminates on the [# insert number of years] anniversary of the date certified as substantial completion of the roofing manufacturer's roof system.
3. Roofing Manufacturer's Liability:
The total liability of the roofing manufacturer under Standard Warranty is (# choose one)
 - a. Standard Warranty I: limited solely to \$0.20 sq. ft. of actual roof area.

- b. Standard Warranty II: limited solely to the Invoice Amount for the roof system (panels, fasteners, trim and accessories) to its customer. (No structural material, freight or taxes included).
- c. Standard Warranty III: no dollar amount of the manufacturer's Roof System as invoiced to the roofing manufacturer's customer.
Standard III requires a certified installer on the job site at all times.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Roof System Profile:
 - 1. 1 inch high x 3/8-inch wide battens (Small Batten-SB) x [# choose one: 12 inch, 16½ inch] wide panels.
 - 2. 2 inch high x 3/8-inch wide battens (High Batten-HB) x [# choose one: 12 inch, 16½ inch] wide panels.
- B. Metal Roof System Style:
 - 1. Snap on batten with factory applied mastic (# Small Batten or High Batten only)
 - 2. Concealed Fastener
- C. Gauge:
 - 1. (22 gauge) (UL-90 rated-Underwriters Laboratories)
- D. Substrate:
 - 1. Galvalume® sheet steel, 0.5-ounces/square foot, minimum yield 50,000 PSI.
- E. Clip:
 - [# choose one]
 - 1. One piece clip with factory applied mastic, 1 inch by 1 inch wide by 2 inches long with one guide hole in the bottom to accommodate a clip fastener (Small Batten).
 - 2. One piece clip with factory applied mastic, 2 inches high by 1 inch wide by 2 inches long with guide holes in the bottom to accommodate a clip fastener (High Batten).
- F. Texture:
 - 1. Smooth
- G. Finish:
 - [# choose one]
 - 1. Premium thermoset silicone polyester (20 year warranty)
 - 2. Premium fluorocarbon coating produced with Kynar 500® or Hylar 5000® resin (20 year warranty)
 - 3. Bare Galvalume Plus® (20 year warranty)
- H. Color:
 - 1. Selected from metal roof system manufacturer's standard offering
- I. Acceptable Manufacturer
 - 1. MBCI – Houston, TX – (281) 445-8555
- J. Other Manufacturer's desiring Approval, Comply with Section 01630
- K. Acceptable Curb and Equipment Support Units:
 - 1. LM Curbs – Longview, TX.

- L. Prefabricated Roof Jacks
 - 1. SFS INTECH – Wyomissing, PA.
 - 2. ITW Buildex – Itasca, IL.

- M. Rooftop Walkways:
 - 1. LM Curbs – Longview, TX.

2.2 MISCELLANEOUS MATERIALS

- A. Fasteners:
 - 1. All self-tapping/self-drilling fasteners, bolts, nuts, self-locking rivets and other suitable fasteners shall be designed to withstand specified design loads.
 - 2. Use long life fasteners for all interior and exterior metal roof system applications.
 - 3. Provide fasteners with a factory applied coating in a color to match metal roof system application.
 - 4. Provide neoprene washers under heads of exposed fasteners.
 - 5. Locate and space all exposed fasteners in a true vertical and horizontal alignment. Use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the neoprene washer.
- B. Accessories
 - 1. Provide all components required per the metal roof system manufacturer's approved shop drawings for a complete metal roof system to include panels, panel clips, trim/flashing, fascias, ridge, closures, sealants, fillers and any other required items.
 - a. All outside closures will be fabricated from Galvalume Plus® or Painted Galvalume® sheet steel of the same gauge, finish and color as the panels.
 - b. All tape seal is to be a pressure sensitive, 100 percent solids, and polyisobutylene compound sealing tape with a release paper backing. Provide permanently elastic, non-sagging, non-toxic, non-staining tape seal approved by the metal roof system manufacturer.
 - c. All joint sealant is to be a one-part elastomeric polyurethane sealant approved by the metal roof system manufacturer.

2.3 FABRICATION

- A. Material shall be in-line leveled prior to roll forming the panel profile.
- B. Where possible, roll form panels in continuous lengths, full length of detailed runs.
- C. Standard panel length shall be no more than 40 feet long for 22 gauge and 24 gauge. (For longer length availability, contact manufacturer).
- D. Fabricate trim/flashing and accessories to detailed profiles.
- E. Fabricate trim/flashing from same material as panel.

2.4 PREFABRICATED CURBS AND EQUIPMENT SUPPORTS

- A. Comply with loading and strength requirements as indicated where units support work of other trades. Coordinated dimensions of curbs and supports with equipment supplier/manufacturer.
- B. Fabricate curbs of structural quality aluminum (Min.080 in. thickness for mechanical fear up to 1000 lbs.; .125 in. thickness for mechanical gear between 1000 lbs. and 2000 lbs.; use a two

curb system per the manufacturer above 2000 lbs.), factory primed and prepared for painting with mitered and welded corner joints. Provide integral cap cells and water diverter crickets. The upper flange of the curb must be a minimum of 18" above the water diverter. (This allows 12" of free area after the panel is lapped over the flange on the high side.)

- C. Minimum height of prefabricated curb will be 8 inches above the finished metal roof system.
- D. Curbs shall be constructed to match the slope of the roof and provide a level top surface for mounting equipment.
- E. Curb flanges must be constructed to match the configuration of the metal roof panels and extend to a panel rib on each side. Minimum distance between curb wall and panel rib is 6".
- F. Curb manufacturer will provide their own curb structural support system that can be installed between the purlins that will allow proper thermal movement of the curb with the roofing system.
- G. Submit roof curb manufacturer's shop drawings to metal roof system manufacturer for review prior to fabrication (refer to metal roof system manufacturer's standard installation details). Metal roof system manufacturer will review roof curb manufacturer's shop drawings for compatibility with metal roof system.

2.5 PREFABRICATED ROOF JACKS

- A. Pipe flashings shall be a one piece [# choose one: EPDM (ethylene propylene diene monomer) molded rubber boot having a serviceable temperature range of -65 F to 212 F (for standard applications) or silicone molded rubber boot having a serviceable temperature range of -100 F to 437 F (for high temperature applications)] and shall be resistant to ozone and ultraviolet rays. Units shall have an aluminum flanged base ring. Do not install pipe flashings through ant panel seams – install only in the flat portion of the panel.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examinations:
 - 1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
 - 2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions. This specifically includes verifying that secondary structural members and/or decking are installed to meet IL and building code requirements. Coordinate with metal roof system manufacturer to insure that reduced clip spacing at eave, rake, ridge and corner areas are accommodated.
- B. Discrepancies:
 - 1. In event of a discrepancy, notify the architect (owner).
 - 2. Do not proceed with installation until discrepancies have been resolved.

3.2 INSTALLATION

- A. Install metal roof system so that it is weathertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
- B. Install metal roof system in accordance with manufacturer's instructions and shop drawings.

- C. Provide concealed anchors at all panel attachment locations.
- D. Install panel plumb, level and straight with seams and ribs parallel, conforming to design as indicated.

3.3 ROOF CURB INSTALLATION

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

3.4 CLEANING, PROTECTION

- A. Dispose of excess materials and remove debris from site.
- B. Clean work in accordance with manufacturer's recommendations.
- C. Protect work against damage until final acceptance. Replace or repair to the satisfactions of the architect (owner), any work that becomes damaged prior to final acceptance.
- D. Touch up minor scratched and abrasions with touch up paint supplied by the metal roof system manufacturer.
- E. Do not allow panels or trim to come in contact with dissimilar metals such as copper, lead or galvanized. Water run-off from these materials is also prohibited. This specifically includes condensate from roof top units-A/C units.

END OF SECTION



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