

# ***NRM-1000* Guide Specifications**

MANUFACTURER • Nu-Ray Metal Products, Inc.

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## **SECTION 07 41 13 – METAL ROOF PANELS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes: Prefinished, prefabricated standing seam roof system with continuous seams.
- B. Related Requirements:
  - 1. Section 05 10 00: Structural Metal Framing.
  - 2. Section 05 40 00: Cold-Formed Metal Framing.
  - 3. Section 05 50 00: Metal Fabrications.
  - 4. Section 07 62 00: Sheet Metal Flashing and Trim
  - 5. Section 07 92 00: Joint Sealants.

#### **1.2 REFERENCES**

- A. Reference Standards:
  - 1. ASCE 7: Minimum Design Loads for Buildings and Other Structures.
  - 2. ASTM A653: Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
  - 3. ASTM A792: Steel Sheet, 55 % Aluminum Zinc Alloy Coated by the Hot Dip Process.
  - 4. ASTM C1371: Determination of Emittance of Materials Near Room Temperature Using Portable Emisometers.
  - 5. ASTM C1549: Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
  - 6. ASTM D523: Specular Gloss.
  - 7. ASTM E1592: Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
  - 8. ASTM E283: Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  - 9. ASTM E331: Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 10. ASTM E1918: Measuring Solar Reflectance of Horizontal and Low Sloped Surfaces in the Field.
  - 11. ASTM E1980: Calculating Solar Reflectance Index of Horizontal and Low Sloped Opaque Surfaces.
  - 12. CRRC-1 Method #1: Measuring Solar Reflectance of a Flat, Opaque, and Heterogeneous Surface Using a Portable Solar Reflectometer.
  - 13. SMACNA Architectural Sheet Metal Manual.
  - 14. UL 580: Standard for Tests for Uplift Resistance of Roof Assemblies
  - 15. US Environmental Protection Agency: Energy Star Reflective Roof Products
  - 16. US Green Building Council (USGBC): Leadership in Energy and Environmental Design (LEED)

#### **1.3 SUBMITTALS**

- A. Product Data
  - 1. Submit manufacturer's technical product data, installation instructions and recommendations for each type of roofing and wall panel required.
- B. Shop Drawings:
  - 1. Indicate thickness and dimensions of parts, fastenings and anchoring methods, details and locations of joints, transitions and other provisions necessary for thermal expansion and contraction.
  - 2. Indicate locations of field- and factory-applied sealant.
- C. Samples:
  - 1. Submit two samples, 12 inches long by full panel width, showing proposed metal thickness and seam profile.
  - 2. Submit standard color samples of metal for Architect's selection.
- D. Installer Qualifications: Submit list of completed projects, with names and contact information for architects and contractors.
- E. Test Reports: Indicating compliance of products with project requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  - 1. Ten years' experience, minimum, in factory fabrication of metal panels.
  - 2. Manufacturer shall carry \$2,000,000 liability insurance, minimum, for metal panel system.
- B. Installer Qualifications:
  - 1. Three years' experience, minimum, in application of metal roof or wall panels.
  - 2. Five satisfactory projects with metal panel work of similar scope and complexity to Work of this Project.
- C. Testing Agency Qualifications: Agency compliant with ISO/IEC Standard 17025, or an accredited independent agency recognized by the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement or ANSI.
- D. Storage and Handling Requirements:
  - 1. Keep panels and accessory items dry.
  - 2. Protect against damage and discoloration.
  - 3. Handle panels with non-marring slings.
  - 4. Support panels to prevent permanent deformation.
  - 5. Store panels above ground, with one end elevated for drainage.
  - 6. Protect panels against standing water and condensation between adjacent surfaces.
  - 7. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and keep sheets separate for air-drying.
  - 8. Painted panels shall be shipped with protective plastic sheeting or a strippable film coating between panels. Remove strippable film coating prior to installation. Do not allow strippable film coating to remain on panels in extreme heat, cold, or direct sunlight or other UV source.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Storage and Handling Requirements:
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  - 9. Do not allow panels to contact treated lumber.

## 1.6 WARRANTY

For projects less than 1320 feet (1/4 mile) from salt water or industrial or other corrosive applications, consult your Nu-Ray Metals Representative. A Coastal Guard coating system may be recommended.

- A. Manufacturer's Warranty: Manufacturer's standard 25-year performance warranty, stating the following:
  - 1. Architectural fluorocarbon finish:
    - a. Will be free of fading or color change in excess of 5 Hunter delta-E units as determined by ASTM D2244-02.
    - b. Will not chalk in excess of numerical rating of 8 when measured in accordance with standard procedures specified in ASTM D4214-98 method D659.
    - c. Will not peel, crack, chip, or delaminate.
  - 2. Metal substrate will not rupture, fail structurally, or perforate.
- B. Installer's Warranty: Warrant panels, flashings, sealants, fasteners and accessories against defective materials and/or workmanship, covering repairs required to maintain wall panels watertight and weatherproof with normal usage for two years following Project Substantial Completion date.
  - 1. Furnish written warranty, signed by installer.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Products: Provide **[one of ]**the following:
  - 1. Nu-Ray Metal Products, Inc.; *NRM-1000* [width] [ribs/striations/flat].
- B. Substitution Limitations: **Substitutions will be considered in accordance with Section 01 25 00 "Substitution Procedures".**

- C. Performance Criteria
  - 1. Wind Uplift: **[Class 90 per UL 580-Select applicable UL construction number below]**  
**[As required by [ASCE 7] <Insert governing code>] <Insert required load>.**
    - a. Panel system shall be ASTM E1592 tested under the supervision of an ANSI or ISO/IEC accredited laboratory and the laboratory shall issue the test report.
    - b. [NRM-1000] UL Construction #397, minimum 24 gauge panels, when installed over minimum 5/8" nominal plywood decking, with roof panel fastener clips spaced 24" on center maximum [or Construction #397A over 22ga min steel decking.]

## 2.2 PANELS

- A. Panel: Nu-Ray Metals, Inc.; Preformed Metal Standing Seam Roofing - *NRM-1000*
  - 1. Material: Steel conforming to ASTM A792.
    - a. **[24/22 ] gauge** Yield strength 50,000 psi; with aluminum-zinc alloy coating conforming to ASTM A792, Class AZ50.
    - b. Thickness and yield strength as required for performance indicated; with aluminum-zinc alloy coating conforming to ASTM A792, Class AZ50 or with zinc coating conforming to ASTM A653, Class G 90.
  - 2. Finishes:
    - a. Exterior Panel Finish: Provide primer and finish coat on exposed faces; provide primer on concealed faces of panels.
      - 1. Kynar 500: Polyvinylidene Fluoride, full 70 percent Kynar 500/Hylar 5000, consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of 8 to 15 when tested in accordance with ASTM D523 at 60 degrees.
      - 2. Zincolume® Plus protective coating for unpainted aluminum-zinc alloy coating.
      - 3. Exterior Panel Color: **[As scheduled.][As selected from manufacturer's full range.]<Insert color.>**
    - b. Interior Panel Finish: Corrosion-resistant primer; primer coat dry film thickness: 0.15 mils; polyester paint; dry film thickness of 0.35 mils, off-white to light gray in color.

## 2.3 ACCESSORIES

- A. Trims and Flashings: Material, metal thickness, and finish to match panels. Profiles indicated in Drawings.
- B. Panel Penetration Flashings: As recommended by panel manufacturer.
- C. Fasteners: Per manufacturer recommendation.
- D. Profile Closures: Polyethylene foam, die-cut or formed to panel configuration.
- E. Sealant for Field Application: See Section 07 92 00 "Joint Sealants".
- F. Insulation: See Section 07 21 00 "Thermal Insulation".

## 2.4 FABRICATION

- A. Fabrication, General:
  - 1. Unless otherwise shown on Drawings or specified herein, fabricate panels in continuous lengths and fabricate flashings and accessories in longest practical lengths.
  - 2. Panels shall be factory correctively-leveled.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verification of Conditions: With Installer present.
  - 1. Examine conditions and substrates on which metal panels are to be installed. Structural support or substrate shall be flat and plumb to avoid panel stresses and distortion.
  - 2. **[Verify that [air ][weather ]barrier work is complete and inspected.]**
  - 3. Prior to starting work, correct defects.
- B. Field Measurements:
  - 1. Coordinate field measurements and fabrication schedule with construction progress.
  - 2. Field measure prior to fabrication. Show recorded dimensions on shop drawings, including locations of shop-fabricated openings.
  - 3. If field measurements differ from drawing dimensions, notify Architect prior to fabrication.
- C. **[Framing][Substrate]** Tolerances: Deviations from flat plane shall not exceed the following.
  - 1. 1/4 inch in 20 feet vertically or horizontally.
  - 2. 1/2 inch across building elevation.
  - 3. 1/8 inch in 5 feet.

### 3.2 PREPARATION

- A. Protection:
  - 1. Treat contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
  - 2. Where panels or trim may come in contact with dissimilar materials or treated lumber, fabricate transitions to facilitate drainage and minimize possibility of galvanic corrosion.
  - 3. At points of contact with dissimilar metal or treated lumber, coat panel or trim with protective paint or separate materials with a weatherproof underlayment.
  - 4. Direct contact or run-off from CCA, ACQ, AC, or other treated lumber (outdoor wood) or fire retardant impregnated or treated wood shakes or siding can cause panels and trim to fail prematurely. Avoid contact with these materials.

### 3.3 INSTALLATION

- A. **[[Secondary Framing][Substrate and Air Barrier][Substrate and Weather Barrier]: Install according to approved shop drawings and metal panel manufacturer's recommendations.]**
- B. Panels and Flashing:
  - 1. Install according to approved shop drawings.
  - 2. Comply with methods and recommendations of SMACNA Architectural Sheet Metal Manual for flashing configurations required.
  - 3. Overlap flashing at least 6 inches.
  - 4. Discrepancies between job site conditions and shop drawings shall be brought to the attention of the Architect for resolution.
  - 5. Cutting and Fitting:
    - a. Cut panels neat, square, and true with shearing action cutters. Torch or power saw cutting is prohibited.
    - b. Openings 6 inches and larger: Shop fabricate and reinforce to maintain original load capacity.
    - c. Openings less than 6 inches: Field cutting is acceptable.

- C. Accessories: Install trims, panel closures, flashings according to Drawings and manufacturer's recommended details.
- D. Sealant Installation: Apply according to approved shop drawings and SMACNA Architectural Sheet Metal Manual recommendations.

### **3.4 CLEANING**

- A. Repairs:
  - 1. Touch up paint is not required for panels with scratches that do not expose metal.
  - 2. Panels or flashings with finish damage exposing metal or with substrate damage shall be replaced.
- B. Cleaning and Waste Management: **[See Division 01 Section "Construction Waste Management and Disposal" for recycling requirements.]** At completion of each day's work and at work completion, sweep panels, flashings, and gutters clean. Do not allow fasteners, cuttings, filings, or scraps to accumulate.

**END OF SECTION**