

Firestone Building Products UC-3RS

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FIRESTONE BUILDING PRODUCTS **FIRESTONE ROOFING SYSTEMS**

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SECTION 07 61 00

FIRESTONE BUILDING PRODUCTS RED SHIELD METAL ROOFING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. General

1. Furnish all labor, material, tools, equipment, and services for all preformed roofing as indicated, in accord with the provisions of the Contract Documents. The Metal Roofing Manufacturer will provide all components required for a complete metal roofing system to include Firestone Building Products UC-3RS panels, panel clips, trim/flashing, fascias, ridge, closures, sealants, fillers and any other required items.
2. Completely coordinate with work of all other trades.
3. See Division 01 for General Requirements.

B. Related work specified elsewhere:

Note to Specifier: Select appropriate Sections below or add other related Sections.

1. Section 05 10 00 - Structural Steel
2. Section 05 31 00 - Decking Wood Selected by Architect/Engineer from manufacturer's standard colors.
3. Section 05 20 00 or 05 40 00 - Steel Joists
4. Section 06 10 00 - Rough Carpentry
5. Section 06 15 00 - Decking, Steel
6. Section 07 50 00 - Membrane Roofing
7. Section 07 60 00 - Flashing and Sheet Metal
8. Section 22 41 00 - Facility Storm Drainage

1.02 QUALITY ASSURANCE

A. Applicable standards:

1. ASTM A653, "Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process," American Society for Testing and Materials, 1998.
2. ASTM B209, "Specification for Aluminum and Aluminum-Alloy Sheet and Plate
3. 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.
4. 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.
5. ASTM E1680, "Test Method for Rate of Air Leakage through Exterior Metal Roof Panels Systems," American Society for Testing and Materials, 1995.

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6. UL 580, "Tests for Uplift Resistance of Roof Assemblies," Underwriter's Laboratories, Inc., 1994.
7. UL 2218 "Impact Resistance of Prepared Roof Covering Materials"

B. Manufacturer's qualifications:

1. Manufacturer shall have a minimum of 10 years experience in manufacturing metal roofing systems. Panels specified in this section shall be produced [in a permanent factory environment with fixed-base roll-forming equipment] [By a factory authorized contractor using only Firestone authorized and inspected equipment]. A letter certifying the manufacturer's qualifications shall accompany the product material submittals.

C. The Installer shall meet the following minimum criteria:

1. Have received training and licensing from the metal roofing manufacturer for the installation of the specified roof system.
2. A letter certifying the installer as the Manufacturer's Certified Installer shall accompany the submittal package.

D. Installation quality control:

1. All roof systems are subject to interim and final inspections, discretionary to Firestone, by a technical field representative/inspector to inspect the installation of the metal roofing system in accordance with manufacturer's warranty requirements.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. Performance testing:

1. Metal roofing systems shall be tested in accordance with Underwriters Laboratories, Inc. (UL) Test Method 580 "Tests for Uplift Resistance of Roof Assemblies," Class 90 rating.
2. Metal roof panel systems shall be tested in accordance with ASTM E1592-95 for negative loading. Capacity for gauge, span, or loading other than those tested may be determined by interpolating between test values only.
3. Metal roof panel systems shall have a maximum air infiltration rate of 0.007 cfm/ft² at a pressure differential of 6.24 psf. when tested in accordance with ASTM E1680-95.
4. Metal roof panel systems shall have no uncontrollable water leakage at a pressure differential of 2.86 psf. when tested in accordance with ASTM E1646-95.
5. Metal roofing systems shall be tested in accordance with Underwriters Laboratories, Inc. (UL) Test Method UL2218 "Impact Resistance of Prepared Roof Covering Materials" Class 4.

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1.04 DESIGN REQUIREMENTS

A. General:

1. The Firestone UC-3RS, Standing Seam Roof System (SSRS) shall be designed by the Manufacturer as a complete system. Members and connections not indicated on the Firestone drawings shall be the responsibility of the Contractor. All components of the UC-3RS system shall be supplied or specified by the same manufacturer with a minimum roof slope of 3 in 12.
2. The UC-3RS shall be installed on a solid substrate approved by the Manufacturer.

B. Design loads:

1. Design load application shall be in accordance with ASCE-7, current version.
2. Wind loads:
 - a. The design wind speed and related factors such as ground roughness and building occupancy factor for the metal roofing system shall be as defined on the contract documents in accordance to local building codes.
3. Thermal effects:
 - a. Roof panels shall be free to move in response to the expansion and contraction forces resulting from temperature variation, as specified in the MBMA Metal Roofing Systems Design Manual.

C. Roof panels:

1. Deflection requirements shall be in accordance with the ASCE-7, or as a minimum, $L/180$ for roof snow load (but not less than 20/psf).

D. Accessories and their fasteners

1. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces and shall allow for thermal movement of the roof panel system. Exposed fasteners shall not restrict free movement of the roof panel system resulting from thermal forces, except at designed points of roof panel fixity.

1.05 SUBMITTALS

A. Installation drawings:

1. Submit completed installation drawings and installation details by the manufacturer, to the architect (owner) for review. Do not proceed with manufacture prior to review and architectural approval of installation drawings. Do not use drawings prepared by the architect (owner) for installation drawings.

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2. Installation drawings shall show methods of installation, elevations, and plans of roof and wall panels, sections and details, specified loads, flashings, roof curbs, vents, sealants, interfaces with all materials not supplied by the metal roofing system manufacturer, and proposed identification of component parts and their finishes.
- B. Physical samples:
1. Submit samples and color chips for all proposed finishes.
 - a. Submit one 12-inch long sample of panel, including clips.
 - b. Submit two 3-inch x 5-inch color chip samples in color selected by the architect (owner).
- C. Test reports:
1. Submit test report showing that metal panels have been tested in accordance with ASTM E1592-95.
 2. Submit test report showing that metal panels have been tested in accordance with ASTM E1646-95.
 3. Submit test report showing that metal panels have been tested in accordance with ASTM E1680-95.
 4. Submit test report showing that metal panels have a UL 2218, Class 4 hail rating.
 5. Submit test report showing that metal panels have a UL 580, Class 90 rating.
- D. Metal roofing system installation inspection reports:
1. Firestone Technical Representative may, at Firestone's option, inspect the installation at any time to appraise the installing contractor of their compliance with Firestones approved details and system specifications.
Typical inspections:
 - Prior to the installation of the metal roofing panels to inspect the underlayments. The roofing contractor is responsible for assuring that the substrate is in suitable condition for the installation of the UC-3RS components to the substrate.
 - Intermediate inspections to ensure proper installation of the UC-3RS (if required).
 - At final completion of all metal roofing system work.
- E. Close Out Submittals:
1. Operation and maintenance for date of installed products in accordance with Division 01 close out submittals, maintenance data, and operation data section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finish's end performance.

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2. Project Warranty: Warranty documents specified herein.
 - a. Firestone Building Products Red Shield warranty: submit for owners acceptance, standard Red Shield warranty documents executed by authorized company official. Manufacturer's warranty is in addition to, and not limited of, other rights the owner may have under the contract documents.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery:

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

B. Handling:

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

C. Storage:

1. Store all material and accessories above ground on well-supported platforms that provide a minimum of 1/4 to 12 of slope. Store materials under waterproof covering or indoors and provide proper ventilation of metal roofing system to prevent condensation build-up between each panel, trim or flashing component.

1.07 WARRANTY REQUIREMENTS

- A. Red Shield or no dollar limit warranty specified is to be followed with no exceptions. The warranty period is in Section 1.07 A. 1.

Note to Specifier: Select proper term in subparagraph below.

1. Warranty coverage: [5-year][10-year][15-year][20-year]
 2. Manufacturers liability requirement: No dollar limit
 3. Warranty coverage to include: All system panels, insulations and system components and accessories manufactured by Firestone Building Products. The warranty covers weathertightness, finish, materials, labor and workmanship.
 4. Roof system is subject to inspection, at Firestone's option, at completion of installation and must be installed in compliance with manufacturer's application requirements and standards. The manufacturer's technical field representative, at Firestone's option, conducts interim and final inspections. The manufacturer's field representative must be a UC-3RS manufacturer employee who is responsible for interim and final inspections.
- B. Finish warranty period 20 years commencing on date of substantial completion.
 1. Firestone Building Products 20-year non pro-rated warranty covering a Red Shield Paint Finish. Consult with manufacturer for specific project warranty requirements.

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PART 2 – PRODUCTS

2.01 MANUFACTURER

A. Firestone Building Products

Note to Specifier: Fill in other manufacturers below or require other manufacturers to submit information which supports their products for the Architect's review prior to bidding or during construction; delete paragraph below if prior approvals or substitutions will not be considered.

- B. Other manufacturers seeking approval of their products must comply with requirements of the Instructions to Bidders (AIA Document A701), Paragraph 3.3 prior to bidding.
- C. Other manufacturers seeking approval of their products must comply with requirements of Section 01 60 00 [Other] during construction.

2.02 ROOFING TYPE

- A. Firestone Building Products UC-3RS Double-Lock Standing Seam Roofing, roll formed roofing panels.

2.03 PANEL MATERIALS AND FABRICATION

Note to Specifier: Select [steel][aluminum][copper][RHEINZINK] Panels paragraphs "A" below.

- A. Steel Panels: ASTM A653, G90 (lock-forming quality), extra smooth, tension-leveled, galvanized steel, minimum spangle

Note to Specifier: Select proper gauge in subparagraph below.

- 1. Thickness: [22(.8mm)] or [24(.7mm)] gauge.

Note to Specifier: Select proper material in subparagraph below.

- A. Aluminum Panels: ASTM B209, Aluminum Association specification sheet 3003-H14/3105-H14 for painted finish.
- B. Aluminum Panels: ASTM B209, Aluminum Association specification sheet 5005-H43 AQ for anodized finish.

Note to Specifier: Select proper gauge in subparagraph below.

- 1. Thickness: [0.040 (1.01mm) inch] or [0.032 (0.81mm) inch]

- A. Copper Panels: ASTM B370

Note to Specifier: Select thickness in subparagraph below.

- 1. Thickness: [16] or [20] ounce.

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- A. RHEINZINK® Panels: EURO – Norm Standard – DIN EN 988 (formally DIN 17770)

Note to Specifier: Select thickness in subparagraph below.

1. Thickness: [.7 mm(24 ga.)][.8 mm(22 ga.)]
- B. Form roofing panels in longest practical lengths (50' (15.24m) longest recommended), true to shape, accurate in size, square, and free from distribution or manufacturing defects.
 1. Seam Height: Minimum of 1.5" (38.1mm) inches

Note to Specifier: Select seam spacing in subparagraph 2 below.

2. Seam Spacing: 12 (304.8mm) or 20 (508mm) inches for optimum material usage, other sizes available, specify.
3. Seams shall be mechanically locked in the field with a mechanical seamer.
4. Seams shall have a factory applied integral seam sealant in leg of panel.

2.04 FINISHES

Note to Specifier: Select from paragraphs below for desired finish: "A" for painted, "B" for anodized, "C" for copper and "D" for Zinc.

A's

- A. [Coil primed and coated] [Spray (batch) primed and coated] on one side with 70% full strength Kynar 500/Hylar 5000 fluoropolymer coating of 1.0 +/- 0.1 mil totally dry film thickness. A wash coat of 0.2 – 0.3 mils dry film thickness shall be applied to the reverse side.
1. Color: Selected by Architect/Engineer from manufacturer's [standard or premium colors] [custom colors].

Note to Specifier: Verify number of coats with manufacturer, dependent on color selection.

2. Number of Coats: [2-coat (typical)] or [3-coats (custom)].
3. Finish Warranty: 20 years.

Paint Finish Colors. This warranty shall extend only to standard colors identified as such in Firestone published literature at the date of issuance of this Limited Warranty or as approved in writing by Firestone Building Products. Colors identified as "metallic" by Firestone Building Products are not warranted against fade or change in color. Firestone standard color "Regal Red" is warranted against fade or color change for a maximum period of ten (10) years.

4. Provide factory applied strippable plastic film for protection during fabrication and installation. Protective film must be removed immediately after installation.

B's

A. Coil Anodized Finish

Note to Specifier: Anodized colors are subject to color variations within a coil as well as from batch to batch, differ in cost; custom colors may be available at an additional cost; contact manufacturer for details.

1. Color: Selected by Architect/Engineer from manufacturer's standard colors.
2. Film Thickness: Test Method ASTM B137; by weight.
 - a. Class II, 0.4 (minimum) to 0.7 mils
3. Provide factory applied strippable plastic film for protection during fabrication and installation.

C's

A. Copper

Note to Specifier: Copper is a natural material and may be subject to color variations in the base material and during the weathering/aging process.

1. Color: [Patriot Green: Pre-Patinated, paint treated Copper] [Architectural Grade Sheet Copper (AGSC)]

Note to Specifier: Patriot Green Pre-Patinated, paint treated Copper shows part of the copper through a uniform special coat of paint the gives way when the exposed copper oxidizes with natural aging.

Architectural Grade Sheet Copper (AGSC) is a natural product and is subject to natural color variations during the weathering/aging process after installation.

2. Provide factory applied strippable plastic film for protection during fabrication and installation.

D's

A. ZINC

Note to Specifier: RHEINZINK® is a natural material and may be subject to color variations in the base material within a coil and during the weathering/aging process.

1. Color: [Shiny] or [Pre-Weathered] or [Graphite Gray]
2. Provide factory applied strippable plastic film for protection during fabrication and installation.

2.05 ACCESSORIES

- A. Installation Clips: Manufacturer's standard stainless steel clips for concealed securement of panels.
- B. Clip Fasteners: Stainless Steel

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- C. Underlayments: See Firestone Metal Roofing approved product listing
1. Waterproof Membrane: ASTM D1970, self-adhering with resistance to direct exposure for at least 42 days. Minimum high temperature resistance of 230 degrees Fahrenheit. Maximum water vapor permeance of 0.1 perms. self-adhering rubberized sheet membrane shall be used for slopes of 3 to 5 in 12.
 2. *Slopes greater than 5 in 12 may use synthetic, non self-adhering underlayments in the field of the roof with self adhering membrane applied at ridges, hips, eaves, base tie-in/flashings, valleys, penetrations or other perimeter details.*

2.06 MISCELLANEOUS MATERIALS

A. Fasteners:

Note to Specifier: Exposed fasteners must be kept to a minimum. If exposed — fastener color must match panel, trim, or accessories. Fastener color must be specified.

1. Fasteners for panels shall be "Red Shield" type and size specified below, or as otherwise, approved for the applicable requirements and shall be the manufacturer's standard. Exposed roof fasteners shall be sealed or have sealed washers on the exterior side of the covering to waterproof the fastener penetration. Washer material shall be compatible with the screw head; have a minimum diameter of 3/8-inch for structural connections; and gasket portion of fasteners or washers shall be EPDM, neoprene or other equally durable elastomeric material.
- B. Components:
1. Components shall be compatible with the roof panel furnished. Flashing, trim, metal closure strips, caps, gutters, downspouts, roof curbs, and similar metal components shall not be less than the minimum thickness specified by the Firestone. Exposed metal components shall be finished to match the panels or trim, as furnished. Molded closure strips shall be closed-cell or solid-cell synthetic rubber or neoprene, or polyvinylchloride or metal pre-molded to match configuration of the covering and shall not absorb or retain water.
- C. Sealants:
1. All tape sealant is to be a pressure sensitive, 100 percent solid, sealing tape with a release paper backing. Provide permanently elastic, non-sagging, non-toxic, non-staining tape sealant approved by Firestone.
 2. Firestone shall approve all joint sealant that will come into contact with the UC-3RS system.

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2.07 FABRICATION

- A. Panels shall be produced by a Manufacturer meeting the requirements of section 1.02B.
- B. Fabricate trim, flashing, and accessories to Manufacturer's specified or approved profiles.

2.08 PREFABRICATED PIPE FLASHINGS

- A. Pipe flashings shall provide a weathertight joint at projections through the roof, taking into account the thermal movement of the roof and the service temperature of the projection. Pipe flashings shall have an aluminum-flanged base ring.

2.09 PREFABRICATED CURBS AND EQUIPMENT SUPPORTS

- A. General
 1. Provide the Manufacturer with the dimensions, weights, and model number of the units to be supported by the curb(s).

Note to Specifier: If curb finish and color is to match roof panel finish, the finish and color must be specified.

- B. Fabricate curbs of structural quality aluminum, Galvalume®, or hot-dipped galvanized sheet. Curbs shall have welded joints unless a two-piece curb is required. Provide integral base plates and water diverters/crickets. Front base plate shall be extended up-slope from the beginning of the water diverter. Curbs shall be designed for a compatible installation with the panel system.
- C. Curbs shall be constructed to match the roof slope and provide a mounting surface as required by the rooftop unit manufacturer.
- D. Submit roof curb manufacturer's shop drawings to Firestone for approval before fabrication of curbs.
- E. Any curb structural support system shall allow proper thermal movement of the curb with the roofing system.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Examination:
 1. The Contractor shall verify installed work of other trades that such work is complete to a point where the roofing system installation may commence.
 2. The Contractor shall verify that the substructure installation is in accordance with the approved shop drawings and Firestone's requirements. Coordinate with Firestone to ensure that the fasteners are correct for the substrate and is installed to accommodate and support the appropriate clip spacing and attachment.

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- B. Discrepancies:
 - 1. In event of discrepancy, notify the architect (owner) in writing.
 - 2. Do not proceed with installation until discrepancies have been resolved.
- C. Verify that roof openings, curbs, pipes, sleeves, ducts, vents, and other penetrations through roof substrate are complete and properly located.

3.02 INSTALLATION

- A. Install the UC-3RS system in accordance with Manufacturer's instructions and approved shop drawings.
- B. Install the UC-3RS system so that it is weathertight and allows for thermal movements.
- C. Locate and space all fasteners in accordance with Firestone's recommendations. For required exposed fasteners (i.e. pipe flashings), use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the sealing washer.
- D. Do not place pipe penetrations through the panel seams.
- E. Do not allow panels or trim to come into contact with dissimilar materials (i.e. copper, lead, graphite, treated lumber, mortar, etc). Water run-off from these materials is also prohibited.
- F. Comply with Firestone's approved installation drawings and instructions.
- G. Field cutting of panels, trim, and/or flashing shall be accomplished by hand or electric shears. At no time shall a hot/friction saw be used.

Note to Specifier: A certain amount of waviness called 'oil canning' is inherent in any product manufactured from coiled sheet material. The amount of 'oil canning' can vary due to several factors: uneven substrates, the width of the panel, weather conditions, etc. 'Oil canning' of a panel does not affect its structural integrity and is not sufficient cause for rejection.

3.03 ADJUSTING AND CLEANING

- A. Repair panels with minor damage.
- B. Remove panels damaged beyond repair and replace with new panels to match adjacent undamaged panels.
- C. Clean exposed panel surfaces promptly after installation in accordance with recommendations of panel and coating manufacturers.
- D. Remove protective film immediately after installation.

END OF SECTION