**Section 05400** (05 40 00) **– Retrofit Cold-Formed Metal Roof Framing System Guide Specification**

This guide specification is intended for use on projects where an existing building roof will be retrofitted using a light-gage steel framing system that creates slope in order to install a new metal roof system. This specification can also be used for new building construction where the steel framing system is installed over new structural concrete deck or structural members.

DISCLAIMER: Use of this Specification is voluntary. Each Retrofit Metal Roof Framing System designer retains the prerogative to choose their own design and commercial practices and the responsibility to design and specify a roofing/wall system to comply with applicable state and local codes, end user specifications, local conditions, and safety considerations. Although every effort has been made to present accurate and sound information, Metal Sales Manufacturing Corporation assumes no responsibility whatsoever for the application of this information to the design, specification or construction of any specific roof/wall system. Metal Sales Manufacturing Corporation *expressly disclaims all liability for damages of any sort whether direct, indirect or consequential arising out of the use, reference to or reliance on this Specification or any of its contents.* Metal Sales Manufacturing Corporation makes no warranty, express or implied, as to any particular roof/wall system or this Specification. METAL SALES MANUFACTURING CORPORATION specifically disclaims any warranties of merchantability or fitness for a particular purpose.

*Specifier: The Notation [Specifier Note:] means that the following text is a specifier’s note or sample.*

*Specifier: Specification Sections indicated in parenthesis (XX XX XX) refer to the CSI MasterFormat specifications.*

**Specifications and Standards**

**Section 05400** (05 40 00) **- Retrofit Cold-Formed Metal Roof Framing System Guide Specification**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

1. General:
	1. The structural Retrofit Metal Roof Framing System will provide support for a new metal roofing system constructed over the existing building roof(s). It shall be engineered in accordance with the specified code and design loading and shall transfer positive acting loads at each attachment location into an existing structural member. In no case shall the framing be supported by or attached to the existing roof decking. The framing shall accommodate inconsistencies in the roof’s topography and perimeter geometry to develop a new roof slope plane and will minimize irregularities that could produce oil-canning in the new metal roof system.
	2. Contractor to furnish labor, material, tools, equipment and services for the Retrofit Metal Roof Framing System as indicated and specified, in accordance with provisions of the Contract Documents.
	3. Contractor to furnish anchoring devices and the design thereof to ensure secure attachment of the Retrofit Metal Roof Framing System to the existing roof’s structural support system to resist imposing wind uplift forces.
	4. Contractor to furnish components and the design of retrofit framing base member devices to properly distribute imposing loads into the existing roof substrate assembly to prevent being overly compressed once subjected to gravity load, resulting in undulation in the framing system and oil-canning induce stresses into the new metal roof system.
	5. Except as otherwise specified, the Retrofit Metal Roof System Manufacturer will provide all components required for a complete single-supplier system assembly including framing base members, clips, purlins, purlin supports, bracing and structural member-to-member fasteners as well as roof/wall cladding, panel clips, trim/flashing, fascias, ridge, closures, sealants, fillers and any other required items as specified in related sections.
	6. Completely coordinate with work of other trades.
	7. Although such work is not specifically indicated, furnish and install supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
	8. See Division 1 (01) for General Requirements.
2. Related work specified elsewhere :
	1. Structural steel: Section 05100 (05 10 00).
	2. Steel joists: Section 05200 (05 20 00) or 05400 (05 40 00).
	3. Metal Roofing: Section 07410 (07 41 00)
	4. Metal Walls/Siding and Soffits or Fascias: Section 07410 (07 41 00) or 07460 (07 46 00)
	5. Flashing and Sheet Metal: Section 07600 (07 60 00).
	6. Insulation: Section 07200 (07 20 00)

*[Specifier Note: Delete references to sections not used and add any references that become pertinent. Delete references to MasterFormat Sections shown in parentheses if not used]*

**1.02 QUALITY ASSURANCE**

1. Applicable standards: The following referenced publications shall be the most current edition in effect on the date of bid solicitation.
	1. American Institute of Steel Construction (AISC), Chicago, IL
		1. AISC Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design, 13th Edition.
	2. American Iron and Steel Institute (AISI)
		1. AISI CF00-01 – A Design Guide for Standing Seam Roof Panels
		2. AISI CF97-01 – A Guide for Designing with Standing Seam Roof Panels.
		3. AISI Cold-Formed Steel Design Manual, American Iron and Steel Institute, Washington, D.C., 1996.
	3. American Society of Civil Engineers (ASCE)
		1. ASCE-7 - Minimum Design Loads for Buildings and other Structures
	4. Metal Building Manufacturers Association, Inc. Cleveland, OH, 2007.
		1. 2012 Low Rise Building Systems Manual
	5. Factory Mutual (if applicable)
		1. FM-4471 – Wind Uplift Test for Metal Roof Panel Systems
	6. American Society for Testing and Materials (ASTM) as applicable
		1. ASTM A 1101 – Steel Sheet and Strip, Carbon, Hot-Rolled
		2. 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.
		3. ASTM A792a, “Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process,” American Society for Testing and Materials, 1997.
	7. Steel Structures Painting Council
		1. SSPC- SP10 - Steel Structures Painting Manual
2. Manufacturer’s Qualifications:

The Retrofit Metal Roof Framing System Manufacturer shall have a minimum of ten years experience in manufacturing retrofit roof framing with metal roofing/wall cladding assemblies. All framing and cladding components specified in this section shall be produced by one Manufacturer in a permanent factory environment with fixed-base roll-forming equipment. A letter from the Manufacturer certifying the Manufacturer’s qualifications shall accompany the product material submittals.

1. Contractor/Installer Qualifications:
	* 1. Maintain a minimum $250,000 general liability coverage for each loss.
		2. Maintain sufficient worker’s compensation coverage, as mandated by law.
		3. Have no viable claims pending regarding negligent acts or defective workmanship on previously performed or current projects.
		4. Have not filed for protection from creditors under any state or federal insolvency or debtor relief statutes or codes.
		5. Shall be a factory-authorized installer of the Manufacturer trained in the installation of the metal roofing system specified in Section 07410 (07 41 00).
		6. Will provide a full-time project foreman/superintendent at the jobsite that has been trained by the Retrofit Metal Roofing System Manufacturer in the supervision of the installation.
2. Installation Quality Control
	* + 1. The Contractor shall conduct inspections of the retrofit framing system prior to metal roof panel installation to confirm all components have been installed in accordance with the Manufacturer’s installation documents and to ensure straightness and proper alignment of the new roof purlins and new roof plane(s) for minimizing oil-canning in the new metal roof system.
	1. The Contractor shall provide an independent engineering analysis, sealed by a professional engineer, to confirm the existing roof system will not be overloaded and overstressed due to the additional weight or loads imposed due to the new Retrofit Metal Roof System once installed. This analysis to be submitted to the Architect and the Retrofit Metal Roof Framing System Manufacturer

**1.03 EXISTING ROOF SYSTEM AND TESTING**

* + 1. Description:
1. The existing roof assembly consists of a *[Specifier Note: Briefly describe the basic construction of the existing roof structural support system, substrate and membrane assembly. If these vary, you will need to expand the description of the multiple roof types. Example: open-web steel bar joists with 22 gauge metal decking, 1-1/2” rigid fiberboard insulation and modified bitumen as the exposed weathering membrane].*
2. Refer to the Existing Roof Plan in the Contract Documents for descriptions of varying roof systems, spacing and span direction of existing structural support members, rooftop mounted equipment and other related appurtenances.
3. Where conditions permit and are required, the Contractor shall obtain field measurements to ensure that all design and installation document submittals are coordinated with the Retrofit Metal Roof Framing System Manufacturer. This due diligent work shall be completed prior to commencement of any engineering and design work and before fabrication of any materials.
	* 1. Testing:
		2. The Contractor shall conduct field pullout testing for evaluation and selection of framing system anchors to attach the new retrofit framing base members to the existing roof support system. The testing will be conducted using a calibrated pullout tester at multiple locations of the existing roof area not to exceed 1000 square feet each. Pullout values shall be recorded at each location for each specific anchor used. All anchors shall penetrate and attach to existing structural support members. The Contractor shall have the attachment connection designed to satisfy wind uplift values, as provided by the retrofit system Manufacturer, multiplied by a safety factor of 2.5. This analysis shall be submitted for review and approval by the Architect.
		3. The Contractor shall conduct field compressive strength testing performed for evaluation of the existing roof substrate and membrane assembly. These values, recorded in pounds per square inch (PSI), shall be analyzed by the Contractor to determine if each retrofit framing system base member’s bearing surface area is adequate in size, to distribute the imposing positive downward acting loads in order to not exceed the compressive strength of the existing roof substrate and membrane assembly. If the values exceed the compressive strength, then an additional structural bearing device (plate, etc.) of sufficient size will be added between the base member and the existing roof.

**1.04 SYSTEM PERFORMANCE REQUIREMENTS**

1. Performance Testing:
	1. Refer to Section 07410 (07 41 00) for the metal roof system testing requirements. All retrofit framing systems shall be designed in accordance with the specified metal roof testing.

**1.05 DESIGN REQUIREMENTS**

A. General:

The Retrofit Metal Roof Framing and Roof/Wall Cladding shall be designed by one Manufacturer as a complete system. Members and connections not indicated on the drawings shall be the responsibility of the Contractor. All components of the system shall be supplied by the same Manufacturer.

1. Building Code and Design Loads:
	1. Design load application shall be in accordance with the latest adopted building code edition of the

*[Specifier Note: (Choose only one) IBC, ASCE-7 or an applicable national or local building code].*

* 1. Dead Loads
		1. The dead load shall be the weight of the new metal roofing/wall cladding plus insulation if applicable.
		2. Deflection requirements shall be in accordance with the applicable building code, or at a minimum L/180 for roof snow load.
	2. Collateral Loads shall be as shown on the contract drawings. Collateral Loads shall not be applied to the roof/wall panels, only to the retrofit framing.

*[Specifier Note: Collateral Loads consist of Rooftop Equipment, Sprinklers, Mechanical and Electrical Systems and shall not be attached to the new metal roof panels.]*

* 1. Live Loads
1. The Retrofit Metal Roof Framing shall be capable of supporting a minimum uniform live load of 20 psf.
	1. Snow Loads
2. The design ground snow loads shall be as specified on the contract drawings.
3. Based on the affect of snow loads and drifting loads due to the new Metal Roof System altering the overall final roof geometry, a design examination shall be performed and consideration shall be given to the existing building roof and its support structure in its ability to receive these new loads. Any remedial work necessary to be performed on existing roof’s support system to increase the load capacity of the existing structural system, shall be included in the scope of this contract.

*[Specifier Note: All sources of snow drifting should be clearly identified in the contract documents, i.e. adjacent structures, roof height changes, etc.]*

* 1. Wind Loads
1. The design wind speed for the Retrofit Metal Roof Framing System shall be as defined on the contract documents.

[*Specifier Note: The design wind speed must be identified as a 3-second gust as appropriate to the applicable code.]*

1. The Retrofit Metal Roof Framing System shall be securely attached only to existing structural support members.
2. Fire Protection
	1. Firestopping, Draft Curtains or other protection in newly created attic space between the old roof and underside of the new roof to comply with the above specified building code and as defined in the contract documents.
3. Existing Roof Drainage:
4. The existing roof drainage system shall be maintained and protected during construction.
5. The Contractor to avoid disrupting and/or blocking any existing roof drains during the erection to prevent rainwater damming and possible overstressing the existing roof system due to the excessive weight of the water..
6. All continuous type retrofit framing base members shall be installed with a 3/8” minimum height shim composed of a non-deteriorating material to elevate the members above the existing roof and to permit rainwater to flow beneath the member.
	1. The shim size shall be of sufficient size to accommodate the required minimum square inches necessary to distribute the imposing load as described in above Section 1.03.B.2.

C. Retrofit Framing Components Supporting the Metal Roof System

1. Any additions/revisions to framing members supporting the Metal Roof System to accommodate the Manufacturer’s design shall be the Contractor’s responsibility, and shall be submitted for review and approval by the Engineer of Record. New or revised framing members and their connections shall be designed in accordance with [AISC] [AISI] [SJI] design specifications. Deflection requirements shall be in accordance with the applicable building code, or as a minimum, the provisions of the AISC Steel Design Guide Series 3 - Serviceability Design Considerations for Low-Rise-Buildings.

*[Specifier Note: Select design specification for paragraph C.1.]*

D. Metal Roof System:

1. Metal Roof System shall comply with Section 07410 of the Specifications.
2. Metal Roof/Wall Cladding systems shall be manufactured and furnished by the same Manufacturer that is providing the Retrofit Metal Roof Framing System.

E. Accessories and Their Fasteners

1. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces.

**1.06 SUBMITTALS**

1. Installation Drawings:
	1. The Manufacturer to submit complete installation drawings and installation details 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.
	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 Manufacturer, and proposed identification of component parts and their finishes.
2. Calculations (All calculations noted below shall be reviewed and sealed by a Licensed Professional Engineer):
	1. Provided by Manufacturer:
		1. Manufacturer to submit engineering calculations defining cladding loads for all roof areas based on specified building codes, allowable clip loads, and required number of fasteners to secure the panel to the retrofit framing system.
		2. Compute gravity load at each base member attachment to the existing roof system and indicated on installation drawing submittals.
		3. Compute uplift loads on framing system fasteners and indicate on installation drawing submittals.
	2. Provided by Contractor:
		1. Contractor to submit engineering calculations confirming that selected anchoring devices and their quantity thereof will satisfy the Manufacturer’s specified uplift loads in the attachment to the existing roof’s structural support system.
		2. These calculations shall use a safety factor of 2.5 applied to required ultimate uplift values provided by the Manufacturer.
		3. Calculate holding strength of fasteners in accordance with submitted test data provided by Fastener Manufacturer based on length of embedment and properties of materials.
3. Physical Samples:
	1. None required.

**1.07 PRODUCT DELIVERY, STORAGE AND HANDLING**

1. Delivery:
	1. Deliver Retrofit Metal Roof Framing System to job site properly packaged to provide protection against transportation damage.
2. Handling:
	1. Exercise extreme care in unloading, storing and installing system components to prevent bending, warping, twisting and surface damage.
3. Storage:
	1. Store all material and accessories above ground on well supported platforms. Store under waterproof covering. Provide proper ventilation of metal roofing system to prevent condensation build-up between component members.

**PART 2 -**

* 1. **APPROVED MANUFACTURERS**
1. The retrofit framing and metal roof panel system as specified in sections elsewhere in this specification shall be as manufactured by the following or a prior approved equal with all roof panel, framing components and accessories from a single source Manufacturer

Metal Sales Manufacturing Corporation - Corporate Office – 545 South 3rd Street, Suite 200 – Louisville, KY 40202

Phone: 800-406-7387 or at www.metalsales.us.com

1. Supply all products specified in this section from the same Manufacturer as for Sections 07410 (07 41 00) and 07620 (07 62 00)
	1. **FRAMING SYSTEM COMPONENTS**
2. The retrofit framing Manufacturer shall engineer the framing system to comply with the “Design Intent” of the existing roof’s supporting structure to ensure that all new load-bearing or load-transferring members are anchored to and located directly over existing secondary or primary load bearing support members. The retrofit framing system shall consist of any of the following components based on the Manufacturer’s design and in accordance with the specifications herewith.
	1. Base clips for purlin supporting member attachment shall be a minimum 3” x 5” x 6” x 16-gage factory-punched steel angle having 15.0 square inches of bearing surface area. At the option of the Manufacturer, provide a minimum 14-gage pre-formed gusseted steel angle base clip that is factory punched for attachment of anchors to the existing roof support system.
	2. Base channel members shall be a 4-1/8” x 3” x 16” x 16-gage long having 66 square inches of bearing surface area.
	3. Continuous zee-shaped base members shall be minimum 16-gage roll-formed steel measuring 4” x 2-1/2”.
	4. Channel or cee-shaped purlin supports (vertical members, posts, columns) shall be a minimum 16-gage roll-formed steel measuring 4” x 2-1/2”.
	5. Zee-shaped purlins (horizontal metal roof supports) shall be a minimum 16-gage roll-formed steel measuring 4” x 2-1/2”.
	6. Purlin clips shall be a minimum 16-gauge formed steel angle shape.
	7. Perimeter eave and wall framing members shall be a minimum of 16-gage formed steel, channel, and cee or custom shapes to satisfy conditions.
	8. Purlin stabilization and transverse or longitudinal strapping shall be a minimum 0.031” thick x 1-1/4” wide x 140 KSI pre-punched steel.
	9. Hat channels used for bracing, girts, struts or other miscellaneous framing members shall be a minimum of 22-gage steel with galvanized, G-90 coating, in accordance with ASTM A 525.

**2.02 MATERIALS**

1. Steel sheet for roll-formed or press-broke members of the gage indicated herein, conforming to ASTM A 1011 and minimum yield strength 55,000 PSI and minimum tensile strength 70 ksi.
2. Structural shapes, if required for special conditions, shall conform to ASTM A 36 and minimum yield strength of 36,000 PSI.
3. Cold form steel framing system members of the minimum gages indicated herein shall have a protective shop primer coating conforming to FS TT-P-646 with base steel prepared in accordance with SSPC-SP10.
4. Supply all hardware items required for installation of retrofit framing system in accordance with Manufacturer’s installation instructions and other indicated items.
	1. **MISCELLANEOUS PRODUCTS**
	2. Fasteners And Anchors
		1. Anchors used for the attachment of the new retrofit framing system to the existing roof structural support system shall be of the type and size that is appropriate for secure attachment to satisfy the required wind uplift pressure values at each location, as specified by the retrofit system Manufacturer. All anchors shall attach directly into existing structural members. A minimum of two (2) anchors shall be used for base clips and minimum of four (4) for base channels.
		2. Fasteners for structural framing connections shall provide both tensile and shear ultimate strengths of not less than 750 pounds per fastener. They shall have a corrosion resistant coating and sized to a minimum ¼” diameter with 14 threads per inch having with a “Stress Relief” head design to prevent screw head overstressing during installation.
	3. Anchor Penetration Sealant
		1. Temporary construction sealant shall be used at each anchor penetration at attachment locations of the new retrofit framing system to the existing roof structural support system. The Installer shall select the appropriate sealant type that is compatible with the existing roof membrane, which will provide a leak-free condition throughout the erection of the framing and the completion of the metal roof panel system installation. The installing Contractor is responsible for any and all leaks including damage to the building contents.
		2. Insulation, if applicable, to be installed at existing roof to be as specified in Section 07200 (07 20 00).
		3. Ventilation of the newly created attic space between the old roof and the underside of the new metal roof to be ventilated.
			1. Design of ventilation system shall yield a minimum intake/exhaust airflow for three (3) air changes per hour.
			2. Refer to Section 07410 (07 41 00) for specified metal roof mounted ventilation as provided by the metal roof Manufacturer.
	4. Metal Roof System
		1. Refer to specification section 07410 (07 41 00) for specified metal roof system to included in the design of and installed on to the retrofit framing system. The following type of metal roof system has been specified.
			1. Structural standing seam metal roof system (SSMRS) capable of spanning retrofit purlins.
			2. Structural thru-fastened (exposed fastener) metal roof system capable of spanning retrofit purlins.
			3. Non-structural standing seam metal roof system requiring a solid sub-decking that is supported by the retrofit purlins.

*[Specifier Note: Choose only one of the three types of metal roof systems and delete the others. Coordinate with your Section 07410 roof system that has been specified]*

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

1. General
	1. Installation shall be as specified and in accordance with the retrofit systems Manufacturer’s approved installation documents and erection drawings.
	2. Install the retrofit framing system with purlins erected to roof plane without waves, warpage, buckles, fastening stresses or other distortion. Every care should be taken in the installation of the retrofit framing to minimize oil canning in the metal roof panel system.
	3. Field cutting of framing members shall be done in a safe manner preventing damage to the existing roof or adjacent materials. The retrofit framing Contractor shall use good construction practices to minimize scrap and to utilize the material as provided by the retrofit system Manufacturer.
	4. Dissimilar materials that are not compatible when contacting each other shall be insulated from each other by means of gaskets or insulating compounds.
2. Erection Tolerances (Over length of member)
	1. Variation from plumb: 1/8 inch, maximum
	2. Variation from level: 1/8 inch, maximum
	3. Variation from true plane: 1/8 inch, maximum
	4. Variation from true position: 1/4 inch, maximum
	5. Variation of member from plane: 1/8 inch, maximum

**3.02 DEMOLITION OF EXISTING ROOF MATERIALS** *(if applicable)*

* + 1. The Contractor shall remove existing loose and semi-loose aggregate from any built-up roofing membrane if applicable. Removal shall be accomplished by carefully removing the aggregate in a method that minimizes damage to the roofing membrane. The removal shall be thorough and shall render a semi-smooth substrate suitable for attachment of new retrofit base framing members.
		2. The Contractor shall exercise care and shall prevent aggregate from entering roof drains and clogging the existing roof’s drainage system. All aggregate surfacing shall be removed and disposed of properly and in accordance with local ordinances and regulations.*[Specifier Note:**Include this entire sub-section if all or any part of the existing roof has built-up roof (BUR) and you wish to have any aggregate removed and disposed of. Please note that removal of aggregate will help in compensating for the added weight of the retrofit system to the existing roof]*

**3.02 EXISTING ROOFTOP EQUIPMENT**

A. General: Additional work may be required to accommodate existing rooftop mounted equipment.

* + 1. New sub-framing for rooftop equipment being mounted atop new roof shall distribute equipment weight equally to vertical support members and to base members for connection to the existing roof support system.
		2. Sub-framing for curb mounted equipment to permit thermal movement.
		3. If any air-handling equipment is to remain at the existing roof level for being roofed over, the Contractor shall inform the retrofit framing Manufacturer of the location and size of the equipment as well any passageway that needs to be provided for future removal and replacement of the equipment.
			1. Manufacturer to accommodate the roofing over existing equipment with framing that provides appropriate clearance over and around the equipment as recommended by the equipment manufacturer.
	1. Coordinate work and materials with other trades as necessary.
1. Existing roof penetrations that are being extended through the new metal roof may require remedial work to ensure that they are routed out between the metal roof’s panel ribs. No piping penetrations shall obstruct a panel rib unless the penetration is installed in accordance with the Manufacturer’s approved details.
2. Extension Of Electrical Service: When air handling equipment is removed and reinstalled on curbs atop the new metal roof system, the Contractor shall extend the electrical service as required to render the equipment operational. Extensions shall be made with like gage and type wire. If the original service is run in conduit, conduit shall be installed on the extension. Junction boxes shall be provided at splices in wire or conduits. Junction boxes and conduit shall be secured to the steel framing structure. All work shall be accomplished to comply with the local electrical code.
3. Extension Of Existing Plumbing Vents: During the installation of the specified metal roof panel system, the extension and flashing of existing plumbing vents will be required. The Contractor shall extend existing plumbing vents through the metal roof panels, as required and provide flexible vent pipe flashings at the roof panel penetration. Plumbing vent extensions shall be made with material of like composition of the plumbing vent being extended, and shall be securely braced within the attic space to ensure continued service of the vent. As often as possible, when extending plumbing vents, the Contractor shall ensure that the roof penetration is located between the side seams of the metal roof panels such that the malleable ring on the flexible vent pipe flashing will lay flat against the roof panel around its entire circumference. The Contractor shall install elbow fittings to horizontally displace the pipe if necessary. The metal roof panel system Manufacturer must approve plumbing vents that do not fall between side seams.
4. Extension Of Existing Hot Flue Stacks: During the installation of the specified metal roof panel system, the extension and flashing of existing hot flue stacks will be required. The Contractor shall extend existing hot flue stacks through the metal roof panels, as required and provide flashings at the roof panel’s penetration. Flashings shall be flexible vent stack type or rooftop equipment curb type depending on the size of the existing stack. Hot flue stack extensions shall be of double wall construction made with material of like composition of the hot flue stack being extended, and shall be securely braced within the attic space to ensure continued service of the vent. Hot flue stacks shall be extended to 3 feet higher than the elevation of any roof within a 10-foot radius of the hot flue stack penetration.
5. Extension Of Existing Ductwork: When existing gravity vents, power vents, gooseneck fresh air make-up, and other vents are installed on curbs on the new metal roof panel system, the extension of vent ductwork will be required. The Contractor shall extend existing ductwork through the metal roof panel system, as required to ensure the continued service of the vent. Ductwork shall be securely attached to new rooftop equipment curb and joints shall be sealed tight to provide a leak-proof assembly. Ductwork extensions shall be made with material of like composition and gage of the ductwork being extended.

**3.03 REINSTALLATION OF EXISTING ROOFTOP EQUIPMENT**

* + - 1. During the installation of the specified metal roof panel system, the removal and reinstallation of existing power vents, gravity vents, and gooseneck vents shall be required. The Contractor shall remove and reinstall vents indicated to extend through the metal roof panel system. The Contractor shall have the responsibility to remove such vents without damage, and reinstall the vents on new rooftop equipment curbs. Vents shall be securely fastened to the equipment curb to prevent displacement and to provide a weathertight installation. In the case of power vents, the electrical service shall be extended to ensure continued service of the vent.

**3.04 CLEANING, PROTECTION**

A. Dispose of excess roofing 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 satisfaction of the architect (owner), any work that becomes damaged prior to final acceptance.

**END OF SECTION**

*To ensure you have the latest information available, please contact METAL SALES MANUFACTURING CORPORATION or visit our web site at* [*http://www.metalsales.us.com*](http://www.metalsales.us.com) *. First published February 2013*