Construction Specification
023 Aluminum or Steel Roof Gutters

SCOPE

The work consists of furnishing and installing roof gutters and downspouts as specified in the construction plans.

MATERIALS

1. Aluminum and Steel
   - Gutters, downspouts, and associated hardware shall be aluminum, galvanized steel, painted steel, or coated galvanized steel. Dissimilar metals shall not be in contact with each other
   - Accessories for gutters or downspouts shall be of like materials. Hardware and accessories shall be of sufficient strength to secure the gutters and downspouts.
   - Aluminum, galvanized steel, painted steel, and coated galvanized steel shall have the following minimum thickness.

	Thickness	
	Galvanized Steel, Painted Steel, and Coated Galvanized Steel	**Aluminum Materials**
Gutters	28 gauge	0.032 inches
Downspouts	28 gauge	0.020 inches
Heavy-duty Hangers	16 gauge	0.060 inches[1]
Roof Straps	19 gauge	0.060 inches
Wrap-around Straps	28 gauge	0.032 inches
[1] If hangers do not have self-bracing sides and/or reinforcing ribs that run the entire length of the hanger, and continue through the points of greatest stress, the nominal thickness shall be 0.075 inches or greater.		

2. Plastic

   Plastic downspouts may be used for metal or aluminum gutters. They shall meet requirements of ASTM D-1785 schedule 40.

3. Wood

   New fascia board (treated/untreated) shall be straight and graded lumber #2 or better and shall be sound and free of or contain minimal knots. If treated lumber is used as fascia, wedges, or rigid supports, it shall have treatment retention applicable for exterior, above ground use and be non-corrosive to aluminum and steel. Lumber treated with micronized copper and labeled for “above ground use” may be used in direct contact with aluminum and steel. Lumber treated with ACQ, AC2, or other corrosive preservatives are not acceptable unless a waterproof coating is applied between the lumber and the gutter.

INSTALLATION

1. Gutters
   - The slope and placement of the gutter shall be as specified in the construction plans.
   - Hangers and straps shall be securely anchored in a manner which will not prevent the entry of water into the gutter
2. Supports
   - Vertical support

     Vertical support shall be provided as specified in the construction plans using either, a heavy duty gutter hanger and a roof strap, or a heavy duty gutter hanger screwed to the fascia. They shall have a maximum spacing of 18 inches for aluminum gutters and 24 inches for steel gutters. For gutter sizes greater than 6 inches, maximum hanger spacing shall be reduced to 12” for aluminum gutters and 18” for steel gutters

Figure 1: Typical Hangers Screwed to Fascia

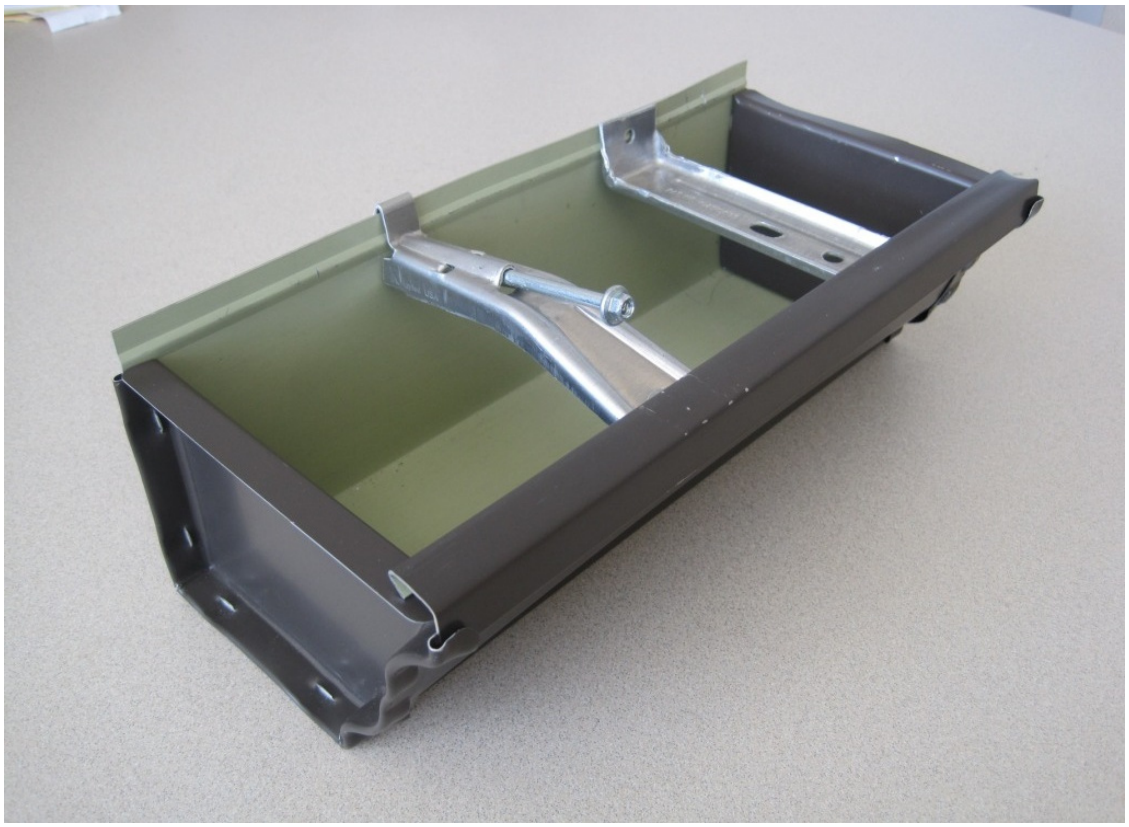
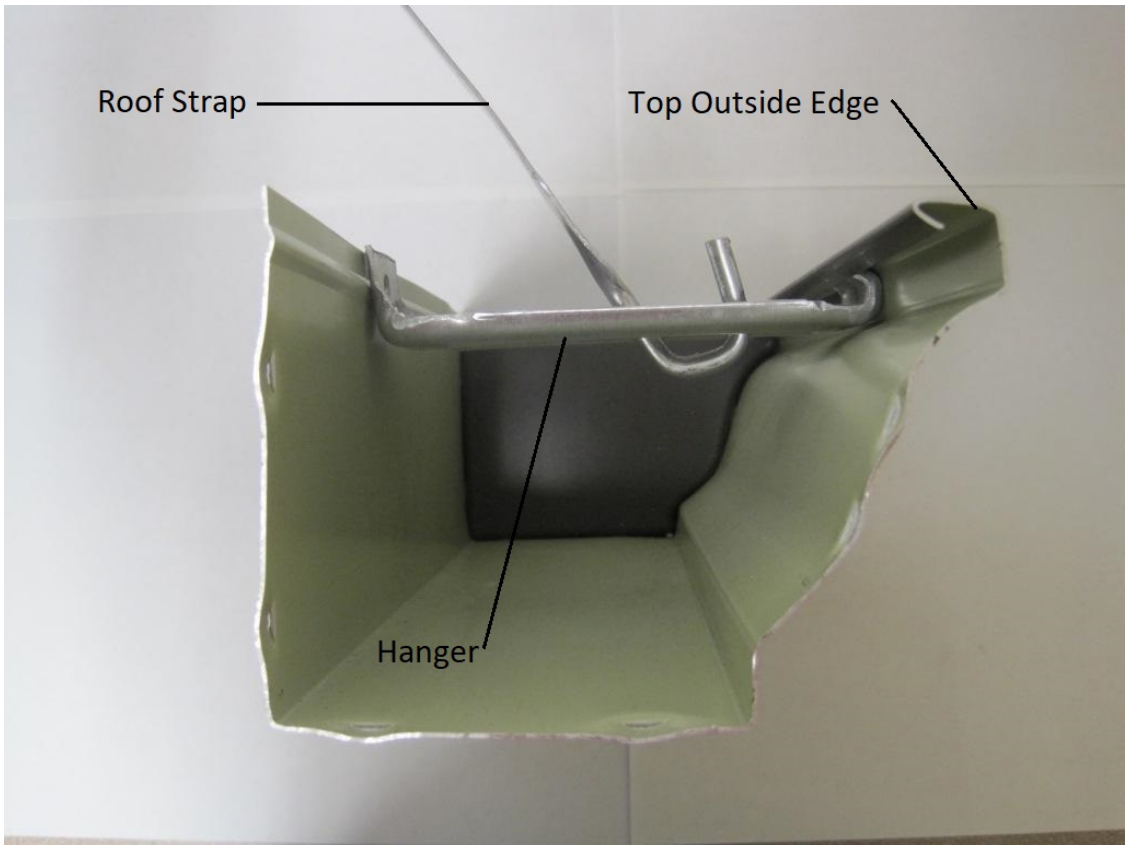


Figure 2: Typical Gutter Hanger and Roof Strap Attachment

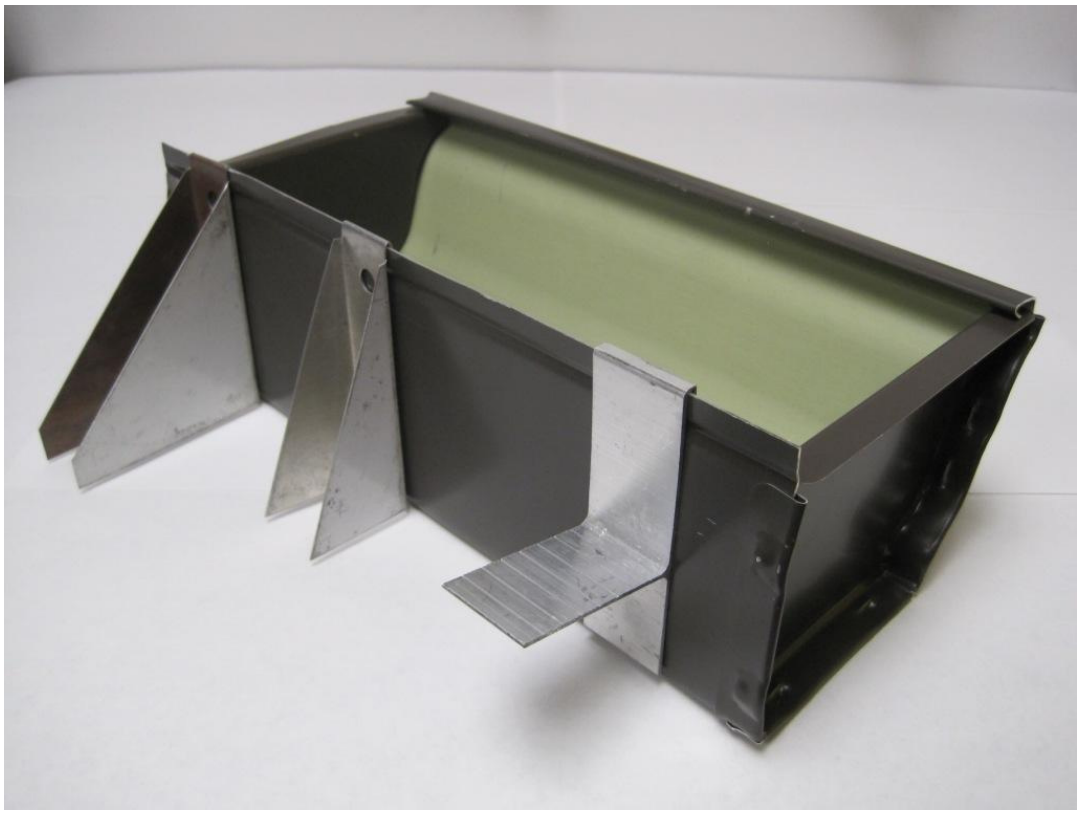


Roof straps shall be securely fastened to each gutter hanger and the roof. Hangers shall have self-bracing sides and/or reinforcing ribs that run the entire length of the hanger, and continue through the points of greatest stress (Figure 3). Alternative gutter hangers shall be approved by the technician prior to installation.

Figure 3: Heavy Duty Gutter Hanger Details

- Lateral Support
  - Lateral supports, if required, shall be as specified in the construction plans, with a maximum spacing of 8 feet.
  - Lateral support may be provided with wedges, wrap-around straps, rigid supports, or any combination thereof which will provide necessary inward and/or outward support. Wrap-around straps and rigid supports shall be as specified in Snow and Ice Support Section.

Figure 4: Typical wedges used for inward lateral support



- Snow and Ice Support
  Wrap-around straps and rigid supports, if required, shall be as specified in the construction plans, with a maximum spacing of 8 feet. Wrap-around straps shall be a minimum of 1 inch wide stock gutter material and be securely fastened to the fascia board or building, and the roof. They shall be in full contact with the bottom and outside face of the gutter, and extend a minimum of 6 inches onto the roof.

Figure 5: Typical wrap-around strap attachment to roof

Figure 6: Typical wrap-around strap attachment to fascia board

Rigid supports may be used in lieu of wrap-around straps. They shall be a minimum of 1 inch wide and shall have a minimum thickness of 1/8 inch for steel and 3/16 inch for aluminum. Materials with equivalent strength and durability are acceptable.

The supports shall be securely attached to the fascia board or building and shall contact the entire gutter bottom width. If supports are screwed into the bottom of the gutter, the screw holes shall be sealed to prevent leakage.

Figure 7: Rigid Support

Figure 8: Rigid Support

Figure 9: Rigid Support

Figure 10: Rigid Support

Snow guards, if required in the construction plans, shall be installed per manufacturer's recommendations.

Figure 11: Typical snow guards to prevent snow and ice slides

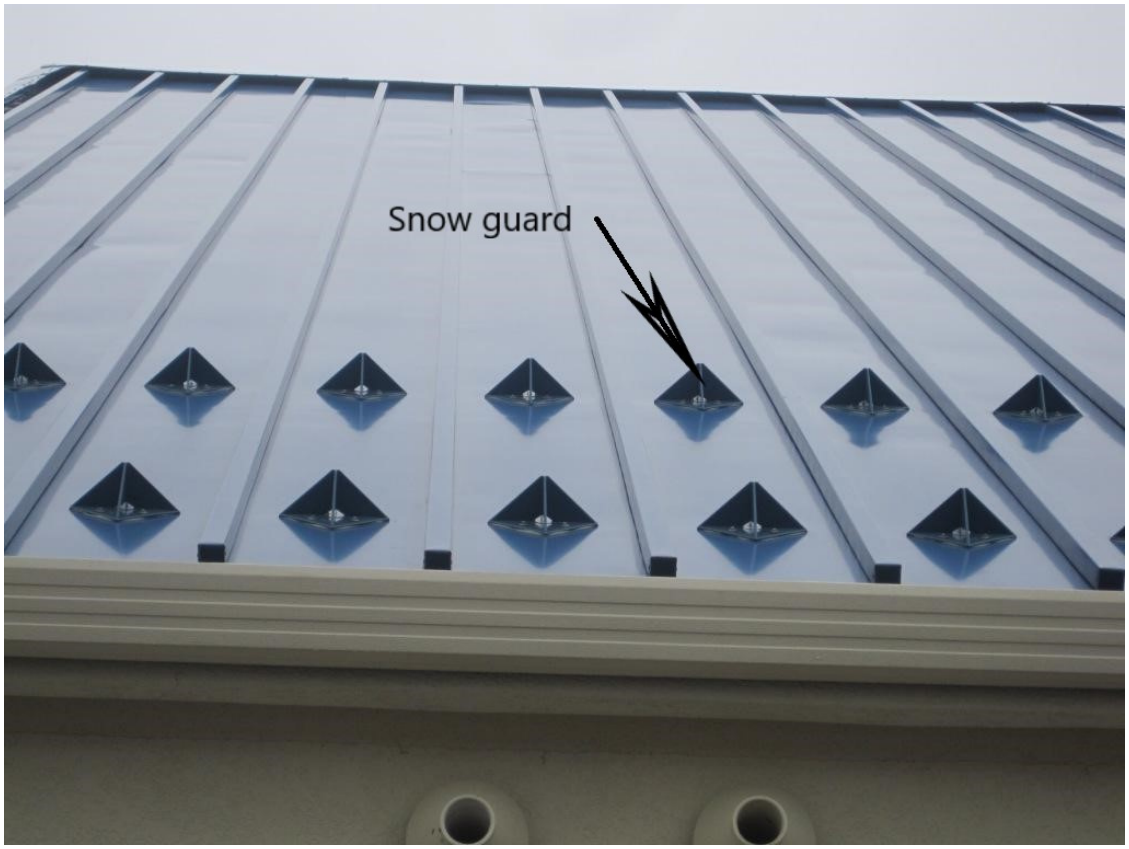
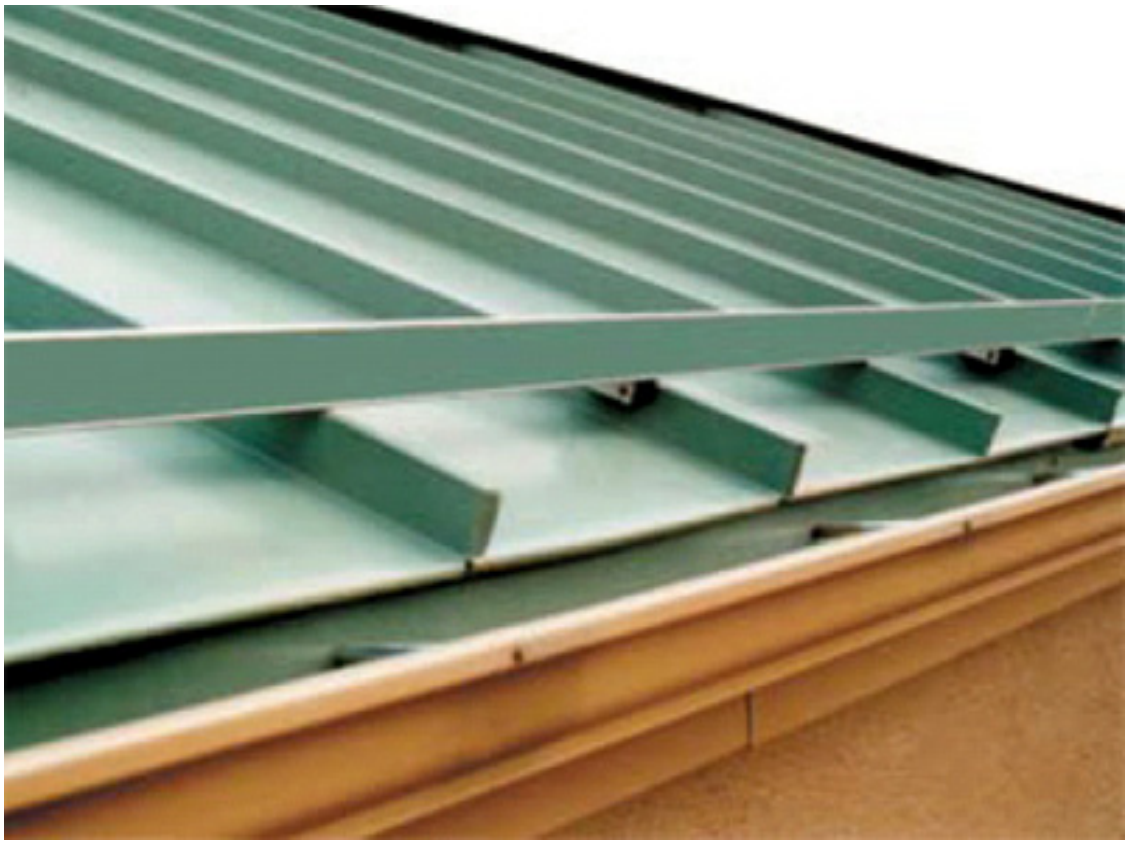


Figure 12: Snow guards to prevent snow and ice slides



Alternative snow and ice support systems shall be approved by the Technician prior to installation.

3. Downspouts
   - Supports for vertical downspouts shall be securely fastened at the top and bottom with intermediate supports placed such that the maximum spacing between supports is 10 feet.
   - Supports for lateral downspouts and cross pipes shall be placed at a maximum spacing of 5 feet.
4. Underground Outlet Conduits
   - Underground conduits shall be installed according to the construction plans and the applicable Wisconsin construction specification.
   - Install appurtenances according to the recommendations of the manufacturer and as noted in the construction plans.

Specific Site Requirements