

SECTION 07 71 40  
GUTTERS AND DOWNSPOUTS

PART I GENERAL

1.0 SUMMARY

A. Section includes the following lead-coated copper sheet metal gutters and downspouts.

1. Formed roof drainage system including 6" downspouts and 6" half-round gutters of 20 ounce lead-coated copper.

B. Related Sections:

1. Section 01 10 10 - Special Processes in Historic Preservation.
2. Section 07 31 13 - Wood Shingle Roofing
3. Section 07 61 10 - Sheet Metal Roofing.
4. Section 07 60 00 - Sheet Metal Flashing and Trim.
5. Section 07 92 00 - Joint Sealers.
6. Section 09 91 00 - Paints and Coatings.

1.1 REFERENCES

A. SMACNA (Sheet Metal and Air Conditioning Contractors National Association) - Architectural Sheet Metal Manual.

1.2 TERMS

A. The terms "downspout" and "leader" are used interchangeably in the project drawings.

1.3 DESIGN REQUIREMENTS

A. Conform to applicable code for size and method of rain water discharge.

1.4 SUBMITTALS

- A. Qualifications: Submit documentation which verifies qualifications of subcontractor, their site supervisors and craftsmen per Part 1.6 of this section.
- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details, including Conductor heads and Downspout Boots.
- C. Product Data: Submit data on manufactured components, materials, and finishes.
- D. Samples: Submit two samples, 12 inches long illustrating component design, finish, color, and configuration.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA Manual.
- B. Installer: Company and designated personnel specializing in performing Work of this section with minimum five years documented experience with each required procedure.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope to drain.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.7 COORDINATION

- A. Gutters and Downspouts to be installed along with new sheathing and new roofs, wood shingle on the main portion of the house, and standing seam lead-coated copper on the east addition. Work should also be coordinated to follow restoration of exterior stucco and wood siding.

1.8 WARRANTY

- A. Provide five year manufacturer warranty for gutter and downspout finishes.

PART II PRODUCTS

2.0 GUTTERS AND DOWNSPOUTS

A. Product Description:

1. Gutters: Lead-coated copper sheet metal; Semi-circular style profile, 20 oz.
2. Downspouts: Lead-coated copper sheet metal; Round profile, 20 oz.
3. Substitutions: Section 01600 - Product Requirements.

## 2.1 COMPONENTS

- A. Copper: ASTM B370, cold rolled 20 oz/sq. ft.; natural finish.

## 2.2 ACCESSORIES

- A. Anchors and Supports: Profiled to suit gutters and downspouts.
- B. Anchoring Devices: In accordance with SMACNA requirements and type recommended by fabricator.
- C. Gutter Supports: Brackets as indicated on drawings.
- D. Downspout Supports: Brackets, as indicated on drawings.
- E. Fasteners: Copper, same material and finish as gutters and downspouts.
- F. Solder: As recommended by manufacturer.
- G. Conductor Heads: Located and shaped as indicated on drawings.
- H. Downspout boots: Provide leader extenders or downspout boots into subsurface drainage system as indicated in drawings. All elements to be built of copper.
- I. Product Data: Submit data on manufactured components, materials, and finishes.

## 2.3 FABRICATION

- A. Form gutters and downspouts of profiles and sizes indicated.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.
- E. Tin edges of copper sheet to be soldered. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints.
- F. Fabricate gutter and downspout accessories; solder watertight.
- G. Fabricate hanging gutters in sections not less than 2400 mm (8 feet) long, except at ends of runs where shorter lengths are required.
- H. Building side of gutter shall be not less than 38 mm (1 ½ inches) higher than exterior side same height as exterior side.

- I. Gutter Bead: Stiffen outer edge of gutter by folding edge over approximately 19 mm (3/4 inch) toward roof and down approximately 19 mm (3/4 inch) unless shown otherwise.
- J. Gutter Spacers:
  - 1. Fabricate of same material and thickness as gutter.
  - 2. Fabricate 25 mm (one inch) wide strap and fasten to gutters not over 900 mm (36 inches) on center.
  - 3. Turn back edge up 25 mm (one inch) and lap front edge over gutter bead.
  - 4. Rivet and solder to gutter except rivet and seal to aluminum.
- K. Outlet Tubes:
  - 1. Form outlet tubes to connect gutters to conductors of same metal and thickness as gutters extend into the conductor 75 mm (3 inch). Flange upper end of outlet tube 13 mm (1/2 inch).
  - 2. Lock and solder longitudinal seam except use sealant in lieu of solder with aluminum.
  - 3. Solder tube to gutter. Seal aluminum tube to gutter and rivet to gutter.
  - 4. Fabricate basket strainers of same material as gutters.
- L. Gutter Brackets:
  - 1. Fabricate of same metal as gutter. Use Lead-Coated Copper.
  - 2. Fabricate to gutter profile.
  - 3. Drill two 5 mm (3/16 inch diameter holes in anchor leg for countersunk flat head screws.
- M. Leaders:
  - 1. Fabricate conductors of same metal and thickness as gutters in sections approximately 3000 mm (10 feet) long with 19 mm (3/4 inch) wide flat locked seams.
  - 2. Fabricate elbows by mitering, riveting, and soldering. Lap upper section to the inside of the lower piece.
  - 3. Fabricate conductor brackets or hangers of same material as conductor, 2 mm (1/16 inch) thick by 25 mm (one inch) minimum width. Form to support conductors 25 mm (one inch)

from wall surface in accordance with Architectural Sheet  
Metal Manual Plate 34, Design E for round shapes.

N. Conductor Heads:

1. Fabricate of same material as conductor.
2. Fabricate conductor heads to not less than 250 mm (10 inch) wide by 200 mm (8 inch) deep by 200 mm (8 inches) from front to back.
3. Form front and side edges channel shape not less than 13 mm (1/2 inch) wide flanges with edge hemmed.
4. Slope bottom to sleeve to conductor or downspout at not less than 60 degree angle.
5. Extend wall edge not less than 25 mm (one inch) above front edge.
6. Solder joints for water tight assembly.
7. Fabricate outlet tube or sleeve at bottom not less than 50 mm (2 inches) long to insert into conductor.

PART III EXECUTION

3.0 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Verify surfaces are ready to receive gutters and downspouts.

3.1 PREPARATION

- A. Paint surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.2 INSTALLATION

- A. Install gutters and downspouts as shown in Sheet Metal and Air Conditioning Contractors National Association, Inc., publication, ARCHITECTURAL SHEET METAL MANUAL, except as otherwise shown or specified.
- B. Apply Sealant as specified in Section 07 92 00, JOINT SEALANTS.

- C. Apply sheet metal to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
- D. Remove projections which would puncture the materials and fill holes and depressions with material compatible with the substrate. Cover holes or cracks in wood wider than 6 mm (1/4 inch) with sheet metal compatible with the roofing and flashing material used.
- E. Confine direct nailing of sheet metal to strips 300 mm (12 inch) or less wide. Nail flashing along one edge only. Space nail not over 100 mm (4 inches) on center unless specified otherwise.
- F. Sheet Metal: Join lengths with formed seams soldered watertight. Flash and solder gutters to downspouts and accessories.
- G. Hang gutters with high points equidistant from downspouts. Slope at not less than 1:200 (1/16 inch per foot.
- H. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.
- I. Fabricate hanging gutters in sections not less than 2400 mm (8 feet) long, except at ends of runs where shorter lengths are required.
- J. Building side of gutter shall be not less than 38 mm (1 ½ inches) higher than exterior side same height as exterior side.
- K. Lap joints, except for expansion joints, at least 25 mm (one inch) in the direction of flow. Rivet and seal or solder lapped joints.
- L. Support gutters in brackets spaced not more than 600 mm (24 inch) on centers, brackets attached to facial or wood nailer by at least two screws or nails. Use brass or bronze brackets and brass screws.
- M. Gutter Bead: Stiffen outer edge of gutter by folding edge over approximately 19 mm (3/4 inch) toward roof and down approximately 19 mm (3/4 inch) unless shown otherwise.
- N. Gutter Expansion Joints:
  - 1. Locate expansion joints midway between outlet tubes.
  - 2. Provide at least a 25 mm (one inch) expansion joint space between end baffles of gutters.
  - 3. Install a cover plate over the space at expansion joint.

4. Fasten cover plates to gutter section on one side of expansion joints only.
  5. Secure loose end of cover plate to gutter section on other side of expansion joint by a loose-locked slip joint.
- O. Outlet Tubes:
1. Form outlet tubes to connect gutters to conductors of same metal and thickness as gutters extend into the conductor 75 mm (3 inch). Flange upper end of outlet tube 13 mm (1/2 inch).
  2. Lock and solder longitudinal seam except use sealant in lieu of solder with aluminum.
  3. Solder tube to gutter. Seal aluminum tube to gutter and rivet to gutter.
  4. Fabricate basket strainers of same material as gutters. Set bracket strainers loosely into gutter outlet tubes.
- P. Gutter Brackets:
1. Fabricate of same metal as gutter. Use Lead-Coated Copper.
  2. Fabricate to gutter profile.
  3. Drill two 5 mm (3/16 inch diameter holes in anchor leg for countersunk flat head screws.
- Q. Leaders: :
1. Fabricate conductors of same metal and thickness as gutters in sections approximately 3000 mm (10 feet) long with 19 mm (3/4 inch) wide flat locked seams.
  2. Fabricate elbows by mitering, riveting, and soldering. Lap upper section to the inside of the lower piece.
  3. Fabricate conductor brackets or hangers of same material as conductor, 2 mm (1/16 inch) thick by 25 mm (one inch) minimum width. Form to support conductors 25 mm (one inch) from wall surface in accordance with Architectural Sheet Metal Manual Plate 34, Design E for round shapes.
- R. Conductor Heads:
1. Fabricate of same material as conductor.
  2. Fabricate conductor heads to not less than 250 mm (10 inch) wide by 200 mm (8 inch) deep by 200 mm (8 inches) from front to back.
  3. Form front and side edges channel shape not less than 13 mm (1/2 inch) wide flanges with edge hemmed.



4. Slope bottom to sleeve to conductor or downspout at not less than 60 degree angle.
5. Extend wall edge not less than 25 mm (one inch) above front edge.
6. Solder joints for water tight assembly.
7. Fabricate outlet tube or sleeve at bottom not less than 50 mm (2 inches) long to insert into conductor.

### 3.3 TESTING

- A. Test gutters and downspouts for proper operation with Architect present.
- B. Block downspouts and fill gutters to verify that there are no leaks.
- C. Release downspout blockage to verify proper flow to and through downspouts.
- D. Remedy deficient conditions and retest until all components of system operate properly.

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