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The representations and warranties of B and B Sheet Metal made in this specification is true and correct as of September 4, 2007. For more up-to date information, or to ensure the correctness of the following information at any given time, please consult with a B and B Sheet Metal employee. Furthermore, all the information contained and specified below is true for stock products and thus any modifications or customizations to any product will change the nature and specifications particular to that product likely making some or all of the information herein inapplicable.

SECTION 07 63 13

ROOF DRAINAGE SHEET METAL

******* B and B Sheet Metal designs and fabricates an extensive line of sheet metal products for the construction industry in modern facilities employing state of the art techniques such as computerized press brakes and waterjet cutting. B and B Sheet Metal's products include flashings, fascia, copings, trim, gutters, leader and conductor heads, scuppers, downspouts, snow guards, finials, spires, cupolas, cornices, roof vents, skylights, louvers, and dormers using a variety of materials such as copper, patina coated copper, lead-coated copper, zinc-coated copper, galvanized steel, stainless steel, terne-coated stainless steel, and aluminum.**

This guide specification section can be used to specify for a competitively bid project standard and custom designed sheet metal fabrications provided by B and B Sheet Metal to convey rainwater from roof areas. Depending of the size and scope of the project all sheet metal can be specified in one section. Hence, Section 07 62 00 - Sheet Metal Flashings and Trim and Section 07 63 13 - Roof Drainage Sheet Metal can be combined into a single Section 07 60 00 Flashing and Sheet Metal. The specifier will need to edit, modify, and expand this section for a specific project. Appropriate options and requirements need to be selected and non-applicable ones deleted. Contact B and B Sheet Metal for assistance in planning, designing, selecting options, and detailing custom installations.

The specification section is organized by placing information in three standard parts:

- | | |
|----------------------------------|---|
| <u>PART 1 - GENERAL</u> | Describes administrative and procedural requirements. |
| <u>PART 2 - PRODUCTS</u> | Describes materials, products, and accessories to be incorporated into the construction project. |
| <u>PART 3 – EXECUTION</u> | Describes how the products will be installed at the construction site. |

Throughout this product guide specification, references are made to other specification

sections that might be contained in the project manual. These references are presented as examples and coordination reminders. For each project, these references will need to be revised to reflect actual sections being used.

The specifier will need to edit this product specification for a specific project to reflect the options and applications being used. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements and options. Options are indicated by []. Notes to assist the specifier in selecting options and editing the specification guide are printed in bold and indicated with *****. For final editing, all brackets and notes will need to be deleted from the guide.

PART 1 - GENERAL

1.1 SUMMARY

******* B and B Sheet Metal provides standard designed roof drainage sheet metal items as well as custom fabrications to accommodate unique project requirements. Edit the following paragraph to reflect specific project requirements. *******

A. Section includes: [Custom fabricated] [Manufactured] sheet metal fabrications to convey rainwater from roof areas including:

- [1. Leader (conductor) heads.]
- [2. Gutters.]
- [3. Downspouts.]
- [4. Scuppers.]
- [5. Snow guards.]
- [6. [____].]

B. Related sections:

******* List other specification sections dealing with work directly related to this section such as the following. *******

1. Section [07 50 00 - Membrane Roofing] [____]: Roof system to coordinate with roof drainage sheet metal.

******* Include the following paragraph if sheet metal other than roof drainage sheet metal is being specified in a separate section. *******

2. Section 07 62 00 - Sheet Metal Flashings and Trim: Sheet metal flashings, counter flashings, and trim installed as part of roof system to prevent water penetration.
3. Section 07 92 00 - Joint Sealants: Sealants and backing material used for installation of sheet metal.

1.2 REFERENCES

******* List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references. *******

- A. American Society for Testing and Materials (ASTM):
 1. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 2. Section A308 - Steel Sheet, Terne (Lead-Tin Alloy) Coated by Hot-Dip Process.
 3. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
 4. ASTM B32 - Solder Metal.
 5. ASTM B101 - Lead-Coated Copper Sheet and Strip for Building Construction
 6. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
 7. ASTM B370 - Copper Sheet and Strip for Building Construction.
- B. National Roofing Contractors Association (NRCA): NRCA Roofing Manual.
- C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - SMACNA Architectural Sheet Metal Manual.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures:
 1. Product data.

2. Shop drawings for roof drainage sheet metal items showing profiles, dimensions, material gauges, fastening methods, and installation details.
3. Sample of selected material and finish.
4. Manufacturer's installation and maintenance instructions.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with applicable NRCA Roofing Manual and SMACNA Architectural Sheet Metal Manual details and requirements.

1.5 HANDLING

- A. Stack preformed material to prevent twisting, bending, or abrasion. Provide ventilation.
- B. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. B and B Sheet Metal, 25-40 50th Avenue, Long Island City, New York 11101; 715-433-2501; www.bbsheetmetal.com.
- B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01630 - Product Substitution Procedures.

2.2 MATERIALS

******* B and B Sheet Metal provides roof drainage fabrications in seven materials and finishes as illustrated in their product data. Contact B and B Sheet Metal for assistance in selecting material and gauge for specific items. Select required material and finish from the following options. Delete unnecessary materials.**

******* Sheet steel can be coated with a thin layer of zinc to protect it from rusting by dipping it into molten zinc to produce galvanized sheet steel which is often used for roof flashings and sheet metal. B and B Sheet Metal provides exposed galvanized steel fabrications which may be field painted. It is available in 26 gauge thickness only. In areas with frequent rainfall and acid deposition, the zinc coating may erode. *******

- A. Galvanized sheet steel: Zinc-coated steel sheet complying with ASTM A653, 26 gauge thick.

******* Three types of copper sheet are provided for roof drainage sheet metal fabrications:**

Plain copper sheet in weights of 16 and 20 ounces per square foot.

Pre-patinaed copper sheet (Evergreen): 16 ounces per square foot copper sheet with a greenish-brown film caused by oxidation.

Lead-coated copper sheet: 16 ounces per square foot copper sheet with a thin coating of lead.

Copper and lead-coated copper are highly ductile and easy to form and solder. When exposed over time, copper forms a greenish-brown crust produced by oxidation. *****

- B. Copper sheet: Plain copper sheet complying with ASTM B370 and weighing [16] [20] ounces per square foot.
- C. Pre-patinaed copper sheet: Copper sheet weighing 16 ounces per square foot and complying with ASTM B370 with greenish-brown patina oxidation film; Evergreen Copper as provided by B and B Sheet Metal.
- D. Lead-coated copper: Copper sheet with a thin lead coating complying with ASTM B101 and weighing 16 ounces per square foot.

******* Sheet aluminum fabrications are provided in 0.025 inch thickness and in three thermoset polyester enamel finishes - brown, high gloss white, and bronze.**

- E. Aluminum sheet: 0.025 inch thick aluminum sheet complying with ASTM B209 and finished with thermoset polyester enamel finish.
 - 1. Color: [Brown] [High gloss white] [Bronze].

******* Stainless steel is an alloy of carbon steel typically containing chromium and nickel to enhance its resistance to corrosion. Roof drainage sheet metal can be fabricated from either plain 26 or 24 gauge stainless steel or from 26 gauge terne-coated stainless steel. Terne coating is a corrosion-protective coating consisting of a combination of lead and tin. Terne-coated stainless steel is glossy upon first exposure, but turns matte gray with exposure. *******

- F. Stainless steel: [26] [24] gauge corrosion resistant chromium, tin, and steel alloy complying with ASTM A167.
- G. Terne-coated stainless steel: 26 gauge stainless steel sheet with a hot dipped lead and tin terne coating complying with ASTM A167 and ASTM A308.
- H. Sealant: [Silicone] [Polyurethane] [Acrylic] [_____] type specified in Section 07 92 00 - Joint Sealants.

- I. Solder: ASTM B32.

2.3 LEADER (CONDUCTOR) HEADS

******* B and B Sheet Metal manufacturers over 20 types of leader (conductor) heads designed to funnel rainwater from gutters and roof areas into downspouts. Refer to B and B Sheet Metal product literature for illustrations of standard designs and available materials. Not all designs are available in all material listed in Paragraph 2.2. B and B Sheet Metal also custom fabricates leader heads based on the Design Professional's design. Contact B and B Sheet metal for assistance in creating a custom fabricated, unique leader head. *******

- A. Type: [Manufactured sheet metal box type fabrication to funnel water from [roof scupper] [gutter] into downspout; [April] [Elan] [Fancy] [Hail] [Joanne] [Joe V] [June] [King 7K] [Loic B] [Monika] [Onasis] [Oma] [Opa] [Plain] [Precious] [Robbie] [The Creator] [Uncle B] [Veronica] Model as manufactured by B and B Sheet Metal.] [Custom designed and fabricated sheet metal box type fabrication to funnel water from [roof scupper] [gutter] into downspout in accordance with design, shape, and dimensions illustrated on Drawings and reviewed shop drawings and fabricated by B and B Sheet Metal.]
- B. Material: [Galvanized sheet steel] [Copper sheet.] [Pre-patinaed copper sheet.] [Lead-coated copper.] [Aluminum sheet with [brown] [high gloss white] [bronze] thermoset enamel paint finish.] [Stainless steel.] [Terne-coated stainless steel sheet.]

******* B and B Sheet Metal fabricates some standard leader/conductor heads with either embossed or applied decorative designs as illustrated in B and B Sheet Metal product literature. Custom fabrications can also be decorated with embossed or applied designs. *******

- C. Fabrication: Fabricate leader/conductor heads from formed sheet metal with soldered joints [and [embossed] [applied] decorative designs [as detailed on Drawings]].

******* B and B Sheet Metal standard leader/conductor heads are provided to accommodate 3 or 4 inches diameter downspouts. Custom fabricated heads can also be designed to accommodate rectangular downspouts. *******

- D. Outlet size: Design leader/conductor heads to accommodate [[3] [4] inches diameter] [[2 by 3] [3 by 4] [4 by 5] inches rectangular] downspouts.

2.4 DOWNSPOUTS

******* B and B Sheet Metal fabricates various downspouts to carry rainwater from gutters and leader/conductor heads. They are provided in several sizes and materials in round and rectangular shapes with smooth surfaces and in rectangular shapes with corrugated surfaces. *******

- A. Type: Vertical sheet metal pipe to carry rainwater from [gutters] [leader/conductor heads] [scuppers] as manufactured by B and B Sheet Metal.
- B. Shape and size: [[3] [4] inches diameter round downspout with a smooth surface.] [2 by 3] [3 by 4] [4 by 5] inches rectangular downspout with smooth surfaces.] [[2 by 3] [3 by 4] inches rectangular downspout with a corrugated front surface.]
- C. Material: [Galvanized sheet steel] [Copper sheet.] [Evergreen copper sheet.] [Lead-coated copper.] [Aluminum sheet with [brown] [high gloss white] [bronze] thermoset enamel paint finish.] [Stainless steel.] [Terne-coated stainless steel.]
- D. Fabricate downspouts with roll forming downspout machine in maximum lengths to eliminate field joints. Provide downspouts with angled bottom boot.

******* B and B Sheet Metal fabricates several decorative sheet metal straps for attaching gutters to exterior walls as illustrated in B and B Sheet Metal product literature. Custom strap designs are also available. *******

- E. Straps: Provide decorative sheet metal straps with fasteners to attach downspout to exterior walls fabricated from material and finish to match downspout; [Model [Violet] [Emerald] [Fancy] [Pine] [Scarlet] [Sienna] [Royal] [[Topaz] [Crimson] as manufactured by B and B Sheet Metal.] [Custom fabricated strap as detailed on Drawings and reviewed shop drawings and fabricated by B and B Sheet Metal.]

******* Various downspout accessories are provided by B and B Sheet Metal as described and illustrated in B and B Sheet Metal product literature. Edit the following paragraph to indicate required accessories. *******

- F. Accessories: Provide downspouts with [elbows] [pipe cleanouts] [brackets] [_____], and other accessories manufactured by B and B Sheet Metal and as indicated on Drawings and reviewed shop drawings or as otherwise required for a complete, secure, functional installation.

2.5 GUTTER SYSTEM

******* B and B Sheet Metal provides Americraft Gutter System, a complete gutter and downspout system field assembled with solderless clamping joints. Americraft Gutter System is fabricated from copper sheets with joints that do not require field soldering. Contact B and B Sheet Metal for availability of gutters in other materials and finishes. *******

- A. Provide gutter system as indicated on Drawings and reviewed shop drawings to collect water at roof edges and convey to downspouts including all components and accessories for a complete, secure, functional system; Americraft Gutter System as manufactured by B and B Sheet Metal.
- B. Material: [Plain copper sheet.] [Evergreen pre-patinaed copper sheet.] [Lead-coated copper sheet.] weighing 18 ounces per square foot.

******* Gutters are provided as a half round profile in either 5 or 6 inches widths. *******

- C. Shape and size: Half round profile, [5] [6] inches wide in maximum lengths up to 18 feet in order to eliminate field joints.

******* Numerous accessories are available for the Americraft Gutter System as illustrated and detailed in B and B Sheet Metal product literature. Select required accessories from the following and delete non applicable items. *******

- D. Accessories: Provide gutter system with the following and other accessories manufactured by B and B Sheet Metal and as indicated on Drawings and reviewed shop drawings or as otherwise required for a complete, secure, functional installation. Accessory sizes shall be compatible with gutter width. Where appropriate fabricated accessories from same material and finish as gutter.
 - 1. Gutter connector: Metal strap connector with locking device and neoprene gasket for joining and sealing two lengths of gutter.
 - 2. Fascia hanger: Strap type anchor fitting under gutter for attachment of fascia panels in front of gutter.
 - 3. Miter/corner: Half round seamless [inside] [outside] mitered corner piece for connecting two intersecting gutter sections.
 - 4. Soldered stop end: Half round gutter end cap to be installed by soldering.
 - 5. Push-in stop end: Half round gutter end cap with neoprene gasket. Installed by pushing into gutter.
 - 6. Ball stop end: Quarter ball gutter end cap installed by soldering,

7. Gutter hook: J shaped strap for suspending gutter from roof structure.
8. Leaf protector: Perforated half-round piece with fixing brackets installed on top of gutter to prevent gutter and downspouts being clogged with leaves. Provided in 72-3/4 inches lengths.
9. Gutter sieve: Dome-shaped wire piece inserted into gutter outlet to prevent leaves and other debris entering downspout.
10. Star outlet: Funnel shaped outlet to convey water from gutter to downspout and installed with folding tabs.
11. Gutter outlet: Cylinder shaped outlet to convey water from gutter to downspout and installed by soldering.
12. Elbow: Seamless pipe connector forming 72 degrees angle.
13. Downspout bracket: Strap bracket for supporting downspouts with threaded socket for wall attachment.
14. Downspout connector: Cylinder shaped piece for connecting two sections of downspout.

2.6 SCUPPERS

******* Scuppers are sheet metal boxes or tube outlets designed to carry water from roof through parapet wall to a downspout, leader/conductor head, or other means of conveying water down side of building. B and B Sheet Metal provides standard scupper boxes with flanges for flashing into roof and wall and a tube or other type outlet. Custom fabricated scuppers are also available. *******

- A. Type: [Manufactured sheet metal box type fabrication to convey water through parapet wall [into downspout] [leader/conductor head] [with tube for carrying water away from side of building; Model [_____] as manufactured by B and B Sheet Metal.] [Custom designed and fabricated sheet metal box type fabrication to convey water through parapet [into [downspout] [leader/conductor head] [with tube for carrying water away from side of building] in accordance with design, shape, and dimensions illustrated on Drawings and reviewed shop drawings and fabricated by B and B Sheet Metal.]
- B. Material: [Galvanized sheet steel] [Copper sheet.] [Evergreen copper sheet.] [Lead coated copper.] [Aluminum sheet with [brown] [high gloss white] [bronze] thermoset enamel paint finish.] [Stainless steel.] [Terne-coated stainless steel.]
- C. Wall opening: [[4 by 4] [6 by 6] [8 by 8] [_____] inches.] [As indicated on Drawings.]

- D. Provide scuppers with flanges for flashing into roof system as shown on [Drawings] [reviewed shop drawings].

2.7 SNOW GUARDS

******* Snow guards are sheet metal fabrications designed to attach to metal roof panel seam to retain snow at eave and allow slow snow evacuation rather than sudden dumping. They are typically installed on pitched roofs with either shingle, wood shake, or standing seam metal roof membranes. B and B Sheet Metal can either provide their standard manufactured snow guards or create a custom design to meet specific project requirements. Refer to B and B Sheet metal for illustrations and descriptions of their standard snow guards. *******

- A. Type: Sheet metal fabrication designed to attach to [shingle] [wood shake] [standing seam metal] [_____] pitched roof system to retain snow at eave and allow slow snow evacuation rather than sudden dumping; [Model [Tri-Wing Snowguard] [_____] as manufactured by B and B Sheet Metal.] [Custom designed and fabricated sheet metal snow guard in accordance with design, shape, and dimensions illustrated on Drawings and reviewed shop drawings and fabricated by B and B Sheet Metal.]

******* B and B Sheet Metal provides standard snow guards in either copper or galvanize steel. Contact B and B Sheet Metal for use of other metals and for custom designed snow guards. *******

- B. Material: [Galvanized sheet steel] [Copper sheet.] [Evergreen copper sheet.] [Lead coated copper.] [_____].
- C. Provide snow guards with fasteners, clips, brackets, and other hardware as required to install snow guards on roof system.

2.8 FABRICATION

- A. Fabricate sections to profiles and dimensions indicated on Drawings and reviewed shop drawings.
- B. Linear components: Form in longest possible lengths with 8 foot as minimum.
- C. Intersections: Cope to fit accurately and solder.
- D. Edges: Turn back all exposed edges to form 1/2 inch hem.
- E. Soldering: Clean and tin materials. Completely fill seams with solder. Soldering on exposed finished surfaces shall be neat, full flowing, and smooth. after soldering, remove flux and wipe and wash joints clean.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Coordinate provision of roof drainage sheet metal with type and installation of exterior walls and parapets, roof deck and membrane, wood blocking and nailers, exterior wall finishes, and other work related to sheet metal.
- B. Deliver sheet metal to site in time for accurate placement and coordination with other work.
- C. Verify roof membrane terminations and base flashings are in place, sealed, and secure.
- D. Coat dissimilar materials in contact with sheet metal:
 - 1. Concrete and masonry: One coat bituminous paint.
 - 2. Wood: 2 coats aluminum paint.

3.2 INSTALLATION

- A. Install roof drainage sheet metals in accordance with Drawings, reviewed shop drawings, manufacturer's instructions and standards of workmanship as published by SMACNA.
- B. Do not allow sheet metal to come in contact with dissimilar materials.
- C. Do not install bent, twisted, scratched, or otherwise damaged sheet metal fabrications. Remove from site and replace.
- D. Erect sheet metal plumb and level without bulges or waves.
- E. Fit sheet metal fabrications tight in place. Make corners square, and surfaces true and straight in planes.
- F. Secure sheet metal in place using concealed fasteners unless shown otherwise. Lap and seal all joints. Exposed fasteners shall be covered with sealant.
- G. Protect finishes of exposed to view sheet metal fabrications. Avoid gouging, scratching, and denting. Use cotton gloves when handling and installing unprotected sheet metal in order to avoid soiling exposed to view surfaces.

3.3 CLEANING

- A. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

- B. Exercise care in removing mortar, cementitious materials, and sand from roof drainage sheet metal. Do not wipe surfaces in order to avoid scratching.
- C. Wash exposed surfaces with solution of mild detergent applied with soft cloth. Wipe surfaces clean.

END OF SECTION