

HARRIS COUNTY HOUSING AUTHORITY

8933 Interchange Houston, Texas 77054 | 713.669-4514 P

AMENDMENT OF SOLICITATION

ADDENDUM # 1

DATE: 01-22-2016

ISSUED BY: Smith & Company Architects

AMENDMENT TO SOLICITATION NUMBER: **IFB #16-01**

Fenix Estates Phase I & II

THE DATE AND TIME SPECIFIED FOR RECEIPT OF PROPOSALS IS
FEBRUARY 15, 2016, 2:00 PM CST.

THE SOLICITATION MENTIONED ABOVE IS AMENDED AS SET FORTH BELOW. PROPOSERS MUST ACKNOWLEDGE RECEIPT OF THIS AMENDMENT PRIOR TO THE HOUR AND DATE SPECIFIED FOR RECEIPT OF PROPOSALS BY SIGNING THIS FORM BELOW.

Proposer/Respondent

Date

Signature

ADDENDUM NO. 1

DATE: January 22, 2016

PROJECT: Fenix Estates Apartments Phase I and II.

LOCATION: 3815 Gulf Freeway Houston, Texas 77004.
PROJECT NO. 032415N

DISTRIBUTION:
DELIVERED VIA:

NO. PAGES: 7

PREPARED BY: Smith & Company Architects, Inc



This addendum forms a part of the Specifications for the Fenix Estates Apartments Phase I and II Project # 032415N for Harris County Housing Authority documents posted on January 11, 2016, for the subject project and modifies/add to them as noted below.

CHANGES TO PROJECT MANUAL

1. Add PRE BID AGENDA, SIGN IN SHEET, dated January 20, 2016.

SPECIFICATIONS

1. Add attached Section 076200 SHEET METAL FLASHING AND TRIM, dated January 22, 2016.
2. Section 074600 SIDING, Paragraph 2.2, 2, a. revise to read "Texture: Textured."
3. Section 084113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS, paragraph 2.9, C. revise to read "Class II, Anodic Finish: AA-M12C22A32/34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
a. Color: Dark bronze.
4. Section 122113 HORIZONTAL LOUVER BLINDS, Paragraph 2.1, G, delete #4. "Tilt: One-direction..."

DRAWINGS-PHASE I

1. Delete Sheet S2.04 - 4TH FLOOR FRAMING PLAN-BUILDING 1 dated January 11, 2016, and replace with attached sheet S2.04 dated January 22, 2016.
2. Delete Sheet S3.05 - 4TH FLOOR CEILING PLAN BUILDING 2 dated January 11, 2016, and replace with attached sheet S3.05 dated January 22, 2016.
3. Delete Sheet A0.11 –UL CEILING, ROOF & FLOORING DESIGNS dated January 11, 2016, and replace with attached sheet A0.11 dated January 22, 2016.
4. Delete Sheet A0.14 –LIFE SAFETY_EGRESS PLAN-LEVEL 2-4 dated January 11, 2016, and replace with attached sheet A0.14 dated January 22, 2016.
5. Delete Sheet A0.15 –LIFE SAFETY_EGRESS PLAN-LEVEL1 dated January 11, 2016, and replace with attached sheet A0.15 dated January 22, 2016.
6. Delete Sheet A2.20–FLOOR PLAN- LEVEL 1 BUILDING 2 dated January 11, 2016, and replace with attached sheet A2.20 dated January 22, 2016.
7. Delete Sheet A2.25–ENLARGED FLOOR PLAN & RCP @ 1 BEDROOM UNIT dated January 11, 2016, and replace with attached sheet A2.25 dated January 22, 2016.
8. Delete Sheet A2.26–ENLARGED FLOOR PLAN & RCP @ EFFICIENCY TYPE 1 UNIT dated January 11, 2016, and replace with attached sheet A2.26 dated January 22, 2016.
9. Delete Sheet A2.27–ENLARGED FLOOR PLAN & RCP @ EFFICIENCY TYPE 2 UNIT dated January 11, 2016, and replace with attached sheet A2.27 dated January 22, 2016.
10. Delete Sheet A2.30–ENLARGED STAIR PLANS dated January 11, 2016, and replace with attached sheet A2.30 dated January 22, 2016.
11. Delete Sheet A3.00-PARTITION TYPES dated January 11, 2016, and replace with attached sheet A3.00 dated January 22, 2016.
12. Delete Sheet A3.20-DOOR SCHEDULE dated January 11, 2016, and replace with attached sheet A3.20 dated January 22, 2016.
13. Delete Sheet L1.00 LANDSCAPE PLAN dated January 11, 2016, and replace with attached sheet L1.00 dated January 22, 2016.
14. Delete Sheet L3.20 FENCING DETAILS dated January 11, 2016, and replace with attached sheet L3.20 dated January 22, 2016.

15. Delete Sheet S1.01 GENERAL NOTES dated January 11, 2016, and replace with attached sheet S1.01 dated January 22, 2016.
16. Delete Sheet S2.02- 2ND FLOOR FRAMING PLAN-BUILDING 1 dated January 11, 2016, and replace with attached sheet S2.02 dated January 22, 2016.
17. Delete Sheet S2.03- 3RD FLOOR FRAMING PLAN-BUILDING 1 dated January 11, 2016, and replace with attached sheet S2.03 dated January 22, 2016.
18. Delete Sheet S2.05- 4TH FLOOR CEILING PLAN-BUILDING 1 dated January 11, 2016, and replace with attached sheet S2.05 dated January 22, 2016.
19. Delete Sheet S3.02- 2ND FLOOR FRAMING PLAN-BUILDING 2 dated January 11, 2016, and replace with attached sheet S3.02 dated January 22, 2016.
20. Delete Sheet S3.03- 3RD FLOOR FRAMING PLAN-BUILDING 2 dated January 11, 2016, and replace with attached sheet S3.03 dated January 22, 2016.
21. Delete Sheet S3.04- 4TH FLOOR FRAMING PLAN-BUILDING 2 dated January 11, 2016, and replace with attached sheet S3.04 dated January 22, 2016.
22. Delete Sheet S5.05- WALL CONSTRUCTION DETAILS dated January 11, 2016, and replace with attached sheet S5.05 dated January 22, 2016.
23. Delete Sheet S6.01- MISCELLANEOUS DETAILS dated January 11, 2016, and replace with attached sheet S6.01 dated January 22, 2016.
24. Delete Sheet E4.00- ELECTRICAL ENLARGED PLANS dated January 11, 2016, and replace with attached sheet E4.00 dated January 22, 2016.

DRAWINGS-PHASE II

1. Delete Sheet A0.13- LIFE SAFETY EGRESS PLAN-LEVEL 1 dated January 11, 2016, and replace with attached sheet A0.13 dated January 22, 2016.
2. Delete Sheet A0.14- LIFE SAFETY EGRESS PLAN-LEVEL 2-4 dated January 11, 2016, and replace with attached sheet A0.14 dated January 22, 2016.
3. Delete Sheet A0.15- LIFE SAFETY EGRESS PLAN-LEVEL 5 dated January 11, 2016, and replace with attached sheet A0.15 dated January 22, 2016.
4. Delete Sheet A2.20- ENLARGED FLOOR PLAN & RCP @ 1 BEDROOM UNIT dated January 11, 2016, and replace with attached sheet A2.20 dated January 22, 2016.

5. Delete Sheet A2.21- ENLARGED FLOOR PLAN & RCP @ EFFICIENCY TYPE 1 UNIT dated January 11, 2016, and replace with attached sheet A2.21 dated January 22, 2016.
6. Delete Sheet A2.22- ENLARGED FLOOR PLAN & RCP @ EFFICIENCY TYPE 2 UNIT dated January 11, 2016, and replace with attached sheet A2.22 dated January 22, 2016.
7. Delete Sheet L3.10-FURNISHING DETAILS dated January 11, 2016, and replace with attached sheet L3.10 dated January 22, 2016.
8. Delete Sheet S1.01-GENERAL NOTES dated January 11, 2016, and replace with attached sheet S1.01 dated January 22, 2016.
9. Delete Sheet S2.02-2ND FLOOR FRAMING PLAN-BUILDING 3 dated January 11, 2016, and replace with attached sheet S2.02 dated January 22, 2016.
10. Delete Sheet S2.03-3RD FLOOR FRAMING PLAN-BUILDING 3 dated January 11, 2016, and replace with attached sheet S2.03 dated January 22, 2016.
11. Delete Sheet S2.04-4TH FLOOR FRAMING PLAN-BUILDING 3 dated January 11, 2016, and replace with attached sheet S2.04 dated January 22, 2016.
12. Delete Sheet S2.05-5TH FLOOR FRAMING PLAN-BUILDING 3 dated January 11, 2016, and replace with attached sheet S2.05 dated January 22, 2016.
13. Delete Sheet S2.06-5TH CEILING PLAN-BUILDING 3 dated January 11, 2016, and replace with attached sheet S2.06 dated January 22, 2016.
14. Delete Sheet S4.05-FRAMING DETAILS dated January 11, 2016, and replace with attached sheet S4.05 dated January 22, 2016.
15. Delete Sheet S6.01-MISCELLANEOUS DETAILS dated January 11, 2016, and replace with attached sheet S6.01 dated January 22, 2016.
16. Delete Sheet PE1.00-PLUMBING & ELECTRICAL-SITE PLANS-BUILDING 3 dated January 11, 2016, and replace with attached sheet PE1.00 dated January 22, 2016.
17. Delete Sheet E1.35-ELECTRICAL-BUILDING 3 LEVEL 5 dated January 11, 2016, and replace with attached sheet E1.35 dated January 22, 2016.
18. Delete Sheet E2.35-LIGHTING BUILDING 3 LEVEL 5 dated January 11, 2016, and replace with attached sheet E2.35 dated January 22, 2016.
19. Delete Sheet E3.00-ELECTRICAL BUILDING 3- ENLARGED PLANS dated January 11, 2016, and replace with attached sheet E3.00 dated January 22, 2016.

20. Delete Sheet M1.31-MECHANICAL PLAN- BUILDING 3 LEVEL 1 dated January 11, 2016, and replace with attached sheet M1.31 dated January 22, 2016.
21. Delete Sheet M1.32-MECHANICAL PLAN- BUILDING 3 LEVEL 2 dated January 11, 2016, and replace with attached sheet M1.32 dated January 22, 2016.
22. Delete Sheet M1.33-MECHANICAL PLAN- BUILDING 3 LEVEL 3 dated January 11, 2016, and replace with attached sheet M1.33 dated January 22, 2016.
23. Delete Sheet M1.34-MECHANICAL PLAN- BUILDING 3 LEVEL 4 dated January 11, 2016, and replace with attached sheet M1.34 dated January 22, 2016.
24. Delete Sheet M1.35-MECHANICAL PLAN- BUILDING 3 LEVEL 5 dated January 11, 2016, and replace with attached sheet M1.35 dated January 22, 2016.
25. Delete Sheet M4.00-MECHANICAL- DETAILS dated January 11, 2016, and replace with attached sheet M4.00 dated January 22, 2016.
26. Delete Sheet M6.01-CONDENSATE PLAN- BUILDING 3 LEVEL 1 dated January 11, 2016, and replace with attached sheet M6.01 dated January 22, 2016.
27. Delete Sheet M6.02-CONDENSATE PLAN- BUILDING 3 LEVEL 2 dated January 11, 2016, and replace with attached sheet M6.02 dated January 22, 2016.
28. Delete Sheet M6.03-CONDENSATE PLAN- BUILDING 3 LEVEL 3 dated January 11, 2016, and replace with attached sheet M6.03 dated January 22, 2016.
29. Delete Sheet M6.04-CONDENSATE PLAN- BUILDING 3 LEVEL 4 dated January 11, 2016, and replace with attached sheet M6.04 dated January 22, 2016.
30. Delete Sheet M6.05-CONDENSATE PLAN- BUILDING 3 LEVEL 5 dated January 11, 2016, and replace with attached sheet M6.05 dated January 22, 2016.
31. Delete Sheet P1.31 PLUMBING WASTE & VENT- BUILDING 3 LEVEL 1 dated January 11, 2016, and replace with attached sheet P1.31 dated January 22, 2016.
32. Delete Sheet P1.32 PLUMBING WASTE & VENT- BUILDING 3 LEVEL 2 dated January 11, 2016, and replace with attached sheet P1.32 dated January 22, 2016.
33. Delete Sheet P1.33 PLUMBING WASTE & VENT- BUILDING 3 LEVEL 3 dated January 11, 2016, and replace with attached sheet P1.33 dated January 22, 2016.

34. Delete Sheet P1.34 PLUMBING WASTE & VENT- BUILDING 3 LEVEL 4 dated January 11, 2016, and replace with attached sheet P1.34 dated January 22, 2016.
35. Delete Sheet P1.35 PLUMBING WASTE & VENT- BUILDING 3 LEVEL 5 dated January 11, 2016, and replace with attached sheet P1.35 dated January 22, 2016.
36. Delete Sheet P2.31 PLUMBING DOMESTIC WATER-BUILDING 3 LEVEL 1 dated January 11, 2016, and replace with attached sheet P2.31 dated January 22, 2016.
37. Delete Sheet P2.32 PLUMBING DOMESTIC WATER-BUILDING 3 LEVEL 2 dated January 11, 2016, and replace with attached sheet P2.32 dated January 22, 2016.
38. Delete Sheet P2.33 PLUMBING DOMESTIC WATER-BUILDING 3 LEVEL 3 dated January 11, 2016, and replace with attached sheet P2.33 dated January 22, 2016.
39. Delete Sheet P2.34 PLUMBING DOMESTIC WATER-BUILDING 3 LEVEL 4 dated January 11, 2016, and replace with attached sheet P2.34 dated January 22, 2016.
40. Delete Sheet P2.35 PLUMBING DOMESTIC WATER-BUILDING 3 LEVEL 5 dated January 11, 2016, and replace with attached sheet P2.35 dated January 22, 2016.
41. Delete Sheet P3.00 PLUMBING ENLARGED PLANS- BUILDING 3 dated January 11, 2016, and replace with attached sheet P3.00 dated January 22, 2016.
42. Delete Sheet P4.00 PLUMBING DETAILS dated January 11, 2016, and replace with attached sheet P4.00 dated January 22, 2016.
43. Delete Sheet P4.01 PLUMBING DETAILS dated January 11, 2016, and replace with attached sheet P4.01 dated January 22, 2016.
44. Delete Sheet P4.02 PLUMBING DETAILS dated January 11, 2016, and replace with attached sheet P4.02 dated January 22, 2016.
45. Delete Sheet P4.03 PLUMBING DETAILS dated January 11, 2016, and replace with attached sheet P4.03 dated January 22, 2016.
46. Delete Sheet P5.00 PLUMBING SCHEDULES dated January 11, 2016, and replace with attached sheet P5.00 dated January 22, 2016.
47. Delete Sheet P5.01 PLUMBING SCHEDULES dated January 11, 2016, and replace with attached sheet P5.01 dated January 22, 2016.
48. Delete Sheet P6.00 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.00 dated January 22, 2016.

49. Delete Sheet P6.01 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.01 dated January 22, 2016.
50. Delete Sheet P6.02 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.02 dated January 22, 2016.
51. Delete Sheet P6.03 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.03 dated January 22, 2016.
52. Delete Sheet P6.04 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.04 dated January 22, 2016.
53. Delete Sheet P6.05 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.05 dated January 22, 2016.
54. Delete Sheet P6.06 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.06 dated January 22, 2016.
55. Delete Sheet P6.07 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.07 dated January 22, 2016.
56. Delete Sheet P6.00 PLUMBING RISER DIAGRAMS-BUILDING 3 dated January 11, 2016, and replace with attached sheet P6.00 dated January 22, 2016.

END OF ADDENDUM NO.1

Fenix Estates IFB 16-01
Pre- Bid Meeting
January 20, 2016 at 2:00 PM
Sign-In Sheet

NAME	Email Address
TERRY SMITH	tsmith@sc-arch.com
Juarez White	jwhite@sc-arch.com
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Robert Remm	ACRM

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Formed steep-slope roof sheet metal fabrications.
- 2. Formed wall sheet metal fabrications.

- B. Related Requirements:

- 1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
- 2. Section 073113 "Asphalt Shingles" for installation of sheet metal flashing and trim integral with roofing.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

- 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
- 3. Review requirements for insurance and certificates if applicable.
- 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- C. Recycled Content of Copper-Sheet Flashing and Trim: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 40 percent.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hussey Copper Ltd.
 - b. Revere Copper Products, Inc.
 - 2. Nonpatinated Exposed Finish: Mill.
- C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
 - 1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- b. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.
2. Color: As selected by Architect from manufacturer's full range.

2.3 UNDERLAYMENT MATERIALS

- A. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F (111 deg C); and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Atlas Roofing Corporation; Summit.
 - b. Engineered Coated Products; Nova-Seal II.
 - c. Kirsch Building Products, LLC; Sharkskin Comp Sharkskin Ultra.
 - d. SDP Advanced Polymer Products Inc; Palisade.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Solder:
 1. For Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead with maximum lead content of 0.2 percent.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than dimension indicated on Drawings. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
 - 1. Gutter Profile: Style K according to cited sheet metal standard.
 - 2. Expansion Joints: Butt type with cover plate.
 - 3. Gutters with Girth 16 to 20 Inches (410 to 510 mm): Fabricate from the following materials:
 - a. Aluminum: 0.040 inch (1.02 mm) thick.
- B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
 - 1. Fabricated Hanger Style: Fig 1-35B according to SMACNA's "Architectural Sheet Metal Manual."
 - 2. Fabricate from the following materials:
 - a. Aluminum: 0.024 inch (0.61 mm) thick.

2.7 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
 - 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
- B. Drip Edges: Fabricate from the following materials:
 - 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
- C. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
 - 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
- D. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Copper: 16 oz./sq. ft. (0.55 mm thick).

E. Flashing Receivers: Fabricate from the following materials:

1. Copper: 16 oz./sq. ft. (0.55 mm thick).

F. Roof-Penetration Flashing: Fabricate from the following materials:

1. Copper: 16 oz./sq. ft. (0.55 mm thick).

2.8 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:

1. Aluminum: 0.032 inch (0.81 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder aluminum sheet.

2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.

H. Rivets: Rivet joints in uncoated aluminum zinc where necessary for strength.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Fasten gutter spacers to front and back of gutter.
 2. Anchor and loosely lock back edge of gutter to continuous cleat.
 3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
 4. Anchor gutter with gutter brackets spaced not more than 30 inches (760 mm) apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
 5. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
 2. Provide elbows at base of downspout to direct water away from building.

3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.

- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200