



Fulton County, GA

# Department of Purchasing & Contract Compliance

*Cecil S. Moore, CPPO, CPPB, CPSM, C.P.M., A.P.P*  
**Director**

August 23, 2011

**Re: 11ITB79735K-JAJ -Welcome All Park Facility Partial Roof Replacement  
and Skylight Repair**

Dear Bidders:

Attached is one (1) copy of Addendum 1, hereby made a part of the above referenced Invitation to Bid.

Except as provided herein, all terms and conditions in the Bid referenced above remain unchanged and in full force and effect.

Sincerely,

*James A. Jones*

**James A. Jones**  
**Assistant Purchasing Agent**

Winner 2000 - 2009 Achievement of Excellence in  
Procurement Award • National Purchasing Institute



**11ITB79735K-JAJ – Welcome All Park Facility Partial Roof Replacement and Skylight Repair  
Addendum No. 1  
Page Two**

This Addendum forms a part of the contract documents and modifies the original ITB documents as noted below:

- 1. Attachment I - Replace Section 01510 Construction Waste Management.**
- 2. Attachment II – Replace Section 07081 Flashing and Sheet Metal.**
- 3. The attached replacement sections are now made part of the solicitation document.**

**ACKNOWLEDGEMENT OF ADDENDUM NO. 1**

The undersigned proposer acknowledges receipt of this addendum by returning one (1) copy of this form with the proposal package to the Department of Purchasing & Contract Compliance, Fulton County Public Safety Building, 130 Peachtree Street, Suite 1168, Atlanta, Georgia 30303 by the ITB due date and time **September 19, 2011 at 11:00 A.M.**

This is to acknowledge receipt of Addendum No. 1, \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Legal Name of Bidder

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Title

## SECTION 01510

## CONSTRUCTION WASTE MANAGEMENT

## 1.1 GENERAL

## A. Summary

1. This Section includes administrative and procedural requirements for the following:
  - a. Salvaging nonhazardous demolition and construction waste.
  - b. Recycling nonhazardous demolition and construction waste.
  - c. Disposing of nonhazardous demolition and construction waste.

## B. Definitions

1. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
2. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
3. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
4. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
5. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
6. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

## C. Performance Goals or Requirements:

1. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 75, percent by weight of total waste generated by the Work.
2. Salvage/Recycle Goals: Owner has established minimum goals for the following materials:
  - a. Demolition Waste:
    - 1) Asphaltic concrete paving.
    - 2) Concrete.
    - 3) Concrete reinforcing steel.
    - 4) Brick.
    - 5) Concrete masonry units.

- 6) Wood studs.
  - 7) Wood joists.
  - 8) Plywood and oriented strand board.
  - 9) Wood paneling.
  - 10) Wood trim.
  - 11) Structural and miscellaneous steel.
  - 12) Rough hardware.
  - 13) Roofing.
  - 14) Insulation.
  - 15) Doors and frames.
  - 16) Door hardware.
  - 17) Windows.
  - 18) Glazing.
  - 19) Metal studs.
  - 20) Gypsum board.
  - 21) Acoustical tile and panels.
  - 22) Carpet.
  - 23) Carpet pad.
  - 24) Demountable partitions.
  - 25) Equipment.
  - 26) Cabinets.
  - 27) Plumbing fixtures.
  - 28) Piping.
  - 29) Supports and hangers.
  - 30) Valves.
  - 31) Sprinklers.
  - 32) Mechanical equipment.
  - 33) Refrigerants.
  - 34) Electrical conduit.
  - 35) Copper wiring.
  - 36) Lighting fixtures.
  - 37) Lamps.
  - 38) Ballasts.
  - 39) Electrical devices.
  - 40) Switchgear and panelboards.
  - 41) Transformers.
- b. Construction Waste:
- 1) Site-clearing waste.
  - 2) Masonry and CMU.
  - 3) Lumber.
  - 4) Wood sheet materials.
  - 5) Wood trim.
  - 6) Metals.
  - 7) Roofing.
  - 8) Insulation.
  - 9) Carpet and pad.
  - 10) Gypsum board.
  - 11) Piping.
  - 12) Electrical conduit.

- 13) Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
  - a) Paper.
  - b) Cardboard.
  - c) Boxes.
  - d) Plastic sheet and film.
  - e) Polystyrene packaging.
  - f) Wood crates.
  - g) Plastic pails.

D. Submittals

1. Waste Management Plan: Submit 3 copies of plan within 7 days of date established for commencement of the Work.
2. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three copies of report. Include separate reports for demolition and construction waste. Include the following information:
  - a. Material category.
  - b. Generation point of waste.
  - c. Total quantity of waste in tons.
  - d. Quantity of waste salvaged, both estimated and actual in tons.
  - e. Quantity of waste recycled, both estimated and actual in tons.
  - f. Total quantity of waste recovered (salvaged plus recycled) in tons.
  - g. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
3. Waste Reduction Calculations: Before request for Substantial Completion, submit three copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
4. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
5. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
6. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
7. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
8. Qualification Data: For Waste Management Coordinator and refrigerant recovery technician.

9. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

E. Quality Assurance

1. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
2. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
3. Waste Management Conference: Conduct conference at Project site. Review methods and procedures related to waste management including, but not limited to, the following:
  - a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
  - b. Review requirements for documenting quantities of each type of waste and its disposition.
  - c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - e. Review waste management requirements for each trade.

F. Waste Management Plan

1. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Include separate sections in plan for demolition and construction waste if Project requires selective demolition or building demolition. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
2. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
3. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - a. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  - b. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

- c. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - d. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - e. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - f. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.
4. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
- a. Total quantity of waste.
  - b. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
  - c. Total cost of disposal (with no waste management).
  - d. Revenue from salvaged materials.
  - e. Revenue from recycled materials.
  - f. Savings in hauling and tipping fees by donating materials.
  - g. Savings in hauling and tipping fees that are avoided.
  - h. Handling and transportation costs. Include cost of collection containers for each type of waste.
  - i. Net additional cost or net savings from waste management plan.

## 1.2 PRODUCTS (Not Used)

### 1.3 EXECUTION

#### A. Plan Implementation

1. General: Implement waste management plan as approved by the Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - a. Comply with Division 01 Section "Temporary Facilities And Controls" for operation, termination, and removal requirements.
2. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
3. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

- a. Distribute waste management plan to everyone concerned within three days of submittal return.
    - b. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
  4. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
    - a. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
    - b. Comply with Division 01 Section "Temporary Facilities And Controls" for controlling dust and dirt, environmental protection, and noise control.
- B. Salvaging Demolition Waste
  1. Salvaged Items for Reuse in the Work:
    - a. Clean salvaged items.
    - b. Pack or crate items after cleaning. Identify contents of containers.
    - c. Store items in a secure area until installation.
    - d. Protect items from damage during transport and storage.
    - e. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
  2. Salvaged Items for Sale and Donation: Permitted as directed, on Project site.
  3. Salvaged Items for Owner's Use:
    - a. Clean salvaged items.
    - b. Pack or crate items after cleaning. Identify contents of containers.
    - c. Store items in a secure area until delivery to Owner.
    - d. Transport items to off-site as designated by the Owner.
    - e. Protect items from damage during transport and storage.
  4. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- C. Recycling Demolition And Construction Waste, General
  1. General: Recycle paper and beverage containers used by on-site workers.
  2. Recycling Receivers and Processors: Provide a list of proposed recycling receiver companies planned to be contracted with.
  3. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.

4. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separaterecyclable waste by type at Project site to the maximum extent practical.
  - a. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - 1) Inspect containers and bins for contamination and remove contaminated materials if found.
  - b. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - c. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  - d. Store components off the ground and protect from the weather.
  - e. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

D. Recycling Demolition Waste

1. Asphaltic Concrete Paving: Grind asphalt to maximum 1-1/2-inch (38-mm) size.
  - a. Crush asphaltic concrete paving and screen to comply with requirements in Division 02 Section "Earthwork" for use as general fill.
2. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
3. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
  - a. Pulverize concrete to maximum 1-1/2-inch.
  - b. Crush concrete and screen to comply with requirements in Division 02 Section "Earthwork" for use as satisfactory soil for fill or subbase.
4. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  - a. Pulverize masonry to an as directed, size.
    - 1) Crush masonry and screen to comply with requirements in Division 02 Section "Earthwork" for use as general fill.
5. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
6. Metals: Separate metals by type.
  - a. Structural Steel: Stack members according to size, type of member, and length.
  - b. Remove and dispose of bolts, nuts, washers, and other rough hardware.

7. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
  8. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
    - a. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.
  10. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
    - a. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
  11. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
  12. Plumbing Fixtures: Separate by type and size.
  13. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
  14. Lighting Fixtures: Separate lamps by type and protect from breakage.
  15. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
  16. Conduit: Reduce conduit to straight lengths and store by type and size.
- E. Recycling Construction Waste
1. Packaging:
    - a. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
    - b. Polystyrene Packaging: Separate and bag materials.
    - c. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
    - d. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
  2. Site-Clearing Wastes: Chip brush, branches, and trees on-site.
    - a. Comply with requirements in Division 02 Section "Exterior Plants" for use of chipped organic waste as organic mulch.
  3. Wood Materials:
    - a. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
    - b. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

4. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
  - a. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
    - 1) Comply with requirements in Division 02 Section "Exterior Plants" for use of clean ground gypsum board as inorganic soil amendment.
  
- F. Disposal of Waste
  1. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
    - a. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
    - b. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  
  2. Burning: Do not burn waste materials.
  
  3. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01510

**SECTION 07081  
FLASHING AND SHEET METAL****PART 1 - GENERAL****1.01 SCOPE**

- A. Contractor shall furnish all labor, materials, equipment and incidentals required to provide and install flashing and sheet metal as shown and as specified.
- B. Contract drawings show only functional features and some of the required external connections. They do not show all components required for a complete installation nor exact dimensions particular to any manufacturer's products. Contractor shall supply all parts, devices and equipment necessary to meet the requirements of the Contract Documents and shall make all dimensional adjustments particular to the products being furnished. All costs associated with such changes and adjustments shall be considered as being included in the price bid for the work shown and specified.
- C. Coordination
  - 1. Review installation procedures under other sections and coordinate the installation of items that must be installed with the roof insulation.
- D. Related Work specified elsewhere:
  - 1. Section 07540 –Fully Adhered TPO Roofing System
  - 2. Section 07610 – Metal Roof

**1.02 SUBMITTALS**

A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined shall signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

- A. Shop drawings:
  - 1. Indicate material types, sizes, shapes, thicknesses, finishes, fabrication details, joint details, anchors, connections, expansion joints, and relations to adjacent work.
  - 2. Draw details and profiles to quarter size scale.
  - 3. Include on detailed shop drawings, locations of sleepers and required fastening strips to secure metal work where sheet metal is applied to other than wood surfaces.

- C. Samples, submit as follows:
  - 1. Special finishes: 6" x 6" samples of manufacturer's standard colors for Architect's color selection, including a clear coated mill finish sample.
  - 2. Manufactured expansion joint covers, copings, gravel stops, flashing reglets, and other flashing items: 1'-0" length in style and finish specified.
  
- D. Quality control submittals:
  - 1. Certificates: Submit certificates indicating materials supplied or installed are asbestos free.
  - 2. Provide a declaration that the VOC levels in all adhesives and sealants used in the installation of the products do not exceed the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168, AND all sealants used as fillers meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

### **1.03 QUALITY ASSURANCE**

- A. Reference Standards. Comply with all federal and state laws or ordinances, as well as all applicable codes, standards, regulations and/or regulatory agency requirements including the partial listing below:
  - 1. American Iron and Steel Institute (AISI).
  - 2. American Society for Testing and Materials (ASTM).
  - 3. Sheet metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
  
- B. Industry Standards:
  - 1. AISI: Stainless Steel Data Manual, 1968 Edition.
  - 2. SMACNA: Architectural Sheet Metal Manual, latest Edition,.
  
- C. Pre-installation conference:
  - 1. Prior to beginning work, conference will be held to review work to be accomplished.
  - 2. Particular requirements are specified in Loose Single Ply Membrane section.

### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. Acceptance at site: Handle materials to prevent damage to surfaces, edges and ends of sheet metal items. Reject and promptly remove damaged materials from site.
  
- B. Storage and protection: Store materials off ground, under cover. Protect from damage and deterioration.

### **1.05 SEQUENCING AND SCHEDULING**

- A. Coordinate requirements of this section with work described under Manufactured Roof section. Use flat stock matching respective roofing for shop fabricated flashings, closures and accessories.

### **1.06 WARRANTY**

- A. Warrant flashing and sheet metal work to be free of defects in materials and workmanship; combine warranty with roofing warranty.
  
- B. Provide a warranty against defective equipment and workmanship in accordance with the requirements of the General Conditions of the Contract Documents.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Sheet metal:
  - 1. General: Follow gauge, thickness, or weight requirements in SMACNA Manual for intended use, but not less than indicated below.
  - 2. Galvanized Sheet Steel, 24 gage. allow Standard Color Kynar.
- B. Soldering materials:
  - 1. Solder: Meeting ASTM 032-76, alloy grade 50A, 50% pig lead and 50% block tin.
  - 2. Solder flux for:
    - a. Stainless steel and copper: Muriatic acid neutralized with zinc.
    - b. Lead: Non-corrosive rosin.
- C. Fasteners: Same material or compatible with sheet metal being fastened:
  - 1. Nails: Flathead, needle point, not less than 12 gauge; sufficient length to penetrate substrate 1" minimum.
  - 2. Expansion shields: Lead sleeves.
  - 3. Screws: Self-tapping type with round heads.
  - 4. Bolts: Furnished complete with nuts and washers.
  - 5. Rivets: Round head, solid shank.
  - 6. Blind clips and cleats: gage per manufactures recommendation.
- D. Caulk: Recommended by Roofing Manufacture.

### **2.02 FABRICATION**

- A. Shop Assembly:
  - 1. General:
    - a. Fabricate sheet metal in accord with reviewed shop drawings and industry standards.
    - b. Form sheet metal work with clear, sharp and uniform arises. Hem exposed edges.
    - c. Fabricate corners with minimum 2'-0" returns each side of return; fully seal joints.
  - 3. Provide linear sheet metal items in 10'-0" sections minimum, except as otherwise noted. Form flashing using single pieces for full width.
  - 4. Form specified sheet metal items in accord with SMACNA details and existing adjacent work; gauge indicated in SMACNA description of particular plate, but no less than 24 GA thickness.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Verification of Conditions:
  - 1. Verify locations of all roof openings and penetrations are in accord with reviewed shop drawings.
  - 2. Examine conditions and substrates under which products of this section are to be installed; submit written notification of unacceptable conditions or substrates.
  - 3. Submit copy of installer's report to the Architect within 72 hours of report receipt.
  - 4. Proceeding with construction activity of this section:

- a. Prior to correction of unacceptable conditions or substrates are prohibited.
- b. Indicates installer's acceptance of conditions and substrates.

### 3.02 INSTALLATION

#### A. Sheet Metal:

1. Install work in accord with reviewed shop drawings and industry standards. Provide sheet metal items true to line, without buckling, creasing, warp or wind in finished surfaces.
2. Coordinate flashing at roof surfaces with roofing work to provide weather tight condition at roof terminations.
3. Perform field joining of lengths specified for shop fabrication, but in lengths no shorter than 10'-0" except at closure pieces.
4. Isolate dissimilar materials to prevent electrolysis. Separate using bituminous paint or roofing felt.
5. Seaming:
  - a. Comply with SMACNA Locks and Seams figures and other applicable plates.
  - b. Flat-lock seams: Finish not less than 3/4" wide.
  - c. Soldered lap seams: Finish not less than 1" wide.
  - d. Other lap seams: Overlap not less than 4" unless otherwise indicated.
  - e. Seams: Orient properly for direction of water flow.
  - f. Flatlock seams with cleats soldered.
  - g. Lap seams occurring in members sloping 45° or more, 4" minimum; bed in with butyl sealant.
  - h. Perform soldering in same manner indicated in FABRICATION Article.
6. Secure sheet metal items using continuous cleats, clips and blind fasteners as indicated; exposed face fastening is prohibited.
7. Fastening:
  - a. Nails: Confine to one edge only of flashing 1'-0" or less in width. Space nails at 4" O.C. Maximum. Provide neoprene washers for nails.
  - b. Cleats: Continuous; form to profile of item being secured.
  - c. Clips: Minimum 2" wide and continuous; form to profile of item being secured.
8. Form joints in linear sheet metal to allow for 1/2" minimum expansion at 20' -0" O.C. maximum and 8'-0" from corners. Provide 1'-0" wide back-up plate at intersections. Form plates to profile of sheet metal items. Apply linear sheet metal items in full bed of butyl or urethane caulk over back-up plate.
9. Gutters and downspouts:
  - a. Construct with riveted and soldered joints, lapped 1" minimum in direction of flow, provide 3/4" minimum expansion joints at 60' -0" O.C. maximum. Form expansion joints in accord with SMACNA Manual, plates for gutters up to 20 gauge; and, 20 gauge and heavier.
  - b. Hang gutters with high points equidistant from downspouts, evenly sloped toward downspouts. Support gutters in accord with SMACNA Manual,.
  - c. Secure downspouts to exterior walls at 6'-0" O.C. maximum using straps and expansion type fasteners. Lap downspout joints, 1-1/2" minimum and solder.
  - d. Finish gutters, downspouts and hangers; required material to match existing.
10. Roof Penetration Flashing:
  - a. Pipe penetrations: Provide flashing extending 2'-6" onto roofing felts each direction for pipes penetrating roof. Flash in accord with roofing manufacturer's requirements.

+++ END OF SECTION 07081 +++