Project Name:

City Hall Building Damage Repairs

Hurricane Harvey Recovery

CITY OF PRAIRIE VIEW

Bid Addendum# 2.

Questions:

1. Please provide a specification for the new roof.

Answers:

1. The new roof specification has been added. Please see the attached specification.

SECTION 07 41 13
Metal Roof Panels

Part 1 GENERAL

1.1 SUMMARY

A. Section Includes: Factory-formed sheet metal roofing, including flashings and trim.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A653/A653M Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A792/A792M Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot Dip Process.
3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. ASTM D2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
5. ASTM E1680 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
6. ASTM E1646 Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
7. ASTM G90 Standard Practice for Performing Accelerated Outdoor Weathering of Non-Metallic Materials Using Concentrated Natural Sunlight.
8. ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
9. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
10. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials
11. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
12. ASTM E 2140 - Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head.

B. Underwriters Laboratories (UL):

1. UL 263 - Fire Tests of Building Construction and Materials.
2. 580 - Tests for Uplift Resistance of Roof Assemblies.
3. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.

4. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.

C. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA); "Architectural Sheet Metal Manual"

D. Miami-Dade County

E. Florida Building Code

F. Texas Windstorm Approval

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings:

1. Schedule meeting to discuss roof project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements before start of work onsite.

2. Required attendees: Contractor, metal deck & roof installer, and any other subcontractors who have equipment penetrating the roof or work that requires roof access or traffic.

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Provide sheet metal roofing which has been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure or infiltration of water.

1. Air infiltration: Maximum 0.06 cfm per lineal foot (0.33 m3/hr per linear meter) of seam at static pressure of 6.24 psf (3.0 kPa) when tested per ASTM E1680.
2. Water penetration:
   a. No uncontrolled water penetration through the joints at a static pressure of 6.24 psf (3.0 kPa) when tested in accordance with ASTM E1646.
3. Fire rating: Class A
4. Uplift Tests:
   a. UL 580 Class 90
   b. ASTM E 1592 (1.5", 2" & 3")
5. Class 4 Impact Resistance: UL 2218
6. Florida State Approval

B. Finish Performance Requirements:

1. Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating consisting of a nominal 0.25 mil dry film thickness primer, and a nominal dry film thickness of 0.7 -0.8 mil color coat for a total 0.9 to 1.1 mil total system dry film thickness.
2. Color change and fade resistance: No cracking, peeling, blistering or loss of adhesion when tested in accordance with ASTM G23; color change, after removal of surface deposits such as dirt or chalk, maximum 5 NBS units.
3. Humidity resistance: No blistering, peeling or loss of adhesion after 1000 hours testing, in accordance with ASTM D2247.

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturer's product data for specified products.

C. LEED Submittal Documentation:

1. Product Test Reports for applicable sustainable sites credits: For roof panels, indicating that panels comply with solar reflectance index requirement.
2. Product Data for applicable materials and resources credits: Indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Contractor to provide a statement indicating cost for each product having recycled content.

D. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.

1. Indicate layout of roofing panels and roof panel sizes, including custom-fabricated roofing panels if indicated; indicate each item of trim and accessories.
2. Indicate in detailed drawings profile and gauge of interior and exterior sheets, and locations and types of fasteners; indicate locations, gauges, shapes and methods of attachment of roofing panels, trim and accessory items.
3. Include Sealant location and denote those that are factory and field applied.
4. Indicate products/materials required for construction activities and field worked conditions of this section not supplied by manufacturer of products of this section.

E. Samples: Submit selection and verification samples for finishes, colors and textures.

1. Selection Samples: For each product requiring color selection, 2 sets of manufacturer's sample chips representing full range of colors and finishes available.
2. Verification Samples: For each color and finish selected, 2 chips indicating match to selected color and finish.

F. Warranties:

1. Substrate Warranty
2. Finish Warranty
3. Weather Tightness Warranty (if applicable)

G. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

H. Quality Assurance Submittals: Submit the following:

1. Contractor Certificates: Contractor's certification that:
   a. Manufacturer of products of this section meets specified qualifications.
   b. Installer of products of this section meets specified qualifications.
2. Manufacturer Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
3. Manufacturer's Instructions: Manufacturer's installation instructions.
4. Manufacturer's Field Reports: Manufacturer's field reports if required.

I. Closeout Submittals: Submit the following:

1. Warranty: Warranty documents specified herein.

J. Buy American Certification: Manufacturer's letters of compliance indicating supplied products comply with requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Provider of "hands on" installer training at manufacturer or customer facility.
2. Minimum of ten years' experience in manufacturing metal roof systems.
3. Provider of product produced in a permanent factory environment with fixed roll-forming equipment and also possesses the capability to roll form continuous panels on jobsites with a factory technician for jobs with panel lengths in excess of 50'

B. Installer Qualifications:

1. At least five years' experience in the installation of structural standing seam metal roof panels.
2. Experience on at least five projects of similar size, type and complexity as this project that have been in service for a minimum of two years with satisfactory performance of the roof system.
3. Employer of workers for this project who are competent in techniques required by manufacturer for installation indicated and who shall be supervised at all times when material is being installed.

4. Certificate: When requested, submit certificate indicating qualification.

C. Mock-Ups: Establish standards by which work will be judged. Mock-Ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's acceptance of finish color, texture and pattern and workmanship standard.
   1. Include eave, ridge, valley, gable and hip conditions.
   2. Mock-Up Size: As required.
   3. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
   4. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

D. Buy American Compliance: Materials provided under Work of this Section shall comply with the following requirements:

   1. Buy American Act of 1933 BAA-41 U.S.C §§ 10a – 10d.
   2. Buy American provisions of Section 1605 of the American Recovery and Reinvestment Act of 2009 (ARRA).

1.7 DELIVERY, STORAGE & HANDLING

A. General

   1. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 label where appropriate.

C. Delivery and Acceptance Requirements: Ensure all panels are received in good condition. In cases where damage is visible, note all paperwork; inform architect and project superintendent.

D. Packing, Shipping, Handling and Unloading:

   1. Roofing panels to be properly protected to avoid shipping damage.
   2. Package trim and accessories in waterproof wrapping paper.

E. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above-ground location.

   1. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture runoff.
   2. Store products of this section in manufacturer's unopened packaging until installation of products

3. Maintain dry, heated storage area for products of this section until installation of products.
4. Remove strippable plastic film before storage under high-heat conditions.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.9 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

1. Panel Material: Furnish manufacturers 25 year warranty covering the panel against rupture, structural failure, or perforation.
2. Panel Coating: Furnish manufacturer's 40-year warranty covering cracking, checking, and peeling, and 30 year warranty covering fade and chalk on the Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating.
   a. Manufacturer's warranty may exclude surface deterioration due to physical damage and corrosive environments.

B. Weather Tightness Warranty

1. Weathertightness Warranty: Manufacturers Joint weathertightness warranty.
2. Warranty Term: 25 year commencing on Date of Substantial Completion.
3. Total Manufacturers Liability: $14.00/sq. ft.
4. Warranty must cover
   a. (If Penetrations are chosen) Pipes must be centered in the panel or a pipe curb must be used, Curbs must be all welded (0.0630 minimum) aluminum or 18ga. Stainless Steel.
   b. (If Wind Rider is chosen) Manufacturer must supply engineered installation shop drawings, signed and sealed by an Engineer registered in the state in which the project is located.

C. Special Warranty: Installer's standard form in which installer agrees to repair or replace panels that fail due to poor workmanship or faulty installation within the specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 Metal Roof Panels

A. Manufacturer: Approved metal roof panel manufacturer.

B. Substitutions:

1. Basis of Design Product: Subject to compliance with requirements provided by the Manufacturer
2. Substitution Limitations
   a. Requests for approval must be submitted in writing at least ten (10) days prior to bid date, and are accompanied by all related test reports and design calculations listed in section 1.4 and Design and Performance criteria Section 2.2.
   b. Substitute manufacturers will be approved by written addendum to all bidders. Voluntary alternates will not be considered. Substitutions will not be permitted after the bid date of this project.
   c. Roof panels proposed for substitution shall fully comply with specified requirements in appearance, assembly, and performance.

2.2 MANUFACTURED UNITS

A. Panels:

1. Profile: Snap together trapezoidal standing seam system.
2. Size: 3” high seam by 24” width (76 x 609 mm) Length as indicated on drawings.
3. Material: Galvalume steel sheet conforming to ASTM A792, AZ50 coating for bare; AZ50 coating for painted; [24; 22] gauge sheet thickness.
4. Panels should be factory formed.

2.3 METAL ROOF PANEL ACCESSORIES

A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, matching the existing profile. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.

B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.

C. Panel Clips: ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.

D. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.

E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:

1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
3. Concealed Joint Sealant: Non-curing butyl, AAMA 809.2.

F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.

G. Roof Accessories: Approved by metal roof panel manufacturer.

H. Snow Guards: Approved by metal roof panel manufacturer.

2.4 FABRICATION

A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.

B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.

C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate.

2.5 FINISHES

A. Finish: Two coat coil applied, baked on full strength (70% resin, PVF2) fluorocarbon coating consisting of a nominal 0.25 mil dry film thickness primer, and a nominal dry film thickness of 0.7 -0.8 mil color coat for a total 0.9 to 1.1 mil total system dry film thickness. Finish to be selected from manufacturer’s standard color selection. The back side of the material should be 0.25 mil primer and a 0.25 mil polyester wash coat.

1. Roof Panel Color:
   a. Selected from full range of manufacturer’s standard colors.
   b. Color: As existing panel.

2. Roof Related Trim/Accessories Color:
   a. Selected from full range of manufacturer’s standard colors.
   b. Color: As existing panel.

B. Bare Galvalume steel sheet conforming to ASTM A792, AZ55

2.6 RELATED MATERIALS

A. General: Coordinate use of related materials:
    1. Underlayment
    3. Sealants

2.7 SOURCE QUALITY

A. Source Quality: Obtain metal panel products from a single manufacturer.

B. Quality Control: Obtain structural standing seam metal roof panels, trim and other accessories from a manufacturer capable of providing on-site technical support and installation assistance.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, recommendations and installation instructions for substrate verification, preparation requirements and installation.

    1. Strippable Film: Remove manufacturer's protective film, if any, from surfaces of roofing panels.

B. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

    1. Verification of Conditions:
        a. Panel support systems are ready for construction activities of this section and within specified tolerances.
        b. Rough-in utilities are in correct locations.
    2. Installer's Examination:
        a. Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
        b. Delay construction activities of this section until unacceptable conditions have been corrected.
        c. Beginning construction activities of this section indicates installer's acceptance of conditions.

3.2 PREPARATION

A. Coordination: Coordinate metal roofing with other work to provide a noncorrosive and leak-proof installation.

1. Install substrate boards, hat channels, purlins, or furring channels in accordance with manufacturer's recommendations.
2. Coordinate work, with installation of other associated Work, to ensure quality application.
3. Coordinate work with installation of associated metal flashings and building walls.
4. Coordinate work to minimize foot traffic and construction activity on installed finished surfaces.
5. Coordinate location of pipe penetrations to allow centering of pipe in panel.
6. Coordinate location of roof curbs, to allow proper integration with roof panel.
7. Coordinate work to minimize foot traffic and construction activity on installed finished. surfaces.
8. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

3.3 INSTALLATION

A. General: Install metal roofing panels to profiles, patterns and drainage indicated and required for leak-proof installation. Provide for structural and thermal movement of work. Seal joints for leak-proof installation.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws.
3. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
4. Install screw fasteners in predrilled holes for clip installation.
5. Locate and space fasteners in uniform vertical and horizontal alignment.
6. Install flashing and trim as metal panel work proceeds.
7. Install continuous length panels if at all possible. If splices are required, locate panel splices over, but not attached to, structural supports.
8. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws.
9. Fasten flashings and trim around openings and similar elements with self-tapping screws.
10. Provide weathertight EPDM Flashing for pipe- and conduit-penetrating panels.
11. Seams: Provide uniform, neat seams; ensure seam is properly engaged.
12. Fix panels at location depicted on reviewed shop drawings.
13. Allow for required panel clearance at penetrations for thermal movement.
14. Align pipe penetrations to occur at center of roof panel. Report and have corrected improperly placed penetrations before proceeding with panel installation. Remove and replace roof panels which have improperly placed penetration flashings.
15. Allow for required panel clearance at penetrations for thermal movement.
16. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leak-proof installation.
17. Sealant-Type Joints: Provide sealant-type joint where indicated. Form joints to conceal sealant. Comply with Division 7 Joint Sealants Section for sealant installation.

B. Roofing Installation:
    1. Install roofing plumb, true and in correct alignment with structural framing, in accordance with shop drawings and manufacturer's printed installation instructions.

2. Install roofing using manufacturer's concealed fastening system or non-corroding fasteners color-matched to panel.
3. Install trim using concealed fasteners where possible; sight-exposed non-corroding fasteners color-matched to trim are permitted on vertical surfaces only.

C. Installation Tolerances:
1. Variation from Plumb: Maximum 1/8" (3.2 mm) in 20 feet (6.096 m).
2. Variation from Level: Maximum 1/8" (3.2 mm) in 20 feet (6.096 m).
3. Variation from True Plane: Maximum 1/4" (3.2 mm) in 20 feet (6.096 m).

D. Underlayment Installation
1. Underlayment to be supplied by metal roof panel manufacturer.
2. Self-adhered High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 40 mils thick adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
3. Thermal Stability: Stable after testing at 240 degree F; ASTM D1970.
4. Low-Temperature Flexibility: Passes after testing at minus 20 degree F; ASTM D1970.
5. Supplied by metal roof panel manufacturer.
6. Retain one of two subparagraphs below or delete both if indicated on Drawings.
   a. Apply over the entire roof surface.
   b. Apply over the roof area indicated below:
7. Revise subparagraphs below to suit Project or delete if indicated on Drawings. If inserting dimensions, note that many self-adhering sheet underlayments are manufactured in 36-inch- (914-mm-) wide rolls.
   a. Roof perimeter for a distance up from eaves of [24 inches] [36 inches] < Insert dimension> beyond interior wall line.
   b. Valleys, from lowest point to highest point, for a distance on each side of [18 inches] < Insert dimension>. Overlap ends of sheets not less than 6 inches.
   c. Rake edges for a distance of [18 inches] < Insert dimension>.
   d. Hips and ridges for a distance on each side of [18 inches] < Insert dimension>.
   e. Roof-to-wall intersections for a distance from wall of [18 inches] < Insert dimension>.
   f. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of [18 inches] < Insert dimension>.

E. Accessory Installation: Install accessories using techniques recommended by manufacturer and which will assure positive anchorage to building and weathertight mounting. Provide for thermal movement. Coordinate installation with flashings and other components

F. Flashing and Trim Installation: Comply with performance requirements, manufacturer's written installation instructions, and the SMACNA "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units to true level. Install work with laps, joints, and seams that will be permanently watertight.

G. Metal Roof Curbs: .063 minimum thickness welded aluminum, or 18 gauge minimum welded stainless steel, factory-insulated, with integral cricket, and designed to fit roof panel module, sized to meet specification.

3.4 FIELD QUALITY REQUIREMENTS

A. Site Tests: (Post-Installation Testing): Owner reserves right to perform post-installation testing of installed metal panel installation.

B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.5 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas.

B. Repair or replace damaged installed products.

C. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

D. Remove construction debris from project site and legally dispose of debris.

E. Remove strippable coating and perform dry wipe-down cleaning of panels as erected.

3.6 PROTECTION

A. Protection: Protect installed product's finish surfaces from damage during construction:

1. Protect installed products from damage by subsequent construction activities.
2. Replace products having damage other than minor finish damage.
3. Repair products having minor damage to finish in accordance with panel Manufacturer's recommendation
4. Architect shall be sole judge of acceptability of repair to damaged finishes; replace products having rejected repairs

END OF SECTION