

I (We) further propose to execute the attached Contract Agreement (Section 00 52 00) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Contract Documents and Advertisement. I (We) also propose to execute the attached Contract Bond (Section 00 61 00) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) enclose a certified check, cashier's check, or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

ADDENDUM NO.   1   DATED   7/2/2008   ADDENDUM NO.            DATED             
ADDENDUM NO.            DATED            ADDENDUM NO.            DATED           

Number	Description
1	Revised Section 00 42 00; Revised Section 00 01 10; Revised Section 00 91 10; Added Section 13 34 17; Added Section 13 34 19; Revised Plan Sheets Nos.2, 3 and 18; Amendment EBS Download Required.

TOTAL ADDENDA:   1    
(Must agree with total addenda issued prior to opening of bids)

Respectfully Submitted,

DATE \_\_\_\_\_

\_\_\_\_\_  
Contractor

BY \_\_\_\_\_  
Signature

TITLE \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

PHONE \_\_\_\_\_

FAX \_\_\_\_\_

E-MAIL \_\_\_\_\_

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of \_\_\_\_\_ and the names, titles and business addresses of the executives are as follows:

_____ President	_____ Address
_____ Secretary	_____ Address
_____ Treasurer	_____ Address

The following is my (our) itemized proposal.

I (We) agree to complete the entire Project within the specified Contract Time.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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AND EQUIPMENT SHED AT LIBERTY IN  
AMITE COUNTY, MISSISSIPPI

**PROJECT NUMBER:** BWO-7099-03(001) 500240  
BWO-7117-03(001) 500240

**DATE:** JULY 2, 2008

**DESCRIPTION A:** The Department of Transportation shall clear and grub the site and have in place a building pad of compact select material within one foot of finish floor. This Work shall consist of minor site work and all construction work necessary in constructing a Maintenance Area Headquarters for District Seven at Liberty in Amite County, Mississippi, Project No. BWO-7099-03(001) 500240, in accordance with these Specifications and conforming to the Drawings.

**DESCRIPTION B:** The Department of Transportation shall clear and grub the site and have in place a building pad of compact select material within one foot of finish floor. This Work shall consist of minor site work and all construction work necessary in constructing an Equipment Shed for the Maintenance Area Headquarters for District Seven at Liberty in Amite County, Mississippi, Project No. BWO-7117-03(001) 500240, in accordance with these Specifications and conforming to the Drawings.

**PAY ITEMS FOR FENCING AND GATES:** Refer to Mississippi Standard Specifications for Road and Bridge Construction, 2004 Edition, and the Drawings for requirements to furnish and install 6' chain link fence with top guard, gates, line posts, brace posts, and gate posts.

It is the intention of these Specifications to provide the necessary items and instruction for a complete building including all code compliance. Omission of items or instruction necessary or considered standard good practice for the proper installation and construction of the building shall not relieve the Contractor of furnishing and installing such items and conforming to the building codes having jurisdiction.

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**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**ADDENDUM No. 1**  
**SECTION 00 91 10**

**DATE:** JULY 3, 2008

**PROJECT:** MAINTENANCE AREA HEADQUARTERS  
AND EQUIPMENT SHED AT LIBERTY IN  
AMITE COUNTY, MISSISSIPPI

**PROJECT NUMBERS:** BWO-7099-03(001) 500240  
BWO-7117-03(001) 500240

PART 1 - GENERAL

- 1.01 DESCRIPTION: Bidders are hereby advised that the following changes are to be made to this Contract. Bidders shall acknowledge receipt of this addendum.
- 1.02 SPECIFICATIONS
- A. Revised Section 00 01 10-01 - Table of Contents
  - B. Section 00 42 00 – Proposal. Delete this Section in its entirety and add revised Section 00 42 00 – Proposal.
  - C. Section 13 34 17 – Pre-Engineered Buildings. Add this Section in its entirety.
  - D. Section 13 34 19 – Metal Building Systems. Add this Section in its entirety.

PART 2 – PRODUCTS  
(Not Used)

PART 3 – EXECUTION  
(Not Used)

END OF SECTION

SECTION 13 34 17

PRE-ENGINEERED BUILDINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Building Type: The buildings are single-story, single-span, rigid-frame-type pre-engineered metal buildings of the nominal length, width eave height, and roof pitch indicated.
- B. Roof system: Standard metal building ribbed-type roof system with exposed fasteners and field installed mastic.
- C. Components and Accessories: Manufacturer's standard building components and accessories may be used, provided components, accessories, and complete structure conform to design indicated and specified requirements.

1.02 RELATED SECTIONS

- A. Section 09 05 15 – Color Design.
- B. Section 09 90 00 – Painting and Coating (Painting for ferrous metal exposed to view.)

1.03 STRUCTURAL FRAMING AND ROOF PANELS

- A. Design Loads: Design anchor bolts, structural members, and exterior covering for applicable loads and combinations of loads in accordance with the MBMA's "Design Practices Manual."
- B. Structural Steel: Comply with AISC's "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
- C. Light Gage Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.
- D. Welded Connections: Comply with AWS's "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.
- E. Metal Roofing: Comply with SMACNA Architectural Sheet Metal Manual.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's sample warranties and product information for building components, accessories and color chart.
- B. Shop Drawings: Submit shop drawings for anchor bolts, structural framing system, roofing components and accessories not fully detailed or dimensioned in manufacturer's product data.
  - 1. Structural Framing: Submit erection drawings. Include fabrication and assembly details. Show anchor bolts settings and sidewall, end-wall, and roof framing.

2. Sheet Metal Accessories and Roofing: Submit 1/4 inch scale layouts and 1-1/2 inch scale details of accessories; show profiles, methods of joining to system components and dissimilar building materials, flashing of each condition for roof penetrations, and anchorage.
- C. Certification: Submit certification prepared, signed, and sealed by a Professional Engineer registered in the State of Mississippi, verifying that anchor bolts, structural framing and covering panels meet loading requirements and codes (IBC 2003), including design calculations.
- D. Installer certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

#### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer, with 5 years minimum experience, who specializes in erection of building similar to that required.
- B. Manufacturer's Qualifications: Provide buildings manufactured by a firm with 10 years experience in manufacturing buildings similar to those indicated. The manufacturer shall be AISC Certified (Class MB).
- C. Welders Qualifications: Qualify welding processes and welding operations in accordance with the AWS D1.1 "Structural Welding Code".
  1. Certify that each welder employed in unit of work of this section has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.
  2. Testing for re-certification is Contractor's responsibility.

#### 1.06 WARRANTIES

- A. Installer: The Installer shall provide a 5 year watertight warranty on the roof system.
- B. Manufacturer:
  1. The manufacturer shall provide a three- year warranty against failures caused by faulty or substandard materials.
  2. The manufacturer shall provide a twenty-year Premium Paint warranty.

### PART 2 PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by Ceco Buildings Division, P. O. Box 6500, Columbus, MS 39703, Tel. (662) 328-6722.
- B. Equivalent products by the following manufacturers are acceptable:
  1. Gulf States, Starkville, MS. Tel.: (662) 323-8021.
  2. Nucor, Terrell, TX. (972) 524-5407.
  3. Ruffin, Oak Grove, LA. Tel. (800) 421-4232.
  4. VP Buildings, Memphis, TN. Tel. (800) 238-3246.



- C. Substitutions shall fully comply with specified requirements and Section 01 62 14 -Product Options and Substitution Procedures

## 2.02 METAL MATERIALS

- A. Hot-Rolled Structural Steel Shapes: ASTM A 36 or A 529.
- B. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529, A 570, or A 572. Provide 42,000-psi minimum yield strength.
- C. Steel Members Fabricated by Cold Forming: ASTM A 607, Grade 50.
- D. Cold-Rolled Carbon Steel Sheet: ASTM A 366 or ASTM A 568.
- E. Hot-Rolled Carbon Steel Sheet: ASTM A 568 or ASTM A 569.
- F. Structural Quality Zinc-Coated (Galvanized) Steel Sheet: ASTM A 446 with G90 coating complying with ASTM A 525.
- G. Aluminum-Zinc Alloy Coated (Galvalume) Steel Sheet: ASTM A792.
- H. Aluminum Sheets: ASTM B 209 for Alclad alloy 3003 or 3004 temper required to suit forming operations.
- I. Bolts for Structural Framing: ASTM A 307 or ASTM A 325 as necessary for design loads and connection details.
- J. Mastic: Nonstaining saturated vinyl polymer as recommended by panel manufacturer for sealing laps.

## 2.03 PAINT MATERIALS

- A. Shop Primer for Ferrous Metal: Fast-curing, lead-free, universal primer. Comply with Federal Specifications TT-P-645.
- B. Shop Primer for Galvanized Metal Surfaces: Zinc dust- zinc oxide primer. Comply with Federal Specifications TT-P-641.
- C. Painted Trim Sheet Metal Surfaces:
  - 1. The paint system shall be applied as follows: Topcoat shall consist of a primer 0.20 - 0.25 mil thick and a top coat 0.70 - 0.80 mil thick, for total film thickness of 1.00 mil. The reverse coat shall consist of a primer .20 - 0.25 mil thick and a wash coat backer 0.30 - 0.40 mil thick, for a total film thickness of 0.50 - 0.65 mil.
  - 2. Finish system shall conform to all tests for adhesion, flexibility, and longevity as specified by the finish supplier.

## 2.04 STRUCTURAL FRAMING

- A. Rigid Frames: Factory welded, shop painted, built-up "I-beam" shape or open-web type consisting of tapered or parallel flange beams and tapered columns with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide length of span and spacing indicated.

- B. Primary Endwall Framing: Provide the following frame members fabricated for field-bolted assembly.
1. Endwall Columns: Shop-painted, built-up factory-welded "I"-shape or cold-formed "C" sections, fabricated from 14 gage (0.0747-inch) steel.
  2. Endwall Beams: Shop-painted "C"-shape roll-formed sections fabricated from 14 gage (0.0747 inch) steel.
- B. Secondary Framing: Provide the following:
1. Roof Purlins: 16 gage (0.598 inch) shop-painted roll-formed steel "C" or "Z" sections. Fabricate purlin spacers from 14 gage (0.0747-inch) cold-formed galvanized steel sections. Purlins to be 8 inches deep.
  2. Eave Struts: Unequal flanges 16 gage (0.0598 inch) shop-painted roll-formed steel "C" sections formed to provide adequate backup for roof panels.
  3. Flange and Sag Bracing: 1-5/8 inch by 1-5/8 inch angles fabricated from 16 gage (0.0598 inch) shop painted roll formed steel.
- D. Wind Bracing: Provide portal beam wind bracing at rigid frame members. Use manufacturer's standard detail.
- E. Bolts: Provide zinc- or cadmium-plated bolts when structural framing components are in direct contact with roofing panels. In other cases provide shop-painted bolts.
- F. Extra Materials: Furnish 5 percent excess over required amount of nuts, bolts, screws, washers, and other required fasteners for each building. Pack in cartons labeled to identify contents and store on site where directed.
- G. Shop Painting: Clean surfaces of loose mill scale, rust, dirt, oil, grease, and other matter. Follow procedures of SSPC-SP3 for power-tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SP1 for solvent cleaning. Prime framing members with rust-inhibitive primer.
- 2.05 ROOFING PANELS: MAP Ribbed-type panel, 11/2 inches high with 36 inches wide coverage and rib spacing at 12 inches on center, 26-gage, Galvalume without color coating. Panels, 40 feet and less, shall be in one continuous length.
- 2.06 FLASHING AND TRIM: Flashing and trim shall be furnished at eaves, rake, corners, base, framed openings, and wherever necessary to seal against the weather and provide a finished appearance. Flashing and trim shall be formed in maximum lengths to minimize joints, from 26 gage, galvanized steel, ASTM A653 with G90 coating and Kynar 500 (70% PVDF) finish. Standard colors from manufacturer's full range of colors to be selected by Project Engineer / MDOT Architect.
- 2.07 SHEET METAL ACCESSORIES
- A. Provide gutters formed in sections not less than 20 feet in length complete with required special pieces. Join sections with riveted and soldered or sealed joints. Provide required expansion joints with cover plate. Provide gutter supports spaced at maximum 48 inches on center constructed of same metal as gutters. Provide aluminum wire ball strainers at each outlet. Gutters shall be, 26-gage, roll formed, galvanized steel, ASTM A653 with G90

coating and Kynar 500 (70% PVDF) finish. Color to match roof fascia and rake. Gutters are box-shaped with face profile shaped to match rake trim.

- B. Provide downspouts formed full length complete with required special pieces. Downspouts shall be, 26-gage, roll formed, galvanized steel, ASTM A653 with G90 coating and Kynar 500 (70% PVDF) finish. Color to match roof fascia and rake. Downspouts are rectangular-shaped and shall have a 45-degree elbow at the bottom. Straps shall be spaced 6 feet on center maximum (minimum of 3 required per downspout) and be the same material and finish as downspout. Strap edges shall be rolled or smooth.

### PART 3 EXECUTION

#### 3.01 ERECTION

- A. Primary Framing: Erect framing required true to line, plumb, level, rigid, and secure. Level base plates to true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use non-shrinking grout to obtain uniform bearing and maintain level baseline elevation. Moist-cure grout for 7 days after placement.
- B. Purlins: Use rake or gable purlins with tight-fitting closure channels and fascias. Secure purlins to structural framing and hold rigidly to straight line by sag rods.
- C. Bracing: Use diagonal angle bracing in roof. Use movement-resisting frames in lieu of sidewall rod bracing.
- D. Framed Openings: Provide shapes of design and size to reinforce openings and carry loads imposed, including equipment furnished under electrical Work. Securely attach to building structural frame.
- E. Sheet Metal Accessories: Install gutters, downspouts, and other accessories for positive anchorage to building. Minimums of 3 straps are required at each downspout, with maximum spacing at 6 feet on center.
- F. Roofing Panels: Comply with manufacturers standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.
  - 1. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb. Coordinate with electrical so that all penetrations through roof occur in flat portion of panel with sufficient space adjacent to penetration to be properly flashed and waterproofed.
  - 2. Attach panels using manufacturer's standard fasteners, spaced in accordance with approved Shop Drawings.
  - 3. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
  - 4. Install sealant for preformed roofing panels as specified on approved Shop Drawings.
  - 5. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
  - 6. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.
  - 7. Remove and replace panels or components that are damaged beyond successful repair.

- 3.02 CLEANING AND TOUCH-UP: Clean component surfaces. Touch up abrasions, marks, skips, or other defects to shop-primed surfaces with same material as shop primer.

END OF SECTION

SECTION 13 34 19

METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Building Type: The building is a single-story, single-span, rigid-frame-type pre-engineered metal building of the nominal length, width eave height, and roof pitch indicated.
- B. Exterior Walls: Field assembled, un-insulated panels attached to framing.
- C. Roof system: Standing-seam roof with thermal insulation blankets, concealed clips and factory-applied sealant.
- D. Components and Accessories: Manufacturer's standard building components and accessories may be used, provided components, accessories, and complete structure conform to design indicated and specified requirements.

1.02 RELATED SECTIONS: Plywood wainscot is specified in Section 06 10 00. Personnel doors and frames and finish hardware are specified in Sections 08 11 13 and 08 71 00. Overhead service doors, including operators, are specified in Sections 08 33 23 and 08 36 13. Colors are specified in Section 09 05 15 - Color Design. Painting for ferrous metal exposed to view is specified in Section 09 90 00 - Painting and Coating. Canopies are specified in Section 10 73 16.

1.03 STRUCTURAL FRAMING AND ROOF AND SIDING PANELS: Design anchor bolts, structural members, and exterior covering for applicable loads and combinations of loads in accordance with the MBMA's "Design Practices Manual."

- A. Structural Steel: Comply with AISC's "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
- B. Light Gage Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.
- C. Welded Connections: Comply with AWS's "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.
- D. Metal Roofing: Comply with SMACNA Architectural Sheet Metal Manual.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's sample warranty and product information for building components, accessories and color chart.
- B. Shop Drawings: Submit Shop Drawings for anchor bolts, structural framing system, roofing and siding panels, and components and accessories not fully detailed or dimensioned in manufacturer's product data.
  - 1. Structural Framing: Furnish erection drawings. Include fabrication and assembly details. Show anchor bolts' settings and sidewall, end-wall, and roof framing.

2. Siding Panels: Provide panel layouts and details of edge conditions, joints, corners, custom profiles, supports, anchorage, trim, flashing, closures, and special details.
  3. Sheet Metal Accessories and Roofing: 1/4-inch-scale layouts and 1-1/2-inch-scale details of accessories; show profiles, methods of joining to system components and dissimilar building materials, flashing of each condition for roof penetrations, and anchorage.
- C. Certification prepared, signed, and sealed by a Professional Engineer registered in the State of Mississippi, verifying that anchor bolts, structural framing and covering panels meet loading requirements and codes (IBC 2003), including design calculations.
- D. Installer certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

#### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer, with 5 years minimum experience, who specializes in erection of building similar to that required and is certified by the building manufacturer as qualified for erection of the manufacturer's products.
- B. Manufacturer's Qualifications: Provide buildings manufactured by a firm with 10 years experience in manufacturing buildings similar to those indicated. The manufacturer shall be AISC Certified (Class MB).
- C. Welders' Qualifications: Qualify welding processes and welding operations in accordance with the AWS D1.1 "Structural Welding Code".
1. Certify that each welder employed in unit of work of this section has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.
  2. Testing for re-certification is Contractor's responsibility.

#### 1.06 WARRANTIES

- A. Paint Finish: Paint finish shall have a 20-year guarantee against cracking, peeling and fade (Not to exceed 5 NBS vertical / 6 NBS non-vertical units per ASTM D2244-93).
- B. Weather Tightness: The entire installation (sub-framing, clips, panels, fasteners, rakes, eaves, ridge/valley flashing conditions, roof to wall conditions as well as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of 20 years. This warranty shall be identified as neither Non-Depreciating, Non-prorated nor have exclusions that identify, valleys, curbs, and flashings. Provide written warranty, signed by the manufacturer and his authorized installer / dealer, agreeing to replace / repair defective materials and workmanship with no cost to the Owner during the warranty period.

### PART 2 PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by Ceco Building Division, P. O. Box 6500, Columbus, MS 39703. Tel. (662) 328-6722.
- B. Equivalent products by the following manufacturers are acceptable:

1. Gulf States, Starkville, MS. Tel. (800) 844-4853.
  2. Ruffin, Oak Grove, LA. Tel. (800) 421-4232.
  3. VP Buildings, Memphis, TN. Tel. (800) 238-3246.
- C. Substitutions shall fully comply with specified requirements and Section 01 62 14 -Product Options and Substitution Procedures.

## 2.02 METAL MATERIALS

- A. Hot-Rolled Structural Steel Shapes: ASTM A 36 or A 529.
- B. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529, A 570, or A 572. Provide 42,000 psi minimum yield strength.
- C. Steel Members Fabricated by Cold Forming: ASTM A 607, Grade 50.
- D. Cold-Rolled Carbon Steel Sheet: ASTM A 366 or ASTM A 568.
- E. Hot-Rolled Carbon Steel Sheet: ASTM A 568 or ASTM A 569.
- F. Structural Quality Zinc-Coated (Galvanized) Steel Sheet: ASTM A 446 with G90 coating complying with ASTM A 525.
- G. Aluminum-Zinc Alloy Coated (Galvalume) Steel Sheet: ASTM A792.
- H. Aluminum Sheets: ASTM B 209 for Alclad alloy 3003 or 3004 temper required to suit forming operations.
- I. Bolts for Structural Framing: ASTM A 307 or ASTM A 325 as necessary for design loads and connection details.
- J. Mastic: Non-staining saturated vinyl polymer as recommended by panel manufacturer for sealing laps.

## 2.03 THERMAL INSULATION

- A. Glass-fiber blanket. Comply with ASTM C 991, 0.5 lb. per cubic foot density, 3 inches thickness, R10, with UL flame spread classification of 25 or less, and 2-inch wide continuous vapor tight edge tabs.
- B. Vapor Barrier: Facing shall be equal to Lamtec Corporation model WMP-50. Facing shall be composed of .0015" white polypropylene film, 4 X 5 tri-directional scrim reinforcing layer, and .0005" metallized polyester film backing layer. The facing shall have a water vapor transmission rate of .02 US perm (ASTM E96, Procedure A), a beach puncture of 125 scale units and a mullen burst of 100 psi. Tensile strength shall be 55# in the machine direction and 50# in the cross-machine direction.
- C. Retainer Strips: 26 gage (0.0179-inch) formed galvanized steel retainer clips colored to match insulation facing.

## 2.04 PAINT MATERIALS: Comply with performance requirements of federal specifications indicated.

- A. Shop Primer for Ferrous Metal: Fast-curing, lead-free, universal primer. Comply with Federal Specification TT-P-645.

- B. Shop Primer for Galvanized Metal Surfaces: Zinc dust- zinc oxide primer. Comply with Federal Specification TT-P-641.
  
- C. Unpainted Galvalume: Unpainted Galvalume shall conform to ASTM A792-89 with a coating class of AZ- 55, chemically treated and lightly oiled. All 24 gage unpainted Galvalume used for roof applications shall be grade 80, except when used for trim it shall be grade 50B. All unpainted Galvalume 24-gage and thicker shall be grade 50B.
  
- D. Painted Galvalume: Galvalume used as a substrate for factory applied baked on paint shall conform to ASTM A792-89 with a coating class of AZ-50 or heavier, minimum spangle, chemically treated and lightly oiled, as specified by the coater. All painted Galvalume shall be grade 50B.
  - 1. The paint system shall be applied as follows: Topcoat shall consist of a primer 0.20 - 0.25 mil thick and a top coat 0.70 - 0.80 mil thick, for total film thickness of 1.0 mil. The reverse coat shall consist of a primer 0.20 - 0.25 mil thick and a wash coat backer 0.30 - 0.40 mil thick, for a total film thickness of 0.50 - 0.65 mil.
  - 2. Finish system shall conform to all tests for adhesion, flexibility, and longevity as specified by the finish supplier.

## 2.05 STRUCTURAL FRAMING

- A. Rigid Frames: Factory welded, shop painted, built-up "I-beam" shape or open-web type consisting of tapered or parallel flange beams and **STRAIGHT** columns with attachment plates, bearing plates, and splice members. Factory drilled for field-bolted assembly. Provide length of span and spacing indicated.
  
- B. Primary End-wall Framing: Provide the following frame members fabricated for field-bolted assembly.
  - 1. End-wall Columns: Shop-painted, built-up factory-welded "I"-shape or cold-formed "C" sections, fabricated from 14-gage (0.0747-inch) steel.
  - 2. End-wall Beams: Shop-painted "C"-shape roll-formed sections fabricated from 14-gage (0.0747-inch) steel.
  
- C. Secondary Framing: Provide the following:
  - 1. Roof Purlins, Sidewall and Endwall Girts: 16 -gage (0.598-inch) shop-painted roll-formed steel "C" or "Z" sections. Fabricate purlin spacers from 14-gage cold-formed galvanized steel sections. Purlins to be 8 inches deep minimum. Girts to be 10 inches deep.
  - 2. Eave Struts: Unequal flange 16-gage (0.0598-inch) shop-painted roll-formed steel "C" sections formed to provide adequate backup for both wall and roof panels.
  - 3. Flange and Sag Bracing: 1-5/8 inch by 1-5/8 inch angles fabricated from 16-gage (0.0598-inch) shop-painted roll- formed steel.
  - 4. Base or Sill Angles: 14-gage (0.747-inch) cold-formed galvanized steel sections.
  - 5. Secondary endwall structural members, except columns and beams, shall be fabricated from 14-gage (0.0747-inch) shop-painted roll- formed steel.
  
- D. Wind Bracing: Provide portal beam wind bracing at rigid frame members. Use manufacturer's standard detail.



- E. Bolts: Provide zinc- or cadmium-plated bolts when structural framing components are in direct contact with roofing and siding panels. In other cases provide shop-painted bolts.
  - F. Extra Materials: Furnish 5 percent excess over required amount of nuts, bolts, screws, washers, and other required fasteners for each building. Pack in cartons labeled to identify contents and store on site where directed.
  - G. Shop Painting: Clean surfaces of loose mill scale, rust, dirt, oil, grease, and other matter. Follow procedures of SSPC-SP3 for power-tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SP1 for solvent cleaning.
    - 1. Prime framing members with rust-inhibitive primer.
    - 2. Prime galvanized members after phosphoric acid pretreatment with zinc dust-zinc oxide primer.
- 2.06 ROOFING AND SIDING PANELS
- A. Roof Panel: CXP Standing Seam Panel, 2 inches high (2-7/8 inches including standing leg) with 24 inches wide coverage, 24 gage, Galvalume. Main roof shall be without color coating.
  - B. Wall Panel: MVW Ribbed-type panel, 1-3/16 inches deep with 36 inches wide coverage and rib spacing at 12 inches on center, 26-gage, Galvalume with Kynar 500 (70% PVDF) finish. Standard colors from manufacturer's full range of colors to be selected by Project Engineer / MDOT Architect.
- 2.07 STRUCTURAL FRAMING: Shop-fabricate framing components to indicated size and section with base plates, bearing plates, and other plates required for erection welded in place. Provide holes for anchoring or connections shop-drilled or punched to template dimensions.
- A. Shop Connections: Power-riveted, bolted, or welded shop connections.
  - B. Field Connections: Provide bolted field connections.
- 2.08 FLASHING AND TRIM: Flashing and trim shall be furnished at eaves, rake, corners, base, framed openings, and wherever necessary to seal against the weather and provide a finished appearance.
- 2.09 SHEET METAL ACCESSORIES
- A. Provide gutters formed in sections not less than 20 feet in length complete with required special pieces. Join sections with riveted and soldered or sealed joints. Provide required expansion joints with cover plate. Provide gutter supports spaced at maximum 48 inches on center, constructed of same metal as gutters. Provide aluminum wire ball strainers at each outlet. Gutters shall be, 2-gage, roll formed, galvanized steel, ASTM A653 with G90 coating and Kynar 500 (70% PVDF) finish. Color shall match roof fascia and rake. Gutters are box-shaped with face profile shaped to match rake trim.
  - B. Provide downspouts formed in full-length sections complete with required special pieces. Downspouts shall be, 26-gage, roll formed, galvanized steel, ASTM A653 with G90 coating and Kynar 500 (70% PVDF) finish. Color shall match roof fascia and rake. Downspouts are rectangular-shaped and shall have a 45 degrees elbow at the bottom. Straps shall be spaced 6 feet on center maximum (minimum of 3 required per downspout) and be the same material and finish as downspout. Strap edges shall be rolled or smooth.

## 2.10 FASTENERS

- A. Wall fasteners shall be No. 14 self-tapping, carbon steel screws with an integral, hex-washer head, and without a sealing washer. Minimum length of fasteners shall be 1 inch.
- B. Roof fasteners shall be No. 12 self-tapping carbon steel screws with an extended life hexagon head that is compatible with Galvalume panels. A sealing washer shall be provided. Minimum length of fasteners shall be 1 inch.

## PART 3 EXECUTION

### 3.01 ERECTION

- A. Primary Framing: Erect framing required true to line, plumb, level, rigid, and secure. Level base plates to true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use non-shrinking grout to obtain uniform bearing and maintain level baseline elevation. Moist-cure grout for 7 days after placement.
- B. Purlins and Girts: Rake or gable purlins shall have tight-fitting closure channels and fascias. Locate and space girts to suit door and window arrangements and heights. Secure purlins and girts to structural framing and hold rigidly to straight line by sag rods.
- C. Bracing: Use movement-resisting frames in lieu of sidewall rod bracing. Rod bracing allowable in roof.
- D. Framed Openings: Provide shapes of design and size to reinforce openings and carry loads and vibrations imposed, including equipment furnished under mechanical and electrical Work. Securely attach to building structural frame.
- E. Siding: Arrange and nest sidelap joints so prevailing winds blow over, not into, lapped joints. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Protect factory finishes from damage.
- F. Field cutting of exterior panels by torch is not permitted.
- G. Wall Sheets: Apply elastomeric sealant continuously between metal base channel and concrete and where necessary for waterproofing. Apply sealant and back up in accordance with the sealant manufacturer's recommendations. Shim up from concrete shelf 1/2 inch for wall panels, and remove shims after panels have been securely fastened.
  - 1. Align bottom of wall panels and fasten with blind rivets, bolts or self-tapping screws. Fasten flashiness, trim around openings, and similar elements with self-tapping screws. Fasten window and door frames with machine screws or bolts. When building height requires two rows of panels at gable ends, align lap of gable panels over wall panels at eave height.
  - 2. Install screw fasteners with power tools having controlled torque to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
  - 3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- H. Sheet Metal Accessories: Install gutters, downspouts, and other accessories for positive anchorage to building and weathertight mounting. Adjust operating mechanism for precise operation.

- I. Thermal Insulation: Install insulation concurrently with roof and wall panels in accordance with manufacturer's directions. Install blankets straight and true in one-piece lengths with both sets of tabs sealed to provide a complete vapor barrier. Locate insulation on inside face of wall panels and on underside of roof sheets, extending across top flange of purlin members and held taut and snug to roofing panels with retainer clips. Install retainer strips at each longitudinal joint, straight and taut, nesting with roof / wall rib to hold insulation in place.
  
- J. Roof Panels: Comply with manufacturers standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.
  - 1. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb. Coordinate with mechanical and electrical so that all penetrations through roof occur in flat portion of panel with sufficient space adjacent to penetration to be properly flashed and waterproofed.
  - 2. Attach panels using manufacturer's standard Concealed clips and fasteners, spaced in accordance with approved Shop Drawings.
  - 3. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
  - 4. Install sealants for preformed roofing panels as specified on Shop Drawings.
  - 5. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
  - 6. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.
  - 7. Remove and replace panels or components that are damaged beyond successful repair.
  
- 3.02 CLEANING AND TOUCH-UP: Clean component surfaces. Touch up abrasions, marks, skips, or other defects to shop-primed surfaces with same material as shop primer.

END OF SECTION