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**PLEASANT VIEW CITY CORPORATION
CITY SHOPS PARKING BAY ROOF PROJECT**

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TECHNICAL SPECIFICATIONS

PROJECT SPECIFICATIONS

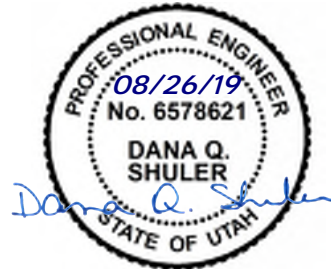
01 11 00	Summary of Work
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CITY STANDARD SPECIFICATIONS

Not Used

2017 APWA STANDARD SPECIFICATIONS

05 05 23	Bolts, Nuts and Accessories
05 12 00	Structural Steel Framing
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**SECTION 01 11 00
SUMMARY OF WORK**

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work covered includes designing, furnishing, and constructing a three-side metal building on an existing foundation.
- B. Location of the Work is at the Pleasant View City Shops, located near the intersection of 500 W and 3100 N.

1.2 WORK SEQUENCE

- A. CONTRACTOR shall submit for approval manufacturer specific design of metal building and connection to existing foundation.
- B. Upon approval, furnish and install building.

1.3 COORDINATION WITH OTHERS

- A. CONTRACTOR shall coordinate with Jay Palmer, Public Works Director, for location of laydown area and relocation of currently parked equipment.

1.4 CONTRACTOR USE OF PREMISES

- A. See Section 1.3.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 05 05 23
BOLTS, NUTS AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Steel bolts, nuts, washers, clamps, straps, rods and accessories.
- B. Galvanize bolts, nuts and accessories unless specified otherwise.

1.2 REFERENCES

A. AISC Standards:

M011: Manual of Steel Construction.

B. ASME Standards:

B1.1 Unified inch Screw Threads (UN and UNR Thread Form), Supplement.

C. ASTM Standards:

A126 Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
A197 Cupola Malleable Iron.
A307 Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
A325 High-Strength Bolts for Structural Steel Joints.
A506 Steel, Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, Regular Quality and Structural Quality.
A575 Steel Bars, Carbon, Merchant Quality, M-Grades.
F593 Stainless Steel Bolts, Hex Cap Screws, and Studs.

PART 2 PRODUCTS

2.1 MATERIALS

A. General:

- 1. Galvanize bolts, nuts, and accessories, Section 05 05 10, (except if stainless steel is required).
- 2. All sizes bolts and nuts, American Standard machined heavy hexagon heads with class two (2) fit and threads, ASME B1.1.

B. Standard Bolts: Steel, ASTM A307.

C. High Strength Bolts: Steel, ASTM A325.

D. Anchor Bolts: Steel, ASTM A307, or ASTM F593 if stainless steel is indicated.

E. Washers: Grey iron, ASTM A126.

- F. Clamps and Straps: Steel, ASTM A506.
- G. Rods: Steel, ASTM A575.
- H. Rod Coupling: Malleable iron, ASTM A197.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Torque all nuts and bolts by procedures contained in AISC M011 to secure items requiring fastening.
- B. Extend bolt through nut not less than 1/4 inch beyond nut.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel framing members, structural steel support members, struts, and miscellaneous structural steel members with required bracing, welds, and fasteners.
- B. Base plates, shear stud connectors, expansion joint plates, and related structural steel items.

1.2 REFERENCES**A. AISC Standards:**

- S302 Steel Buildings and Bridges.
- S326 Cold-Formed Structural Members for Buildings.
- S329 Structural Joint Using ASTM A325 or A 490 Bolts.

B. ASTM Standards:

- A6 General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use.
- A27 Steel Castings, Carbon, for General Application.
- A36 Structural Steel.
- A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- A242 High-Strength Low-Alloy Structural Steel.
- A307 Carbon Steel, Bolts and Studs, 60,000 psi Tensile Strength.
- A325 High-Strength Bolts for Structural Steel Joints.
- A441 High-Strength Low-Alloy Structural Manganese Vanadium Steel.
- A446 Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- A490 Heat-Treated Steel Structural Bolts, 150 ksi (1035 MPa) Minimum Tensile Strength.
- A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- A501 Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- A502 Steel Structural Rivets.
- A570 Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.

A606 Steel Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

A607 Steel Sheet and Strip, High-Strength, Low-Alloy, Columbium and or Vanadium, or Both, Hot-Rolled and Cold-Rolled.

A611 Steel, Sheet, Carbon, Cold-Rolled, Structural Quality.

C. AWS Standards:

D1.1 Structural Welding Code Steel.

D. FS Standards:

TT-P-31 Paint, Oil: Iron Oxide, Ready-Mixed, Red and Brown.

1.3 SUBMITTALS

- A. Heat of Steel or Iron: Before fabrication, submit a mill certified test report for each heat of steel or iron from which the material is to be fabricated containing the results of chemical and physical tests required by ASTM specifications for the materials. Select the material from as few heat numbers as possible and furnish certified mill test reports for each of the heat numbers. Submit two (2) Samples from each heat number; one for the tension test and one for the cold-bend test. If the heat numbers cannot be identified ENGINEER may select random specimens from unidentifiable heats.
- B. Certification of Welders: Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests within the previous 12 months on the same type of work to be done. If recertification of welders is required, retesting will be CONTRACTOR's responsibility.

1.4 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. AISC S302, AISC S326, AISC S329.
 - 2. ASTM A6 and AWS D1.1.
- B. Qualify welding processes and welding operators in accordance with AWS.
- C. Supplementary Tests:
 - 1. ENGINEER reserves right to require or make additional mill and laboratory tests. The number of such additional tests will be limited as follows, except that in case of Failure of the material to comply with ASTM requirements, more tests may be made or the materials rejected:
 - a. Structural Steel: One complete test for each heat number or each 10 tons of identifiable stock.
 - b. Rivets: One complete test for each size.
 - c. Bolts: One complete test for each lot.
 - 2. "Identifiable stock" is material for which authentic records of the chemical and physical properties are available.

- 3. Cut and machine test specimens in accordance with ASTM specifications for material to be tested.
- D. When fabrication is to be done using material already in stock, obtain approval before fabrication.
- E. Furnish steel with rolling and cutting tolerances, permissible variations in weight and dimensions, defects, and imperfections that meet the limits contained in ASTM A6.

1.5 SHOP DRAWINGS

- A. Submit Shop Drawings, Section 01 33 00.
- B. Indicate profiles, sizes, spacing, and locations of structural members, connections, attachments, fasteners, cambers, loads, and any special details.
- C. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
- D. Under seal of a structural professional engineer prepare Shop Drawings structural connections, setting drawings, templates, and directions for installation for anchor bolts and other anchorages to be installed by others.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver anchor bolts and anchorage devices which are to be embedded in concrete or masonry in ample time to not delay work.
- B. Store materials to permit easy access for Inspection and identification. Keep steel members off the ground using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- C. Do not store materials on structure in a manner that might cause deterioration or damage to members or supporting structures. Repair or replace damaged materials or structures.

PART 2 PRODUCTS

2.1 GENERAL

- A. For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes, including pitting, seam marks, roller marks, rolled trade names, and roughness.
- B. Remove blemishes by grinding or by welding and grinding before cleaning, treating, and application of surface finishes.

2.2 STRUCTURAL STEEL FRAMING MATERIALS

- A. Stock Materials: Select the material intended for use from stock and place it in a location apart from other stock material and accessible for Inspection and sampling.
- B. Structural Steel Shapes, Plates, and Bars: ASTM A36 steel.
- C. High Strength Low-Alloy Structural Steel: In accordance with ASTM

A242, A 441, A 606, A 607, or A 446 (Grades C, D, or E) as indicated.

D. Tubing:

1. Cold-formed steel, ASTM A500, Grade B.
2. Hot-formed steel, ASTM A501.

E. Pipe: ASTM A53 steel Type E or S, Grade B with black finish, except where indicated to be galvanized.

F. Copper Bearing Structural Steel: ASTM A36, A 446, A 570, or A 611 as indicated.

G. Castings: ASTM A27 Grade 65-35, medium strength carbon steel.

2.3 STEEL ACCESSORIES

A. Anchor Bolts: Galvanized steel; Section 05 05 23.

B. Unfinished Threaded Fasteners: ASTM A307, Grade A, regular low carbon steel bolts and nuts with hexagonal heads and nuts for all connections.

C. High Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers. Quenched and tempered medium carbon steel bolts, nuts, and washers complying with ASTM A325. For high strength low alloy steel, provide Type 3 fasteners of similar composition as members to be connected.

D. Rivets: ASTM A502, high strength, hot-driven type or carbon-manganese steel.

E. Welding Materials: Refer to AWS D1.1; type required for materials being welded. For high strength, low alloy steel provide electrodes, welding rods, and filler metals equal in strength and compatible in appearance with parent metal joined.

F. Primer: FS TT-P-31, red paint.

2.4 FABRICATION

A. Fabricate structural steel members in accordance with AISC specifications and as indicated on approved Shop Drawings.

B. Fabricate and assemble structural members in shop to greatest extent possible. Provide camber in structural members where indicated. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials. Where finishing is required, complete assembly, including welding of units before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

C. Connections: Weld or bolt shop connections as indicated. Bolt field connections except where welded connections or other connections are indicated. Provide high strength, threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.

D. High Strength Bolted Construction: Install high strength, threaded fasteners in accordance with AISC S329.

E. Welded Construction: Comply with AWS welding code for procedures,

appearance, and quality of welds and methods used in correcting welding work. For high strength, low alloy steels follow welding procedures recommended by steel producer for exposed and concealed connections.

- F. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members as shown on approved Shop Drawings. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work. Cut, drill, or punch items as indicated to receive other work. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.5 SHOP PAINTING

- A. General: Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on exposed portions and initial two (2) inches of embedded areas only. Do not paint surfaces which are to be welded or high strength bolted with friction type connections. Do not paint surfaces of exposed high strength, low alloy steel members. Apply two (2) coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- B. Surface Preparation: After Inspection and before shipping clean steel work to be painted. Remove loose rust, loose mill scale, spatter, slag, or flux deposits. Clean steel per Steel Structures Painting Council (SSPC) standards.

2.6 NON-SHRINK GROUT

- A. Cement based, Section 03 61 00.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which structural steel work is to be installed and notify ENGINEER in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Erect structural steel in accordance with AISC Specifications.
- B. Have all torque wrenches or impact wrenches certified by a testing laboratory before starting erecting.
- C. Make provisions for erection loads and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- D. Do not field cut or alter structural members without approval.
- E. Clean concrete and masonry bearing surfaces. Clean bottom surface of base and bearing plates. Set loose and attached base plates and bearing

- plates for structural members on jack nuts for leveling adjustments.
- F. Tighten anchor bolts after supported members have been positioned and plumbed.
 - G. Pack non-shrink grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 - H. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Level and plumb individual members of structure within specified AISC tolerances.
 - I. Establish required leveling and plumbing measurements on mean operating temperature of structure.
 - J. Splice members only where indicated and accepted on Shop Drawings.
 - K. On exposed welded construction remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.
 - L. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 - M. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
 - N. Do not use gas cutting torches for correcting fabrication errors in structural framing.
 - O. Immediately after erection clean field welds, bolted connections, and abraded area of shop paint. Apply paint to exposed area with same materials as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of two (2) mils.

END OF SECTION

SECTION 13 34 19
METAL BUILDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Furnish all structural design data, fabrication, and erection of a metal building, including all primary and secondary structural framing members, connection bolts, covering, skylights, access hatches, windows, doors, flashing, fasteners, closures, sealer, insulation, and other miscellaneous items.

1.2 DESIGN CODES

- A. All structural steel members shall be designed for those sections of the following listed codes as considered to be applicable by the building manufacturer and as related to design requirements and allowable stress.
1. AISC: Specification for the Design, Fabrication and Erection of Structural Steel for Building.
 2. MBMA: Recommended Design Practices Manual.
 3. SDI: Steel Door Institute.
 4. Publications:
 - a. Underwriters Laboratories (UL): Building Materials Directory.
 - b. State of Utah: Utah Energy Code.

1.3 REFERENCES

A. ANSI Standards:

B18.6.4 Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series).

B. ASTM Standards:

- A325 High-Strength Bolts for Structural Steel Joints.
- A441 High-Strength Low-Alloy Structure Magnesium Vanadium Steel.
- A446 Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Structural (Physical) Quality.
- A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- A525 General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- A529 Structural Steel with 42 ksi (290 MPa) Minimum Yield Point (1/2 In. (13-mm) Maximum Thickness).
- A570 Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.

- A572 High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
- C167 Thickness and Density of Blanket or Batt Thermal Insulations.
- C177 Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- D1494 Diffuse Light Transmission Factor of Reinforced Plastic Panels.
- D3220 Reinforced Thermoplastic Polyester Molding and Extrusion Materials.
- E84 Surface Burning Characteristics of Building Materials.
- E96 Water Vapor Transmission of Materials.

B. AWS Standards:

- D1.1 Structural Welding Code.

C. FS Standards:

- FF-H-106 Hardware, Builders': Locks and Door Trim.

D. SSPC Standards:

- SP6 Commercial Blast Cleaning.

1.4 DEFINITIONS

- A. **Clear Span Buildings:** A building of the single-gable, rigid frame type with clear span primary transverse rigid frames.
- B. **Modular Frame Buildings:** A building of the single-gable, rigid frame type with the primary transverse frames supported by intermediate columns.
- C. **Shed Roof Buildings:** A building of the single slope, rigid frame type with the primary transverse frames being clear span or supported by intermediate columns.

1.5 BUILDING NOMENCLATURE

- A. Measure the building "Width" and "Length" in accordance with the manufacturer's method.
- B. Measure the building "Eave Height" from the bottom of the base plate of the rigid frame columns to the intersection of lines representing the inside of the wall covering and the inside of the roof covering.
- C. "Slope Roof" as indicated with a minimum of 1/8 inch of rise for each 12 inches of horizontal run or as indicated.
- D. The "Bay Spacing" between intermediate frame center lines as indicated.

1.6 WIND UPLIFT RATINGS

- A. Furnish, when required, a roof deck system having a UL wind uplift rating of Class 30, Class 60, or Class 90 per Guide No. TGKX in Underwriters' Laboratories, Inc. "Building Materials Directory".

1.7 DESIGN REQUIREMENTS

- A. Apply roof live loads to the horizontal roof projection or as indicated and in accordance with local Laws and Regulations.
- B. Apply a snow load on a horizontal projected area for determining maximum load conditions. Snow loads shall be in conformance with local Laws and Regulations.
- C. Use the design wind pressure indicated, applied to the primary framing and to the wall components per MBMA's recommended design practices manual. Wind and seismic loading shall conform to local Laws and Regulations.
- D. Use wind or seismic conditions to control design, whichever is largest.
- E. Design Load Combination: Determine maximum load combinations as follows:
 - 1. LL = live load; DL = dead load; WL = wind load
 - 2. **30 psf LL and over:**
 - DL + LL, DL = WL, DL + 1/2 LL + WL or DL + 1/2 WL + LL
 - 3. **LL less than 30 psf:**
 - DL + LL and DL + WL

1.8 SUBMITTALS

- A. Erection Drawings: Submit complete erection drawings to ENGINEER showing anchor bolt settings, sidewall, endwall, and roof framing, transverse cross-sections, covering and flashing details, and accessory installation details to clearly indicate the proper assembly of all building parts.
- B. Certificate: Signed by a licensed design professional stating that the building design meets the requirements of this section and is in accordance with Accepted Engineering Practices.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

- A. Structural Framing:
 - 1. Shop fabricate all framing members for bolted field assembly. Indicated on Shop Drawings all field cutting or drilling when required.
 - 2. Primary structural framing includes the transverse rigid frame, wing unit rafter beams and columns, canopy beams, intermediate columns, end bearings frames, endwall columns, and wind bracing.
 - 3. Secondary structural framing includes the purlins, girts, eave struts, flange bracing, sill support, clips, and other miscellaneous structural parts.
 - 4. Use hot rolled steel sheet, plate, and strip in the fabrication of

welded assemblies conforming to ASTM A529, A 572, A 441, or A 570, Grade E with a 50 ksi yield as applicable. Use hot roll sheet and strip in the fabrication of cold-formed members conforming to ASTM A570, Grade E except for the following:

- a. For thicknesses .050" to .097" use a minimum yield strength of 55,000 psi and a minimum tensile strength of 67,500 psi.
 - b. For thicknesses .098" to .130" use a minimum yield strength of 55,000 psi and a minimum tensile strength of 65,000 psi.
 - c. For thicknesses .131" to .229" use a minimum yield strength of 50,000 psi and a minimum tensile strength of 62,500 psi.
 - d. Use smooth round bars for diagonal rod bracing conforming to the requirements of ASTM A572, Grades 60 or 65.
5. Use structural tubing for columns and other structural uses conforming to ASTM A500, Grade B (42,000 psi yield).
 6. Manufacture cold-formed sections by precision roll or brake forming with all dimensions true, and free of fluting or buckling.
 7. Weld all shop connections, AWS D1.1. Weld all flange to web connections using continuous submerged arc partial penetration fillet welds on one side of the web. Make all other welds by either the gas metal, submerged or shielded arc process. Make welds in flange plates full penetration.
 8. Make all field connections per manufacturer's specifications.
 9. Mark all framing members with an easily visible identifying mark, either stamped, penciled, or painted.
- B. Wind Bracing: Use diagonal rod bracing in both roof and sidewall, wind columns, or manufacturer's standard method. Use double roof purlins interconnected by diaphragms between the rigid frames at all points of attachment of diagonal roof bracing. Fixed base corner columns or other suitable designed bracing may be used in lieu of sidewall rod bracing. Wind bracing in the roof or sidewall need not be furnished where it can be shown that the diaphragm strength of the roof or wall covering is adequate to resist the longitudinal wind forces.
- C. Flange Bracing: Brace laterally the inside flange of all rigid frames so that the allowable compressive stress is adequate for any combination of loading.
- D. Sill Support: Provide a continuous member to which the base of the wall covering may be attached.
- E. Framed Openings: Design the structural framing members for all openings for the specified design loads.
- F. Painting: Clean by rotary abrasive blasting to an SSPC-SP6 commercial blast grade all primary structural framing members which are not galvanized. Following cleaning, apply 1 shop coat of iron-oxide zinc-chromate primer.

2.2 ROOF AND WALL COVERING

- A. General: Unless indicated otherwise, provide roof coverings to resist the

design loads.

B. Panel Materials:

1. Insulate all wall and roof covering units to provide a maximum "U" factor as specified by the Utah Energy Code unless indicated otherwise. Use rigid urethane polystyrene, cellular glass or fiberglass for insulation, all with a suitable vapor retarder.
2. Provide roof and wall panel units consisting of galvanized steel facings and conforming to ASTM A446, G-90 coating class and the required grade and yield stress as required by the design load. Use galvanized coated steel of commercial quality with a nominal coating weight of 1.25 ounces per square foot. Aluminum-zinc alloy coating of the same quality and 0.5 ounces per square foot is also acceptable.

C. Fasteners:

1. Self-tapping sheet metal screws conforming to ANSI B18.6.4 with Type "A" threads. Where required for weather tightness use screws equipped with metal and neoprene washers. Use screws and washers that are carbon steel plated with 0.0003 inch thick cadmium. Coat all exposed fasteners and washers after plating with zinc phosphate and with one prime coat and two finish coats of baked silicone polyester. Match the color of the finish with the wall and roof panels. Type ASTM A325 stainless steel fasteners plated with 0.00015 inch thick cadmium and aluminum washers may be substituted for the above.
2. Use standard wall fasteners that are nylon headed, cadmium plated, carbon steel, Type "AB" screws. Color-match wall panels and nylon screw heads.
3. Use structural blind rivets that are pull type fasteners having an aluminum body and an aluminum mandrel. Install to securely clinch the joined surfaces together.

D. Sealant and Closures:

1. Use a sealant for sidelaps, endlaps, and flashings that is a gray pressure-sensitive tape blended from butyl and EPDM rubbers, with not less than 50 percent butyl and suitable inert fillers and pigments. Use only sealants that are non-asphaltic, non-shrinking, non-drying, and non-toxic with superior adhesion to metals, plastics, and painted surfaces at temperatures from -10 deg F to +140 deg F and will not flow at 200 deg F. For standing seam roof panels use the manufacturer's standard sealant.
2. Seal side joints of tongue and groove units with a non-skinning liquid butyl sealant, applied in the female joint of the interior face.
3. Use standard closures that are closed cell foam EPDM closures matching the panel profile and installed along the eave, rake, and at accessories to be weather-tight.

E. Flashing, Closures, and Trims:

1. Furnish all flashing and trim at the rake, corners, and eaves, at framed openings, to provide weather-tightness and a finished

appearance.

2. Use only galvanized steel for flashing, metal closures, trim, and other miscellaneous uses, conforming to ASTM A525, coating Class G-90, 26 gage or heavier.
3. Provide a formed panel matching the slope and profile of adjoining roof panels along the building ridge on (1:12) buildings.

F. Color Finish:

1. Unless indicated otherwise color coat exposed surface of all galvanized steel roof and wall panels, flashing, trim, gutters, downspouts, ventilators, louvers, and other exterior galvanized steel surfaces. Use a color coating system utilizing a silicone polyester (colors) or polyester (white).
2. Unless indicated otherwise color coat all interior wall coverings and the interior face of units with a polyester finish.
3. Finish the interior side of all panels with a 0.5 mil, stone white polyester coating.

2.3 ACCESSORIES

A. Metal Swing Doors:

1. Use only door leaves that are 1-3/4 inches thick, full flush, fabricated from 20 gage, galvanized, mill bonderized steel with a core consisting of either one piece, full size, impregnated Kraft paper honeycomb with a minimum crush strength of 45 psi, or foamed-in-place polyurethane. Hang each door leaf using three 4-1/2 inches x 4-1/2 inches galvanized steel interlocking template butt hinges.
2. Use only door frames that are constructed from 16 gage galvanized steel of a rabbeted design with field applied, continuous weather stripping.
3. Use thresholds of extruded aluminum and provide a positive weatherseal.
4. Equip doors with cylindrical lock sets conforming to FS FF-H-106, Series 160, Type A, Series 161, Type A; or Security Lock Type A. When not specified use a Security Lock Type A with two (2) sets of keys.
5. Use door leaves and frames that are made with embossed steel faces, bonderized, and prime painted. Apply a finish coat of enamel to all doors and frames.

B. Aluminum Horizontal Slide Windows:

1. Extruded aluminum alloy sections meeting the requirements of AAMA.
2. Install clear flat drawn window glass as required to qualify for the high wind zone requirements of the AAMA. Embed glass in mastic and securely retained by extruded vinyl spines.
3. Use only screen cloth that is full or half length made of aluminum frames wired with aluminum cloth.

4. Use hardware that is made of corrosion resistant materials.
 5. Use weather stripping that is of the finest quality woven pile together with vinyl extrusions.
 6. Equip all windows with integral head and sill flashing with jamb fins specially designed to match the wall panel profile and ensure complete weather-tightness.
 7. Install windows so only minor amounts of caulking or sealant are visible from exterior.
- C. Skylight Panels:
1. Type I, structural (general purpose) fiber reinforced polyester skylight panels conforming to ASTM D3220.
 2. Use skylights that have a profile matching the type of panel and are 1/16 inches thick, weight eight (8) ounces per square foot with a minimum acrylic content of 15 percent. Use white skylights with a granitized surface finish and minimum ASTM D1494 light transmission of 66 percent.
 3. Use insulated skylights consisting of white plastic panels to which a three (3) inches deep pan is factory bonded to create an insulating air space. The pan shall be clear acrylic and consist of two (2) pans to give a nominal length skylight to fit two (2) adjacent purlin spaces. Light transmission shall be a minimum of 66 percent.
- D. Eave Gutters and Downspouts: Use only eave gutters that are formed to a true profile free of objectionable waviness and imperfections from 26 gage galvanized steel. Match the face of the gutter to the profile of the rake trim. Provide positive counters flashing. Fasten sections securely and seal at end laps. Support outside face of gutter with heavy gage galvanized steel supports.
- E. Insulation:
1. Fiberglass blanketing insulation manufactured per ASTM C167, and C177. (k value is not to exceed 0.31 BTU/hr/sq.ft./inch thick/deg F)
 2. Furnish all facings with 1 or two (2) inch tabs without adhesive as required:
 - a. Vinyl sheet facing: Nominal 0.004 inch thick with a permeability rating of 1. to 1.5 grains/hr./sq. ft. tested by ASTM E96, Method A, workable at five (5) deg F and above, and available in white; colors may change.
 - b. Vinyl-Scrim-Foil: Linen textured with a permeability rating of less than 0.1 grains/hr./sq.ft. tested by ASTM E96, workable at 30 deg F and above with a white finish.
 - c. Foil-Scrim-Kraft: Foil-surfaced with a permeability rating of less than 0.1 grains/hr./sq.ft. tested by ASTM E96, workable at -10 deg F and above with a regular aluminum finish. Kraft paper shall be free of any chemical treatments which could cause deterioration of metal panels under any environmental condition.

3. Use a composite insulation with a UL approved flame spread rating of 25 or less tested per ASTM E84 (tunnel test) with rolled and stapled side joints.
- F. Ventilators: Gravity type fabricated from galvanized steel and conforming to one of the following:
1. Continuous, furnished in 10'-0" lengths. Provide splice plates and end caps to make up the specified length. Continuous ventilators shall have dampers that provide an adjustable opening at the throat and are of the manually operated screw type or pull chain type: or
 2. Circular with interior baffles and exterior wind band designed to provide maximum air flow. Optional dampers shall be a spring-loaded butterfly type operated by a fused pull chain.
 3. Furnish all ventilators with birdscreens.
- G. Louvers: Fabricated from galvanized steel overlapping blades providing maximum weather-tightness while allowing free air flow. Louvers shall be either fixed type with integral birdscreen, adjustable, operated by pull chain, or gravity type indicated.
- H. Access Hatches: Provide steel access hatches on roof as indicated to allow accessibility for removing equipment. Fit hatches with approved locking devices located on the inside of building.

2.4 BUILDING ANCHORAGE

- A. Design building anchor bolts and related anchorage to resist column reactions resulting from specified loads as applied in the specified loading combinations.

PART 3 EXECUTION

3.1 FRAMING ERECTION

- A. Do no erection work on the building before review of Shop Drawings.
- B. Erect framing, AISC and MBMA specifications.
- C. Provide temporary bracing for erection and wind loads to maintain structure plumb and in alignment until completion of erection.
- D. Set column base plates per manufacturer's specifications.
- E. Do not field cut or alter structural members without approval.
- F. After erection prime welds, abrasions, and surfaces not shop primed. Use a primer consistent with shop coat.

3.2 WALL AND ROOFING SYSTEMS

- A. Before beginning panel installation, align structural framing true, plumb, and square. Accurately locate all accessory openings.
- B. Install roof panel continuous from ridge to eave for buildings 60 feet wide or less. Where endlaps are required, lap a minimum of three (3) inches at a roof purlin.
- C. Install wall panels continuous from 1-3/4 inches below the column base to the roof line. Where the required length would exceed 32 feet, Splice at a girt. Square cut all panels at the roof line.
- D. Before securing, seal all laps of roof panels with a continuous ribbon of tape sealer.
- E. Secure roof and wall panels to intermediate framing members with sheet metal screws at a maximum spacing of 12 inches; 24 inches at endlaps roof panels. On standing seam roof panels attach with manufacturer's standard method.
- F. Stitch sidelaps of roof panels through the high rib with sheet metal screws at a maximum 20 inches spacing.
- G. Install insulated wall units continuous from 1-3/4 inches below the column base to roof line. Where panel length exceeds 24 feet, splice at a girt. Flash the splice for complete weather-tightness.
- H. Predrill panels and fasten to the sill support and to the eave or rake framing with sheet metal screws. Attach at intermediate framing with structural blind rivets or acceptable alternate.
- I. Exercise care to ensure that panels are erected true and square and that the module is accurately maintained. Adjust for squareness of module when indented side joint in the interior face does not deviate more than 1/8 inch from parallel.
- J. Following complete erection of wall panels, place a 1 inch wide adhesive-backed accent tape at each interior joint.

3.3 TOLERANCES

- A. Framing Members: 1/4 inch from level, 1/8 inch from plumb.
- B. Siding and Roofing: 1/8 inch from true position.

3.4 INSTALLATION OF ACCESSORIES

- A. Install door frames, doors, overhead doors, windows and glass, and other accessories per manufacturer's instructions.
- B. Seal wall and roof accessories watertight and weather-tight with sealant.

3.5 GUTTER AND DOWNSPOUT ERECTION

- A. Rigidly support and secure components. Join lengths with formed seals sealed watertight. Flash and seal gutters to downspouts.
- B. Apply bituminous paint on surfaces in contact with cementitious materials.
- C. Slope gutters minimum 1/8 inch per foot.

END OF SECTION