

**PUBLIC WORKS BUILDING
WALKER, IOWA**

CONTRACTOR'S BID DATE: Thursday, August 10, 2023 @ 2:00 P.M.

PLACE FOR CONTRACTORS
TO SUBMIT BIDS:

City of Walker
City Hall
204 Greene St.
Walker, Iowa 52352

ADDENDUM NO.1
July 24, 2023

TO ALL PLANHOLDERS:

The following changes, clarifications, additions, and/or deletions are hereby made a part of the contract documents for the above-referenced project, as fully and completely as if the same were fully set forth therein. All Bidders submitting a Bid on the above Contract shall carefully read this Addendum and give it consideration in the preparation of their Bid.

This Addendum No. 1 consists of the following:

- Addendum No. 1 (pages ADN1-1 through ADN1-2)
- Substitution Request Form (1 page)
- Updated Specification Section 13 1250 Pre-Engineered Metal Building Systems (13 pages)

CLARIFICATIONS:

1. Submit the attached Substitution Request Form to Engineer for materials to be considered as an approved equal.
2. Exterior windows and walkway doors are to be furnished and installed by Contractor. Refer to attached revised Specification Section 13 1250 for window and door specifications.
3. Interior metal fabrications (stairs, ladders, guardrails, etc.) by Owner unless noted otherwise.


SPECIFICATIONS:

1. **REPLACE SECTION 13 1250 – PRE-ENGINEERED METAL BUILDING SYSTEMS** with the attached.

PLANS:

N/A

All bidders shall acknowledge receipt and acceptance of Addendum No. 1 by signing in the space provided on the Bid Form. Bids submitted without Addendum No. 1 being acknowledged will be considered non-responsive.

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p>
	<p><i>Haley Jindrlich</i> Date: 7/24/2023 HALEY ANNE JINDRICH, P.E. License No. 26406 My renewal date is December 31, 2023 Pages or sheets covered by this seal: Addendum #1.</p>

HALEY JINDRICH, PE
HR GREEN, INC.
8710 EARHART LANE
CEDAR RAPIDS, IOWA 52404
PHONE: (319) 841-4000

END OF ADDENDUM #1

Substitution Request Form (During Procurement)

IDENTIFICATION:

Owner: _____
Design Professional: _____
Project Name: _____
Project Number: _____ Date: _____

REFERENCE:

Specification Title: _____
Specification No.: _____ Page: _____ Article/ Paragraph: _____

DESCRIPTION:

Manufacturer's Name: _____ Model No: _____
Trade Name: _____
Proposed Substitution General Description: _____

CERTIFICATION:

The Undersigned certifies:

- Proposed substitution has been investigated and determined that it meets or exceeds the quality level of the specified product.
 - Same warranty will be furnished for proposed substitution as for specified product.
 - Same maintenance service and source of replacement parts, as applicable, is available.
 - Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
 - Proposed substitution does not affect dimensions and functional clearances.
 - Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
-

Submitted and Signed by: _____
Name Title

Firm: _____
Address: _____
Telephone: _____

ATTACHED SUPPORTING DATA:

Drawings Product Data Samples Tests Reports _____

A/E's REVIEW AND ACTION:

- Substitution approved - Make submittals in accordance with Specification Section 01 2500.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 2500.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____
Name Title Date

**SECTION 13 1250
PRE-ENGINEERED METAL BUILDING SYSTEMS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Structural-steel framing.
 - 2. Metal roof panels.
 - 3. Metal wall panels.
 - 4. Doors and frames.
 - 5. Soffits, gutters and downspouts.
 - 6. Insulation.
 - 7. Accessories.

1.03 REFERENCE STANDARDS

- A. Use the most up to date ASTM standards and use codes as required by authorizing agency having jurisdiction.
- B. AISC 360 - Specification for Structural Steel Buildings, 15th Edition; 2017.
- C. ASTM A36 - Standard Specification for Carbon Structural Steel; 2019.
- D. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength; 2014e1.
- F. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2018.
- G. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- H. ASTM A529 - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2019.
- I. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2018.
- J. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2019a.
- K. ASTM A792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010 (Reapproved 2015).
- L. ASTM A992 - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).
- M. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
- N. ASTM C991 - Standard Specification for Flexible Glass Fiber insulation for Metal Buildings; 2016.
- O. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2017.
- P. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-KSI Yield Strength; 2018.

- Q. ASTM F3125 - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 KSI and 150 KSI Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2018.
- R. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- S. AWS D1.1 - Structural Welding Code - Steel; 2015.
- T. MBMA (MBSM) - Metal Building Systems Manual; Metal Building Manufacturers Association; 2018.
- U. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- V. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.

1.04 DEFINITIONS

- A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.05 SUBMITTALS

- A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - 1. Structural-steel-framing system.
 - 2. Metal roof panels.
 - 3. Metal wall panels.
 - 4. Metal liner panels.
 - 5. Flashing and trim.
 - 6. Doors.
 - 7. Accessories.
- B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
 - 2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 - a. Show provisions for attaching roof joists, curbs, service walkways, and platforms.
 - 3. Metal Roof and Wall Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
 - a. Show roof-mounted items including roof hatches, equipment supports, door supports, pipe supports and penetrations, lighting fixtures, and items mounted on roof curbs.
 - b. Show wall-mounted items including doors, windows, louvers, and lighting fixtures.
- C. Samples for Initial Selection: For units with factory-applied color finish.
- D. Opening Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of framing reinforcement.
- E. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer, licensed in the State of Iowa, responsible for their preparation.
- F. Qualification Data: For qualified erector and manufacturer.
- G. Welding certificates.

- H. Metal Building System Certificates: For each type of metal building system, from manufacturer.
 - 1. Letter of Design Certification: Signed and sealed by a qualified professional engineer licensed in the State of Iowa. Include the following:
 - a. Name and location of Project.
 - b. Order number.
 - c. Name of manufacturer.
 - d. Name of Contractor.
 - e. Building dimensions including width, length, height, and roof slope.
 - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - g. Governing building code and year of edition.
 - h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
 - i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 - j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
 - k. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
- I. Erector Certificates: For each product, from manufacturer.
- J. Manufacturer Certificates: For each product, from manufacturer.
- K. Material Test Reports: For each of the following products:
 - 1. Structural steel including chemical and physical properties.
 - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 - 4. Shop primers.
 - 5. Nonshrink grout.
- L. Maintenance Data: For metal panel finishes and door hardware to include in maintenance manuals.
- M. Warranties: Sample of special warranties.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.
 - 1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- D. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.08 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.09 COORDINATION

- A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Commander Buildings, Monticello, IA.
 - 2. Butler Manufacturing, Kansas City, MO.
 - 3. Engineer Approved Equivalent.

2.02 METAL BUILDING SYSTEMS

- A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
 - 1. Provide metal building system of size and with bay spacings, roof slopes, and spans indicated.
- B. Primary-Frame Type:
 - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
- C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of primary frame, capable of supporting one-half of a bay design load, and end-wall columns.
- D. Secondary-Frame Type: Secondary-Frame Type: Manufacturer's standard purlins and inset-framed girts as shown on Sheet S102 Vendor Drawings.
- E. Eave Height: Manufacturer's standard height, as indicated by nominal height on Drawings and as required for vertical space above coiling door openings.
- F. Bay Spacing: As indicated on drawings.
- G. Roof Slope: 2 inches per 12 inches
- H. Roof System: Manufacturer's standard vertical-rib, structural standing-seam metal roof panels. Minimum of 26 gauge prefinished roll formed steel.
- I. Exterior Wall System: Manufacturer's standard metal wall panels. Minimum of 24 gauge prefinished roll formed steel. Provide field-installed insulation at locations shown on drawings.
- J. Interior Wall System: Manufacturer's standard metal liner wall panels. Minimum of 26 gauge prefinished roll formed steel. Provide field-installed insulation at locations shown on drawings.

2.03 METAL BUILDING SYSTEM PERFORMANCE

- A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
1. Design Loads, load importance factors, and other pertinent design criteria: As indicated on Drawings.
 2. SERVICE LIVE LOAD of 1,000 plf line load to the supporting PEMB exterior wall at cold form metal joists at office and bathroom roofs.
 3. Interior Office and Bathroom Roof loads: 125 PSF Uniform Live Load or 300 lb Concentrated load. See drawings for roof materials.
 4. Collateral loads: Minimum 10 PSF.
 - a. Interior Office and Bathroom roof joists support a 5/8" gypsum board below with a Collateral Dead Load of 15 PSF
 5. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
 - a. Purlins and Rafters: Vertical deflection of 1/180 of the span.
 - b. Girts: Horizontal deflection of 1/180 of the span.
 - c. Metal Roof Panels: Vertical deflection of 1/180 of the span.
 - d. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
 - e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
 6. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
 - a. Lateral Drift: Maximum of 1/200 of the building height.
 7. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.
- C. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Air Infiltration for Metal Roof and Wall Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 1.57 lbf/sq. ft..
- E. Water Penetration for Metal Roof and Wall Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft..
- F. Thermal Performance: Provide insulated metal panel assemblies with the following maximum U-factors and minimum R-values for opaque elements when tested according to ASTM C 1363 or ASTM C 518:
1. Metal Roof Panel Assemblies:
 - a. **Fill Entire Purlin Cavity**
 - b. Code Minimum R-Value: R19 + R11 LS with R5 thermal blocks
 2. Metal Wall Panel Assemblies:
 - a. **Fill Entire Girt Cavity**
 - b. Code Minimum R-Value: R13 + R13 continuous.

2.04 STRUCTURAL-STEEL FRAMING

- A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
 3. Frame Configuration: Single gable and One-directional, sloped as shown on the drawings.
 4. Exterior Column Type: Uniformed depth or Tapered, pinned at base.
 5. Rafter Type: Uniformed depth or Tapered.
- B. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:
1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
- C. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating.
- D. Bracing: Provide adjustable wind bracing as follows:
1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 (345); or ASTM A 529/A 529M, Grade 50 (345); minimum 1/2-inch- (13-mm-) diameter steel; threaded full length or threaded a minimum of 6 inches (152 mm) at each end.
 2. Cable: ASTM A 475, 1/4-inch- (6-mm-) diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
 3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
 4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
 5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
 6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.
 7. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.

2.05 METAL ROOF AND CANOPY PANELS

- A. Vertical-Rib, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced or flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.
1. Material: Aluminum-zinc alloy-coated steel sheet, nominal thickness.
 - a. Exterior Finish: Fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
- B. Materials:
1. Metallic-Coated Steel Sheet: Restricted-flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
- C. Finishes:
1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.06 METAL WALL PANELS

- A. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced or flat pan between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
 - 1. Material (galvanized) steel sheet, 0.028-inch nominal thickness.
 - a. Exterior Finish: Two-Coat Fluoropolymer
 - b. Color: Manufacturer's standard, as selected by Architect from manufacturer's full range.
- B. Tapered-Rib-Profile, Metal Liner Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced or flat pan between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
 - 1. Material: Zinc-coated (galvanized) steel sheet, 0.022-inch nominal thickness.
 - a. Exterior Finish: Two-Coat Fluoropolymer
 - b. Color: Manufacturer's standard, as selected by Architect from manufacturer's full range.
- C. Materials:
 - 1. Metallic-Coated Steel Sheet: Restricted-flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
- D. Finishes:
 - 1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.07 THERMAL INSULATION

- A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
- B. Unfaced Metal Building Insulation: ASTM C 991, Type I, or NAIMA 202, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
 - 1. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm when tested according to ASTM E 96/E 96M, Desiccant Method.
- C. Mineral-Fiber-Blanket Insulation: ASTM C 665; consisting of fibers manufactured from glass, slag wool, or rock wool.
- D. Retainer Strips: 0.025-inch nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.
- E. Roof System:
 - a. Insulation R-value: Installed thickness as required to completely fill cavity from the fabric surface to the underside of roof panels. Roof system shall be a double layer system.
 - b. Thermal Block: R-5 minimum thermal block shall be installed.
 - c. Fall Protection
- F. Wall System With Metal Liner Panels to +8'-0" AFF. Fall Protection Fabric above:
 - a. Insulation R-value: See Drawings. Installed thickness as required to completely fill cavity from the fabric surface to the underside of roof panels. Wall system shall be a double layer system.

- b. Fall protection fabric from top of Metal Liner Panels
- c. 6 mi. vapor retarder behind Metal Liner Panels. Attach to Fall Protection Fabric.

2.08 FALL PROTECTION FABRIC SYSTEM

- 1. 'Steel Strap & Fall Protection Fabric System' Components:
 - a. Steel Strap: 50 KSI tempered, high-tensile-strength steel, galvanized, primed, and painted white. Minimum size shall be 0.22" thick by 1" wide by continuous length.
 - b. Fasteners: Use 12-14 TY3 3/4" self-drilling fasteners with 3/4" OD washers, for up to 1/4" thick, light gauge steel (typically purlins). For heavier gauge steel (typically primary framing), up to 3/8", use 12-24 TY5 1-1/4" self-drilling fasteners with a banding clip. All fasteners shall be colored to match fabric color.
 - c. Sealants: Shall be fast-tack solvent-based synthetic rubber adhesive for sealing fabric laps and edges. Two-sided tape approved by system manufacturer may be substituted for synthetic rubber adhesive.
 - d. Insulation: Per above
 - e. Insulation Hangers: Shall be coils for supporting insulation between wall girts at frequency specified by system manufacturer.
 - f. Fabric: Woven reinforced high-density polyethylene yarns coated on both sides with a continuous white polyethylene film. This material shall be manufactured in large custom-fit pieces by hot air welding from roll goods. Pieces shall be fabricated to substantially fit the large defined building areas with minimum practical sealing to be done on the job site. Fabric shall be folded or rolled to allow for rapids pullout on the strap support system. Fabric data as follows:
 - 1) Coating Thickness: 1.5 VVFR WHT (+/- 10%).
 - 2) Weight: 4.65 oz./sq. yd. (+/- 10% ASTM D-1910).
 - 3) Tensile Strength: 175 lbs. warp x 156 lbs. weft (ASTM D-751, Grab).
 - 4) Elongation: 31% warp x 26% fill.
 - 5) Tear Strength: 56 lbs. warp x 51 lbs. weft (ASTM D-751, Tounge).
 - 6) Moisture Vapor Transmission: 0.015 (ASTM E-96 Method A)
 - 7) Thickness: 7.5 mils (+/- 10%).
 - 8) Mullen Burst: 270 PSI (ASTM D-751).
 - 9) Puncture Resistance: 81 lbs. (ASTM D-4833).
 - 10) Flame Resistance: Flame Spread – 5 / Smoke Developed – 20 (ASTM E-84).
 - 11) Sound Absorption: NRC Rating 0.70 (ASTM C-423 – 02a).
 - 12) UV Weathering: UV stabilizers added for extra protection.
 - 13) Cold Temperature Flexibility: -55 degrees Fahrenheit (ASTM D-2136).
- 2. Line Entire Ceiling & Walls to top of Metal Liner Panels.

2.09 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- 1. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Ceco Door; ASSA ABLOY.
 - 2) Curries Company; ASSA ABLOY.
 - 3) Mesker Door Inc.
 - 4) Steelcraft, an Allegion brand
 - 5) Architect approved equal
 - b. Physical Performance: Level A according to SDI A250.4.
 - c. Doors:
 - 1) Size: As indicated on Drawings
 - 2) Thickness: 1-3/4 inches (44.5 mm).

- 3) Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum G60 coating.
 - 4) Edge Construction: Model 2, Seamless
 - 5) Core: Manufacturer's standard insulation material
- d. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value compliant with Energy Standards applicable to this project when tested according to ASTM C 1363.
- e. Frames:
- 1) Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum G60 coating.
 - 2) Construction: Full profile welded
- f. Exposed Finish: Prime, paint in field.

2.10 WINDOWS

1. Thermally Broken Aluminum Storefront Framing System
 - a. Size: As indicated on Drawings
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Kawneer North America; an Alcoa company.
 - b. Oldcastle BuildingEnvelope™
 - c. Tubelite Inc.
 - d. YKK AP America Inc.
3. Basis of Design: Kawneer, Trifab 451UT, thermally broke, center, insulated glazing
4. Finish: Clear anodic finish, Class I, 0.018 mm or thicker
5. Glazing: Clear insulating glass.
 - a. Overall Unit Thickness: 1 inch (25 mm).
 - b. Minimum Thickness of Each Glass Lite: 6 mm.
 - c. Outdoor Lite: Heat-strengthened (minimum) or Fully tempered (where indicated on drawings) float glass.
 - d. Interspace Content: Argon.
 - e. Indoor Lite: Heat-strengthened (minimum) or Fully tempered (where indicated on drawings) float glass.
 - f. Low-E Coating: Sputter-coated on second surface.
 - g. Visible Light Transmittance: 71 percent minimum
 - h. Winter Nighttime U-Factor: 0.24 maximum.
 - i. Summer Daytime U-Factor: 0.28 maximum.
 - j. Solar Heat Gain Coefficient: 0.39 maximum
 - k. Provide safety glazing labeling.

2.11 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly and canopies including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

- C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
- D. Flashing and Trim: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
 - 1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
- E. Louvers: Size and design indicated; self-framing and self-flashing. See additional information of the mechanical drawings.
- F. Materials:
 - 1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
 - 2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
 - 3. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
 - 4. Metal Panel Sealants:
 - a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
 - b. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.12 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
 - 1. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
- D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
- E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
 - 1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.03 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.
- B. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- C. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- D. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.04 METAL PANEL INSTALLATION, GENERAL

- A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
 - 1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.
- B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

3.05 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
 - 1. Install ridge caps as metal roof panel work proceeds.
 - 2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
- B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

3.06 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
- B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

- C. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet, nonaccumulative, on level, plumb, and on location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.07 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire cavity, according to manufacturer's written instructions.
- B. Blanket Roof Insulation: Comply with the following installation method:
 - 1. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.
 - a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
- C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.
 - 1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
 - 2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.

3.08 DOOR AND FRAME INSTALLATION

- A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.
- B. Personnel Doors and Frames: Install doors and frames according to SDI A250.8. Fit non-fire-rated doors accurately in their respective frames, with the following clearances:
 - 1. Between Doors and Frames at Jambs and Head: 1/8 inch.
 - 2. Between Edges of Pairs of Doors: 1/8 inch.
 - 3. At Door Sills with Threshold: 3/8 inch.
 - 4. At Door Sills without Threshold: 3/4 inch.
- C. Door Hardware: Mount units at heights indicated in DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 1. Install surface-mounted items after finishes have been completed on substrates involved.
 - 2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
 - 4. Set thresholds for exterior doors in full bed of butyl-rubber sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.09 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

3.10 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
1. Inspection of fabricators.
 2. Steel construction.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Tests and Inspections:
1. High-Strength, Field-Bolted Connections: Connections shall be inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- D. Product will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

3.11 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
- D. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 13 1250