

**SECTION 13 3423**  
**PREFABRICATED STRUCTURE**

**PART I - GENERAL**

**1.01 SUMMARY**

- A. Section Includes: Preassembled, pre-engineered steel building as specified herein.

**1.02 DESIGN REQUIREMENTS**

- A. Codes and Standards: The structure design and manufacture shall, as a minimum, conform to ASCE (American Society of Civil Engineers) current edition of "Minimum Design Loads for Buildings and Other Structures" and to the MBMA (Metal Building Manufacturers Association) "Recommended Design Practices Manual." Building shall be manufactured and built to satisfy the current editions of the International Building Code (IBC), and the National Electrical Code (NEC). Building manufacturer shall supply plans and calculations stamped by a registered professional engineer for the state where the building is to be installed and is responsible for obtaining any state industrial building commission approvals and third party inspections if required by the state where building is installed.
- B. Loading: The building shall be designed at a minimum to support the following loads:
1. Roof Load - 50 PSF (40# live and 10# dead)
  2. Ceiling Dead Load - 10 PSF
  3. Wall Load - 110 mph wind, plus wall-mounted equipment.
  4. Seismic Zone: Per IBC for site location.

**1.03 DRAWINGS AND SUBMITTALS**

- A. Shop Drawings: Indicate building floor plan, interior and exterior dimensions, elevations, suggested foundation elevations and dimensions, and the location of all primary accessories included with the building.
- B. Submit a standard color chart shall be provided to the owner for exterior color selection prior to manufacturing.

**1.04 QUALITY ASSURANCE**

- A. Building manufacturer to have a quality control program that follows building through to completion and is passed onto owner with all instruction manuals and final drawings. Additionally, the building manufacturer to have been in the control building business for a minimum of five years and able to show proof of supplying at least 25 buildings of a similar type in that time.

### **1.05 WARRANTY**

- A. Manufacturer shall guarantee that the complete building will have no defects in materials and workmanship for a period of two years, except as limited or extended by the original equipment or component manufacturer.
- B. Metal exteriors, roofing and liner panel shall have a baked-on PVDF resin-based paint coating, over either a Galvalume or galvanized substrate, with a 20-year warranty against rust perforation (Galvalume), a 30-year Kynar 500 warranty against fading and chalking and a 40-year Kynar 500 warranty against flaking peeling and checking. Coatings to meet minimum performance requirements as set forth in ASCA specification 96 and AAMA specification 2605. (Kynar 500 is an approved coating).

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. The building shall be a structurally steel framed, Trachte, Inc. Powerhouse® design, manufactured with Channelframe™ construction. Any other design must be pre-approved by the owner and/or their engineer.
- B. The materials shall be new, unused, and fabricated in a workmanlike manner in a factory environment. Hot-rolled steel to meet as a minimum standard ASTM –A36, and all galvanized steel to meet as a minimum standard ASTM A -653.
- C. The components and building parts shall be clearly marked on the drawings.

### **2.2 BASE - PERIMETER ANGLE SYSTEM**

- A. Building base shall have a properly sized hot-rolled steel angle framework, welded, primed and painted, with maximum deflection of L/240. Base shall be pre-drilled for anchoring to a concrete slab with expansion anchors. Concrete slab floor/foundation to be by others with design assistance supplied by building manufacturer.
- B. Base framework to be fully cleaned, primed and painted with a self-priming, VOC-compliant (EPA method 24), catalyzed coating system designed to provide an extremely durable finish, suitable for heavy industrial, severe coastal, chemical or offshore environments with superior corrosion protection and resistance to fading. Paint system to have a minimum dry film thickness, per coat of 5–7 mils. Color to be Navy Gray. Floor to have a non-slip texture added to paint. Approved coating: Sherwin Williams Macropoxy 646 Fast-Cure Epoxy with a minimum dry film thickness of 5-7 mils.
- C. Floor system weld standards shall as a minimum meet AWS recommended practices.
- D. Ground lugs to be bolted to frame where and if indicated on drawings.
- E. Lift eyes to be mounted to roof trusses.

## **2.3 BUILDING**

- A. Framework: The building shall have a complete, internal, self-supporting, structural steel frame which does not utilize or rely on the exterior panels or roof cover panels for any of its structural strength or framing. The buildings stand-alone framework shall include 8- to 16-gauge, cold-formed, galvanized steel structural members. Building framework to have a flush wall, post and beam format with girts and purlins, and full trusses on both end walls which easily allows for future expansion and/or modifications. Wall and ceiling structural support system are to be designed to provide load carrying capability for anticipated equipment loads using 16-gauge galvanized steel hat channels behind liner panel for reinforcement as needed, with locations shown on approval drawings. Roof to have 8-gauge to 14-gauge solid web hot-rolled steel trusses.
- B. Insulation: Exterior walls shall have a minimum of 3.5" fiberglass batt insulation and a vapor barrier. The ceiling shall have a minimum of 6" insulation and a vapor barrier. In addition to the insulation in the walls and ceiling, an additional 1" fiber-glass insulation blanket shall be installed over the entire building framework and under the exterior wall and roof panels, as a thermal break. The insulation system shall provide a minimum of R-19 in the walls and R-24 above the ceiling.
- C. Roof: Gable style roof with roof pitch of no less than 2:12 unless width and height cause transport restrictions, then 1:2 is acceptable. Roof to have a covering of mechanically-seamed, 24-gauge, steel standing-seam roofing, with a minimum seam height of 2". Standing seam roof panels shall have a Galvalume steel substrate, with a baked-on Kynar 500, PVDF resin-based coating and shall have no visible fasteners on main run. Roof to include a matching, die-formed ridge cap and a fully supported 3" overhang. Properly sized attic space ventilation shall be provided.
- D. Exterior Walls: The exterior walls shall be 24-gauge ribbed steel panels with a Galvalume substrate and a baked-on PVDF resin-based finish in manufacturer's standard colors. Exterior siding panels to be overlapped and installed with appropriate self-tapping fasteners with integral gaskets and shall be removable without any disturbance to interior panels. Butted seams are not allowed. All openings in walls are to be structurally framed, sleeved, trimmed, and provided with external drip caps. Repair or replacement of exterior panels must be able to be done entirely from outside.
- E. Exterior Trim: The exterior trim package shall include stepped or boxed eave, rake, fascia, base, corner, jamb, and header trim in 26-gauge Galvalume material with owner's choice of standard Kynar colors.
- F. Interior Finish: The building's interior walls and ceiling shall be lined with flush-fit 22-gauge, roll-formed steel liner panels, with concealed fasteners and a baked-on white Kynar 500 finish over Galvalume substrate. The building interior shall feature a

complete matching trim system including base, jamb, header, and ceiling trim. Vertical hat channels of 16-gauge x 6" galvanized steel to be added behind liner panel as required for wall-mounted equipment.

- G. Interior Dimensions: The building's finished interior dimensions shall be no less than 10' in width and length from the exterior dimensions shown on the drawings. Minimum floor to ceiling dimension shall be nominal 10'.
- H. Fasteners, Adhesives and Sealants: The fasteners, adhesives and sealants utilized shall be of types approved for use on this type of structure as required by the appropriate agency or governing body, as covered in section 1.02 of these specifications.
- I. Closures: Matching, pre-molded, closed cell elastomer closures provided by the siding and roof panel manufacturer shall be installed according to the manufacturer's recommendations at the eave line, beneath the roof panels and where the trim meets the wall panels.

## **2.4 DOOR AND HARDWARE**

- A. Minimum Standards. Doors shall at a minimum comply with Steel Door Institute directive SDI-100.
- B. Doors and Frames. Doors to be constructed of no less than 18-gauge steel faced leafs with stiffeners and 16-gauge door frames. Doors and frames to be hot-dipped galvanized to ASTM designations A924 and A653, then factory primed and painted with epoxy enamel to match the building or the trim. Door to have insulated core.
- C. Sizes and Quantity: Shall be as indicated on the drawings. Minimum size door is 36" x 84" x 1 3/4."
- D. Door Hardware shall include:
  - 1. NRP stainless steel ball bearing hinges, minimum of three (3) per door.
  - 2. Von Duprin low profile rim device type panic interior openers, with cylinder lock keyed entry and thumb latch exterior (22TP-SP28).
  - 3. LCN4110 closer with hold open arm.
  - 4. Weatherstripping and sweep, Reese #797B.
  - 5. Threshold, Reese #V301.
  - 6. Watershed, at top of door, Reese #202C; 203C.
  - 7. Drip cap, extending 3" past door edge.
  - 8. Entry alarm contacts, Edwards #61.

## **2.5 MISCELLEANEOUS BUILDING ACCESSORIES**

- A. Telecommunications Board: If indicated on the drawings, building manufacturer to install a 7/16" thick white FRP veneer plywood telecommunications board over a 7/16" OSB

backer with flush transition trim to wall liner. Painted plywood fastened over the wall liner is not acceptable. Size and quantity to be as indicated on drawing or in the BOM.

- B. PVC Chases: 1" PVC cable chases to be installed in the wall near the bottom of telecommunications board and in diagonal building corners for ground leads. Chase(s) to be sealed with silicone caulk.
- C. Emergency Eye Wash: If indicated on the drawings, building manufacturer to install a wall-mounted self-contained emergency eye wash station containing, at a minimum, two 16-ounce bottles of sterile saline solution.
- D. Fire Extinguisher(s): Wall-mounted 10# dry chemical ABC rated fire extinguishers are to be provided in a convenient location at each doorway.
- E. Furnishings: Furniture such as desks, file cabinets, drawing racks, etc. to be supplied by building manufacturer only if specifically called for in Appendix A or in the BOM.

## **2.6 HEATING, VENTILATION, and AIR CONDITIONING**

- A. Minimum Standards: Unit(s) to be a readily available wall-mounted commercial grade air conditioner with integral heater, (Bard, Marvair or equal). All electrical connections to meet NEC standards. Unit(s) to be supplied by a manufacturer with service representation within a 250-mile radius of area where building is installed.
- B. Size and Quantity: Unit(s) to be sized by building manufacturer to maintain a minimum interior temperature of 60 degrees F, and a maximum interior temperature of 85 degrees F, based on the ambient site conditions and expected internal heat gains as shown on the attached Appendix A. Quantity to be as shown on the drawings or as determined by building manufacturer. Power feed is assumed to be 120/240 VAC, single phase unless noted otherwise in Appendix A or the BOM.
- C. Filters and Controls: Unit(s) to have supply and return grilles, and a replaceable pleated high efficiency filter on the return side. Unit(s) to be controlled by a separate wall-mounted auto-change over thermostat or a lead-lag controller if two units are used.

## **2.7 EXHAUST FANS**

- A. Minimum Standards: Intake to have a filter rack, pleated high efficiency filter, insect screens and painted steel weather hood. Exhaust to have a back draft damper, insect screen and painted steel weather hood. Units to be louvered aluminum with gravity dampers unless otherwise specified.
- B. Size and Quantity: Unless otherwise indicated, intake and exhaust to be sized by building manufacturer based on size of the building and/or any specific requirements based on battery system being used.

- C. Controls: Exhaust fan to be controlled by a manual on-off switch and a cycle timer (such as Intermatic). It may also be controlled by a hydrogen detector and/or a separate wall-mounted thermostat, if called out in Appendix A or the BOM.

## **2.8 BUILDING ELECTRICAL - STANDARDS**

- A. Minimum Standards: All grounding, workmanship and materials shall conform, as a minimum, to the current edition of the National Electric Code (NEC). All conduit shall be electrical thin wall metallic tubing (EMT) except service runs which are PVC and flexible metallic conduit used for motor and fixture connections. All interior junction boxes are NEMA 1. All wiring and conduit is surface mounted and run tight to walls and ceiling. Conductors shall be 98% conductivity copper with 600 volt insulation, THHN, sized as required, 12-gauge minimum for line voltage wiring and 18-gauge for alarms.

## **2.9 LIGHTING**

- A. Interior Lighting: Building to be equipped with 4' twin tube 40-watt (or 32-watt) fluorescent light fixtures with rapid start ballasts, lamps and acrylic lens cover. Lighting to be designed to provide a minimum of 30 foot candles at desk level.
- B. Exterior Lighting: Building to have a vandal resistant 70-watt high pressure sodium (HPS) exterior light above each door, equipped with acrylic lens cover and controlled by a built-in photocell.
- C. Emergency Lighting/Exit Signs: Combination wall-mounted emergency lighting and red LED exit signs to be installed in the quantity shown on the drawings. Lights to be dual head, 90-minute back-up, with lamps included, provided above each door.

## **2.10 RECEPTACLES**

- A. Interior Receptacles: Wall-mounted 20-amp, 125 VAC duplex receptacles shall be installed in the quantity indicated on the drawings, with standard ivory cover plates, at 18" above floor level, unless otherwise indicated in Appendix A.
- B. Exterior Receptacles: Weatherproof, 20-amp, 125 VAC, GFI protected duplex receptacles shall be installed next to any air conditioners and in any other location indicated on the drawings.

## **2.11 SWITCHES**

- A. All switches are to be 20-amp, wall-mounted with standard ivory cover plates, at 44" above floor. Switches are standard single pole except lighting if more than one door is used and then switches to be three-way.

## **2.12 ALARMS/DETECTORS**

- A. Smoke Alarm(s): A ceiling mounted 120 VAC smoke detector and relay to be installed.

- B. Door Alarm(s): Each door to have a magnetic contact entry alarm.
- C. High and Low Temperature Alarms: One high temperature and one low temperature alarm to be provided.

### **2.13 ALARM ENCLOSURE**

- A. All alarms are to be wired to a wall-mounted 12" x 12" NEMA 1 enclosure, with terminal blocks mounted and alarms wired to one side only, wiring from other side by others.

### **2.14 WIREWAY**

- A. Building manufacturer to install a standard 4" x 4" metal wireway with hinged removable cover around perimeter of building interior near the ceiling unless indicated otherwise on the drawings.

### **2.15 CABLETRAY**

- A. An aluminum ladder type cable tray system to be provided in a layout and size as indicated in the drawings. Cable tray to be mounted from a reinforced ceiling using uni-strut and threaded rods. Load capacity of the cable tray shall at a minimum meet NEMA Class "C" (100 lbs. per lineal foot). The bottom of the cable tray shall be 8' 6" from the floor, unless indicated otherwise on drawings.
- B. The building to have either a fully framed and sleeved floor cutout with a removable cover plate or fully framed and sleeved wall opening(s) with removable cover plates.
- C. Additionally, if indicated on the drawings, the building will have an exterior cable riser with two-piece, weatherproof removable cover, stainless steel bolts and wing nuts and a run of vertical tray.

### **2.16 GROUNDING AND ACCESSORIES:**

- A. Interior ground grid with brackets, connectors and fittings, run to exterior ground lugs as shown on drawings.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Before erection proceeds, survey elevations and locations of concrete and masonry bearing surfaces, baseplates, and anchor bolts to receive structural framing. Verify compliance with requirements and metal building system manufacturer's tolerances.

### **3.2 ERECTION**

- B. Erect prefabricated system, including roof and wall panels and accessories, according to manufacturer's written instructions and erection drawings.

- C. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

END OF SECTION