

SECTION 13122

PRE-ENGINEERED FIBERGLASS BUILDINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pre-engineered buildings.
- B. Pre-engineered shelters.
- C. Pre-engineered enclosures.
- D. Electrical wiring and devices for pre-engineered structures.
- E. Heating equipment for pre-engineered structures.
- F. Ventilation equipment for pre-engineered structures.
- G. Air conditioning equipment for pre-engineered structures.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Concrete building pad.
- B. Division 16: Electrical connections.

1.3 REFERENCES

- A. ASTM C 518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- B. ASTM D 256 - Standard Test Method for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- C. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
- D. ASTM D 732 - Standard Test Method for Shear Strength of Plastics by Punch Tool.
- E. ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

- F. ASTM D 792 - Standard Test Method for Specific Gravity (Relative Density) and Density of Plastics by Displacement.
- G. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- H. ASTM D 2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
- I. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data:
 - 1. Provide manufacturer's standard details and catalog data demonstrating compliance with referenced standards.
 - 2. Provide installation instructions.
- C. Shop Drawings: Submit drawings showing layout, dimensions, anchorages, and accessories.

1.5 SYSTEM DESCRIPTION

- A. Design factory-fabricated, pre-engineered structures to withstand 125 mile per hour wind load and 30 PSF snow load.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products on flat surface and protect from construction traffic, and damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Provide products manufactured by Warminster Fiberglass Company; P.O. Box 188, Southampton PA 18966-0188; ASD. Tel. (215) 953-1260, Fax. (215) 357-7893.

- B. Products from other manufacturers will be considered for substitution prior to receipt of bids. Requests for substitution after bids have been received will not be considered. Requests for substitution must include the following information in order to be considered:
1. Formal written request certifying that products to be substituted will match specified products in terms of structural properties, dimensions, physical appearance, quality level, and quantities, and that they will perform the same function in the same manner and will achieve the same end result.
 2. Manufacturer's and supplier's material data sheets, specifications, and performance data.
 3. A list of three or more projects in satisfactory service for not less than three years that use products identical to those being proposed for substitution. For each project, include name, address, and telephone number of the engineer, the contractor, and the plant manager.

2.2 MATERIALS

- A. Molded composite: Exterior and interior resin-fiberglass laminate with foam core.
1. Laminate: Polyester resin and chopped strand fiberglass; minimum glass content of 25%.
 - a. Gel coat resistant to _____.
 - b. Exterior surface: White gel coat with low luster finish, smooth and free from fiber pattern, roughness, or other irregularities.
 - c. Exterior laminate: 1/8 inch thick, minimum; chemically bonded to gel coat.
 - d. Interior laminate: White color; encapsulate core in place.
 - e. Laminate properties:
 - 1) Tensile strength (ASTM D 638): 11 000 PSI.
 - 2) Flexural strength (ASTM D 790): 18,000 PSI.
 - 3) Shear strength (ASTM D 732): 12,000 PSI.
 - 4) Barcol hardness (ASTM D 2583): 40.
 - 5) Impact (ASTM D 256): 12 ft lbs/inch.
 - 6) Density/specific gravity (ASTM D 792): 93.6 PCF/1.5.
 - 7) Surface burning characteristics (ASTM E 84): Flame spread, less than 150; smoke density, less than 1000.
 - 8) Surface burning characteristics (ASTM E 84): Class A - flame spread 20-25.

- 9) Surface burning characteristics (ASTM E 84):
Class B - flame spread 70-75.
2. Core:
 - a. Rigid closed cell, self extinguishing, polyisocyanurate foam with a density of 2.0 pounds per cubic foot.
 - b. 1 inch thick with a minimum insulating value of R-7.
 - c. 2 inch thick with a minimum insulating value of R-14.
 - d. Core properties:
 - 1) Thermal conductivity (ASTM C 518): 0.13 BTU inch / Hr. SF F.
 - 2) Density/specific gravity (ASTM D 1622): 2.0 PCF/.03.
 - 3) Surface burning characteristics (ASTM E 84):
Flame spread, 35; smoke density, 240.
 3. Coupons prepared in accordance with ASTM D 618 test method.

- B. The manufacturer shall maintain a continuous quality control program and upon request shall furnish to the engineer certified test results of the physical properties.

2.3 COMPONENTS

- A. Door: One-piece, resin transfer molded (RTM) in matched metal molds to produce an industrial quality door which exhibits a smooth finished, seamless, monolithic, warp-free composite consisting of gel-coat, fiberglass reinforcement, polyester resin, insulating core, and internal reinforcements with all mortises, openings, recesses, and pockets molded in place.
 1. Mount door with continuous stainless steel hinge.
 2. Door gasket: Neoprene sponge rubber bulb type gasket with flexible lock to retain permanent grip.
 3. Provide single-point keyed stainless steel cylindrical latch and cadmium plated door stop with chain.
 4. Provide two-point latch with stainless steel padlock hasp, and cadmium plated door stop with chain.
 5. Provide doors with stainless steel panic hardware.
- B. Base Mounting Flange Gasket: 1/4 inch thick by 4 inches wide closed cell neoprene sponge rubber to provide a weather tight seal around the building perimeter.

- C. Louvers: Provide two, 6-inch diameter aluminum wall louvers with manually adjustable damper and insect screen.
- D. Louvers: Provide two, 6-inch diameter PVC wall louvers with manually adjustable damper and insect screen.
- E. Lifting Eye Bolts: Provide 3/4 inch cadmium plated eye bolts in roof.
- F. Lifting Eye Bolts: Provide 3/4 inch stainless steel eye bolts in roof.
- G. Floor:
 - 1. Load rating: 100 PSF.
 - 2. One piece molded fiberglass floor with skid-resistant surface.
 - 3. 2-1/2 inches thick with a 2 inches thick polyisocyanurate foam core.
 - 4. Insulation value: R-14.
 - 5. Bolts for attaching walls to fiberglass floor: Stainless steel.
 - a. 1/2-inch diameter for buildings.
 - b. 3/8-inch diameter for shelters and enclosures.
 - 6. Provide containment floor construction with capacity of _____ gallons.

2.4 PRE-ENGINEERED FIBERGLASS COMPOSITE BUILDINGS

- A. Assembly:
 - 1. Construct buildings using prefabricated molded composite wall and roof panels.
 - 2. Provide factory assembled buildings.
 - 3. Provide unassembled buildings.
- B. Model:
 - 1. WFS 1010.
 - 2. WFS 1012.
 - 3. WFS 1014.
 - 4. WFS 1016.
 - 5. WFS 1018.
 - 6. WFS 1020.
 - 7. _____.
- C. Encapsulated aluminum extrusion 3 inches wide by 1-1/2 inches high by 0.125 inch thick with a 1 inch wide side flange shall be encapsulated into each corner of end panels (full height) and around the entire roof perimeter to maintain flatness, straightness, and structural integrity. Integral internal flanges on mating panels

shall be provided for bolting the sides, ends, and roof to the encapsulated aluminum extrusions.

1. Aluminum extrusions: Incorporate threaded inserts on 12-inch centers for internal bolting to mating panel flange during assembly.
2. Assembly bolts shall not penetrate the exterior wall of the structure.
3. Assemble panels with 3/8 inch diameter stainless steel bolts on 12-inch centers and a 1/4 inch thick by 3 inches wide urethane foam gasket for a weather tight seal at all joints.
4. Structurally reinforce wall and roof panels with steel and aluminum extrusions to meet loading conditions.
 - a. Galvanized steel mounting channel reinforcement: 0.078 inch thick by 13/16 inch high by 1-5/8 inches wide. Mechanically attach to the interior surface with aluminum pop rivets on 12-inch centers.
5. Steel reinforcement: 1/4 inch thick by 1-1/2 inches wide structural angle.
6. Aluminum reinforcement: Extruded channel sections 3 inches wide by 1-1/2 inches high by 0.125 inch thick with a 1 inch wide side flange as required.
7. Encapsulate aluminum and steel reinforcements to form a continuous, one-piece molded composite wall or roof panel.
8. Provide wall panels with an integral 4 inches wide internal mounting flange pre-drilled on 12-inch centers with 5/8 inch diameter holes for attaching to floor.
9. Floors:
 - a. Provide structural fiberglass floor.
 - b. Concrete pad specified in Division 3.

2.5 PRE-ENGINEERED ONE-PIECE FIBERGLASS COMPOSITE SHELTERS AND ENCLOSURES

- A. Fabricate shelters and enclosures of one piece molded construction with composite walls and roof.
- B. Form a continuous, one-piece molded composite structure with an integral 4 inches wide internal mounting flange around the perimeter.
- C. Pre-drill flange on 12-inch centers with 7/16 inch diameter holes for bolting to floor.

- D. Floors:
 1. Provide structural fiberglass floor.
 2. Concrete pad specified in Division 3.
- E. Model:
 1. WFS 3030 enclosure.
 2. WFS 3636 enclosure.
 3. WFS 4836 enclosure.
 4. WFS 4848 enclosure.
 5. WFS 6048 enclosure.
 6. WFS 6060 enclosure.
 7. WFS 3627 enclosure.
 8. WFS 5428 enclosure.
 9. WFS 1004 shelter.
 10. WFS 1006 shelter.
 11. WFS 1008 shelter

2.6 ACCESSORIES

- A. Anchor bolts for attaching structure to concrete pad:
 1. Buildings: 1/2 inch diameter stainless steel expansion anchors.
 2. Shelters and enclosures: 3/8 inch diameter stainless steel expansion anchors.
- B. Exhaust fan with gravity shutter, fiberglass canopy, and insect screen.
 1. 7 inches diameter; 120 CFM.
 2. 10 inches diameter; 580 CFM.
 3. 12 inches diameter; 775 CFM.
 4. _____ inches diameter; _____ CFM.
- C. PVC intake louver: 12 inches square, with gravity shutter and insect screen.
- D. Lamp: Incandescent, vapor-tight.
- E. Lamp: Fluorescent, 48-inch 2-bulb fixture with acrylic lens.
- F. Duplex switch box.
- G. Door actuated switch.
- H. Manual/automatic selector switch.
- I. Heater: 1500 watt with thermostat and tip-over switch.
 1. Heater mounting including mounting channel, outlet, and brackets.

- J. Heater: _____ watt _____ volt with thermostat.
- K. Duplex outlet.
- L. Air conditioner: _____ BTU.
- M. Heat pump: _____ BTU heating, _____ cooling.
- N. Duplex fuse box: 30 amp.
- O. Circuit breaker panel: 125 amp, MLO - including 4 - 1 pole breakers (total spaces - 8).
- P. Electrical wiring in flexible, liquid tight, PVC jacketed galvanized steel Anaconda conduit Type EF. Provide for:
 - 1. Fan and switch.
 - 2. Lamp and switch.
 - 3. Duplex outlet.
 - 4. Other appliances indicated.
- Q. Provide explosion proof equipment.
 - 1. Class: _____.
 - 2. Group: _____.
 - 3. Division: _____.

2.7 FINISHES

- A. Color: Standard white.
- B. Color: _____.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete is level and true to plane and of correct dimensions to receive structure. Correct any deficiencies before proceeding.

3.2 INSTALLATION

- A. Layout anchor bolt pattern according to drawings. Drill holes of depth and diameter required by anchor bolt manufacturer.
- B. Install structures in accordance with manufacturer's instructions.
- C. Erect structures true to line and plumb, free of twist or warp.

- D. Install and test accessories in accordance with manufacturer's instructions.

3.3 ADJUST AND CLEAN

- A. Adjust components for proper operation.
- B. Leave Project site clean and free of debris.

END OF SECTION