GEMINI 2 FIBERGLASS EQUIPMENT ENCLOSURE

1. REFERENCE SPECIFICATIONS, CODES, AND STANDARDS
	1. ASTM D256 – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
	2. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.
	3. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
	4. ASTM D2583 – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
	5. All references shall be of the latest revision.
2. SUBMITTALS
	1. Units
		1. All submittals, specifications, drawings, brochures, installation instructions, descriptive literature, etc. shall have all units of measurement in both Imperial and SI units.
	2. Drawings
		1. Project specific drawings, showing:
			1. Critical dimensions.
			2. Joints, connections, fasteners.
			3. Sizes, spacing, and locations of structural members, ribs, anchoring clips, and dimensional bracing.
			4. Materials and thicknesses of construction.
		2. Generic layouts or check marked brochures shall be rejected without review.
	3. Specifications
		1. Project specific specifications.
		2. Generic or check marked specifications shall be rejected without review.
	4. Receiving, Handling, and Storage Instructions
	5. Installation Instructions
	6. Operation and Maintenance Instructions
	7. Product Warranty
	8. Test Data
		1. Independent certified test results confirming material properties.
			1. Test results are to be performed on specimens representative of the resins and reinforcements submitted upon with such resins and reinforcements listed by the certifying party.
			2. Data shall be no more than three (3) years old.
	9. Laminate Sample
		1. 6-inch [15.24 cm] square sample of representative laminate, upon request.
3. RECEIVING, HANDLING, AND STORAGE
	1. Receiving
		1. Inspect for damage
			1. All parts should be inspected upon delivery to the site, noting any missing items or visible damage.
			2. Verify that surfaces have not been damaged or otherwise marked during transit.
			3. Base and panel connection flanges should also be inspected.
			4. For smaller boxed items make sure to verify that all packaging seals are in place and that there is no visible damage to the packaging.
		2. Investigate for order correctness and count
			1. Once the order has been received review the packing list against what has been received. Should any items not appear to be present or the configuration of the items does not match the description on the packing list, contact Openchannelflow immediately.
			2. Small connection hardware (nuts, bolts, etc.) not attached to the Equipment Enclosure ship in individual boxes – with those contents clearly marked. Special care should be taken to secure these and any other small items that can be misplaced on a job site.
	2. Handling
		1. While rugged and designed for a long service life, Equipment Enclosures must be handled with care.
		2. When cranes, hoists, and other machinery are used to Equipment Enclosures, spreader bars and lifting straps should always be used. When performing any overhead lift, all lifting eyes must be used in conjunction with good rigging practices. Rigging and lifting sequences and schedules of equipment are solely the responsibility of the installing party.
		3. Chains, ropes, and the like should never be used to move or position any Equipment Enclosures as they may serrate the fiberglass laminate or compromise the protective gel coat surfaces.
	3. Storage
		1. Equipment Enclosures not intended for immediate installation may be stored until the site is ready for their installation.
		2. Equipment Enclosures should only be stored in a location that is clean, level, and protected from construction traffic.
		3. When shipped on pallets, Equipment Enclosures should be left on those pallets until such time as they are needed.

1. MANUFACTURER
	1. Supply Gemini Fiberglass Equipment Shelters as manufactured by:
		1. Openchannelflow (phone: 855.481.1118 / fax: 855.3316475 / [www.openchannelflow.com)](http://www.openchannelflow.com))
2. SUBSTITUTIONS
	1. Manufacturers wishing consideration as acceptable substitutes must follow the steps outlined below.
	2. Include a copy of this specification section with all applicable plans sheets / details, addendum updates, and all referenced / applicable sections.
	3. Each paragraph must be check marked to indicate complete compliance with the specification or clearly marked to indicate a request for deviation from the specification requirements.
		1. Use check marks (✔) to denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated and, therefore requested, underline each deviation and denote by a number in the margin to the right of the identified paragraph.
		2. The remaining portions of the paragraph not underlined will signify compliance on the part of the Manufacturer with the specifications.
		3. Include a detailed, written justification for each numbered deviation.
		4. Failure to comply with the above is sufficient cause to summarily reject the entire request for substitution.
	4. Requests for substitution must be made in writing and be received by the engineer’s office a minimum of ten (10) business days before the bid opening.
	5. Manufacturers not pre-approved shall not be given consideration.
	6. To ensure strict quality control, the Manufacturer may incorporate raw materials from outside vendors, but the Manufacturer must fabricate the final product.
		1. Job shopping or outside fabrication / sourcing shall not be acceptable.
	7. In addition, the request for substitution must provide information regarding a minimum of ten (10) comparable North American installations, including:
		1. Owner’s name, location, and contact information.
		2. Application and performance specifications.
		3. Date of installation.
		4. Operational history.
		5. Equipment arrangement, including configuration and materials of construction.
3. WARRANTY
	1. Equipment Enclosures within the continental United States shall be warranted to be free of defects in workmanship and materials for five (5) years with a completed warranty registration.
	2. The warranty period shall begin from the date of shipment.
4. SYSTEM DESCRIPTION
	1. Configuration
		1. Size:
			1. Width:
				1. 3-feet 6-inches [1.07 m].
			2. Depth:
				1. 2-feet 3-inches [0.69 m].
			3. Height (as measured at the highest point of the Enclosure):
				1. 2-feet 10-inches [0.86 m].
	2. Materials of Construction
		1. Fiberglass reinforced plastic laminate
			1. ISO certified polyester laminating resin:
				1. Low VOC.
				2. Properties shall meet or exceed:

Tensile Strength (ASTM D638) 12,000 psi [82.74 MPa].

Flexural Strength (ASTM D790) 23,000 psi [158.6 MPa].

Flexural Modulus (ASTM D790) 800,000 psi [5.516 GPa].

Barcol Hardness (ASTM D2583) 30.

Notched Izod (ASTM D256) 8 ft-lb/in [4.272 J/cm].

Temperature limit 150° F [65.56° C].

* + - 1. E-glass:
				1. Minimum of 30% of laminate content by weight.
				2. Silane coupling agent.
				3. C-glass shall not be allowed.
		1. Gel coat:
			1. All surfaces must be gel coated.
			2. 15 mil cured thickness.
			3. U.V. inhibitors in all gel coat formulations, regardless of application or installation location.
			4. Color:
				1. Interior surfaces: White.
				2. Exterior surfaces: White.
		2. Insulating core:
			1. Rigid, unfaced, CFC / HCFC free, closed cell polyisocyanurate
				1. Properties shall meet or exceed:

Density (ASTM D1622) 2.0 lb/ft3 [32 kg/m3]

Initial R-value (ASTM C518) 6.0 Hr ft2ºF/Btu [1.06 m2ºC/W]

Compressive Strength (ASTM D1621) 27 psi [186 kPa]

Shear Strength (ASTM C273) 22 psi [151 kPa]

Tensile Strength (ASTM 1623) 41 psi [283 kPa]

Surface Burn (E84)

Flame spread <25

Smoke developed <185

* 1. Construction
		1. Molded construction utilizing X-Web technology.
		2. Laminate Schedule:
			1. Exterior gel coat:
				1. 15 mils cured.
			2. Outer laminate:
				1. 1/8-inch [0.3175 cm] thick.
			3. Insulating core:
				1. 1-inch [2.54 cm] thick.
			4. Inner laminate:
				1. 1/8-inch [0.3175 cm] thick.
			5. Inner gel coat:
				1. 15 mil cured.
1. COMPONENTS
	1. Access Doors
		1. Quantity
			1. Gullwing front access door.
				1. (2) door support gas struts.
				2. (2) Stainless steel strap hinges.
				3. Stainless steel padlockable hasp.
				4. EPDM or Neoprene weather-resistant sponge gasket.
				5. (4) spring loaded lift handles.
	2. Floor
		1. Integral, reinforced fiberglass floor.
2. EQUIPMENT
	1. Electrical
		1. Conduit
			1. Flex / PVC, schedule 40.
		2. Load Center
			1. 125 A main lug.
			2. 8 space.
			3. NEMA 3R thermoplastic
			4. Single phase.
			5. GE TPL412R.
		3. Outlet
			1. Interior.
			2. 20 A GFCI.
			3. Commercial grade duplex.
			4. Clear weather cover.
			5. Leviton N7899-GY.
		4. Wiring
			1. Stranded 12 gauge THHN.
	2. HVAC
		1. Fan
			1. 200 CFM [0.16 CMM].
			2. Exhaust.
		2. Heater
			1. 250 / 500 / 750 watt.
			2. Line powered.
			3. Integral thermostat.
		3. Louver - Fixed
			1. 5-inch [12.7 cm].
			2. Fixed.
			3. Stainless steel with fixed fiberglass insect screen.
		4. Louver – Manually Adjustable
			1. 6-inch [15.24 cm].
			2. Manually adjustable from enclosure interior.
			3. Aluminum with insect screen.
	3. Lighting
		* 1. Fluorescent Strip Light.
				1. Integral switch.
	4. Miscellaneous
		1. Coupling
			1. 2-inch threaded PVC coupling.
		2. Mounting Panel
			1. Full width x full height encapsulated 3/4-inch [1.905 cm] thick OSB mounting panel.
3. EXECUTION
	1. Examination
		1. Verify that the Equipment Enclosure dimensions are correct and that the site conditions are suitable for installing the unit – in particular that there is enough height to fully open the front access door.
	2. Installation
		1. Concrete Foundation Slab
			1. Provide a concrete foundation slab on which to mount / secure the Equipment Enclosure. The slab should extend a minimum of 6-inches [15.24 cm] on all sides beyond the Equipment Enclosure.
			2. The thickness of the slab should be a minimum of 6-inches [15.24 cm], but as local soil conditions may vary, the final design of the slab and anchoring details are the responsibility of the installing party and must be sized so as to prevent wind uplift and any other applicable local conditions.
			3. The slab must have a smooth, troweled surface to provide uniform support over the entire base structure. The slab must be level in both directions to within 1/8-inch [0.3175 cm] and free from exposed aggregate and debris.
		2. Lifting the Equipment Enclosure
			1. **Inspect the installation location and surrounding areas for any obstacles (INCLUDING OVERHEAD) that may cause difficulties or present a hazard – addressing them as necessary before proceeding.**
			2. On the concrete foundation slab caulk out the corners of the intended location of the Equipment Enclosure.
			3. Using **PROPER RIGGING TECHNIQUES**, move the Equipment Enclosure to the desired installation location.
		3. Securing the Equipment Shelter
			1. Drill through the Equipment Shelter floor and into the concrete foundation slab in each corner to the size / depth as indicated by the anchor bolt manufacturer.
			2. Install the anchor bolts.
				1. Anchor bolts should be used to ensure that wind uplift cannot occur.
			3. Seal the floor penetrations with silicone (or other suitable) caulking compound.
	3. Adjust and Clean
		1. Verify that the complete installation meets the criteria above and any additional criteria supplied by the Engineer.
		2. Clean the flow surfaces in accordance with the manufacturer’s operation and maintenance instructions.
		3. Remove all trash and debris, leaving the site in a clean condition.