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Valve Box Prefabricated FRP Lift Station Specifications

1. Description

Scope of Work

Contractor shall furnish all labor, materials, equipment and performance of all work necessary or incidental to furnish and install a simplex/duplex prefabricated fiberglass reinforced polyester (FRP)

Lift station. The lift station shall be completely factory-assembled unit, requiring minor adjustments and reassembly on site.

2. Quality Assurance

Qualifications of Manufacturer

The Manufacturer shall demonstrate the ability to fabricate the various lift station components, as shown in the plans and as specified herein. The complete Lift Station shall be manufactured by **AK Industries**.

Standards:

ASTM A36: Standard Specification for Structural Steel (Most Recent Rev)
ASTM A283D: Standard Specification for Structural Steel (Most Recent Rev)
ASTM D883: Terms and Definitions relating to Plastics (Most Recent Rev)
ASTM D3753-99 American Society for Testing and materials for Glass Fiber-reinforced polyester

3. Materials

Unless otherwise indicated, The Plastic terminology used in this standard shall be in accordance with the definitions given in American Society for Testing and Materials (ASTM) D883. With a Pipe stiffness values as specified in (ASTM D3753-99). The Resin used shall be of commercial grade and shall either be evaluated as a laminate by test or determined by previous service to be acceptable for the environment. The Reinforcing material shall be a commercial grade of glass fiber (continuous strand, chop strand) having a coupling agent, which will provide a suitable bond between the glass reinforcement material and resin.

Physical Properties

Wet well FRP Wall Laminate must be designed to withstand wall collapse or buckling based on these assumptions and **Third-party** specifications.

Hydrostatic Pressure 62.4 lbs. Per SQ Ft.
Saturated soil weight 120 lbs. Per Cubic Ft.
Soil Modulus of 700 lbs. Per SQ Ft.
Pipe Stiffness As specified in **ASTM D 3753**

The wet well FRP laminate must be constructed to with stand or exceed two times the assumed loading on any depth of the wet well. These are built to a safety factor of two.

4. Exterior Layer

The exterior layer of body of laminate shall be of construction suitable for the service intended and contain sufficient glass by weight (50 TO 80 %) to provide the aggregate strength necessary to meet the tensile and flexural requirements. The exterior surface shall be relatively smooth with no exposed fibers or sharp projections. Hand work is acceptable, but enough resin shall be present to prevent fiber show.

5. Inner Surface

The resin rich inner surface shall be free of cracks and crazing with smooth finish with an average of not more than (2) two pits per square foot, providing the pits are less than 0.125 in diameter and 0.3125 inches in depth and are covered with sufficient resin to avoid exposure of any fiberglass reinforcement materials. Some waviness shall be permissible as long as the surface is smooth. A minimum of 0.100 inch of the laminate next to the inner surface shall be reinforced with not less than 20 percent nor more than 30 percent by weight of non-continuous glass strands having fiber lengths from 0.5 to 2.0 inches. Both exterior and interior laminates shall have a Barcol Hardness of at least 90 percent of resin manufacture specified hardness for fully cured resin.

6. Tank Bottom

Must be constructed suitable for the service designated by the project engineer. Under total water submerged conditions. The center deflections of any basin bottom must be less than 3/8" in as not to interfere with the pump mounting requirements and Rail system. No bottom shall have a form of glue adhesive as attachment of the basin bottom and or anti floatation collar.

7. Wet Well Top Flange

The wet well top flange shall have an outside diameter at least 4 inches greater than the inside diameter of the basin. A (10) ten-hole pattern shall accommodate the mounting of a cover with at least 3/8 inches in diameter 300 series stainless steel fasteners. Non –corroding stainless steel threaded inserts shall be fully encapsulated with non-continuous mat or chop strand glass fiber reinforcement, the inserts shall have an offset tab to prevent stripping or spinning out when removing and reinserting cover fasteners.

8. Square Fiberglass Anti-floats

The fiberglass anti float shall be manufacture by way of (RTM) resin transferred molded Continuous Mat, and or chop spray, with an outside diameter no less than (4) inches larger than the ID of any basin. The anti-float shall have no glue adhesive in form of attachment to any basin. No more than 3/8-inch deflection in center of basin bottom.

9. Square Steel Anti floats

The steel anti-floatation shall be constructed from 0.187 inches this (ASTM A 36) structural steel plate, encapsulated in at least 0.125 inches of chopped-strand glass fiber reinforcement on all sides, the steel anti-floatation may be square, with no less than 4 inches greater than the inside diameter of any basin. The steel anti-floatation collar shall be attached to the basin bottom with chopped-strand glass fiber reinforcement. AK recommends basins over 10 feet in length to install steel anti-floatation.

10. Pump Disconnect mounting studs

The 300 series stainless steel threaded studs shall be no less than 3/8" in diameter. Once installed, shall be sealed with at least (2) **two** layers of non-continuous glass fiber mat or chopped-strand glass fiber reinforcement.

11. Steel Valve Box Covers

The cover shall be constructed of 1/4 inch material for wet well of diameter from 24 inch to 48 inches. Material for 60 diameters and up will be of 3/8" all conforming to (ASTM A36). The hatch shall have a positive means of holding door open in the vertical position (Locking hold open arm) made of a non-corrosive material. All hardware shall be of 300 series stainless steel. The cover shall be mounted with minimum of ten 300 series stainless steel fasteners. The access hatch cover shall have a lift handle and a means of locking. The cover will have a pump access hatch and an access hatch in the valve chamber.

12. Aluminum Valve Box Covers

The cover shall be constructed of 1/4 inch thick material finish aluminum diamond plate pattern with 300 series stainless steel hardware. The hatch shall have a positive means of holding door open in the vertical position (Locking hold open arm) made of non-corrosive material. The cover shall be mounted with minimum of ten 300 series stainless steel fasteners. The access hatch cover shall have a lift handle and a means of locking. The cover will have a pump access hatch and an access hatch in the valve chamber.

13. Valve Box

The integral valve box shall be constructed of fiberglass with 48" x 48" (FIGURE 8), 48" x 60", 48" x 72". Valve box diameters are determined based on Pipe size and Pumps being used inside the basin. Please contact your AK Sales Team to determine what size fits your application.

D-Shaped valve boxes are only available on 60" Wet wells and above.

14. Discharge Fittings

Stainless Steel Discharge are designated size NPT, 300 series stainless coupling, full welded in the center of a 300 series stainless steel plate. Mounted with 300 series stainless steel hardware. 1 1/4 inch thru 4 inches. Wet well penetrations to be sealed prior to mounting of coupling.

Link Seals modular seals are considered to be the premier method for permanently sealing pipes of any size passing through basin walls. In fact, any cylindrical object may be quickly, easily and permanently sealed, as they pass through barriers, by the patented Link-Seal modular seal design. Ductile iron, concrete, metal as well as plastic pipes may be hydrostatically sealed within walls to hold up to 20 psig (40 feet of static head).

Flexible Entry Boots are reliable, safe seals for pipe and conduit entries into underground containment sumps. These entry boots allow for angled pipe entries and have no exposed metal parts to the underground environment. These entry boots are available in a variety of sizes and designs to accommodate rigid and flexible piping, ducting and access pipe.

15. Electric Coupling

A 1 1/2" inch (simplex) and or 2-inch (duplex) Glass filled Nylon NPT full coupling. Mounted with 300 series stainless steel hardware. Wet well penetrations to be sealed prior to mounting of coupling.

16. Inlet Fitting

The Cast Iron Caulking Hubs are made of cast iron conforming to radius of fiberglass basin, all fasteners to be 300 series stainless steel. Use local plumbing codes for approved sealing methods and materials.

Adapt flex fittings, constructed of durable PVC Composition, the grommet shall provide a mechanical seal and shall not require any secondary sealing materials.

Link Seal Hubs modular seals are considered to be the premier method for permanently sealing pipes of any size passing through basin walls. In fact, any cylindrical object may be quickly, easily and permanently sealed, as they pass through barriers, by the patented Link-Seal modular seal design. Ductile iron, concrete, metal as well as plastic pipes may be hydrostatically sealed within walls to hold up to 20 psig (40 feet of static head).

17. Float Bracket

Float bracket shall be fabricated from 300 series stainless steel with compression style cord grips to maintain float level position. Install with 300 series stainless steel hardware.

18. Ventilation

Wet well ventilation shall comply with all applicable codes

19. Slide Rails

Shall be 300 series stainless steel, Galv. Sch40, per engineer design, size to match Quick Disconnect.

20. Discharge Pipe

Shall be (PVC SCH 80, 300 Series Stainless Steel, Galv. Sch40, and or Ductile Pipe) per engineer design. With means of positive seal joints per material.

21. Delivery and Handling

Purchaser of prefabricated **FRP** lift station shall coordinate with contractor so that the lift station is delivered to project site for installation. Handling instructions shall be provided by lift station manufacture with lift station to insure proper handling of the lift station. After inspection up on delivery by receiver, the contractor shall store any loose items and account for them in a clean and dry environment. All equipment needed to off load and install lift station shall be determined and be provided by contractor on the project.

22. Guarantee

The prefabricated **FRP** lift station manufacture shall guarantee the prefabricated lift station as approved drawings for a period of **One** year from the date of delivery.