GeoVault® Engineering Specifications

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Scope: This specification designates requirements for the GeoVault®.

Structure: The vault shall be a composite steel and concrete structure. The vault shall be shipped from factory preformed for a concrete pour with all reinforcement rods, manifolds, valves and piping secured in place. The interior shell shall consist of a heavy-duty steel frame and base where all joints have a continuous weld. The base frame and cross bracing shall be constructed of 1/4" – 3" x 8" square steel tubing. The base cross bracing shall be spaced a maximum of 2 feet on center with ¼" – 3" x 8" square steel tubing. The sidewall and ceiling frames and all cross bracing shall be constructed of ¼" – 3" x 3" angle iron. Sidewall and ceiling cross bracing shall be spaced a maximum of 2 feet on center. The steel interior walls/ceiling, stainless steel floor and stainless steel sump pump pit shall be constructed of 12-gage sheet that are specially treated with an epoxy coating on interior side. All interior sheet steel shall have a continuous weld on seams and a 2" weld every 12" at support framing and exterior form walls. #5 reinforcement rods shall be placed on a 12" spacing for sidewalls and #6 reinforcement rods shall be placed on a 12" x 12" grid spacing for the ceiling. All steel pipe sleeves will be schedule 40 and have a continuous weld on interior side. All reinforcement rods shall be located 3" within the concrete from the interior side and welded to steel framing every 2 feet or less. The outer shell of the walls and ceiling shall consist of 8" thick 4,000 psi concrete that is poured by the contractor on-site and vibrated into place. The manhole shall be constructed of ¼" sheet steel with a 3" flange that is anchored into ceiling concrete and welded to ceiling frame; all manhole welds being continuous. The manhole cover shall be constructed of ¼" steel tread plate with framing constructed of ¼" – 3" x 3" angle iron. The manifold stand's support channel shall run continuous between circuits and be constructed of ¼" – 3" x 3" angle iron with 1/8" – 1" tube supports every 3 feet welded to the floor.

Manifolds: High density polyethylene (HDPE) pipe and fittings, joined together with heat fusion, shall be used for all circuit and main header piping. All HDPE pipe and heat fused materials shall be manufactured from high-density, high molecular weight PE 3408 polyethylene compound that meets or exceeds ASTM D 3350 cell classification 345464C, and is listed by the Plastic Pipe Institute in PPI TR-4 with HDB ratings of 1600 psi (11.04 MPa) at 73°F (23°C) and 800 psi (5.52 MPa) at 140°F (60°C). All 3" and larger HDPE piping will be DR15.5 and all 2" and smaller HDPE piping will be DR11. All circuits 2" and greater shall include butterfly valves constructed of lug type/lever with cast iron body, aluminum-bronze disc, EPDM Seat, 416 stainless steel stem, rated at 200 psi. All circuit setter flow balancing valves will have a fixed port venture orifice, have blow-out proof stem, flow measurement function independent of ball position, install in any position, and serve as a service shutoff with a tamper resistant memory stop to accurately reset to balancing. Circuits smaller than 2" and all fill ports shall be ball valves with full port opening with

blow out proof stem, 600 psi non-shock cold WOG. Pressure/temperature ports shall be brass and have a dual seal core of Nordel, good up to 350°F for water and shall be rated zero leakage from vacuum to 1000 psig. Plug shall be capable of receiving a 1/8" pressure or temperature probe. A stainless steel pressure gauge with ¼" isolation valve will be included on both supply and return mains. The pressure gauge will be Sisco brand with 4 ½" dial size and read 0 – 100 psig. A stainless steel bimetal thermometer will be included on both supply and return mains. The pressure gauge will be Ashcroft brand with 3" dial size with 4" stem and reads 0 – 250°F. The manifold will be leak proof checked at factory with 100 psi pressure for a period of 24 hours or more.

Keyed Entry: The manhole cover of the vault will be fastened with four stainless steel pentagon head bolts requiring a special socket key for removal. These bolts will be counter sunk a minimum of 1" in a circular hole just large enough to accommodate the socket key to inhibit tampering/removal with conventional tools. Two socket keys will be included with each vault.

Seals: All HDPE pipe penetrations in the vault will utilize a Link-Seal – EPDM modular hydrostatic seal to water proof and anchor the pipe. This seal will be removable to allow replacement of the HDPE pipe should it ever be damaged at the point of vault penetration. The manhole cover and stainless steel sump pit will utilize EPDM gaskets for seals where bolted connections are made.

Sump Pump: A Little Giant series 6 with mercury switch will be supplied with the vault. The pump will be 1/3 HP, continuous duty rated, 60Hz, 120V - 9.0A. The pump will discharge at a rate of 46 GPM at the point it exits the vault.

Ventilation: Vault will come with its own ventilation blower and 8" flexible ducting. The blower will be industrial grade made with heavy duty metal construction and produce high velocity air movement. The blower will be Aloha model 39008 rated for 60Hz, 120V - 1.4A. The blower will produce 1,580 CFM open and 1,200 CFM connected to 20 feet of 8" industrial grade flexible ducting. The blower will be ceiling mounted at the opposite end of the manhole within the vault. The 8" flexible duct will be run from the blower up to the top of the manhole entry. The blower will be switched with the lights with this switch being located right below the manhole cover.

Electrical: The electrical service required for the vault is 60 Hz, 120V - 20A with GFCI breaker. The vault shall have all required electrical conduit and boxes ceiling mounted with 1" conduit exiting the vault. All outlets, light fixture(s), switch and weatherproof covers will be included with the vault. The vault is to be field wired by a licensed electrician in the state of installation. The electrical components include:
Light Fixture(s): Sealed glass lens with aluminum guard and aluminum ceiling mounted base. The fixture is suitable for damp locations and uses a 100 W bulb.
Switch: The switch will be a 120V - 20A heavy duty double pole that will power the lights as well the ventilation outlet.

Outlets: The two outlets used will be 120V - 20A heavy duty duplex. The utility outlet will be wired continuous power for sump pump and servicing equipment. The ventilation outlet will be switched with the lights for the blower.