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***Piping Systems, Inc*.**

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**Part 1 – General**

* 1. **Double Wall Steel Containment with Heat Trace Tube & optional Leak Detection**
	2. **The system** shall be **Above Ground Heat Trace Containment System** **with optional
	 Leak Detection** as manufactured by **Rovanco Piping Systems** of Joliet, Illinois.

**Part 2 – Products**

**2.01 Carrier Pipe:** Shall be carbon steel A-53B ERW. Pipe 10” and smaller shall be Schedule 40. Pipe 12” and larger shall be .375 wall. Schedule 80 shall be used for condensate lines 10” and smaller, XH for 12” and larger. Other pipe types also available. (Copper, stainless-steel, etc.)

* 1. **Inner Pipe Supports:** All pipe shall be aligned and supported within the casing with

galvanized steel supports spaced on centers approximately 10’0”. The insulated inner pipe shall bear directly on the steel support. The support shall be designed as to permit drainage and free air passage. All pipe passing through supports shall be insulated. Concrete type pipe supports will not be allowed.

**2.03 Containment Casing:** Containment casing shall be black steel. Casing up through 24” shall be 10 gauge. Casing 26” and larger shall be 6 gauge. The interior surface shall be smooth to permit free moisture drainage and removability of the inner assembly. The casing shall be sized to provide adequate annular space between the inner surface of the casing and outer surface of the carrier pipe.

**2.04 Containment Casing Insulation:** The containment casing insulation shall be a polyisocyanurate high temp foam injected with one shot into the annular space between carrier pipe and jacket. Insulation shall be rigid, >90% closed cell polyisocyanurate with a minimum 2.0 lbs per foot3 density, compressive strength of 30 psi @ 75˚F, a thermal conductivity K factor no higher than 0.14 @ 75˚F per ASTM C-518 and an E84 25/50 passive fire resistance rating. Maximum continuous operating temperature of polyisocyanurate foam shall not exceed 300˚F, except for intermittent spikes of 350˚F.

**2.05 Jacket Material:** The insulation shall be encapsulated in a watertight outer metal jacket with an interior surface that is smooth to permit free moisture drainage and removability of the inner assembly. The outer casing shall be sized in accordance to Table 1 and based on jacket material so there is an adequate amount of annular space between the carrier pipe and the interior surface.

Table 1:

|  |  |  |
| --- | --- | --- |
| Jacket Size | Spiral Seamed Aluminum Jacket with impact and Chemical resistance equivalent to H-14 Temper T-3003 in accordance with ASTM-B-313 specifications. | Spiral Seam Galvanized Steel Jacket in accordance with ASTM A-366 ASTM A-526 G-90 |
| 4 | 26 Gauge | 26 Gauge |
| 6 | 26 Gauge | 26 Gauge |
| 8 | 24 Gauge | 26 Gauge |
| 10 | 24 Gauge | 26 Gauge |
| 12 | 24 Gauge | 26 Gauge |
| 14 | 20 Gauge | 22 Gauge |
| 16 | 20 Gauge | 22 Gauge |
| 18 | 20 Gauge | 22 Gauge |
| 20 & larger | 20 Gauge | 22 Gauge |

**2.06 Heat Trace:** Shall have 1” EMT Heat Trace Tube will be incorporated into the foam portion of the pre-insulated piping system. Either one or two tubes will be used. This to be analyzed & determined during submittal review.

**2.07 Leak Detection (optional):** Shall be a Nordic Leak Detection system consisting of 2 single-strand, bare copper wires, with one being blank and the other tinned, which will function in tandem to locate moisture by means of resistance or pulse measurements. Leak detection system will include a unit utilizing TDR (time Domain Reflectometer) to monitor leak detection system. Copper wiring and leak detection box must meet specifications and be submitted at bid time.

**2.08 Insulated Fittings & Joints:** Shall be insulated using material supplied by system manufacturer. All fittings will be factory pre-formed foam, insulated and covered with metal covers designed to fit snug on the jacketing to provide a watertight closure. Foam will have to be “notched out” by installing contractor. All covers shall be banded in place with 3/8” wide stainless-steel straps and will be the same thickness as the jacketing. Leak Detection and Heat Trace to be run while joint is being completed.

**2.09 Weld or Bent Fittings:** Will make all changes in direction. Where tee branches are smaller than the mains they join, weld-o-lets may be used. All weld fittings shall be long radius and shall be the same wall thickness as adjacent piping.

**2.10 Anchors:** Shall be prefabricated onto the piping units and shall be equipped with drainage and vent openings at the top and bottom of the anchor plate and provide room for EMT tube and Rovanco leak detection.

**2.11 End Seals:** Shall consist of a stainless-steel bulkhead plate isolated to the pipe conduitwill equip terminal ends inside manholes, pits, or building walls. End Seals will be designed to allow HT and LD access. End seals shall be made with drain or vent openings located top and bottom and shall be shipped to the job site with plugs in place. Terminate all conduits 2 inches beyond the inside face of building walls to protect any exposed piping insulation from damp wall condensation.

**2.12 Field Tests:** The inner pipes of this system shall be tested hydrostatically to 1-1/2 times the working pressure of the line. If a leak is found, it shall be repaired and the test repeated. The 10-gauge casing shall be tested with air at 15psig, and a soap solution shall be applied to the field joints to locate leaks. If leaks occur, they shall be repaired and the test repeated. After approved by test, all field joints shall be insulated by the contractor

**2.13 Installation:** Shall be made in accordance with plans and specifications, and manufacturer’s installation instructions. Pre-insulated Piping provider will provide a field service instructor on site to train the contractor on all phases of installation.

**2.14 Approved Vendors:** Pre-Insulated Heat Traced & Leak Detection Above Ground Containment Pipe System by Rovanco, Joliet, Illinois, or approved, ISO Certified, equal. Any alternate supplier must submit their technical data to the engineer 10 days prior to bid date to be approved in writing as equal. Must provide independent foam certification meeting specified (ASTM E84 25/50).