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***Piping Systems, Inc*.**

November 13, 2023

**Part 1 – General**

* 1. **Insul-8® Below Ground – Domestic Thin Wall Steel x Foam x HDPE**

**1.02** **This system** shall be a **Domestic Thin Wall Steel x HDPE with Polyisocyanurate Foam Piping System** which includes **Nordic Leak Detection** and optional **RhinoJoint** for **Below Ground Applications** as manufactured by **Rovanco Piping Systems** of Joliet, Illinois.

**Part 2 - Products**

**2.01** **Carrier Pipe:** 6” and below shall be Sch 10, 8” and above shall be .250 wall carbon steel.

**2.02 Carrier Pipe Insulation:** Shall be hi-temp polyisocyanurate foam insulation has a K factor of .14, density of 2.0. closed cell content of >90%, compressive strength of 30 psi, and service temperature of 300ºF. Insulation must be capable of handling intermittent temperature spikes to 350°F. Conformance with ASTM Standards D1621, 1622, 1623, 2126, 2842, 2856, and C518-91. Completely filling the annular space between the carrier pipe and jacketing. Provide written independent performance certification with submittals. Meets 25/50 Flame Smoke Rating ASTM E84.

**2.03 Jacket Material:** The outer casing shall be high density polyethylene (HDPE) conforming to ASTM D3350. Type III, Category 5, Class C and Grade P23/P34. With a minimum of 2% by weight of carbon black. Minimum thickness is 175 mils. No FRP overwrap or spray and wrap jacketing will be allowed. Minimum jacket thickness shall be in accordance with Table 1:

Table 1:

|  |  |  |  |
| --- | --- | --- | --- |
| Nominal Pipe Size In Inches | Minimum Insulation Thickness In Included | Jacket SizeIn Inches | Jacket Thickness In Mils |
|  1-1/2 | 2.15 | 6.60 | 200 |
| 2 | 1.91 | 6.60 | 200 |
| 2-1/2 | 2.66 | 8.00 | 200 |
| 3 | 2.35 | 8.00 | 200 |
| 4 | 2.57 | 10.00 | 175 |
| 5 | 2.04 | 10.00 | 175 |
| 6 | 2.51 | 12.43 | 175 |
| 8 | 2.72 | 14.06 | 175 |
| 10 |  2.48 | 15.87 | 175 |
| 12 |  2.38 | 17.83 | 175 |
| 14 |  2.74 | 19.80 | 175 |
| 16 |  2.7 | 22.17 | 200 |
| 18 |  2.89 | 24.17 | 225 |
| 20 |  2.89 | 26.17 | 225 |

\*Larger sizes are available upon request.

**2.04 Fittings:** All fittings will conform to pipe type and will be insulated and jacketed with materials supplied by the system supplier as per manufacturers’ standard procedures.

**2.05 RhinoJoints (optional):** After welding and testing, all joints on outer polyethylene joint shall be certified EN 489, RhinoJoint by Rovanco or equal. Certification required during submittal. Joints must be air tested in a way that the polyethylene is not drilled into. Air test from the side of joint is recommended. Contractor to log each joint and present to owner at time of final test.

**2.06 Backfill:** Should be tamped compactly in place so as to assure a stable surface. No rock should be used in the first foot of backfill. 24 inches, top to pipe to grade, of compacted fill shall meet H-20 Highway Loading.

**2.07 Leak Detection:** 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 Manufacturer’s Assistance:** Rovanco will provide a field service man on-site to properly train the installing personnel in all phases of installation, (if required).

**2.09 Approved Vendors:** Insul-8 Thin Wall Systems by Rovanco, Joliet, Illinois or approved, ISO Certified equal. Any alternate supplier must submit their technical data to the engineer ten days prior to bid date to be approved in writing as an equal.