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***Piping Systems, Inc*.**

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**Part 1 – General**

**1.01 Insul-8® Below Ground – Steel x Foam x HDPE**

**1.02 This system** shall be a **Below Ground** **Steel x HDPE with Polyisocyanurate Foam Piping System for Condensate, Chilled Water, Glycol and Hot Water Applications** manufactured by **Rovanco Piping Systems** of Joliet, Illinois.

**Part 2 - Products**

**2.01 Carrier Pipe:** Shall be Steel A-53 Grade B ERW in Schedule (40) or (80). Pipe 10” and above will me standard weight .375 wall or extra heavy .500 wall.

**2.02 Carrier Pipe Insulation:** Carrier pipe 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.

**2.03 Jacketing 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 if 175 mils. No FRP overwrap or sprayed 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 Inches | Jacket Size in Inches | Jacket Thickness in Mills |
| 2 | 1.81 | 6.63 | 200 |
| 2-1/2 | 1.56 | 6.63 | 200 |
| 3 | 1.25 | 6.63 | 200 |
| 4 | 1.75 | 8.00 | 200 |
| 5 | 2.22 | 10.00 | 200 |
| 6 | 1.51 | 10.00 | 200 |
| 8 | 1.68 | 12.43 | 175 |
| 10 | 1.64 | 14.06 | 175 |
| 12 | 1.46 | 15.87 | 175 |
| 14 | 1.72 | 17.83 | 200 |
| 16 | 1.70 | 19.80 | 200 |
| 18 | 1.89 | 22.17 | 200 |
| 20 | 2.24 | 24.92 | 225 |

\*Larger pipe sizes are available upon request.

**2.04 Joining Method:** Straight lengths of pipe will be joined by welding.

**2.05 Fittings:** All fittings will conform to pipe type and will be insulated and jacketed with materials supplied by the system supplier as per manufacturer’s standard procedure.

**2.06 End Seals:** Each length of pre-insulated pipe will be fitted with a watertight mastic end seal at jacket and pipe surfaces. All field cuts will be sealed with a field applied end seal.

**2.07 Insulation of Straight Joints:** After welding and testing, all joints shall be insulated and sealed as per manufacturer’s standard procedures.

**2.08 Backfill (if below ground):** Should be tamped compactly in place to assure a stable surface. No rock should be used in first foot of backfill. 24 inches, from top of pipe to grade, of compacted fill shall meet H-20 Highway Loading.

**2.09 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).

**2.10 Approved Vendors:** Steel Pipe System 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.