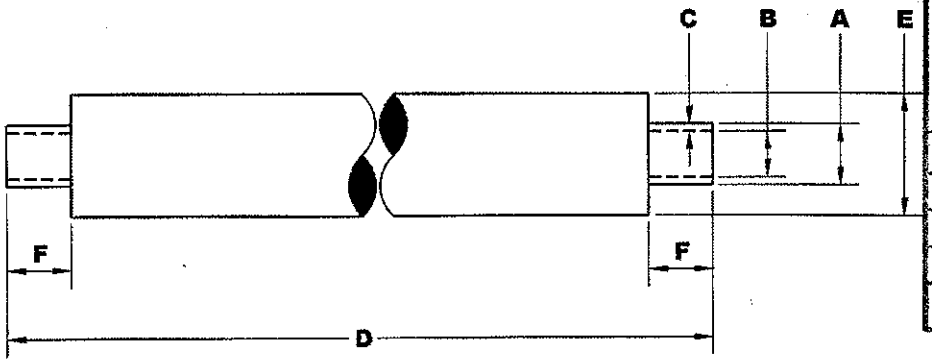
URECON PRE-INSULATED HIGH DENSITY POLYETHYLENE PIPE WITH HIGH DENSITY POLYETHYLENE WRAPPED JACKET SHOP DRAWING



SHOP DRAWING REVIEW

THIS DRAWING HAS BEEN REVIEWED FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT ONLY. SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR ERRORS OR OMISSIONS OR OF MEETING THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS.

✓ NO COMMENT	Submission No. 77
SEE COMMENTS	Project No. 078107
AMEND & RESUBMIT	By GS
REJECTED	Date June 29/10

DILLON CONSULTING LIMITED

PIPE

Material :	HDPE
Nominal Diameter :	12"
Series/Class/Sch. :	DR17
Pipe service :	Intake
Operating temperature :	N/A
Joint type :	N/A
Specification :	PE 3408
Manufacturer :	KWH Pipe Canada
Outside diameter "A" :	12.750"
Inside diameter "B" :	11.160"
Wall thickness "C" :	.750
Overall length "D" :	50'

INSULATION

Thickness :	2.5"
Outside diameter "E" :	18.80"
Cutback "F" :	9"
Mastic on ends :	NO

TRACING

Number of trace conduit(s) :	0
Size of trace conduit(s) :	N/A
Location :	N/A
Length "G" :	N/A
Cable type :	N/A
Watts/m :	N/A
Voltage :	N/A

JACKET

Type :	Sprially Wound
Material :	HDPE
Gauge or thickness :	50 mils
Color :	Black
UV inhibited :	Yes

URECON U.I.P.® PRE-INSULATED PIPE	
PROJECT	Taloyoak
OWNER	Government Services
ENGINEER	Dillon
DATE	June 23, 2010
CONTRACT NUMBER	

MARKING TAPE COLOR: n/a

URECON INSULATED PIPE DETAILED SPECIFICATION

Standard "U.I.P®." System

1) General

The pipe shall be insulated using the U.I.P.® factory insulation process, as supplied by Urecon Ltd., complete with integral conduit for electric heat trace cable *(if required)* and 1,27 mm *(50 mils)* minimum black polyethylene jacket with UV inhibitor. Insulation of associated joints, fittings and accessories shall be as per Urecon's recommendations, depending on the size and type of pipe involved. The product shall be manufactured in accordance to ISO 9001-2000 Standards, or approved equal.

2) Pipe preparation

Pipe shall be cleaned of surface dust or dirt and treated, if necessary, to insure a positive bond of the foam to the entire pipe surface. The pipes may be treated by sand blasting or the application of a chemical foam-bonding compound if deemed necessary by Urecon.

3) Heat tracing conduit(s)

Heat tracing conduit(s) shall consist of an extruded molding and shall be applied to the pipe prior to application of the insulation. The conduit(s) will be securely fastened to the pipe to prevent the ingress of foam therein during the insulation process. All conduit(s) shall be checked after insulating to insure they are not plugged. The ends shall be sealed prior to shipping to prevent any foreign material from entering the conduit while in transit or during installation.

4) Insulation

a) Material: rigid polyurethane foam, factory applied.
b) Thickness: 50 mm *(2 in.)* or as required.
c) Density: (ASTM D 1622) 35 to 46 kg/m^3 *(2.2 to 3.0 lbs/ft^3)*.
d) Closed cell content: (ASTM D 2856) 90%, minimum.
e) Water absorption: (ASTM D 2842) 4.0% by volume .
f) Thermal conductivity: (ASTM C518) 0,020 to 0,026 W/m ^{0}C *(0.14 to 0.17 Btu • in/ft^2 •hr • ^{0}F)*.

Note: the above specification is for 141B HCFC Foam

5) System Properties

a) System compressive strength: (modified ASTM D 1621 with 50 mil jacket) approximately 414 to 552 kPa *(60-80 lbs/in^2)*, varies with pipe diameter.
b) Temperature limitations: -in service, -45° to 85^{0}C *(-49^0 to 185°F)*
-installation, -34^0 C (-30^{0}F)

6) Outer Jacket on Pipe Insulation *with enhanced 'Cold Climate handling' properties*

The outer protective jacket shall consist of custom blended black polyethylene, 1,27 mm *(50 mils)* or 1,90 mm (*75 mils*) thick, UV inhibited factory applied. The jacket shall be a Scapa 366 superior cold weather tape having a modified butyl rubber adhesive to ensure positive adhesion to the foam insulation and shall be applied hot in two counterwound and overlapping layers each 0,64 mm (*25 mils*) thick to ensure a shrink tightened waterproof bond throughout its entire length.

Outer jacket characteristics

a) Jacket material: polyethylene UV inhibited, specially formulated for superior cold environment properties.
b) Sealant: butyl rubber and resin.
c) Jacket thickness: 1,27 mm *(50 mils.)*
d) Minimum elongation: (ASTM D 1000) 300%, 6 month test.
e) Service temperature range: -installation @ -34^0 to 71^{0}C *(-30^0 to + 180^{0}F)*
- in service @ -45^0 to 85^0 C (-49^0 to + 185^0 F)
f) Tensile strength: (ASTM D-1000) 6,83 kg/cm wide *(38 lbs/in wide).*

7) Insulated Pipe Joints

a.) Butt-Fused and Welded joints

Insulated pipe joints shall be completed using pre-fabricated rigid polyisocyanurate or urethane half shells and sealed with the application of suitable wrap around adhesive lined heat shrink sleeves as supplied by Urecon. The heat shrink sleeves shall overlap the insulation jacket by a minimum of 75 mm *(3 in)* on either side of the joint.

b) Bell x Spigot Joints

Insulated pipe joints shall be sealed with a 150 mm (*6 in.*) wide heat shrink sleeve or butyl mastic tape if the system is not electrically heat traced, 300 mm (*12 in.*) wide if traced.

8) Insulation kits for fittings.

Insulation kits for fittings shall consist of rigid polyisocyanurate or urethane foam insulation with a fully bonded polymer protective coating on all exterior and interior surfaces, including ends. Insulation kits for all fittings and ancillary items are to be designed, manufactured, and supplied by the insulation pipe manufacturer and include silicone caulking for seams, stainless steel attachment straps and clips, and heat shrink sleeves or butyl mastic tape to seal between pipe and insulation kit.

a) Rigid Polyisocyanurate or Urethane Foam Insulation
.1 Density: (ASTM D1622) 27 to 32 kg/m^3 *(1.7 to 2.0 lbs/ft.^{3})*.
.2 Compressive strength: (ASTM D1621) 131 to 158 kPa *(19 to 23 lbs/in.^{2})* .
.3 Closed cell content: 90%, minimum.
.4 Water absorption: (ASTM D2842) 4.0% by volume.
.5 Thermal Conductivity: (ASTM C 518) 0,027 W/m ^{0}C *(0.19 Btu • in/ft^2 • hr • ^{0}F).*
.6 Thickness: to match pipe insulation thickness.
b) Polymer Coating, Urecon BL-75-20EP
.1 Two component high density polyurethane coating, black in color.
.2 Density: 1170 kg/m^3 *(73 lbs/ft^3).*
.3 Durometer D scale 60.
.4 Tensile strength: 11,100 kPa *(1610 lbs/in^2).*
.5 Tear strength: 26,5 N/mm *(151 lbs/in.).*
.6 Thickness: 1,9mm *(75 mils)* outside surfaces, 0,51mm *(20 mils)* inside surfaces.

9) Electric Tracing System

The electric tracing system and associated controls shall be as per the manufacturer's recommendations with particular attention being paid to the watt densities applied through conduits on plastic pipes. All tracing cables and related accessories to be CSA approved and comply with CSA heat tracing standard C22.2 No. 130.2-93. Standard of acceptance is Urecon's Thermocable or approved equal. All electrical heat trace components are to be supplied by the insulation pipe manufacturer.

Note: -Physical characteristics are nominal and may vary depending on pipe type and diameter. (Revised March 2003).