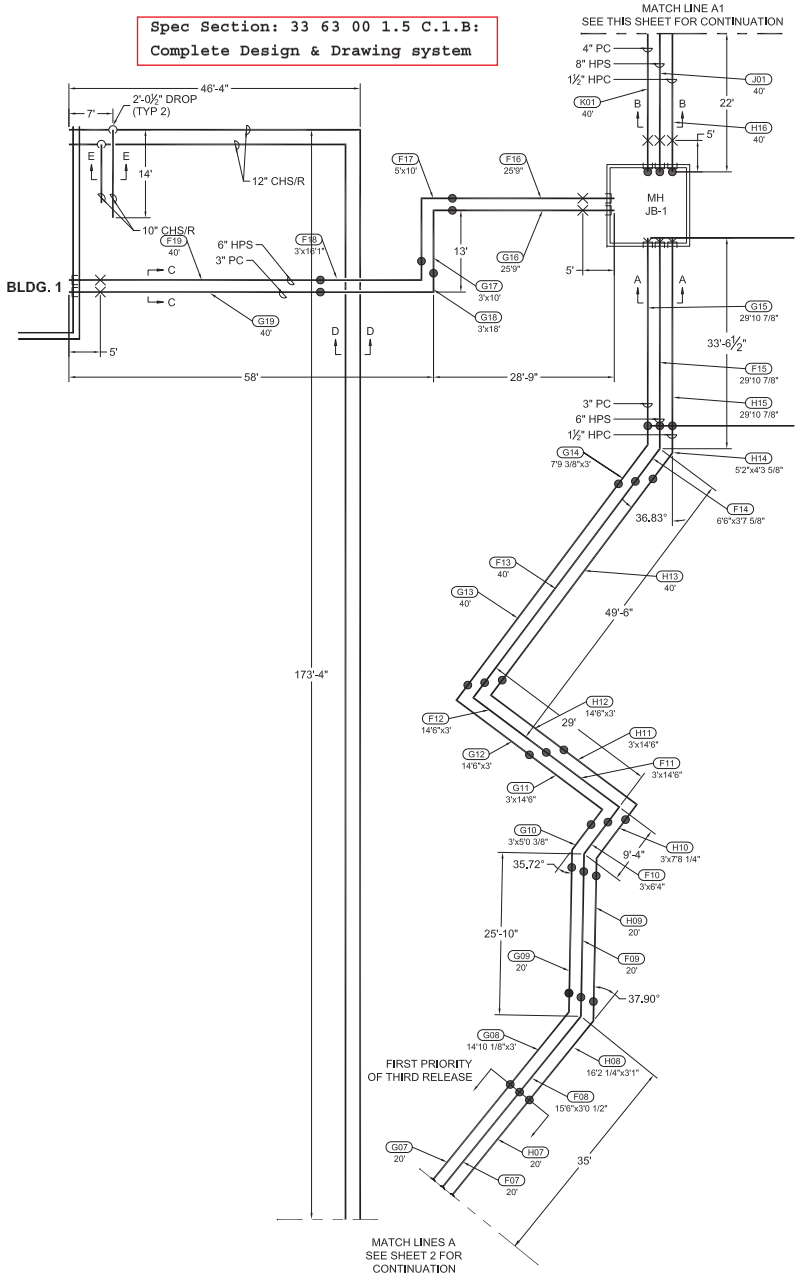
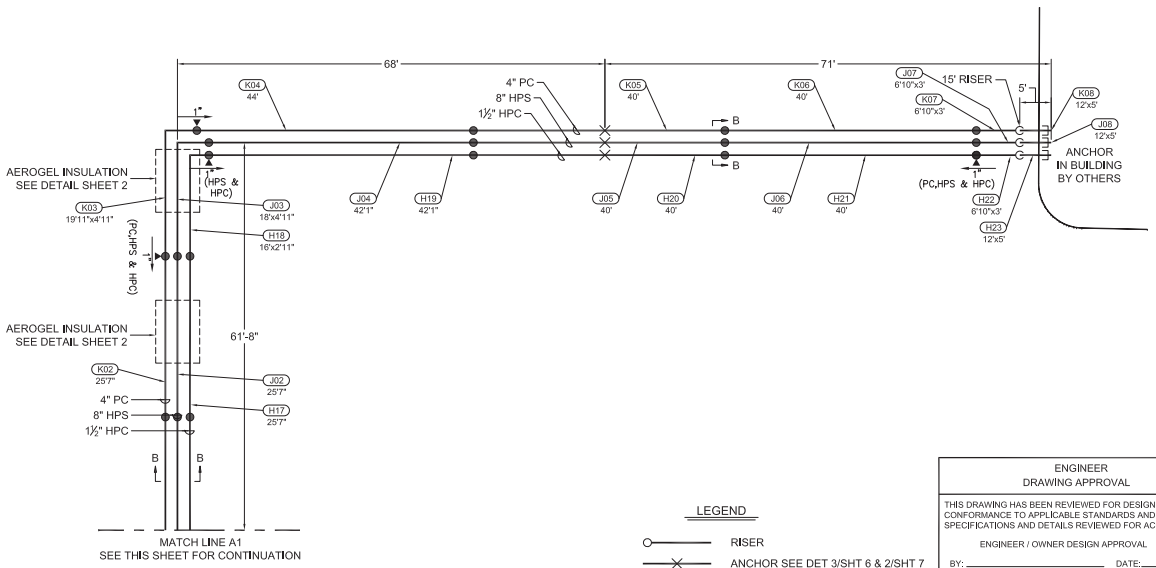
Spec Section: 33 63 00 1.5 C.1.B:
Complete Design & Drawing system





ABOVE GROUND HPS, HPR, & PC NOTES

1. ALL ABOVE GROUND **HIGH PRESSURE STEAM (HPS), HIGH PRESSURE RETURN (HPR), AND PUMPED CONDENSATE (PC)** LINES ARE AN INSUL-800 CONDUIT SYSTEM AS MANUFACTURED BY ROVANCO PIPING SYSTEMS INC., JOLIET, ILLINOIS.
   - 1.1. HPS CARRIER PIPE IS SCH 40 A53B ERW STEEL PIPE.
   - 1.2. HPR CARRIER PIPE IS SCH 80 A53B ERW STEEL PIPE.
   - 1.3. PC CARRIER PIPE IS SCH 80 A53B ERW STEEL PIPE.
   - 1.4. CARRIER PIPE INSULATION IS MINERAL WOOL CONFORMING TO ASTM C-547 WITH A K-VALUE OF NO GREATER THAN .29 AT 200°F. SECTIONAL INSULATION IS BANDED ON PIPE WITH STAINLESS STEEL BANDING ON 18" CENTERS.
   - 1.5. THE INNER CONDUIT IS **.250" WALL** WELDED STEEL CONFORMING TO ASTM A-139.
   - 1.6. THE INNER CONDUIT INSULATION IS HI-TEMP POLYISOCYANURATE FOAM INSULATION K FACTOR OF .145, DENSITY OF 2 PCF, CLOSED CELL CONTENT OF 90%, COMPRESSIVE STRENGTH OF 35 PSI, RATED FOR 300°F. CONFORMING TO ASTM STANDARD D1621, 1622, 1623, 2126, 2842, 2856, AND C518-91.
   - 1.7. THE OUTER JACKET IS 22 Ga. ALUMINUM JACKET
   - 1.8. ALL CONDUIT UNITS WILL BE SHIPPED WITH SHIPPING BARS IN PLACE, ATTACHING THE CARRIER PIPES TO THE CONDUIT. THESE SHIPPING BARS MUST BE REMOVED IN THE FIELD PRIOR TO CLOSING OF THE FIELD JOINT. DETAILED INSTALLATION INSTRUCTIONS WILL BE PROVIDED WITH SHIPMENT.
   - 1.9. WHERE REQUIRED AND SHOWN ON FINAL DESIGN DRAWING, THE CARRIER PIPE MUST BE COLD SPRUNG IN THE FIELD.
2. ALL DIMENSIONS AND DESIGN PARAMETERS SHOWN ON THIS DRAWING MUST BE VERIFIED BY THE INSTALLING CONTRACTOR. CORRECTED FIELD DIMENSIONS AND / OR DESIGN PARAMETERS MUST BE SHOWN ON THIS DRAWING. WE REQUIRE 1 COPY OF THIS DRAWING MARKED "APPROVED AND RELEASED FOR FABRICATION" PRIOR TO RELEASING THIS PROJECT FOR FABRICATION. PLEASE SIGN APPROVAL BLOCK PROVIDED.
3. ALL DIMENSIONS ARE CENTER LINE OF CARRIER PIPE TO CENTER LINE OF CARRIER PIPE OR FROM CENTER LINE OF CARRIER PIPE TO END OF CARRIER PIPE.
4. ALL FACTORY CARRIER WELDS SHALL BE 100% RADIOGRAPHICALLY TESTED PER ANSI B31.1 LEVEL **III.** FILMS AND RADIOGRAPHERS REPORTS TO BE SENT AFTER TESTING
5. THE MATERIALS FOR THIS PROJECT SHALL MEET THE BUY AMERICAN FAR 52.225-11. MILL CERTS SHALL BE PROVIDED WITH SHIPMENTS
6. STAINLESS STEEL TAGS AND HANG CHAINS SHALL BE SUPPLIED FOR EACH BUILDING / MH PENETRATION.

UNDERGROUND HPS, HPR, & PC NOTES

1. ALL UNDERGROUND **HIGH PRESSURE STEAM (HPS), HIGH PRESSURE RETURN (HPR), AND PUMPED CONDENSATE (PC)** LINES ARE AN INSUL-800 CONDUIT SYSTEM AS MANUFACTURED BY ROVANCO PIPING SYSTEMS INC., JOLIET, ILLINOIS.
   - 1.1. HPS CARRIER PIPE IS SCH 40 A53B ERW STEEL PIPE.
   - 1.2. HPR CARRIER PIPE IS SCH 80 A53B ERW STEEL PIPE.
   - 1.3. PC CARRIER PIPE IS SCH 80 A53B ERW STEEL PIPE.
   - 1.4. CARRIER PIPE INSULATION IS MINERAL WOOL CONFORMING TO ASTM C-547 WITH A K-VALUE OF NO GREATER THAN .29 AT 200°F. SECTIONAL INSULATION IS BANDED ON PIPE WITH STAINLESS STEEL BANDING ON 18" CENTERS.
   - 1.5. THE INNER CONDUIT IS **.250" WALL** WELDED STEEL CONFORMING TO ASTM A-139.
   - 1.6. THE INNER CONDUIT INSULATION IS HI-TEMP POLYISOCYANURATE FOAM INSULATION K FACTOR OF .145, DENSITY OF 2 PCF, CLOSED CELL CONTENT OF 90%, COMPRESSIVE STRENGTH OF 35 PSI, RATED FOR 300°F. CONFORMING TO ASTM STANDARD D1621, 1622, 1623, 2126, 2842, 2856, AND C518-91.
   - 1.7. THE OUTER JACKET IS A HIGH DENSITY POLYETHYLENE CONFORMING TO ASTM D1248, TYPE 3, CLASS C.
   - 1.8. ALL CONDUIT UNITS WILL BE SHIPPED WITH SHIPPING BARS IN PLACE, ATTACHING THE CARRIER PIPES TO THE CONDUIT. THESE SHIPPING BARS MUST BE REMOVED IN THE FIELD PRIOR TO CLOSING OF THE FIELD JOINT. DETAILED INSTALLATION INSTRUCTIONS WILL BE PROVIDED WITH SHIPMENT.
   - 1.9. WHERE REQUIRED AND SHOWN ON FINAL DESIGN DRAWING, THE CARRIER PIPE MUST BE COLD SPRUNG IN THE FIELD.
2. ALL DIMENSIONS AND DESIGN PARAMETERS SHOWN ON THIS DRAWING MUST BE VERIFIED BY THE INSTALLING CONTRACTOR. CORRECTED FIELD DIMENSIONS AND / OR DESIGN PARAMETERS MUST BE SHOWN ON THIS DRAWING. WE REQUIRE 1 COPY OF THIS DRAWING MARKED "APPROVED AND RELEASED FOR FABRICATION" PRIOR TO RELEASING THIS PROJECT FOR FABRICATION. PLEASE SIGN APPROVAL BLOCK PROVIDED.
3. ALL DIMENSIONS ARE CENTER LINE OF CARRIER PIPE TO CENTER LINE OF CARRIER PIPE OR FROM CENTER LINE OF CARRIER PIPE TO END OF CARRIER PIPE.
4. ALL FACTORY CARRIER WELDS SHALL BE 100% RADIOGRAPHICALLY TESTED PER ANSI B31.1 LEVEL **III.** FILMS AND RADIOGRAPHERS REPORTS TO BE SENT AFTER TESTING
5. THE MATERIALS FOR THIS PROJECT SHALL MEET THE BUY AMERICAN FAR 52.225-11. MILL CERTS SHALL BE PROVIDED WITH SHIPMENTS
6. STAINLESS STEEL TAGS AND HANG CHAINS SHALL BE SUPPLIED FOR EACH BUILDING / MH PENETRATION.

LEGEND

- RISER
- ANCHOR SEE DET 3/SHT 6 & 2/SHT 7
- END SEAL
- 90° OFFSET
- REDUCER
- DROP
- POINT OF CONNECTION TO EXISTING
- BELOW GRADE PIPING
- ABOVE GRADE PIPING

ENGINEER DRAWING APPROVAL

THIS DRAWING HAS BEEN REVIEWED FOR DESIGN CONFORMANCE TO APPLICABLE STANDARDS AND SPECIFICATIONS AND DETAILS REVIEWED FOR ACCURACY.

ENGINEER / OWNER DESIGN APPROVAL

BY: _____ DATE: _____

CONTRACTOR CERTIFICATION OF FIELD DIMENSIONS

THIS DRAWING HAS BEEN REVIEWED FOR CONFORMANCE TO SITE CONDITIONS. THE DIMENSIONS AND DETAILS SHOWN HAVE BEEN VERIFIED AND CERTIFIED FOR FABRICATION.

CONTRACTOR FIELD DIMENSION APPROVAL

BY: _____ DATE: _____

WRITTEN APPROVAL MUST BE RECEIVED BY ROVANCO BEFORE PROJECT IS RELEASED FOR FABRICATION AFTER APPROVAL DRAWINGS WILL BE ISSUED AND PROJECT SCHEDULED FOR PRODUCTION.

OPERATING SERVICE CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	100#	338°F	50°F	288°F	2,333"
HPR	75#	310°F	50°F	260°F	2,084"
PC	50#	200°F	50°F	150°F	1,179"

DESIGN CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	150#	366°F	50°F	316°F	2,572"
HPR	150#	366°F	50°F	316°F	2,572"
PC	75#	310°F	50°F	260°F	1,871"

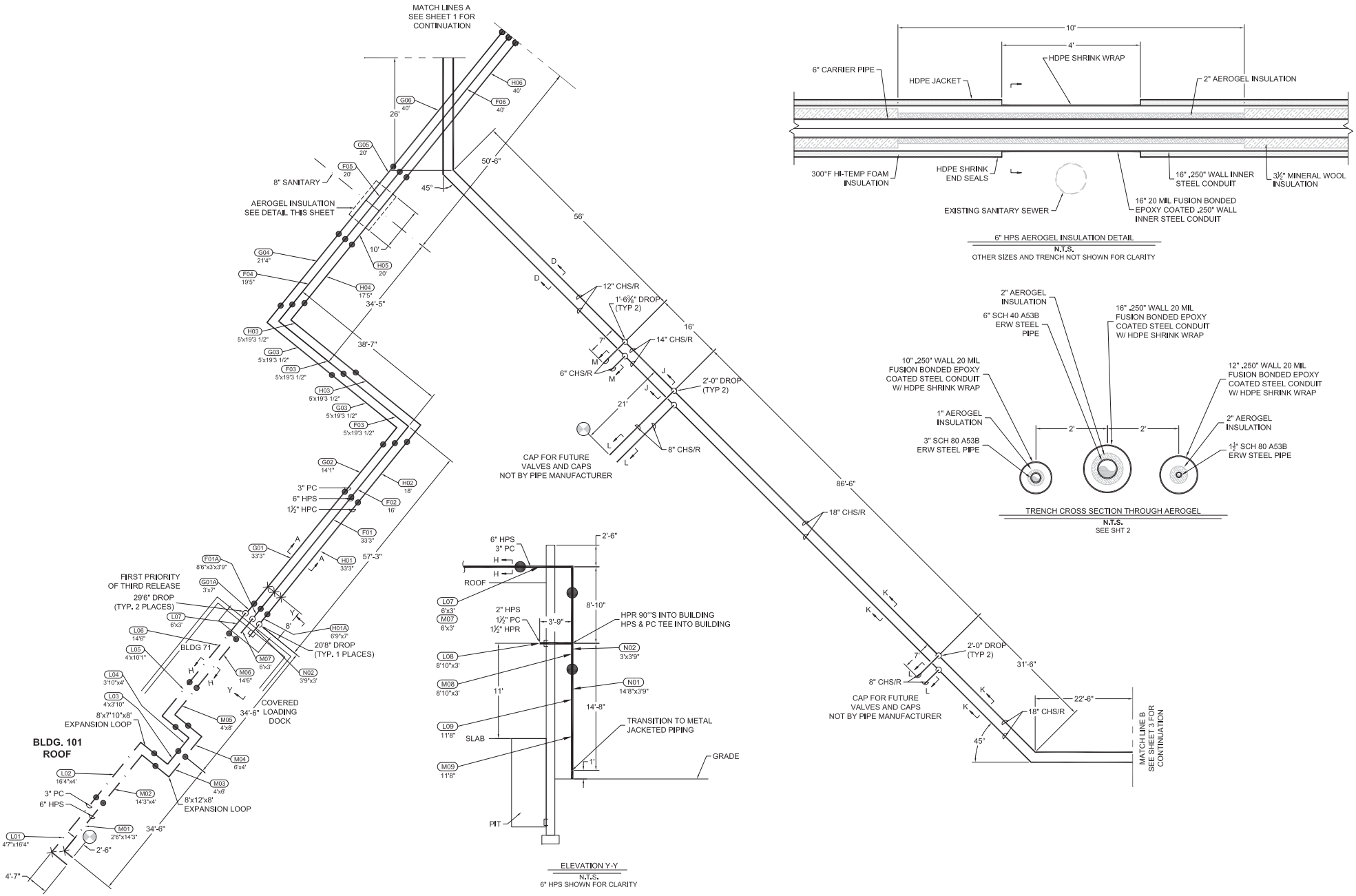
SPECIFICATION SECTION: 33 63 00
SHOP DRAWINGS: HIGH PRESSURE STEAM & PUMPED CONDENSATE

ENGINEERED PIPING SYSTEM BY
ROVANCO® PIPING SYSTEMS
20535 SE FRONTAGE RD.- JOLIET, ILLINOIS 60431
PH. (815) 741-6700 - FAX: (815) 741-4229
E-MAIL: MARKETING@ROVANCO.COM WEB: WWW.ROVANCO.COM

CUSTOMER: RANDALL MECHANICAL
ENGINEER: ELLERBE BECKET
OWNER: DEPARTMENT OF VETERANS AFFAIRS
FOR: VAMC BAY PINES
TITLE: PIPING SITE PLAN

REV	DATE	DESCRIPTION	BY	CK
M	08/01/12	ADDED 4" TO SPOOLS H19,J04 & K04	LWW	LEW
I	06/21/12	REVISED LAYOUT PER AEI AND RANDALL DIRECTION	DDH	LEW
G	06/15/12	REVISED LAYOUT PER AEI AND RANDALL DIRECTION	LEW	LEW
F	06/05/12	REVISED LAYOUT PER AEI AND ARCHER WESTERN	LEW	LEW
C	01/17/12	ADDED RISERS PER CONT. PARTIAL RELEASE	LEW	DK

JOB NO. 41556 | DRAWN BY: DK | SHT NO 1 OF 9
FOL NUMBER | CHECKED BY: LEW | SCALE: 1/8" = 1'-0"
DATE: 08/17/11 | APPROVED BY: LEW | DRAWING NO. 7828



6" HPS AEROGEL INSULATION DETAIL
N.T.S.
OTHER SIZES AND TRENCH NOT SHOWN FOR CLARITY

TRENCH CROSS SECTION THROUGH AEROGEL
N.T.S.
SEE SHT 2

ELEVATION Y-Y
N.T.S.
6" HPS SHOWN FOR CLARITY

OPERATING SERVICE CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	100#	338°F	50°F	288°F	2,333"
HPR	75#	310°F	50°F	260°F	2,084"
PC	50#	200°F	50°F	150°F	1,179"

DESIGN CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	150#	366°F	50°F	316°F	2,572"
HPR	150#	366°F	50°F	316°F	2,572"
PC	75#	310°F	50°F	260°F	1,671"

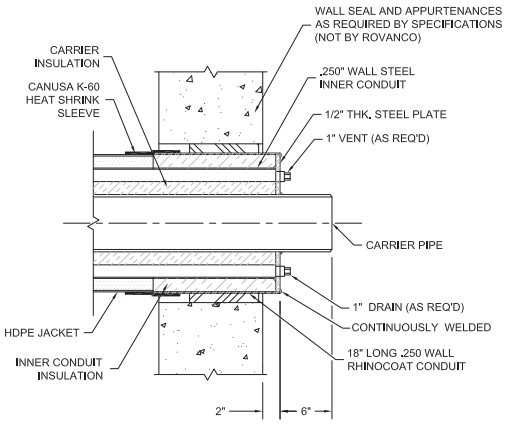
SPECIFICATION SECTION: 33 63 00
SHOP DRAWINGS: HIGH PRESSURE STEAM & PUMPED CONDENSATE

ENGINEERED PIPING SYSTEM BY
ROVANCO® PIPING SYSTEMS
20535 SE FRONTAGE RD. - JOLIET, ILLINOIS 60431
PH. (815) 741-6700 - FAX: (815) 741-4229
E-MAIL: MARKETING@ROVANCO.COM WEB: WWW.ROVANCO.COM

CUSTOMER: RANDALL MECHANICAL
ENGINEER: ELLERBE BECKET
OWNER: DEPARTMENT OF VETERANS AFFAIRS
FOR: VAMC BAY PINES
TITLE: PIPING SITE PLAN

REV	DATE	DESCRIPTION	BY	CK
K	07/02/12	REVISED BLDG 101 RISER PIPING	LEW	LEW
J	06/27/12	ADDED BUILDING 101 ROOF PIPING	LEW	LEW
G	06/15/12	REVISED LAYOUT PER AEI AND RANDALL DIRECTION	LEW	LEW
F	06/05/12	REVISED LAYOUT PER AEI AND ARCHER WESTERN	LEW	LEW
C	01/17/12	ADDED RISERS PER CONT, PARTIAL RELEASE	LEW	DK

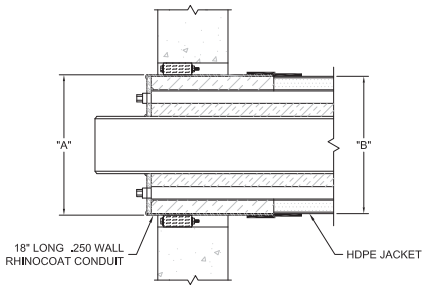
JOB NO. 41556 | DRAWN BY: DK | SHT NO 2 OF 9
DATE: 08/17/11 | CHECKED BY: LEW | SCALE: 1/8" = 1'-0"
APPROVED BY: LEW | DRAWING NO. 7828



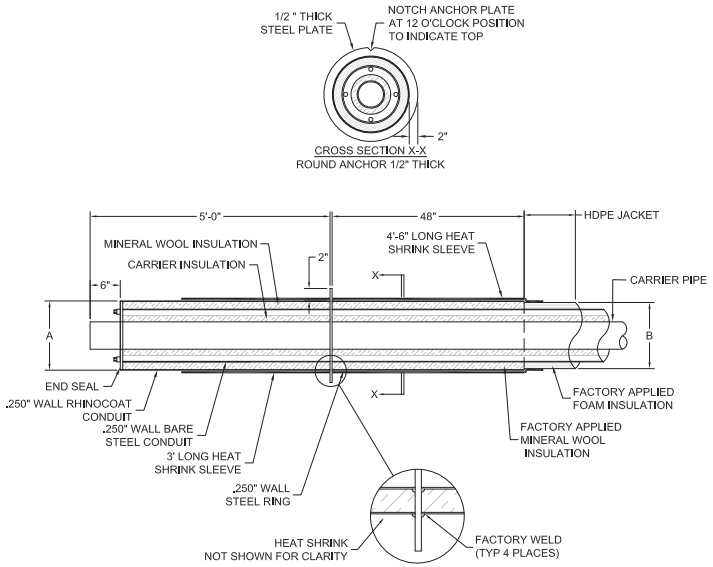
1 INSUL-800 CONDUIT END SEAL DETAIL
N.T.S.

NOTE: THE SYSTEM OD MAY VARY SLIGHTLY AT THE WALL OR FLOOR PENETRATIONS. PLEASE SEE THE CHART BELOW FOR CORRECT OD.

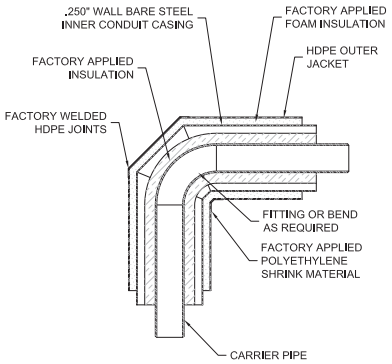
OUTER JACKET OD AT PENETRATION		
CARRIER SIZE	STEEL CONDUIT OD AT WALL PENETRATION DIM "A"	STD HDPE OD FOR STD PIPE SECTION DIM "B"
3" HPS	18.00"	17.83"
6" HPS	20.00"	19.80"
1¼" HPR	16.00"	15.87"
2" PC	14.00"	14.06"
3" PC	14.00"	14.06"



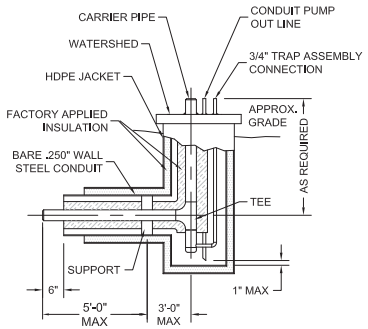
2 INSUL-800 UG BLDG PENETRATION SIZING DETAIL
N.T.S.



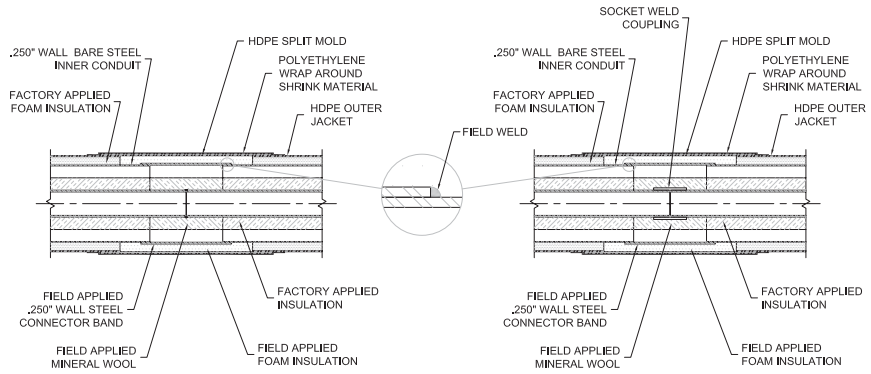
3 INSUL-800 PREFAB ANCHOR DETAIL WITH END SEAL
CONCRETE BLOCK NOT SHOWN FOR CLARITY



4 INSUL-800 GORED ELBOW DETAIL
N.T.S.



5 INSUL-800 CONDUIT DRIP TEE DETAIL
N.T.S.



NOTE: FOR 2" AND LARGER STEEL CARRIER PIPE

6 INSUL-800 FIELD JOINT DETAIL
N.T.S.

NOTE: FOR 1½" AND SMALLER STEEL CARRIER PIPE

7 INSUL-800 FIELD JOINT DETAIL
N.T.S.

OPERATING SERVICE CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	100#	338°F	50°F	288°F	2,333"
HPR	75#	310°F	50°F	260°F	2,084"
PC	50#	200°F	50°F	150°F	1,179"

DESIGN CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	150#	366°F	50°F	316°F	2,572"
HPR	150#	366°F	50°F	316°F	2,572"
PC	75#	310°F	50°F	260°F	1,671"

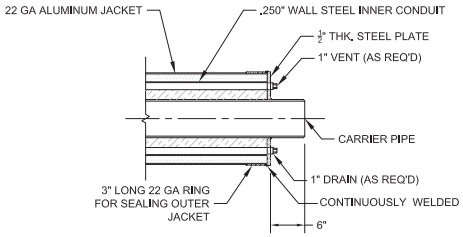
SPECIFICATION SECTION: 33 63 00
SHOP DRAWINGS: HIGH PRESSURE STEAM & PUMPED CONDENSATE

ENGINEERED PIPING SYSTEM BY
ROVANCO® PIPING SYSTEMS
20535 SE FRONTAGE RD. - JOLIET, ILLINOIS 60431
PH. (815) 741-6700 - FAX: (815) 741-4229
E-MAIL: MARKETING@ROVANCO.COM WEB: WWW.ROVANCO.COM

CUSTOMER: RANDALL MECHANICAL
ENGINEER: ELLERBE BECKET
OWNER: DEPARTMENT OF VETERANS AFFAIRS
FOR: VAMC BAY PINES
TITLE: UNDERGROUND HPS, HPR, PC PIPING DETAILS

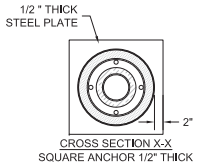
REV	DATE	DESCRIPTION	BY	CK
C	01/17/12	ADDED RISERS PER CONT. PARTIAL RELEASE	LEW	DK
B	12/28/11	REVISED PER RETURNED COMMENTS	LEW	DK
A	11/08/11	ADDED DESIGN CRITERIA	DK	DK

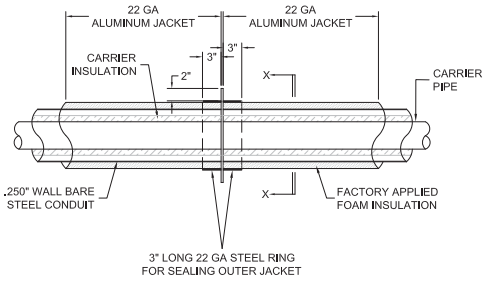
JOB NO: 41556
DRAWN BY: DK
CHECKED BY: LEW
APPROVED BY: LEW
DATE: 08/17/11
SCALE: NONE
DRAWING NO: 7828
SHT NO 6 OF 9



1 INSUL-800 ABOVE GROUND END SEAL DETAIL

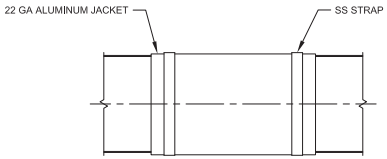
N.T.S.

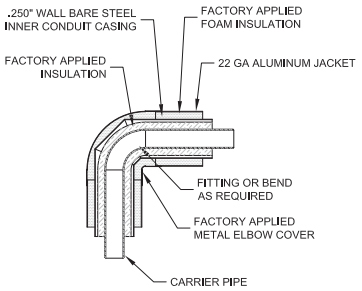




2 INSUL-800 ANCHOR DETAIL WITH END SEAL

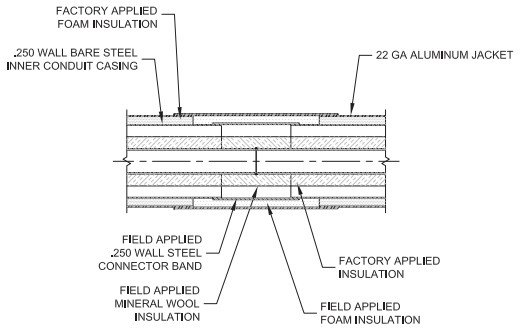
N.T.S.





3 INSUL-800 ABOVE GROUND ELBOW DETAIL

N.T.S.



4 INSUL-800 ABOVE GROUND FIELD JOINT DETAIL

OPERATING SERVICE CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	100#	336°F	50°F	286°F	2,333"
HPR	75#	310°F	50°F	260°F	2,084"
PC	50#	200°F	50°F	150°F	1,179"

DESIGN CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	150#	366°F	50°F	316°F	2,572"
HPR	150#	366°F	50°F	316°F	2,572"
PC	75#	310°F	50°F	260°F	1,671"

SPECIFICATION SECTION: 33 63 00
SHOP DRAWINGS: HIGH PRESSURE STEAM & PUMPED CONDENSATE

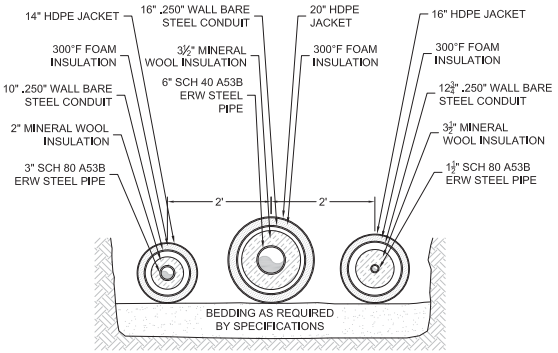
ENGINEERED PIPING SYSTEM BY
ROVANCO® PIPING SYSTEMS
20535 SE FRONTAGE RD. - JOLIET, ILLINOIS 60431
PH. (815) 741-6700 - FAX: (815) 741-4229
E-MAIL: MARKETING@ROVANCO.COM WEB: WWW.ROVANCO.COM

CUSTOMER: RANDALL MECHANICAL
ENGINEER: ELLERBE BECKET
OWNER: DEPARTMENT OF VETERANS AFFAIRS

FOR: VAMC BAY PINES
TITLE: ABOVE GROUND HPS, HPR, PC PIPING DETAILS

REV	DATE	DESCRIPTION	BY	CK
C	01/17/12	ADDED RISERS PER CONT. PARTIAL RELEASE	LEW	DK
B	12/28/11	REVISED PER RETURNED COMMENTS	LEW	DK
A	11/08/11	ADDED DESIGN CRITERIA	DK	DK

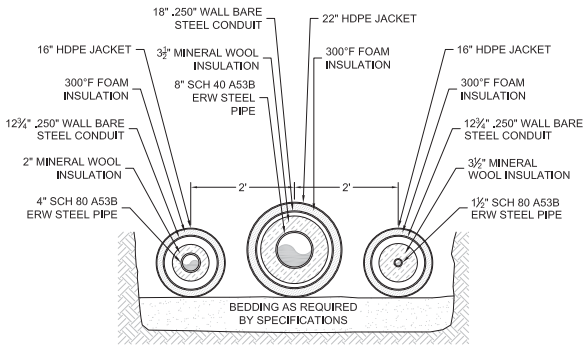
JOB NO: 41556
DRAWN BY: DK
FOLDER NUMBER:
CHECKED BY: LEW
DATE: 08/17/11
APPROVED BY: LEW
SCALE: NONE
DRAWING NO: 7828
SHT NO 7 OF 9



TRENCH CROSS SECTION A-A

N.T.S.

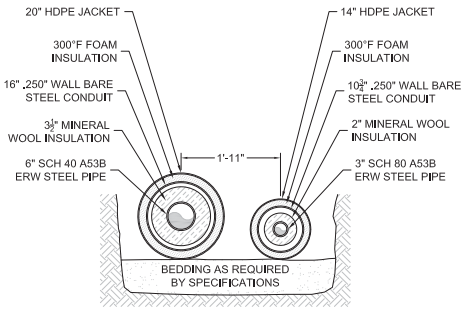
SEE SHT 1 & 2



TRENCH CROSS SECTION B-B

N.T.S.

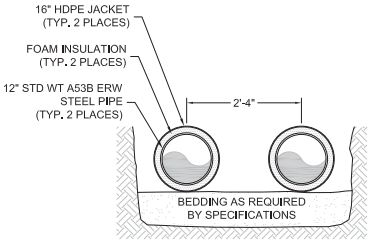
SEE SHT 1



TRENCH CROSS SECTION C-C

N.T.S.

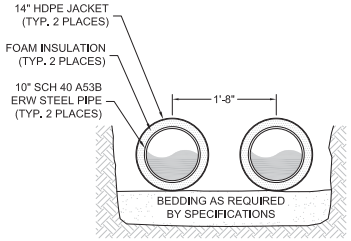
SEE SHT 1



TRENCH CROSS SECTION D-D

N.T.S.

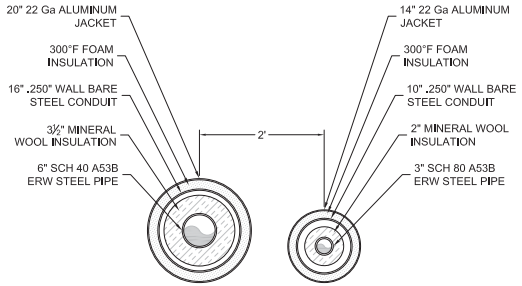
SEE SHT 1, 2 & 3



TRENCH CROSS SECTION E-E

N.T.S.

SEE SHT 1



ROOF PIPING SECTION H-H

N.T.S.

SEE SHT 2

OPERATING SERVICE CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	100#	336°F	50°F	286°F	2,333"
HPR	75#	310°F	50°F	260°F	2,084"
PC	50#	200°F	50°F	150°F	1,179"

DESIGN CRITERIA					
SERVICE	PSIG	DESIGN TEMP.	AMBIENT TEMP.	△ TEMP.	△ LENGTH/100'
HPS	150#	366°F	50°F	316°F	2,572"
HPR	150#	366°F	50°F	316°F	2,572"
PC	75#	310°F	50°F	260°F	1,671"

SPECIFICATION SECTION: 33 63 00
SHOP DRAWINGS: HIGH PRESSURE STEAM & PUMPED CONDENSATE

ENGINEERED PIPING SYSTEM BY
ROVANCO® PIPING SYSTEMS
20535 SE FRONTAGE RD. - JOLIET, ILLINOIS 60431
PH. (815) 741-6700 - FAX: (815) 741-4229
E-MAIL: MARKETING@ROVANCO.COM WEB: WWW.ROVANCO.COM

CUSTOMER: RANDALL MECHANICAL
ENGINEER: ELLERBE BECKET
OWNER: DEPARTMENT OF VETERANS AFFAIRS

FOR: VAMC BAY PINES
TITLE: PIPING CROSS SECTIONS

REV	DATE	DESCRIPTION	BY	CK
J	06/27/12	ADDED BUILDING 101 ROOF PIPING	LEW	LEW
G	06/15/12	REVISED LAYOUT PER AEI AND RANDALL DIRECTION	LEW	LEW
F	06/05/12	REVISED LAYOUT PER AEI AND ARCHER WESTERN	LEW	LEW
C	01/17/12	ADDED RISERS PER CONT. PARTIAL RELEASE	LEW	DK
B	12/28/11	REVISED PER RETURNED COMMENTS	LEW	DK

JOB NO.: 41556
DRAWN BY: DK
FAX NUMBER:
CHECKED BY: LEW
DATE: 08/17/11
APPROVED BY: LEW
SCALE: NONE
DRAWING NO.: 7828
SHT NO 8 OF 9

Spec Section: 33 63 00 1.5 C.1.B: Field installation instructions

Rev-1
Rev-2 Section 002
Revision 10/10

Rovanco® Piping Systems
20535 S.E. Frontage
Joliet, IL 60431
(815) 741-6700

Insul-800 High Temp Conduit System Installation Instructions INS-HTC

Last Revision 10/10

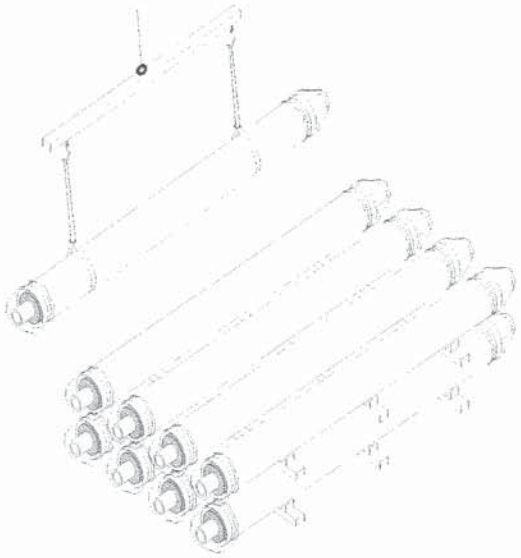
This instruction manual will give you all the information needed in terms of techniques, tools, and accessories required to install ROVANCO Insul-800 High Temp Conduit. If you follow the instructions carefully, the end result will be a high quality, pressure testable conduit piping system. Thank you for showing your confidence in ROVANCO by purchasing its products. We sincerely appreciate your business and we will provide you with quality products with a fair price and "great" service to deserve your future business. Please consult your local ROVANCO Manufacturer's Representative for information about all of the products provided by ROVANCO.

INSPECTION

Inspect all shipments on receipt. Examine all pipe and accessories as they are unloaded. Check to insure that every item on the packing list is received. Check the contents of the cartons to insure that the materials have arrived safely. Do not throw the cartons from the vehicle. Handle all materials carefully. Have the freight carrier make out a damage or short receipt if any discrepancies are found. Keep a signed copy of this receipt and notify ROVANCO immediately. All spool pieces shipped have individual part numbers labeled on each end. Refer to your packing list to be sure you have all spool pieces shown. With your paperwork, you will receive two copies of the installation drawings. These drawings will show the location of each piece of ROVANCO Insul-800 High Temp Conduit.

UNLOADING

ROVANCO Insul-800 systems are manufactured to withstand normal field handling but, like any piping material, damage can occur from careless handling. The spool pieces should be unloaded from the truck using a cherry picker or other suitable equipment. Lift the pieces with nylon slings and spreader bars so as not to damage the polyethylene jacket. Do not use chains or chokers in direct contact with the polyethylene jacket. Do not drop spool pieces because this can damage the insulation or the polyethylene jacket.



STORAGE

Use dunnage material under the pipe and between successive layers to protect the casing from foreign objects. Do not stack higher than it was loaded on the truck to avoid excessive weight on the bottom layer. Cartons of material (i.e. stainless steel bands, insulation, polyethylene shrink material, etc.) should be stored in a dry area. Keep the insulation and pipe ends dry during installation. Open-end spool pieces shipped to you have bags attached over the ends from the factory. Do not remove these bags until the pipe is to be installed, they are intended to protect the insulation from moisture. It is very time consuming to dry out the insulation after it becomes wet.

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Section	2	Welding of Carrier pipe	4
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TESTING:

All carrier pipes must be hydro-tested and conduits must be air tested per the specifications prior to pouring thrust blocks or backfilling the system.

SECTION 1: GETTING STARTED

Fig. 1.1

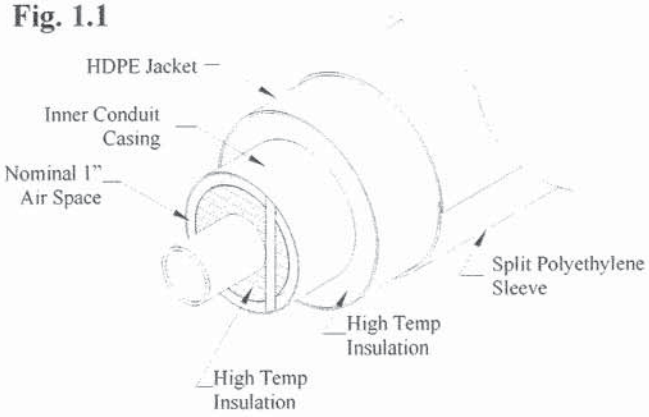


Fig. 1.2

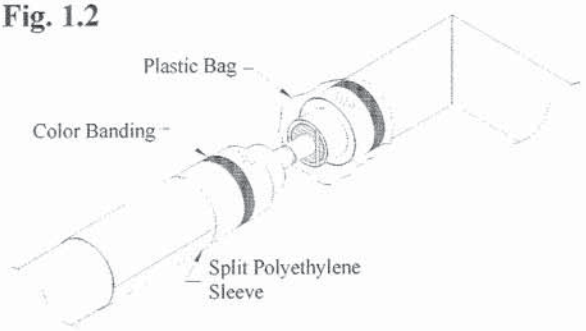
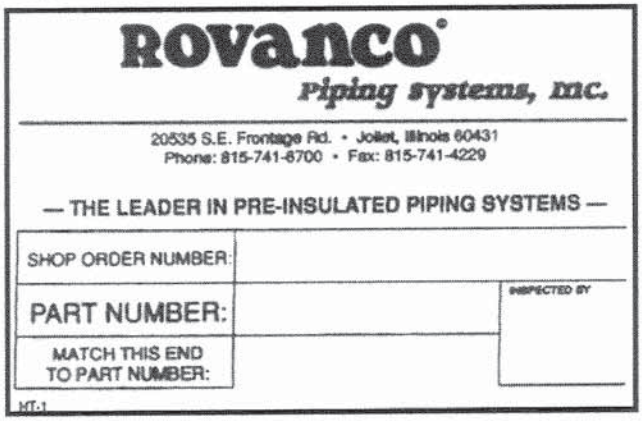


Fig. 1.3

Fig. 1.4



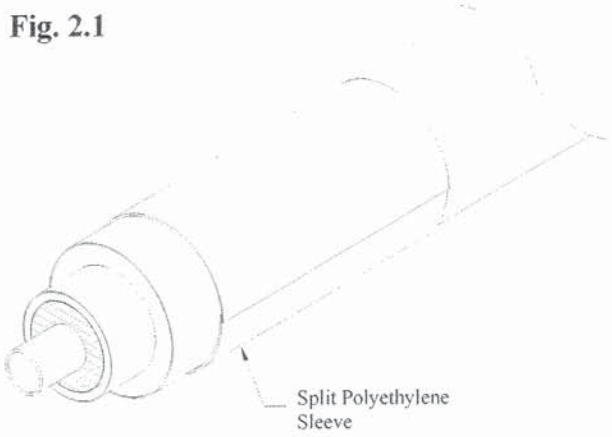
After the ditch has been opened, the spool pieces should be installed in accordance with the installation drawings bearing the latest revision number. Each spool piece has its own part number which will match the drawing showing its approximate length. If the conduit is not going to be installed immediately, leave the plastic bag over the end of the pipe. Plastic garbage bags with the bottoms cut out or plastic sheeting can be taped over the polyethylene sleeve to help prevent water from entering the system should the trench flood. Test cans can be used at the open ends of the systems to prevent water from entering the system. It is very important that the insulation is kept dry during installation!

ROVANCO suggests that you dig bell holes for field welding before lowering the pieces in the ditch. Lower the conduit into the trench, using a spreader bar and nylon slings. As pieces are lowered into the ditch, make sure that the trench bottom is free of sharp objects or rocks. ROVANCO recommends the use of clean backfill material without sharp stones. If the project specifications require a specific backfill material, we recommend the installer follow the specifications.

Check the drawings for possible cold spring locations. Notice that there are colored bands located on the end of some spool pieces. This band is to match an identical colored band of the adjacent piece at the field joint location. See Figure 1.2 This is to insure that expansion pipe supports are located in the proper areas. Also note that straight lengths coming off an expansion loop or elbow have a ROVANCO label marked TOP on the conduit end. This designates that these spool pieces have a top. This must be at the 12 o'clock position before the pipe is welded. This insures that the service pipe can move laterally within this special support. See Figure 1.2. See Figures 1.3 and 1.4 for example labels.

SECTION 2: WELDING OF CARRIER PIPE

Fig. 2.1

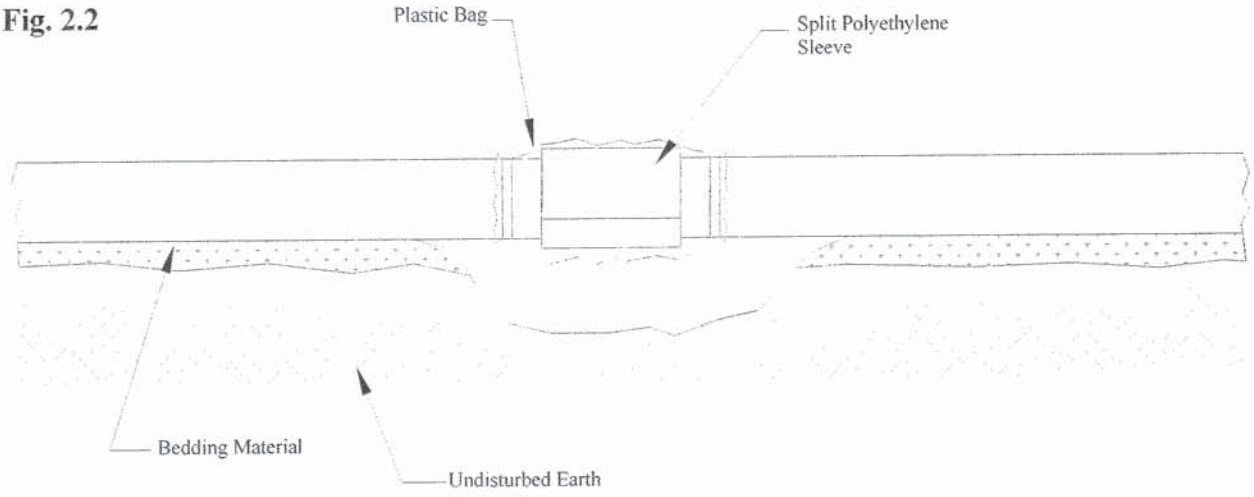


Prior to the welding of the carrier pipe, remove the shipping bar attached between the carrier pipe and inner conduit casing. After removing the shipping bar, repair any damage. The shipping bars have been put there to keep the pipe from sliding out of the inner conduit casing during transit, unloading, and lowering into the trench. These bars must be removed to allow the service pipe to expand during operation. See Figure 2.1.

After removing the shipping bar, you will find it easier to align the inner pipe. If cold springing is required, see Section 3. Align and weld the carrier pipe. If the carrier pipe is not welded immediately, slide the polyethylene sleeve over the joint, and cover the entire joint with a plastic bag or sheeting as described in Section 1. See Figure 2.2.

If a hydrostatic test of the carrier pipe is not specified in the contract, ROVANCO recommends that a hydrostatic test be run on the internal pipe at 1½ times the job working pressure, not to exceed 250 psig without prior approval from ROVANCO. This test should be done prior to insulating the field joints and welding the connector bands closed, to allow inspection and repair of welds if necessary.

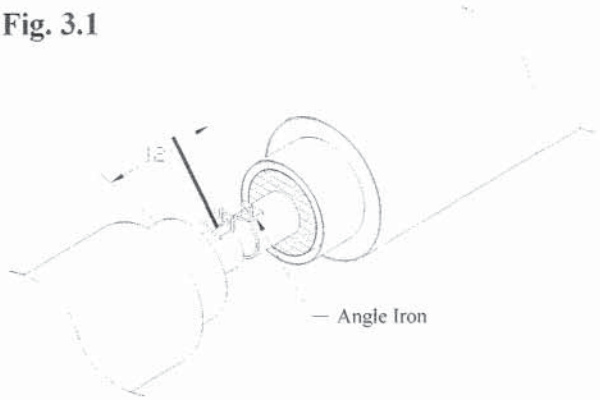
Fig. 2.2



SECTION 3: COLD SPRINGING INSTRUCTIONS

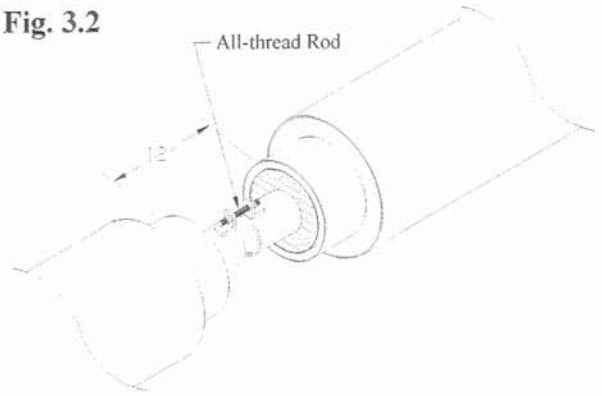
All systems do not require cold springing, refer to your ROVANCO site drawing to determine if the system you are installing requires cold springing. If so follow the instructions below, if not, go on to Section 4.

Fig. 3.1



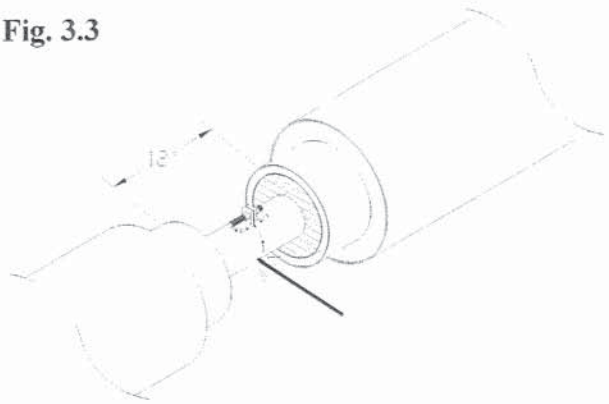
Refer to the ROVANCO installation drawings since an expansion elbow or a loop may require cold springing. The drawings will show you the amounts to cold spring at each leg. If the concrete anchor blocks can be poured before cold springing, use this method. When project scheduling requires that the cold-springing be completed prior to pouring concrete anchor blocks, the "Bridge Method" can be used. See page 6.

Fig. 3.2



Be sure that all spool pieces except the cold spring locations are welded up first. Concrete anchor plates must be poured prior to this method of cold springing. When you skip the joint to be cold sprung, leave the cold spring amount gaped between the two pipes.

Fig. 3.3



1. Weld angles with a bolt hole in it on each end of the carrier pipes. See Figure 3.1.

Note: Angles and rods not supplied by ROVANCO.

2. Run a piece of all-thread rod through the holes and tighten until the two pipes meet. See Figure 3.2.

3. Tack weld the joint and remove the angles. Then complete the welding of this joint. See Figure 3.3.

Fig. 3.4

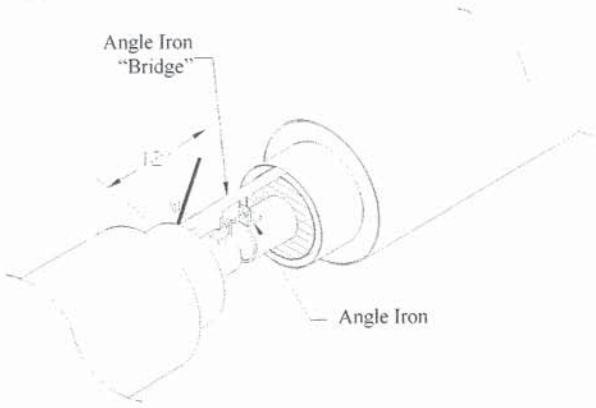


Fig. 3.5

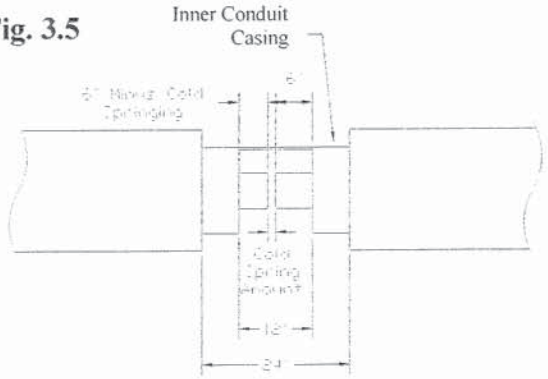
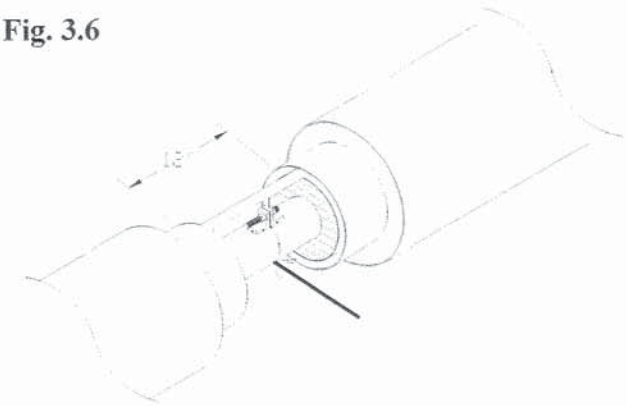


Fig. 3.6



BRIDGE METHOD

This method of cold springing allows cold springing to be done before anchors are poured in concrete.

1. Make sure that exactly 12" is maintained between the ends of the inner conduit casing.

2. Weld an angle iron "Bridge" between the conduit ends. The bridge should be welded on the inside of the conduit at 12 o'clock. This is to prevent interference while installing the connector band and yet maintain drainage of the conduit system. Make sure that a 12" gap is maintained between all conduit ends. Also make sure that the distance to be cold sprung is left between the pipe ends. See Figures 3.4 and 3.5.

3. Install a "bridge" at every field joint in the run of pipe, including the joint to be cold sprung. I.E. anchor to end seal or gland seal, and anchor to anchor.

4. Weld angles with holes and run a piece of threaded rod through the holes and tighten. Weld the carrier pipe as with the standard cold springing instructions in Section 3A. See Figure 3.6.

5. Leave the bridges in place. Insulate joints and install connector bands per Section 6.

6. For inner conduit casing sizes 12¾" and larger, put two bridges, one at 3 o'clock, and one at 9 o'clock.

SECTION 4: FIELD ALTERATION OF SPOOL PIECES

Although the ROVANCO spool pieces have been fabricated in accordance with contractor field measurements, sometimes obstructions or errors can require field alteration. Prior to making any field alterations, contact ROVANCO's Customer Service Department in Joliet, Illinois (815) 741-6700, so that we can instruct you in this process, and insure that the resulting layout will function properly. This prior notification will also maintain the ROVANCO warranty.

SECTION 5: INSULATING FIELD JOINTS

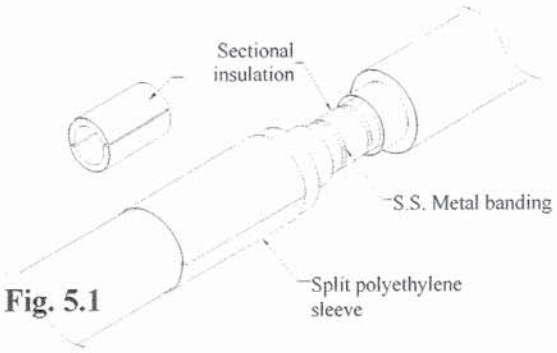
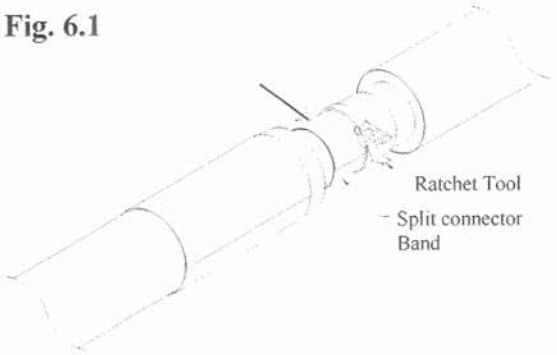


Fig. 5.1

After the hydrostatic test has been completed, insulate the field joints. Sectional insulation has been provided in the cartons. Cut this insulation to length plus a 1/2" as required for each field joint and fasten with two stainless steel bands and clips, which have been provided by ROVANCO. See Figure 5.1.

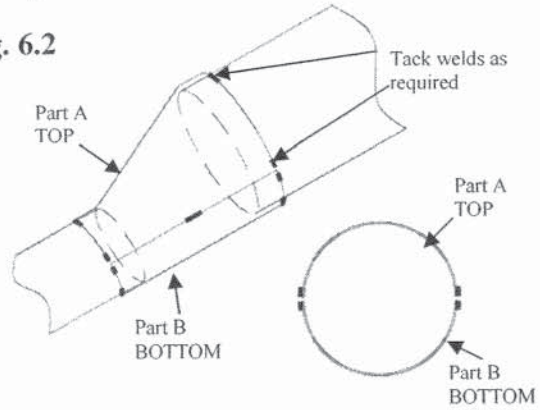
SECTION 6: WELDING AND AIR TESTING OF CONNECTOR BANDS AND REDUCTION CONES

Fig. 6.1



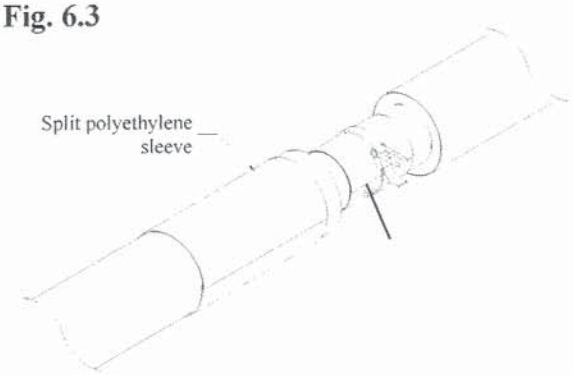
The connector bands are provided in two sections. The top half is A#, and the bottom half is B#. The A and B pieces should have the same number. The length of each band is 15" to allow an overlap on your 12" joint area. After centering the top half over the joint area, place one tack on each side of the connector band, apply the bottom half and tighten with a ratchet tool. After tightening, tack the bands in several other places so it will not loosen. Then weld all seams on the connector band. See Figure 6.1 & 6.2

Fig. 6.2



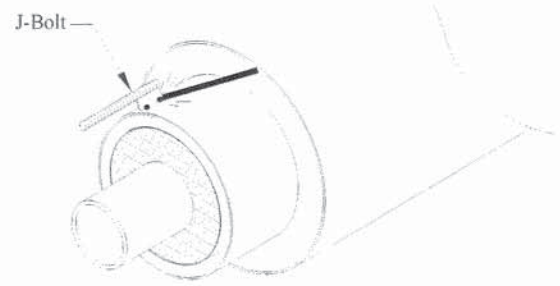
In some areas of a piping system the outer jacket may be larger than the adjacent pipe. In those situations the connector band will be supplied as an eccentric reducer sleeve. The reducer sleeve is supplied in two segments, See Figure 6.3. The two sections are assembled around the joint area and adjusted to "fit up" to each other. The ratchet straps are applied to hold both sections in position so they can be tacked up. After both segments are tacked up so they cannot move, the ratchet straps are removed and all seams are welded air tight

Fig. 6.3



After all connector bands are welded, a 15 psi air test should be put on the inner conduit casing **prior to pouring thrust blocks or backfilling the system**. Each connector band, gland seal, and testing apparatus should be checked for leaks with a soap and water test. If bubbles appear, a leak exists. Note: depressurize prior to repairing leaks. If you try to repair with the pressure on, you are subject to blowing a larger hole at the leak area. After leaks are repaired, retest the system. Re-soap the repaired joints to insure that the leak has been fixed.

Fig. 7.1

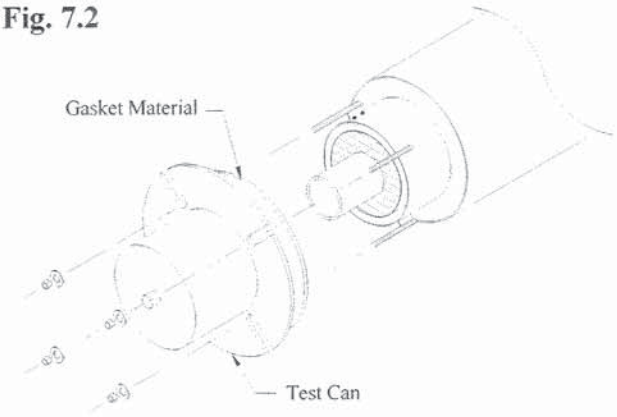


If possible, install the entire system before air testing. ROVANCO can furnish test cans in case you need to do an air test on only part of the system or in case you have an area where a watershed is to be installed.

SECTION 7: TEST CAN APPLICATION

Remove any burrs on conduit ends that may have been caused by removing the shipping bar to insure a proper seal. J bolts are then welded to the outer edge of the conduit. See Figure 7.1. The test can butts up to an open end unit, is sealed with a gasket, and tightened down with bolts. Attach a safety chain around the test can, and to other end of conduit. See Figures 7.2 and 7.3.

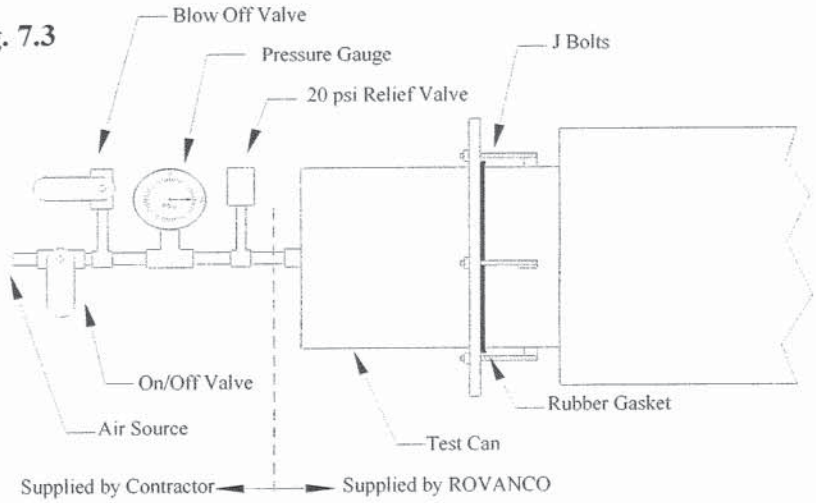
Fig. 7.2



CAUTION: No one in the area is to step in front of the test can during pressurization.

After testing is complete, remove the test can and gasket and cut the J bolts off of conduit and grind or file down any burrs.

Fig. 7.3



SECTION 8: IINSULATION AND SEALING OF THE INNER CONDUIT CASING

After testing is complete, insulate the joint with either sectional insulation or poured in place foam insulation.

Fig. 8.1

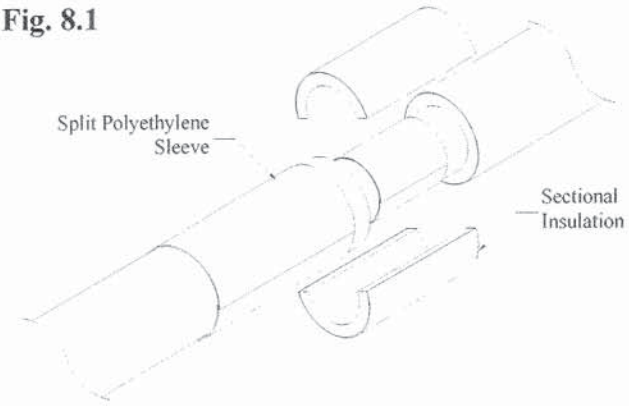


Fig. 8.2

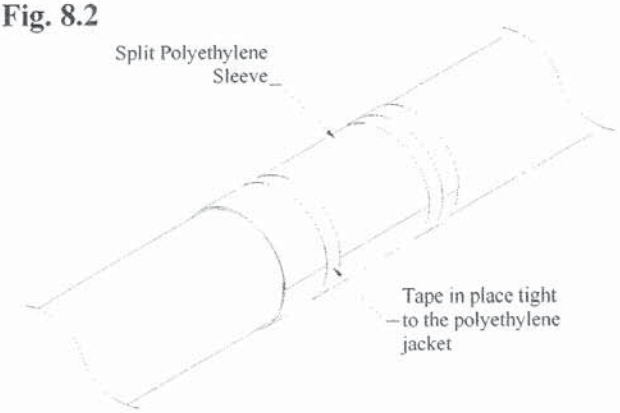
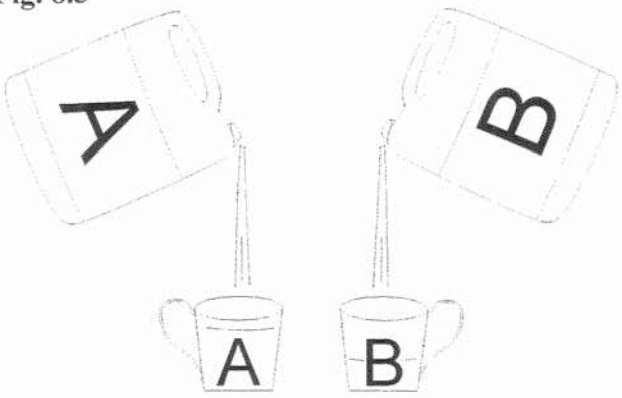


Fig. 8.3



Mid-Temp (2) parts "A" to (1) part "B"
Polyurethane (2) parts "A" to (1) part "B"
("A" is a different product for the two foams, where "B" is the same product in both Mid-Temp and Polyurethane

8A. Sectional Insulation

For sectional insulation, measure each joint area and cut the insulation to fit. Band in place and cover with the polyethylene sleeve provided. Fit sleeve tightly around the polyethylene jacket and tape in place prior to applying the shrink wrap. A wrap around shrink sleeve must be heated and shrunk over the split polyethylene sleeve. This material is 34" wide and should be centered over the joint area. This is necessary to protect the joint, and insure a water tight system. A closure strip will be shrunk over the longitudinal seam.

8B. Poured in Place Foam Insulation

1) Do not begin the foaming process until you have read and understand the foaming process. Prepare the joint to be insulated following the procedures outlined in the piping system installation instructions included with your shipment.

2) Label your measuring cups with the letters A & B to prevent a mix-up later on. Examine the mixing charts on page 10, then pour the correct amount of A & B agents into the separate measuring cups. See figure 8.3. Make sure to have the right size joint from the table. Some larger sizes require two or three separate pours.

3) Pour the measured amounts of A & B material into a mixing cup. See figure 8.4.

Fig. 8.4

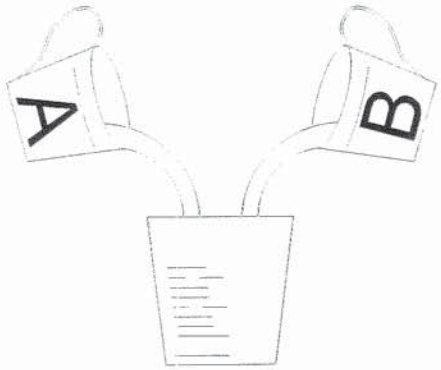
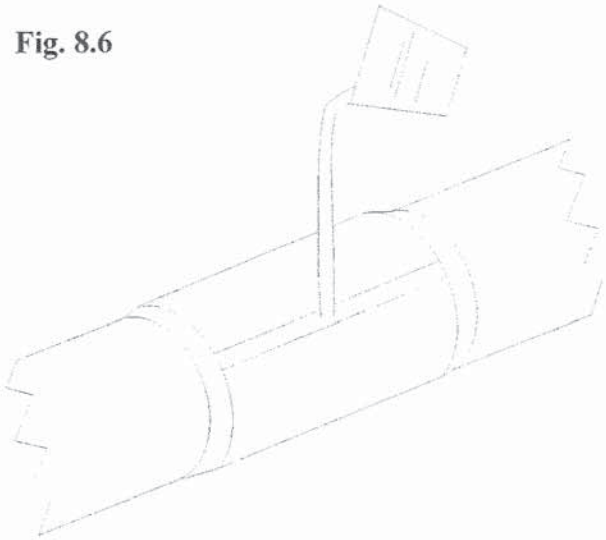


Fig. 8.5

4) Using an electric drill with the mixer head attachment provided, mix the components for twenty seconds. In temperatures above 70 degrees mix for 12-15 seconds. See figure 8.5. The cream time is shown on the graph below. Spin the mixing bit clean in an empty cup or box. If foam build up occurs it can be cleaned off with a utility knife or similar tool after it has curred.

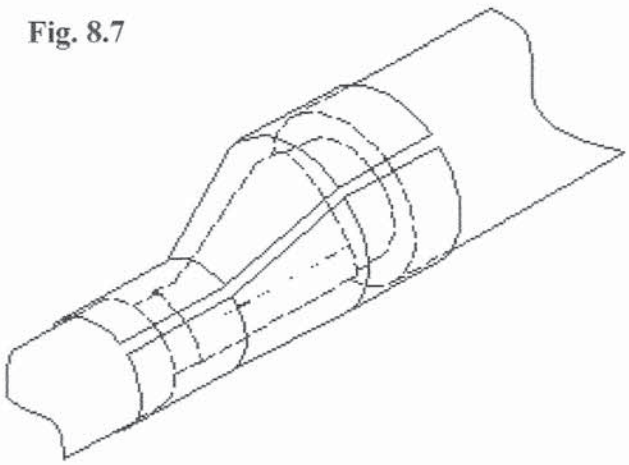
5) Pour the mixed foam into the mold which you are insulating. See figure 8.6.

Fig. 8.6



6) Insulate and seal the reduction cone the same as for the straight joint. See figure 8.7

Fig. 8.7



Note: For best results, store and maintain A & B components as close to 70 degrees (f) as possible. In temperatures below 70 (f), for best performance, pre-heat pipe and molds. Read M.S.D.S thoroughly, you are using chemicals which could present a hazard if used improperly. This page illustrates the proper mixing quantities for Parts A & B of the Mid-Temp Foam and Polyurethane Foam Kits. Please use these charts when mixing your quantities of foam.

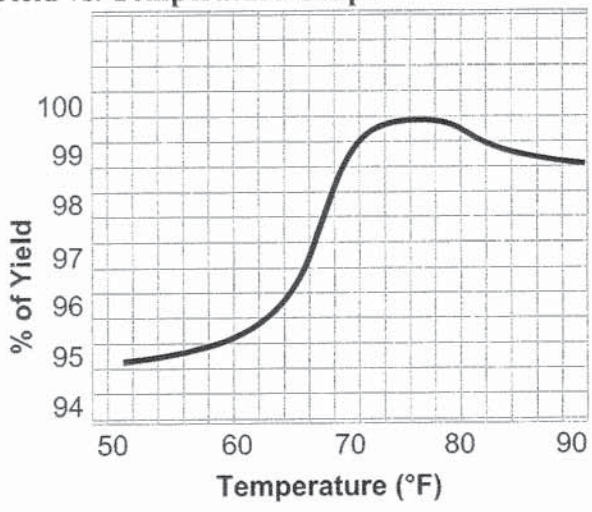
Mixing Table for Mid-Temp Foam

Cross Section		Straight Joint	
Inner Conduit	Jacket	Cup "A"	Cup "B"
6"	10"	4	2
8"	12"	4 3/4	2 3/8
10"	14"	5 1/2	2 3/4
12"	16"	7	3 1/2
14"	18"	8 3/4	4 3/8
16"	20"	10	5
18"	22"	11	5 1/2
20"	24"	12	6
22"	28"	20 1/2	10 1/4
24"	28"	14	7

Mixing Table for Polyurethane Foam

Cross Section		Straight Joint	
Inner Conduit	Jacket	Cup "A"	Cup "B"
6"	10"	4	2
8"	12"	4 3/4	2 3/8
10"	14"	5 1/2	2 3/4
12"	16"	7	3 1/2
14"	18"	8 3/4	4 3/8
16"	20"	10	5
18"	22"	11	5 1/2
20"	24"	12	6
22"	28"	20 1/2	10 1/4
24"	28"	14	7

Yield vs. Temperature Graph



Cream Time vs. Temperature Graph

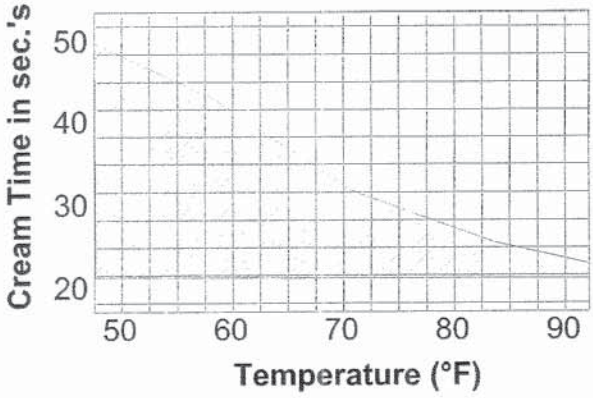


Fig. 8.7

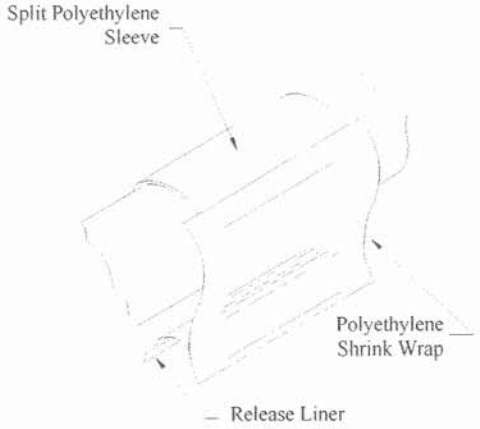


Fig. 8.8

Fig. 8.9

8C. Applying the Shrink Wrap

Tools needed: (Not supplied by ROVANCO)

- Turbo Torch or Rosebud tip propane
- Gloves
- Utility Knife
- Tape

1. Weld the inner conduit casing, air test, and insulate the joint as required per specifications. Tape the polyethylene split sleeve tightly in place. Then cover the polyethylene split sleeve with the shrink wrap. The polyethylene jacket must be dry and free of moisture before applying shrink wrap.

2. Wrap around shrinks must be cut to length for each joint size. See the table on page 13.

3. The release liner on the cut piece of shrink wrap, center it over the joint to assure proper alignment and centering over the polyethylene sleeve.

4. Peel back the release liner approximately 6". Press the shrink to the far side of the top of the pipe at approximately 11 o'clock. See Figure 8.7.

5. Wrap shrink around the joint, removing the release liner as it is wrapped around the split polyethylene sleeve. Leave release liner on the last 12" of the shrink and allow it to hang free. See Figure 8.8.

6. Heat the area to be overlapped with the propane torch, pressing down firmly to create a good bond. Be sure to wear gloves during this process. Move the torch rapidly, take care not to apply direct heat to the polyethylene jacket or too much heat to one area of the shrink material. See Figure 8.9.

Fig. 8.10

Fig. 8.11

7. Remove remaining 12" of release liner and complete the wrapping operation. Heat the overlap slowly, removing wrinkles. See Figure 8.10. Center the closure strip over the overlap and press down firmly. Heat until well bonded. See Figure 8.11.

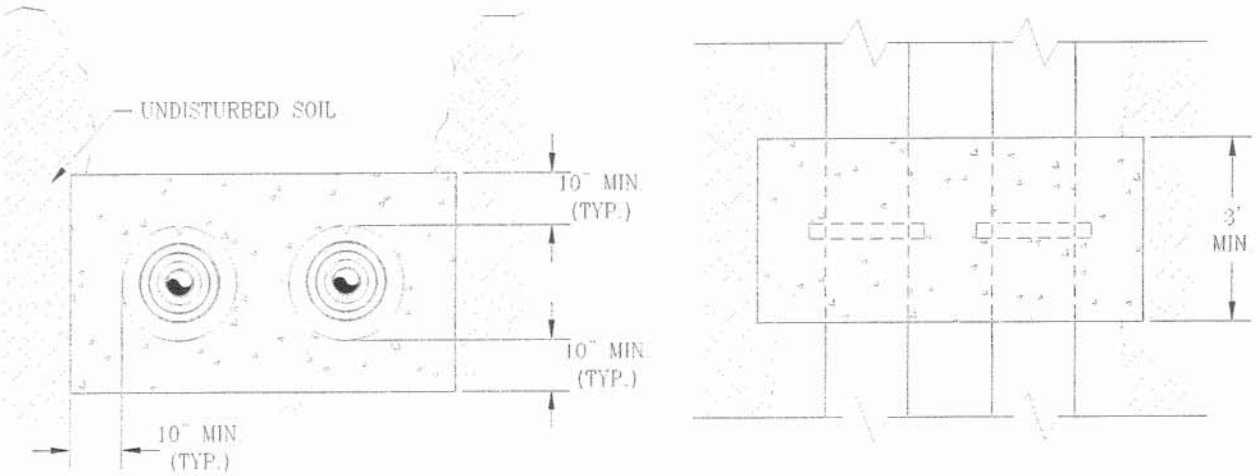
8. Starting in the center continue shrinking the sleeve toward one end until about 2" are left. Aim torch inward toward the underside to bring the remainder down. Follow the same steps for the other end of the sleeve.

9. Check sleeve overlaps to insure no wrinkles or voids remain. A ½" bead of mastic will appear at the ends of the shrink wrap if all the material has been shrunk.

Shrink Wrap Cut Length Chart				
Jacket Pipe Size	Cut Length		Jacket Pipe Size	Cut Length
6"	2'-1"		22"	6'-3"
8"	2'-7'		24"	6'-10"
10"	3'-2"		26"	7'-4"
12"	3'-8"		28"	7'-10"
14"	4'-2"		30"	8'-4"
16"	4'-8"		32"	9'-0"
18"	5'-3"		34"	9'-5"
20"	5'-9"		36"	10'-0"

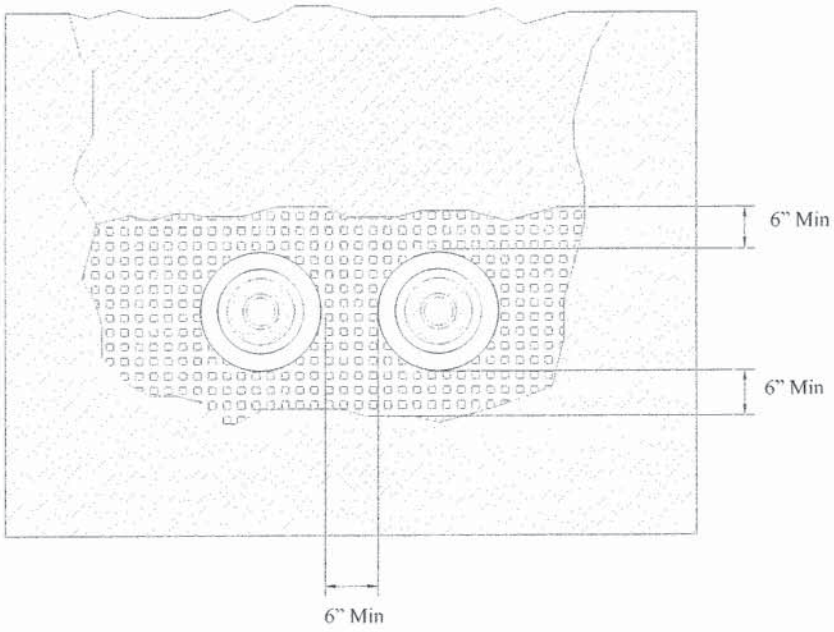
SECTION 9: POURING CONCRETE ANCHORS

ROVANCO recommends that the forms for the concrete anchor plates be done with sandbags or wood. These forms do not need to be stripped. The block should be 10" larger than the anchor plate, and 3' thick. See Figure 10.1. Make sure that the block is large enough to anchor it to undisturbed earth.



SECTION 10: BACKFILLING THE SYSTEM

The first foot of backfill must be free of frozen soil, rocks or other debris. ROVANCO recommends the use of clean backfill material without sharp stones. If the project specifications require a specific backfill material, we recommend the installer follow the specification. Hand tamp in 6" layers to six inches above the conduit. After the 6" of cover is obtained, native backfill can be used to grade, compacting in 12" layers. See Figure 11.2. Field tests for density of soil compaction shall be performed in sufficient number to ensure that the specified density is obtained.



SECTION 11: DRYING INNER CONDUIT CASING

If the insulation in any section of the conduit should get wet, make note of the location. After the line is put in service and the internal pipe is heated from the boiler, force air through the air space with a portable compressor at not less than 3 cfm. Pump the air in through the vent at the high end of the system, and force out of the drain at the low end. Vent and drain plugs are located at end seals and gland seals. This will push out any water and force moisture out of the system.

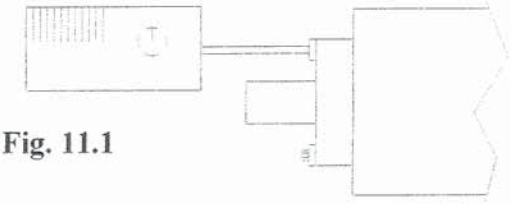


Fig. 11.1

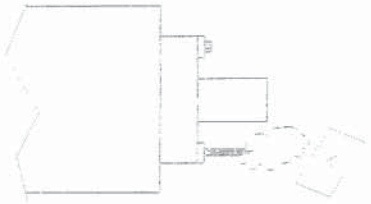
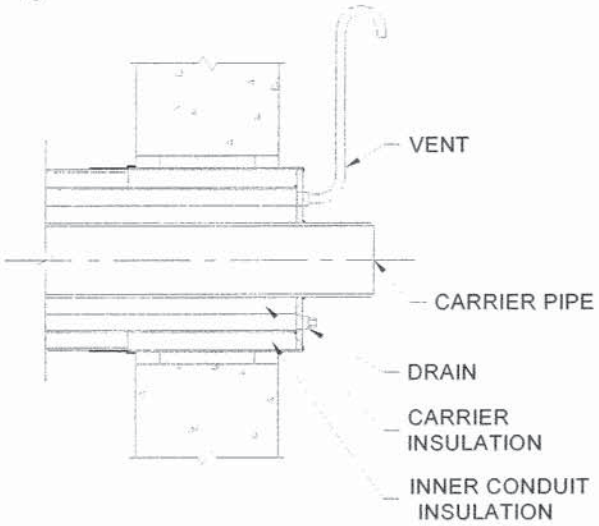


Fig. 11.2

CAUTION: personnel not to stand in front of the drain during the drying process to avoid the possibility of scalding.

The line is dry when you can not fog a cool mirror with the air coming out of the conduit at the low end drain plug. Drying time of insulation will vary with the amount of saturation, and the type, size, and thickness of the insulation. After the system is dry, pipe up the vents at the ends of the system with a goose neck and leave open for venting. Close the drain plugs at all ends of the pipe system. See Figures 11.1 and 11.2.

Fig. 12.1



SECTION 12: MANHOLE OR BUILDING ENTRIES

See Figure 12.1 for the proper building entry or manhole entry detail. Also, as mentioned in the previous section, be sure before turning the job over to the owner that the vent on each end of the system is piped up above any potential water level and goose necked for venting. This is done so that water can not get high enough to enter the system. The vent piping is not supplied by ROVANCO. The drains should remain closed. It is recommended that at least 3" of the polyethylene jacket enter through the wall before our system ends.

SECTION 13: OPERATION AND MAINTAINANCE OF STEAM CONDUIT

Annual: Remove the drain plugs to check for the presence of water in the air space yearly. When removing the drain plug, be alert for a possible steam flash. If water is found follow the repair procedure outlined below. The drain plugs must be replaced after the inspection to insure water does not inadvertently enter the air space from a flooded manhole or mechanical room.

CAUTION: Extreme caution must be exercised when entering steam manholes and opening vents and drains.

Also do an air test of the conduit yearly. Using an air compressor, pressurize the air space to 15 psig and hold for one (1) hour. If the pressure can not be maintained, see the repair procedure below.

Repair: If a leak in the casing is found, it should be repaired, tested, coated, and backfilled as it was originally installed.

If a leak in the carrier pipe is found, at least a 2' section of pipe should be removed and replaced. The carrier pipe should then be hydrostatically tested at 1½ times it's operating pressure, not to exceed 500 psig. Re-insulate the carrier pipe as specified. Repair the inner conduit casing using a split sleeve, similar to the connector band used in assembling the field joints. Air test the inner conduit casing, then insulate as specified. Cover with a polyethylene sleeve and seal with a wrap around shrink sleeve..

Insulation: If insulation within the conduit becomes wet, then force ventilate the air space in the system at a rate of not less than 3 cubic feet per minute, and apply heat through the internal piping. Introduce the air through the system's high point vent, and force out the low point drain. Caution personnel regarding the possibility of a steam flash out of the low point drain while air is being forced through the system. Place a cool mirror at the exhaust point for a short time at appropriate intervals and position to indicate maximum fogging due to moisture. Continue ventilation until the mirror exhibits no visible fogging.

System shut down: If the system is shut down for any length of time, seal the system vents by plugging the goose neck or removing it and installing a plug. Purge with dry nitrogen be fore sealing system. The vents must be opened and the goose neck replaced before the system is turned on again. This will prevent moisture entry during shutdown.

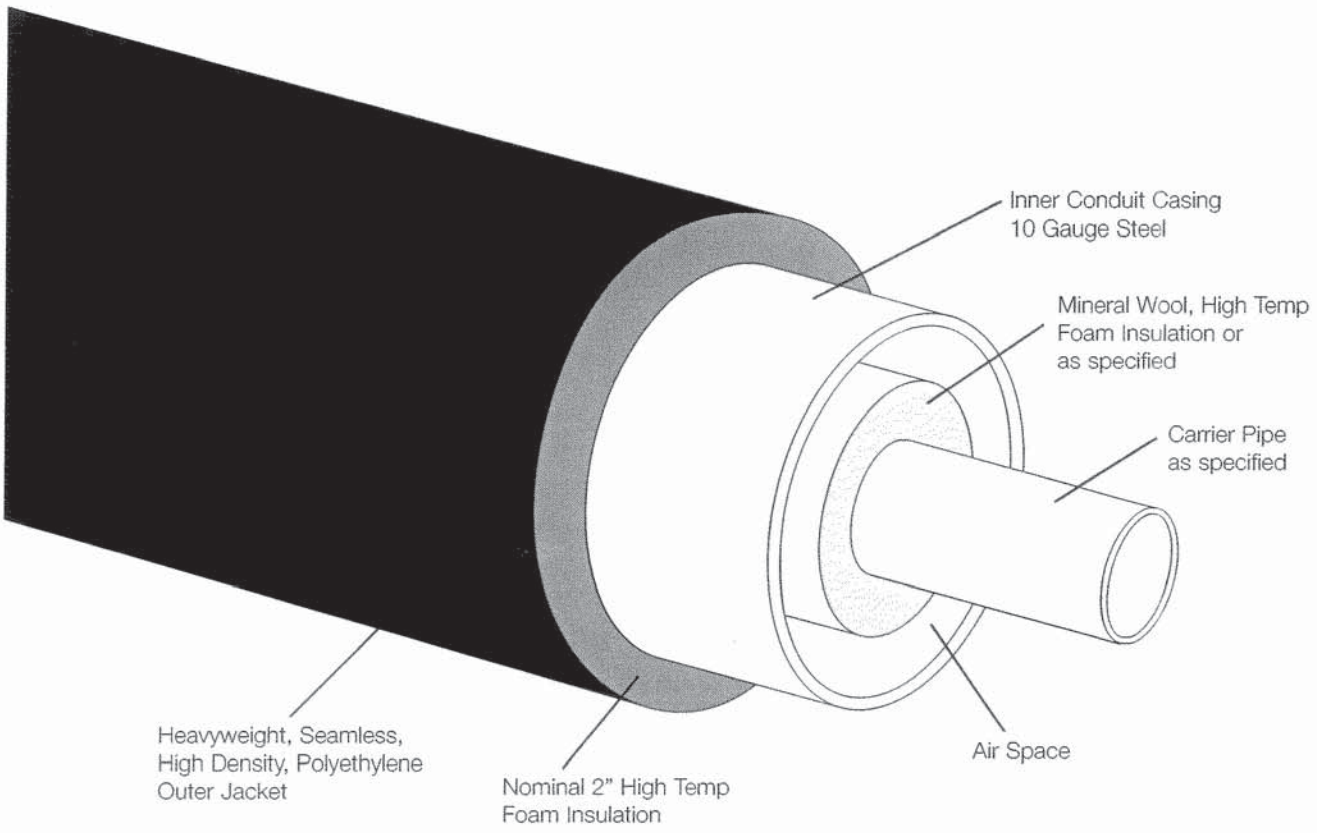
Manholes: Automatic sump pumps, if any, should be thoroughly inspected for proper operation annually. Steam traps, if any, should be routinely inspected and/or replaced, based upon the recommendations of the manufacturer. All flanges should be checked for leakage and tightened if necessary. Any evidence of groundwater leakage should be investigated and repaired. Gland seals, end seals, and the inside wall of prefabricated steel manholes should be routinely inspected for leaks and/or corrosion. Sand and repaint any corrosion to match the existing coating. Check valves routinely for leaks and repack when necessary. Insulation and jacketing of internal piping and equipment should routinely be checked and replaced when necessary.

If you have any questions about anything in this instruction manual, or have any difficulty in completing the work please feel free to contact ROVANCO's Customer Service Department at our main office in Joliet, Illinois (815) 741-6700.

Thank you once again for showing your confidence in ROVANCO by purchasing our High Temp Insul-8 products. We want you to know that we have a full line of pre-insulated and pre-fabricated piping systems for almost any temperature, pressure, or site condition.

If you are not familiar with our complete product line and you would like to know more about our product or would like to have our local Manufacturer's Representative call on you, call ROVANCO at (815) 741-6700 or write us at 20535 S. E. Frontage Road, Joliet, Illinois 60431 or find us on the World Wide Web at http://www.rovanco.com or email us at marketing@rovanco.com

Insul-800 High Temp Conduit *by Rovanco*



Rovanco's Insul-800 High Temp Conduit is designed for below ground high temperature systems (210°F and above). It is Drainable, Dryable and Air Testable. The product is composed of a steel, copper or stainless steel carrier pipe, mineral wool or high temp foam insulation. The insulated pipe is enclosed in an inner conduit casing of a 10 gauge steel which is insulated with a high temperature foam insulation, rated for 400°F continuous service. The outer layer of foam insulation is protected by a heavyweight, seamless, high density polyethylene outer jacket. This combination results in an economical, high quality, high temp system, and the most energy efficient available. Since the system has a polyethylene outer jacket that is non-corrosive, the system does not require cathodic protection.

Rovanco's systems are engineered to the latest edition of ANSI B31.1.

Rovanco's Insul-800 High Temp Conduit is provided with part numbered cut-to-length pieces manufactured to verified field dimensions. All piping systems are spooled out with elbows, tees, anchors and end seals added to lengths of pipe at Rovanco's Joliet, Illinois factory.

The piping system comes complete with all accessories of steel sleeves, joint insulation, and polyethylene shrink sleeve to make the installation completely watertight.

To find out more about Rovanco's Insul-800 High Temp Conduit system, you can call your local representative, phone us at (815) 741-6700, fax us at (815) 741-4229, visit our web site at www.rovanco.com or e-mail us at marketing@rovanco.com.

STANDARD SPECIFICATIONS

INSUL-800 HIGH TEMP, PRE-INSULATED CONDUIT SYSTEM FOR STEAM, HIGH TEMP HOT WATER, CONDENSATE, ETC.

Carrier Pipe

All carrier pipe shall be carbon steel A-53-B 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.)

Carrier Pipe Insulation

Shall be sectional mineral wool with K factor of .29 at 200°F. Sectional insulation shall be banded on pipe with stainless steel banding on 18" centers. Insulation thickness shall be as specified or recommended by system supplier.

Optional Carrier Pipe Insulation—High Temp polyisocyanurate. Same as specified below for Inner Conduit Casing Insulation.

Inner Pipe Supports

All pipe shall be aligned and supported within the inner conduit casing with galvanized steel supports spaced on 10' centers. The carrier pipe shall not bear directly on the steel support. The support shall be designed to permit drainage and free air passage. All pipe passing through supports shall be insulated.

Inner Conduit Casing

Casing shall be 10 gauge black steel. The interior surface shall be smooth to permit free moisture drainage and removability of the inner assembly. The outer casing shall be sized to provide an adequate annular space between the outer surface of the insulation material and the interior surface of the casing. Inner conduit casing field joint closures shall consist of 10 gauge steel and shall be field welded over adjacent units.

Inner Conduit Insulation

Insulation thickness shall be 1 3/4" minimum.

High-temp polyisocyanurate insulation applied to the inner conduit casing shall have the following properties:

Minimum Density:	2.0 pcf per ASTM D 1622
Closed Cell Content:	90% per ASTM D 2856
Compressive Strength:	30 PSI per ASTM D 1621

K factor

• Initial @ 75°F Mean Temperature	0.130
• @ 200°F Mean Temperature	0.235
• Aged @ 400°F for 28 days	0.220
• @ 400°F Service Temperature and 75° Amb	0.240

Dimensional Stability—% change per ASTM 2126
400°F Exposure of 2" cube foam sample

• 1 Day + 1.3% length	+0.1% Volume
• 7 Day + 2.3% length	-2.3% Volume

450°F Exposure of 2" cube foam sample

• 1 Day + 10.31% length	+14.6% Volume
• 7 Day + 7.1% length	+1.5% Volume

Insulation must be capable of handling intermittent temperature spikes to 450°F for 8-12 hours. Insulation must completely fill the annular space between the inner conduit casing and HDPE jacket. System supplier shall provide written temperature performance certification from foam insulation manufacturer and an Indpendent Testing Agency Report and Certification that the insulation to be provided meets the above referenced performance standards.

Outer Jacket

The exterior protective jacket shall be heavyweight, seamless, minimum .175 mil thickness, high impact, polyethylene conforming to ASTM D1248 & D3350. Field joints shall be insulated and covered with a polyethylene sleeve the same thickness as the outer jacket. The joint will then be sealed water tight with polyethylene heat shrink material.

Expansion Loops and Els

Expansion loops, expansion elbows and other fittings shall be pre-fabricated and furnished in the same types and thickness of insulation and casing as those for the straight section of the piping system. They will be of a size to permit the inner pipe or pipes to expand and contract without damage to the insulation material.

Fittings

All changes in direction of the carrier pipe shall be made with fittings. Mitering of pipe will not be permitted. When tee branches are smaller than the main they join, weld-o-lets may be used. All weld fittings shall be the same wall thickness as adjacent piping.

Anchors

Anchors shall be pre-fabricated onto the piping units and shall be equipped with drain and vent openings at the top and bottom of the anchor plate. Anchor plates shall be made of minimum 1/2" steel plate.

End Seals and Gland Seals

Terminal ends of conduits inside manholes, pits or buildings shall be equipped with end seals consisting of a steel bulkhead plate welded to the conduit and carrier pipe if there is an anchor within five feet of the end seal. Where there is no anchor within five feet of a terminal end, conduits shall be equipped with gland seals consisting of a high temp gasket and follower plate. End seals or gland seals shall be made of 1/2" steel plate with drain and vent openings on the vertical center line of the mounting plate.

Field Tests

The carrier pipe shall be field tested hydrostatically to 1 1/2 times the working pressure of the line or as specified. The 10 gauge steel inner conduit casing shall be tested with air at 15 psig. All leaks shall be repaired and the test repeated. After test, all field joints shall be insulated and sealed water tight.

Back Fill

Clean, granular backfill should be tamped in place so as to assure a stable surface. No rock should be used within 24" of the pipe. Top of pipe to grade shall not be less than 24" to meet H-20 Highway loading.

Installation

The installation shall be made in accordance with plans, specifications, and manufacturers' installation instructions. Pipe system supplier will provide an installation instructor on site to train the contractor in all phases of installation if required.

Approved Vendors

Insul-800 manufactured by Rovanco, Joliet, Illinois, 815-741-6700, or approved equal. Any alternative supplier wishing to be approved as an equal must submit their technical data, including HDPE outer jacket and insulation material test reports.

These reports must be certified by an independent Testing Agency that the high temperature polyisocyanurate insulation and the polyethylene jacketing material have been tested to and meet all ASTM standards listed in the "inner conduit insulation" and "outer jacket" section of the specifications. These reports must be submitted to the engineer ten days prior to bid date for an alternate supplier's product to be approved in writing as an equal to the specified products.

Copyright 2005 - Rovanco's products are covered by various U.S. patents, including but not limited to U.S. Patent #5,996,643 (Insul-800). Rovanco & Insul-8 are federally registered trademarks. Rovanco manufactures a complete line of Insul-8 engineered, pre-insulated piping systems for temperatures from -320°F to 700°F. For information on Rovanco and its Insul-8 piping systems, please contact us.

Contact Your Rovanco® Representative

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Hard Shell Fitting Cover Installation Instructions INS-SO1

Last Revision 11/20/07

This instruction manual will give you all the information needed in terms of techniques, tools, and accessories required to install ROVANCO's Foam Insul-8 system. If you follow the instructions carefully, the end result will be a high quality, foam piping system. Thank you for showing your confidence in ROVANCO by purchasing its products. We sincerely appreciate your business and we will provide you with quality products with a fair price and "great" service to deserve your future business. Please contact your local ROVANCO Manufacturer's Representative for information about all of the products provided by ROVANCO.

INSPECTION

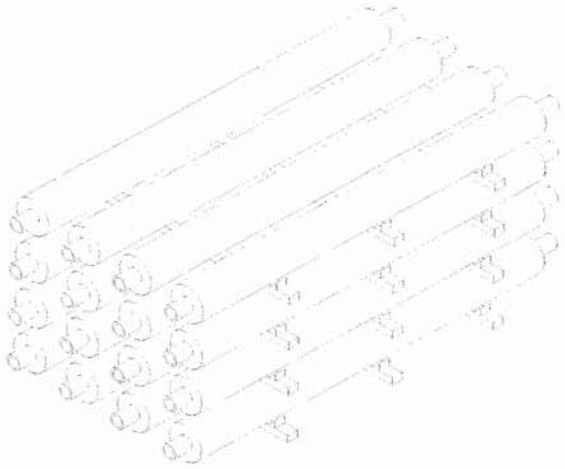
Inspect all shipments upon receipt. Examine all pipe and accessories as they are unloaded. Check to insure every item on the packing list is received. Check the contents of the cartons to insure that the materials have arrived safely. Handle all materials carefully at all times. Have the freight carrier make out a damage or "short" receipt if any discrepancies are found. Keep a signed copy of this receipt and notify ROVANCO immediately.

UNLOADING

ROVANCO Insul-8 systems are manufactured to withstand normal field handling but, like any piping, damage can occur from careless handling. If using a mechanical means for unloading, use nylon slings and spreader bars to unload the pipe. Do not use chains or chokers. If the pipe is to be unloaded by hand, it should be lifted to avoid damage to the casing from sliding on a rough surface.

STORAGE

Use dunnage material under the pipe and between successive layers to protect the casing from foreign objects. Do not stack more than four layers high to avoid excessive weight on the bottom layer. Prior to installation cover the pipe ends with a tarp or black visqueen to keep out water, excessive dust, and debris. If the pipe will be stockpiled in direct sunlight at temperature exceeding 90° F, cover the entire system with a tarp or black visqueen. Do not use opaque covers. There should be a layer of wood dunnage between the pipe and visqueen. Cartons of material (i.e. tape, glue, foam kits, fiberglass adhesives, etc.) should be stored in a dry area at 60° to 70° F. Freezing or high temperature may affect the product's ability to perform their functions.



TESTING

All carrier pipe must be hydro tested prior to insulating, pouring thrust blocks, or backfilling the system.