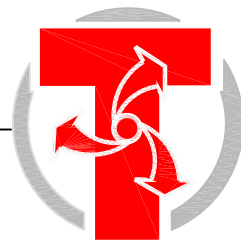
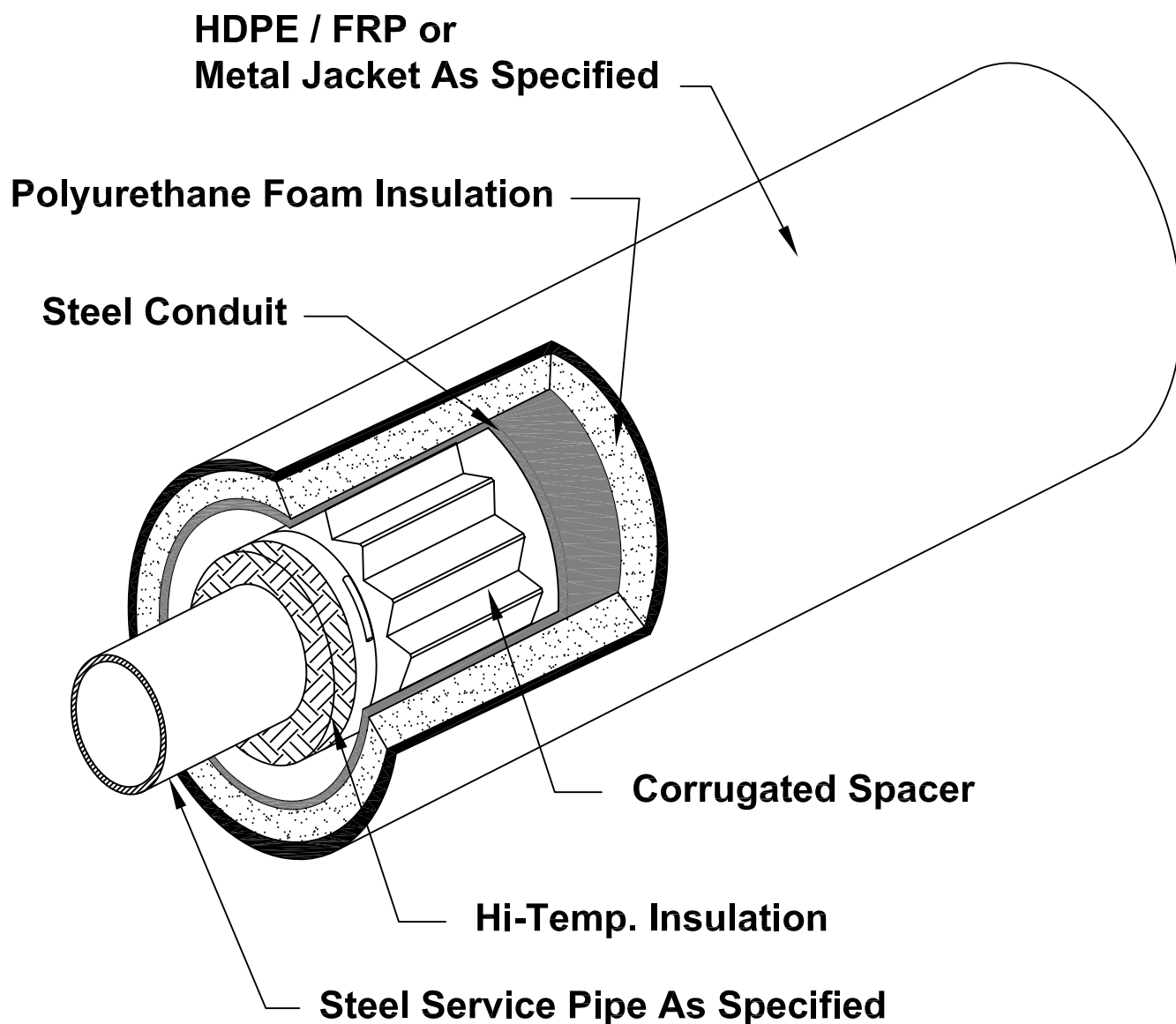


TRICON STEEL-CON PLUS PIPE SYSTEM



**Class "A" System For Applications Up To 450° F
Below And Above Ground**

- Condensate
- Fuel Oil
- Heating Hot Water
- High Temp. Hot Water
- Process Piping
- Steam



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Pipe Size	Insulation Thickness (IN)*	Steel Conduit O.D.	Outer Insulation (IN)*	HDPE Jacket O.D. (IN)	System Temperature
1"	1"	6.63"	1"	10.00"	Based on a minimum 3'-6" burial depth. 353° operating temperature, 50°F ground temperature and soil conductivity of 15 BTU-IN/HR-F ² -°F and mineral wool insulation
2"	1"	6.63"	1"	10.00"	
3"	1½"	8.63"	1½"	12.43"	
4"	1½"	10.75"	1½"	14.06"	
5"	1½"	10.75"	1½"	14.06"	
6"	1½"	12.75"	1½"	15.87"	
8"	2"	16.00"	1½"	19.80"	
10"	2"	18.00"	1½"	22.17"	
12"	2"	20.00"	1½"	24.00"	

Service Pipe:

Carbon steel service pipe shall be standard weight A53 ERW or A106 seamless beveled for welding. Condensate return piping shall be Schedule 80. All joints for pipe 2 ½" and larger in size shall be butt-welded. Sizes 2" and smaller shall be socket welded. Straight lengths of piping will be supplied with 6" of piping exposed at each end for field joint fabrication. Where possible, piping lengths shall be supplied in 40 Ft. random lengths.

Insulation: (Inner Layer)*

Service pipe insulation shall be fiberglass, mineral wool, calcium silicate, cellular glass or aerogel. The insulation will be held in place by stainless steel bands on 18-inch centers. The insulation shall be applied to a thickness as specified on the contract drawings.

Service Pipe Supports:

The service pipe within the inner-conduit shall be supported at not more than 10 feet intervals. The supports shall be designed to allow for continuous airflow and draining of the conduit system. The insulated service pipe shall not bear directly on the steel support and shall be insulated through out.

Steel Conduit: ***

The outer conduit shall be a smooth wall, spiral welded or electric resistance welded steel pipe conforming to ASTM Specification A-139/A-135. The conduit shall be of thickness as listed below.

Conduit Size	Conduit Thickness
6" – 26"	10 Gauge
28" – 36"	06 Gauge
38" – 42"	04 Gauge

Insulation: (Outer Layer)*

The outer conduit insulation shall be polyurethane foam with a minimum 1-inch thickness. The polyurethane foam shall have a minimum density of 2.0, and a closed cell content of 90% to 95% per ASTM D-2856, and shall have a "K" factor of .14 per ASTM C-177 @ 75° F.

Exterior Casing:**

The exterior casing shall be seamless, extruded High Density Polyethylene (H.D.P.E.) ASTM D-1248, with the following physical properties:
 ASTM D-3350...Resin Type III, Grade P34
 ASTM D-638...Ultimate Elongation 850%
 ASTM D-638...Tensile Yield Strength 3300 psi
 ASTM D-790...Tangent Flexural Modules 175,000 psi
No polyethylene tape casings will be allowed.

Field Joint Closures:

Conduit field joint closures shall consist of the specified inner insulation, a cylindrical 10-gauge sleeve having two (2) horizontal splits, insulation outer layer of polyurethane foam and a heat shrinkable sleeve with rockshield.

Sub-Assemblies:

Fittings, end seals and anchors shall be factory fabricated and insulated to prevent the ingress of moisture into the piping system. All sub-assemblies shall be designed and factory fabricated to allow for complete draining, drying and testing of the conduit system. All fittings larger than 2" will be made with long radius weld fittings and shall be the same wall thickness as the service piping.

Expansion Loops and Elbows:

Expansion loops and elbows shall be factory manufactured in the same manner as the straight lengths of piping. Loops and elbows shall be sized and designed to permit thermal movement of the service pipe without damage to the insulation.

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Installation:

No Piping shall be installed in standing water. Trenches shall be maintained dry until final field closure is complete. The installing contractor shall handle the piping system in accordance with the directions furnished by the manufacturer and as approved by the architect and engineer. The service piping shall be hydrostatically tested to 1-1/2 times the operating pressure, or as specified in the contract documents. The inner conduit shall be air tested at 15 psig. The test shall be maintained for a minimum time of 1 hour. **EXERCISE DUE CARE WHEN INSTALLING AND TESTING THE PIPING SYSTEM**

Backfill:

A 4-inch layer of sand or fine gravel, less than 1/2" in diameter, shall be placed and tamped in the trench to provide uniform bedding for the **Steel-Con Plus** system. Once the system is in place, the trenches shall be carefully backfilled with similar material and hand tamped in 6" layers until a minimum of 12" above the top of the preinsulated pipe has been achieved. The remainder of the backfill shall be void of rocks, frozen earth and foreign material. The trench shall be compacted to comply with H-20 Highway loading.

Accessories:

- Heat Tracing
- Leak Detection

System Options:

- Contact your Tricon representative for available sizes and system options.
- * Insulation thickness will vary depending on the type of insulation specified and the operating temperature.
- ** Optional non-metallic casings for below grade offered include, Filament Wound FRP.
- *** Optional Fusion Bonded Epoxy or Hot Dipped Galvanized coatings available for the 10-Ga. steel conduit

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Installation:

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Backfill:

A 4-inch layer of sand or fine gravel, less than 1/2" in diameter, shall be placed and tamped in the trench to provide uniform bedding for the **Steel-Con Plus** system. Once the system is in place, the trenches shall be carefully backfilled with similar material and hand tamped in 6" layers until a minimum of 12" above the top of the preinsulated pipe has been achieved. The remainder of the backfill shall be void of rocks, frozen earth and foreign material. The trench shall be compacted to comply with H-20 Highway loading.

Accessories:

- Heat Tracing
- Leak Detection

System Options:

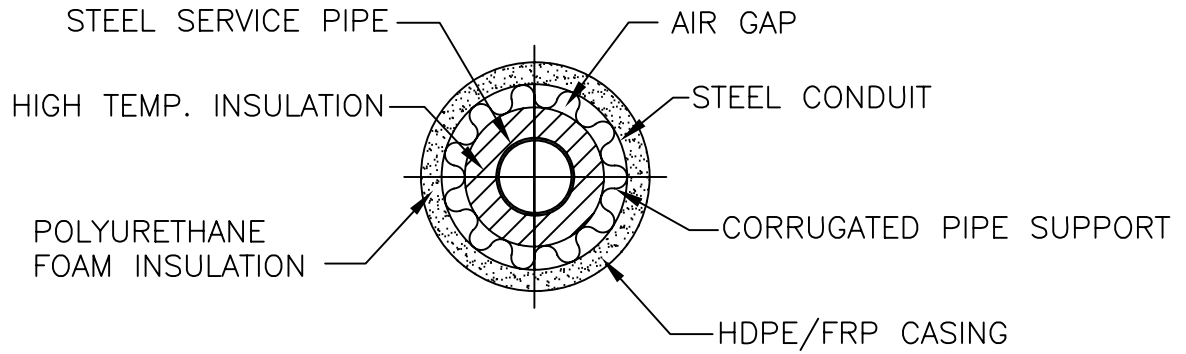
- Contact your Tricon representative for available sizes and system options.

* Insulation thickness will vary depending on the type of insulation specified and the operating temperature.

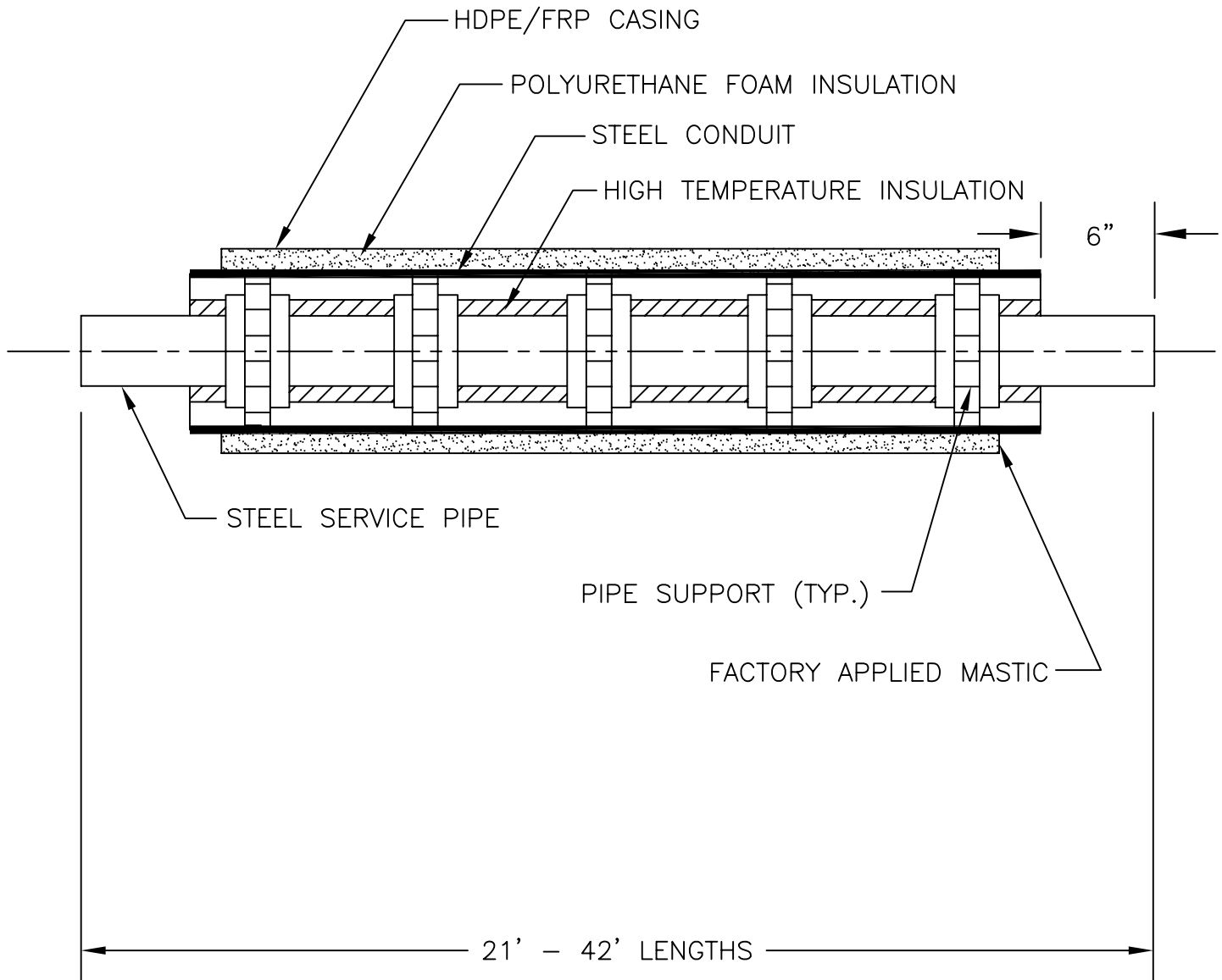
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END VIEW
NOT TO SCALE



STEEL-CON PLUS STRAIGHT LENGTH DETAIL

TRICON STEEL CON PLUS

Date: 03/09/06

Dwg. No.: SCP-1

Rev.:

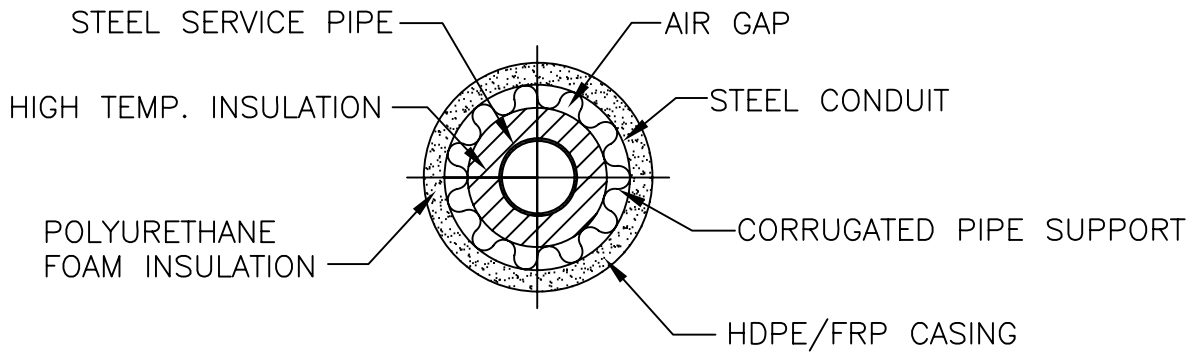


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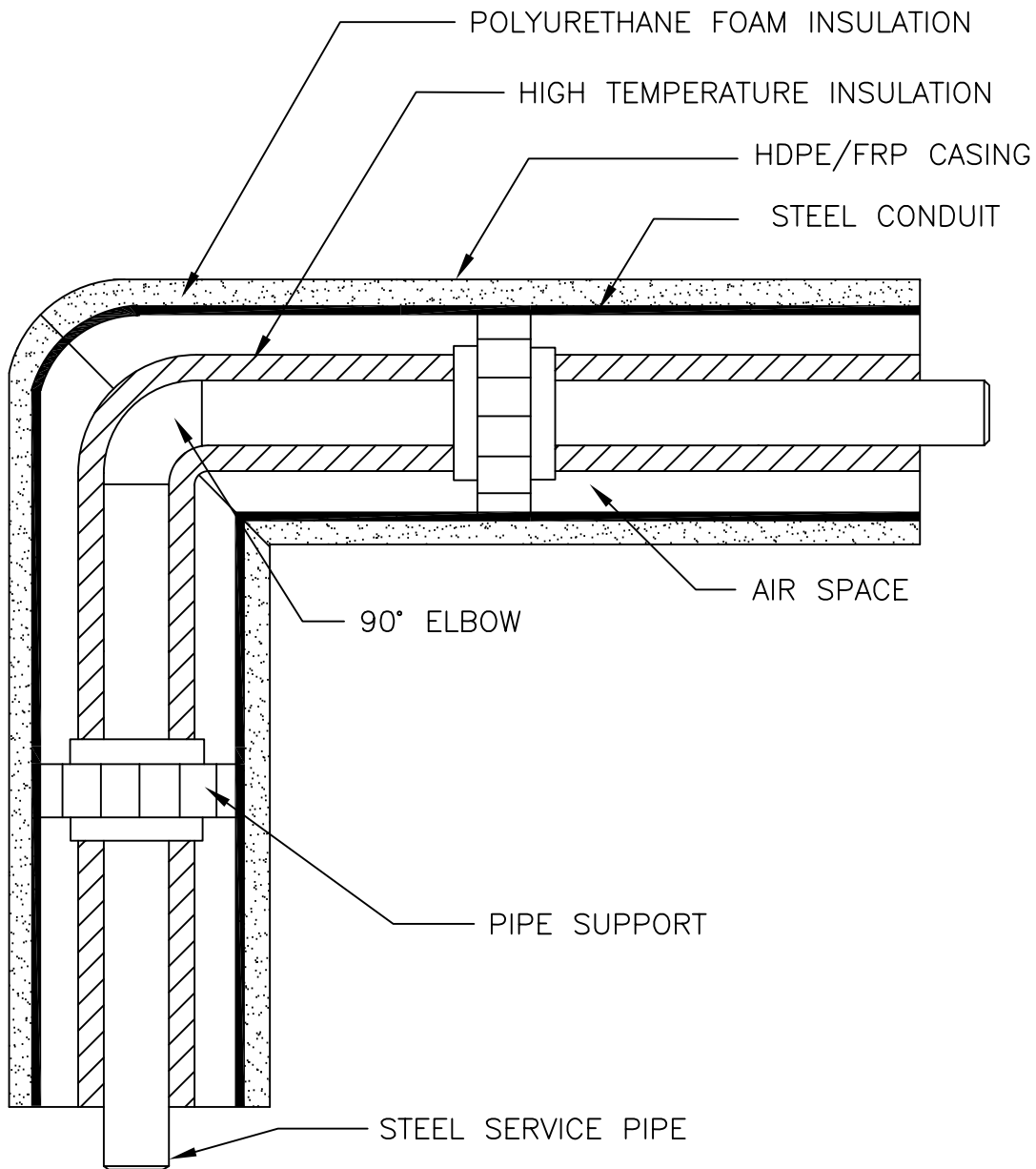
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END VIEW
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STEEL-CON PLUS 90° ELBOW DETAIL

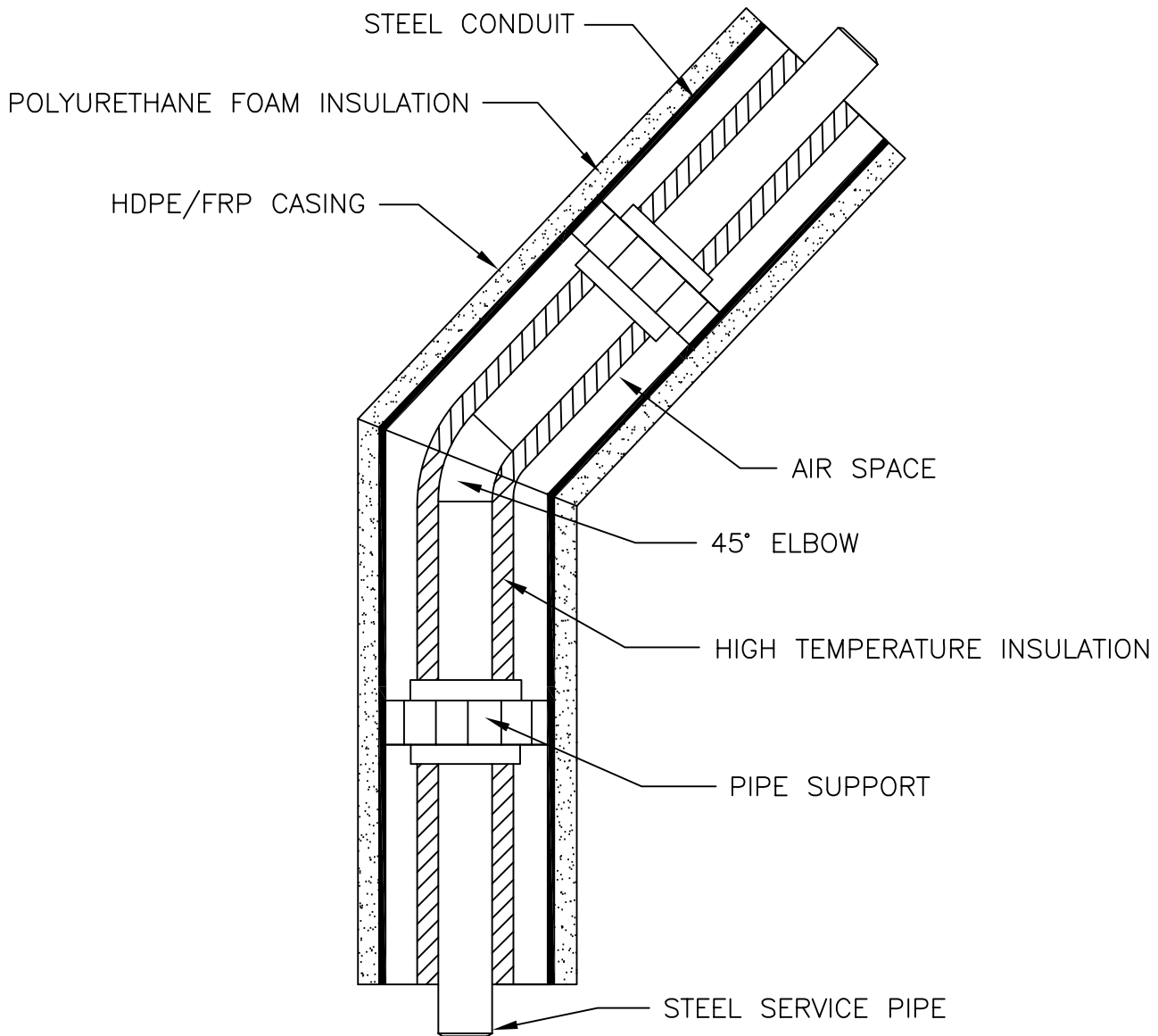
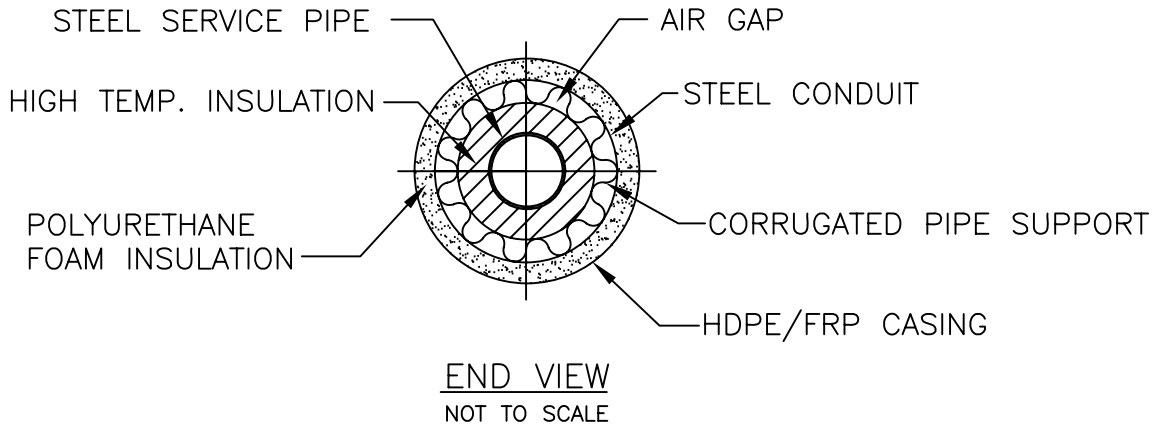
TRICON STEEL CON PLUS

Date: 03/09/06 Dwg. No.: SCP-2
Rev.:



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STEEL-CON PLUS 45° ELBOW DETAIL

TRICON STEEL-CON PLUS

Date: 03/09/06

Dwg. No.:SCP-3

Rev.:

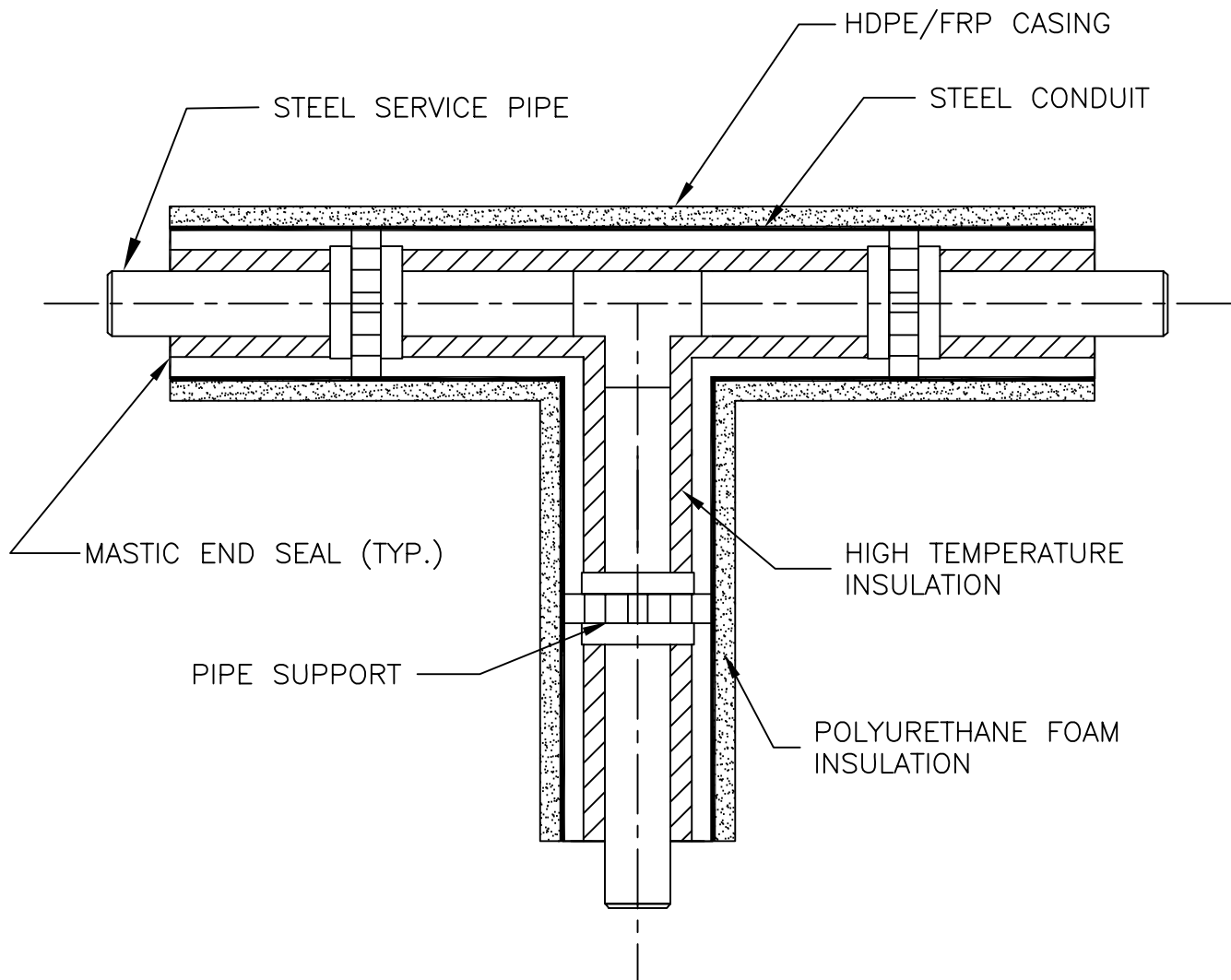
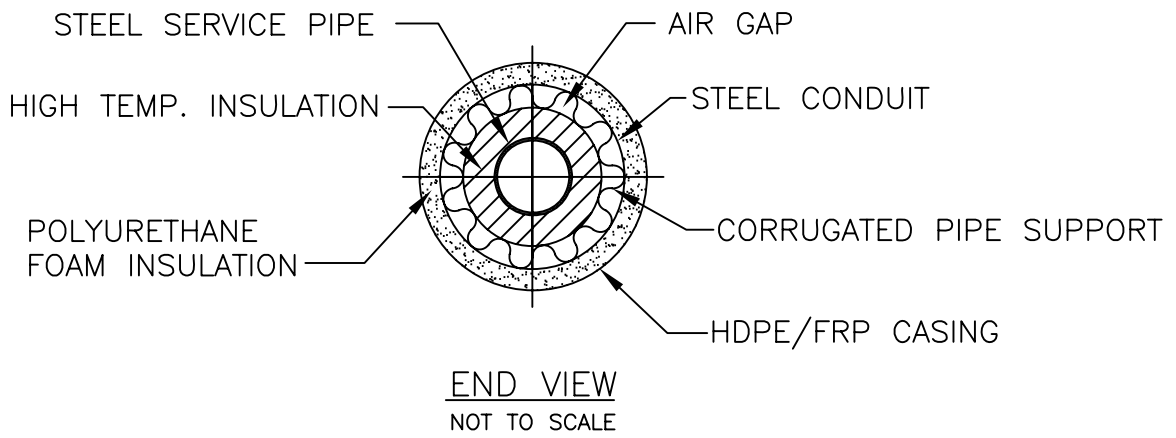


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STEEL-CON PLUS TEE DETAIL



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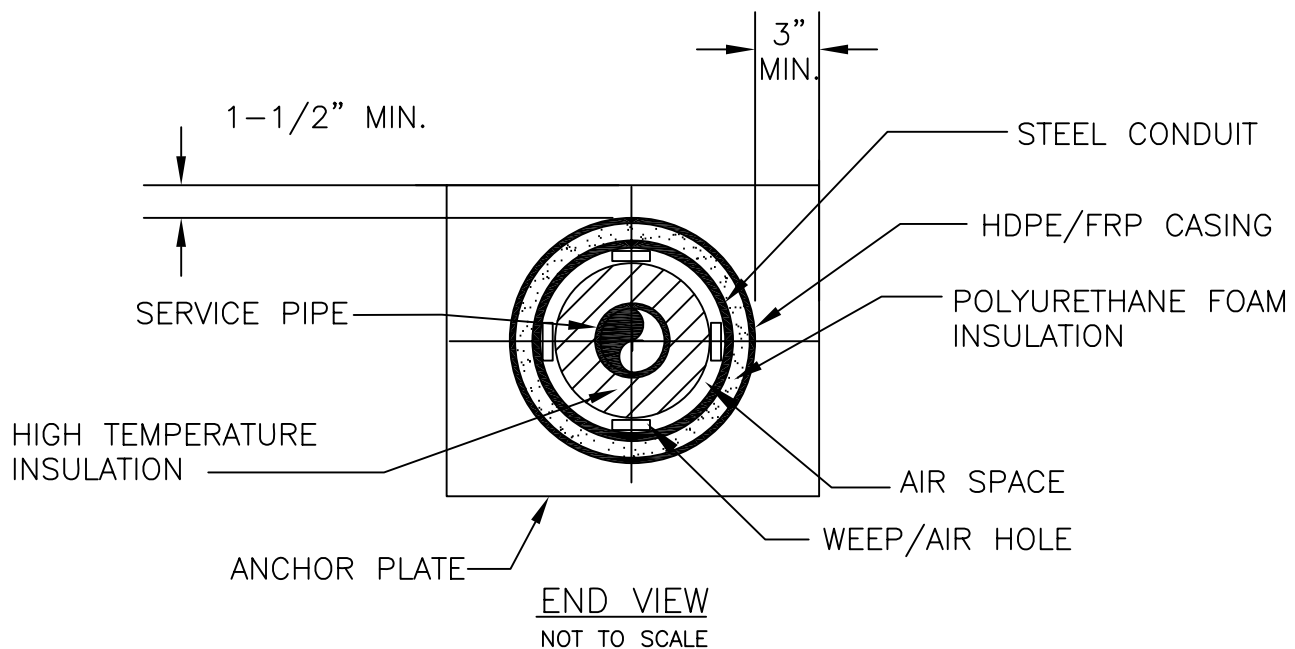
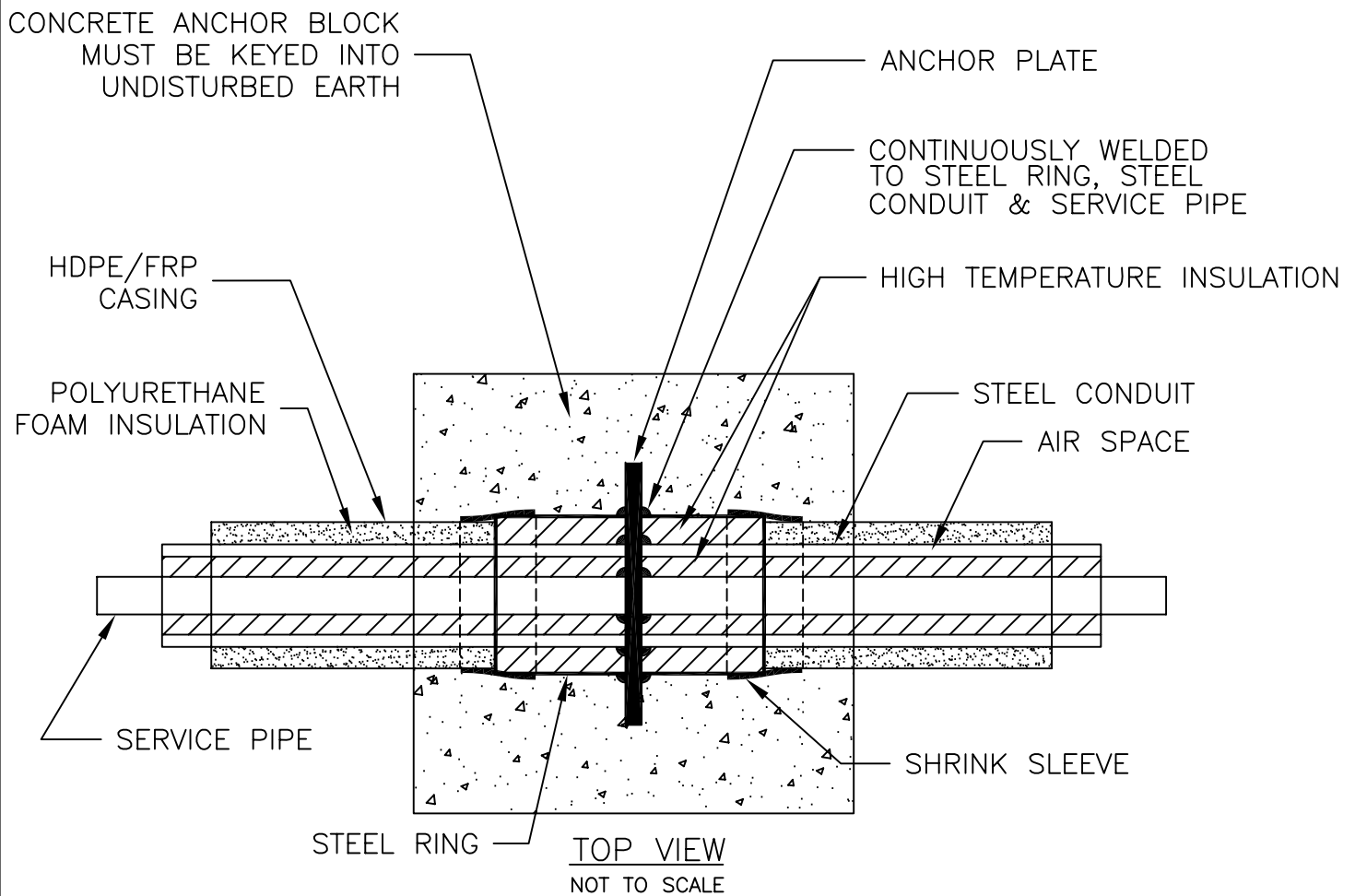
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Date: 03/09/06 Dwg. No.: SCP-4

Rev.:



NOTE: CONCRETE ANCHOR BLOCK MUST BE KEYED INTO UNDISTURBED EARTH.

STEEL-CON PLUS ANCHOR DETAIL

TRICON STEEL CON PLUS

Date: 03/09/06 Dwg. No.: SCP-5

Rev.:

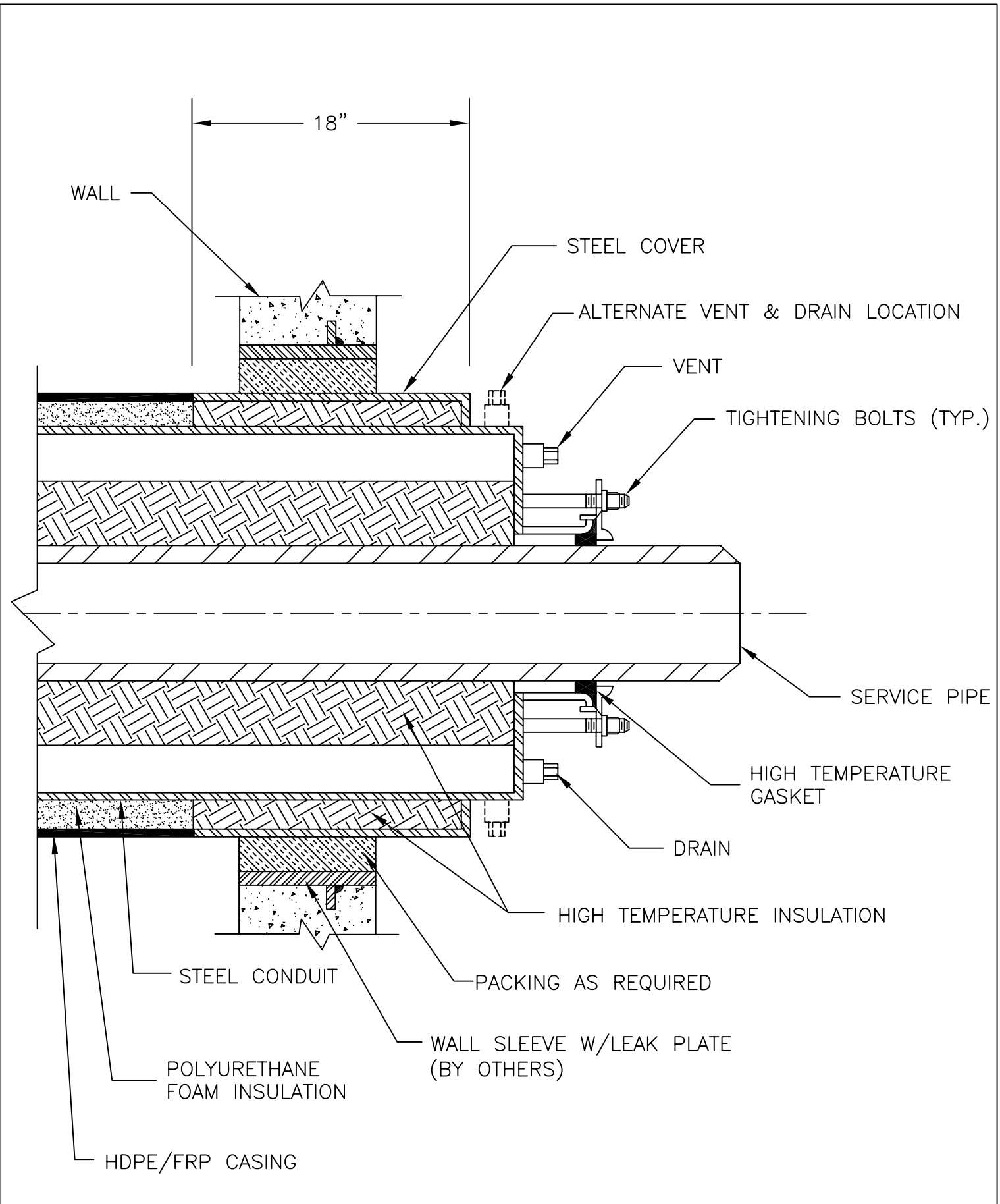


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STEEL-CON PLUS GLAND END DETAIL

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Date: 03/09/06 Dwg. No.: SCP-6

Rev.:

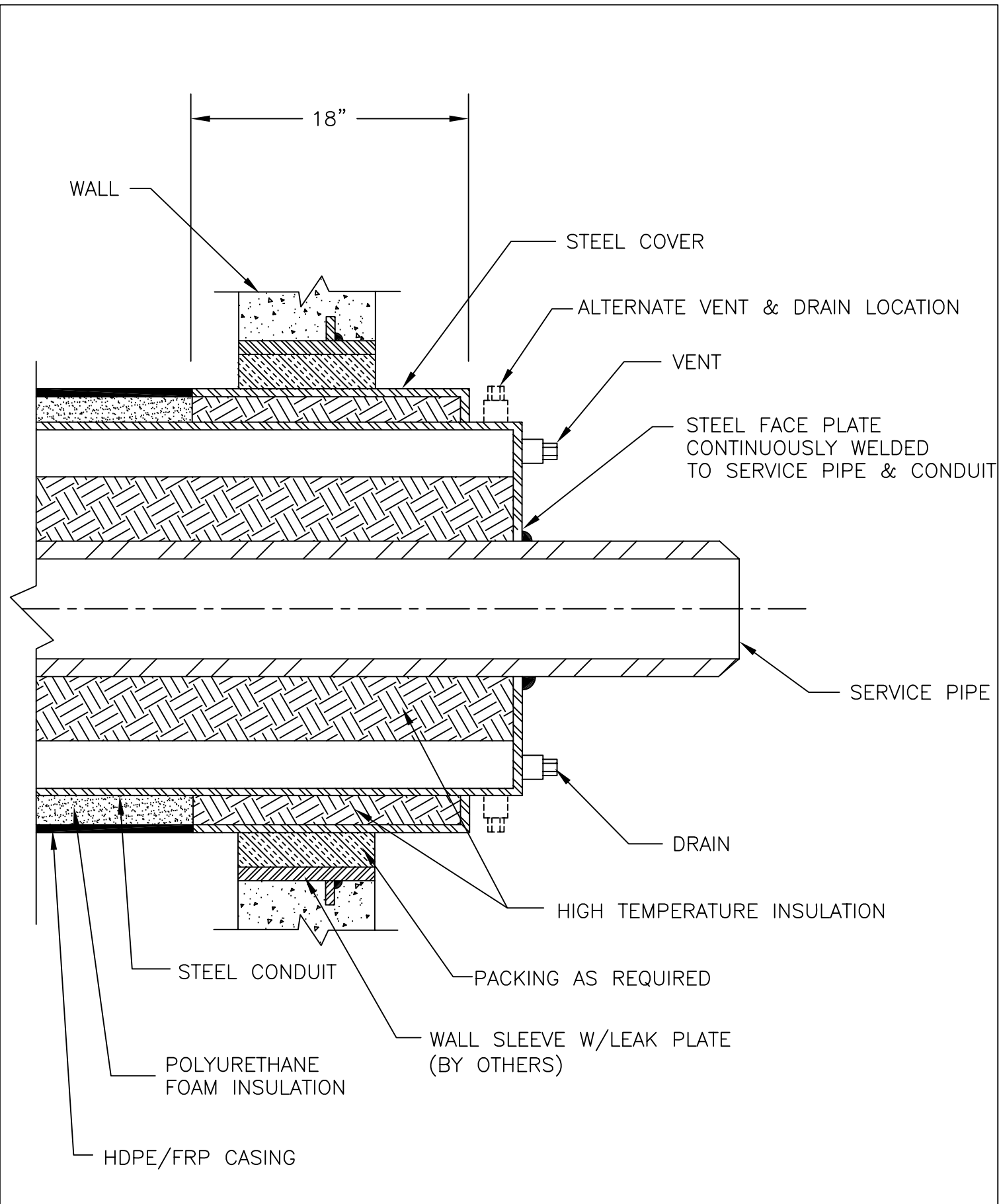


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STEEL-CON PLUS WELD END DETAIL



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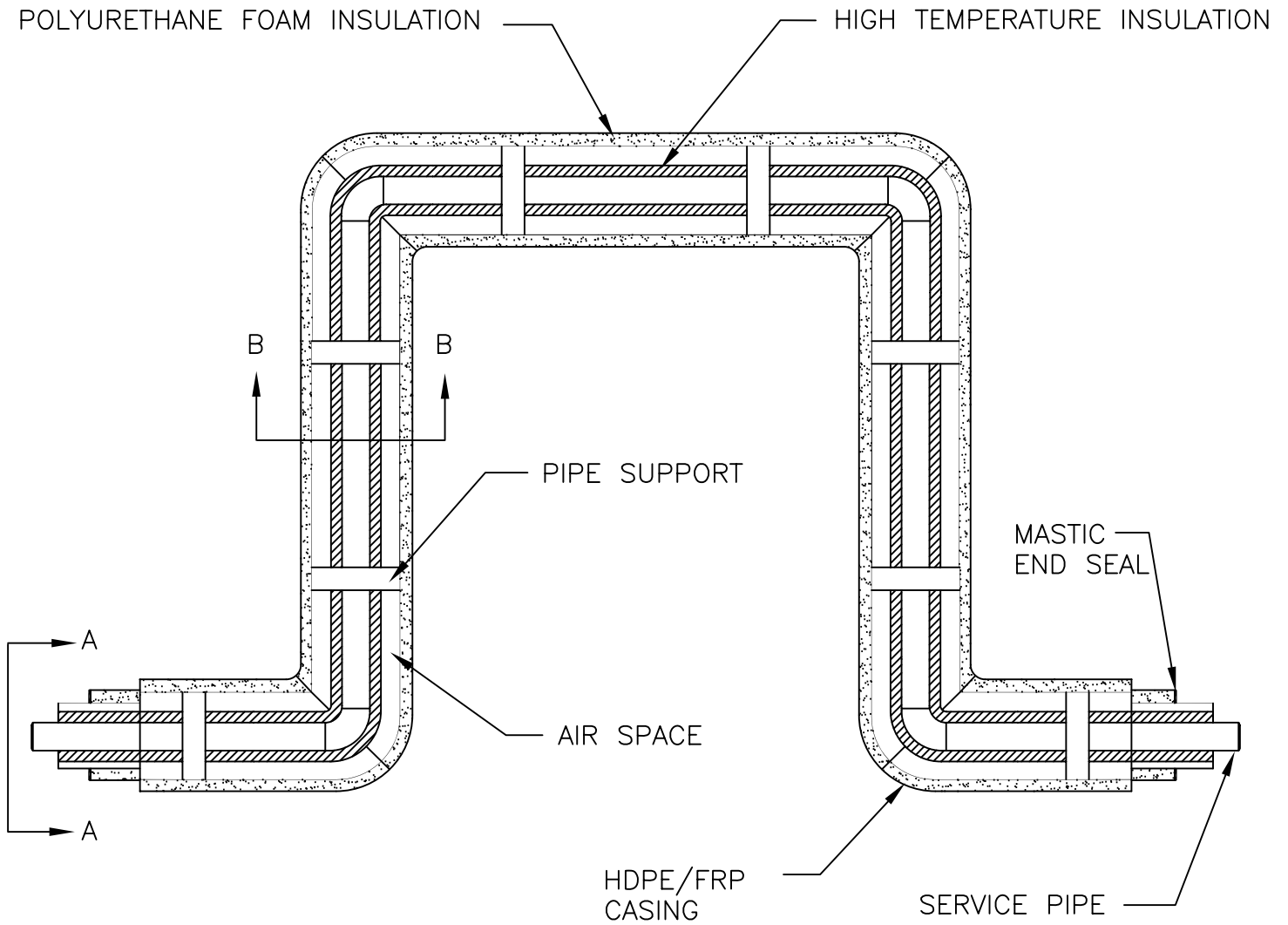
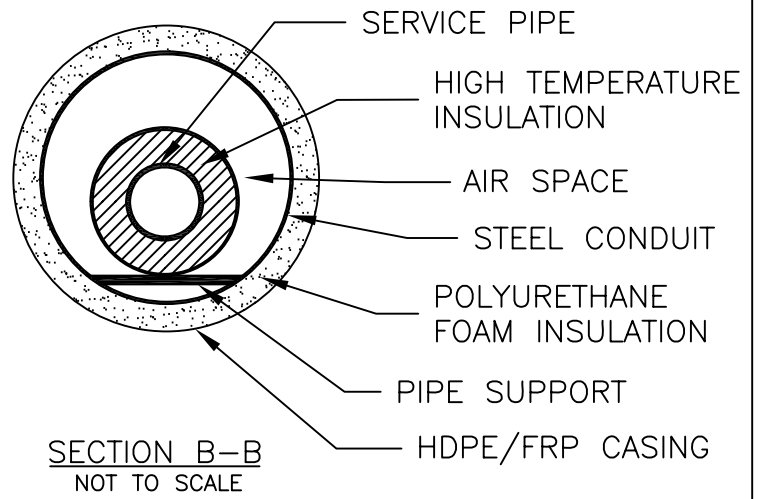
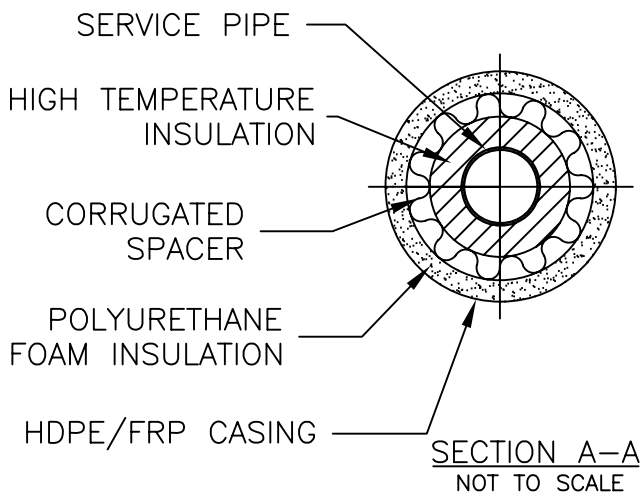
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Dwg. No.: SCP-7

Rev.:



STEEL-CON PLUS EXPANSION LOOP DETAIL

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WELDED IN FIELD
AFTER AIR TEST OF
CONDUIT (IF REQUIRED)

STEEL
CARRIER PIPE

WATERSHED

CONDUIT PUMP OUT LINE

CARRIER PIPE
DRAIN LINE

5"

2"

1"

AS REQUIRED

SLOPE
DOWN

TEE

AIR SPACE

1" MAX.

HDPE/FRP JACKET

HIGH TEMPERATURE INSULATION

POLYURETHANE
FOAM INSULATION

STEEL CONDUIT

CONDUIT PUMP-OUT

STEEL-CON PLUS SINGLE DRIP TEE ASSEMBLY WITH WATERSHED



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TRICON STEEL-CON PLUS

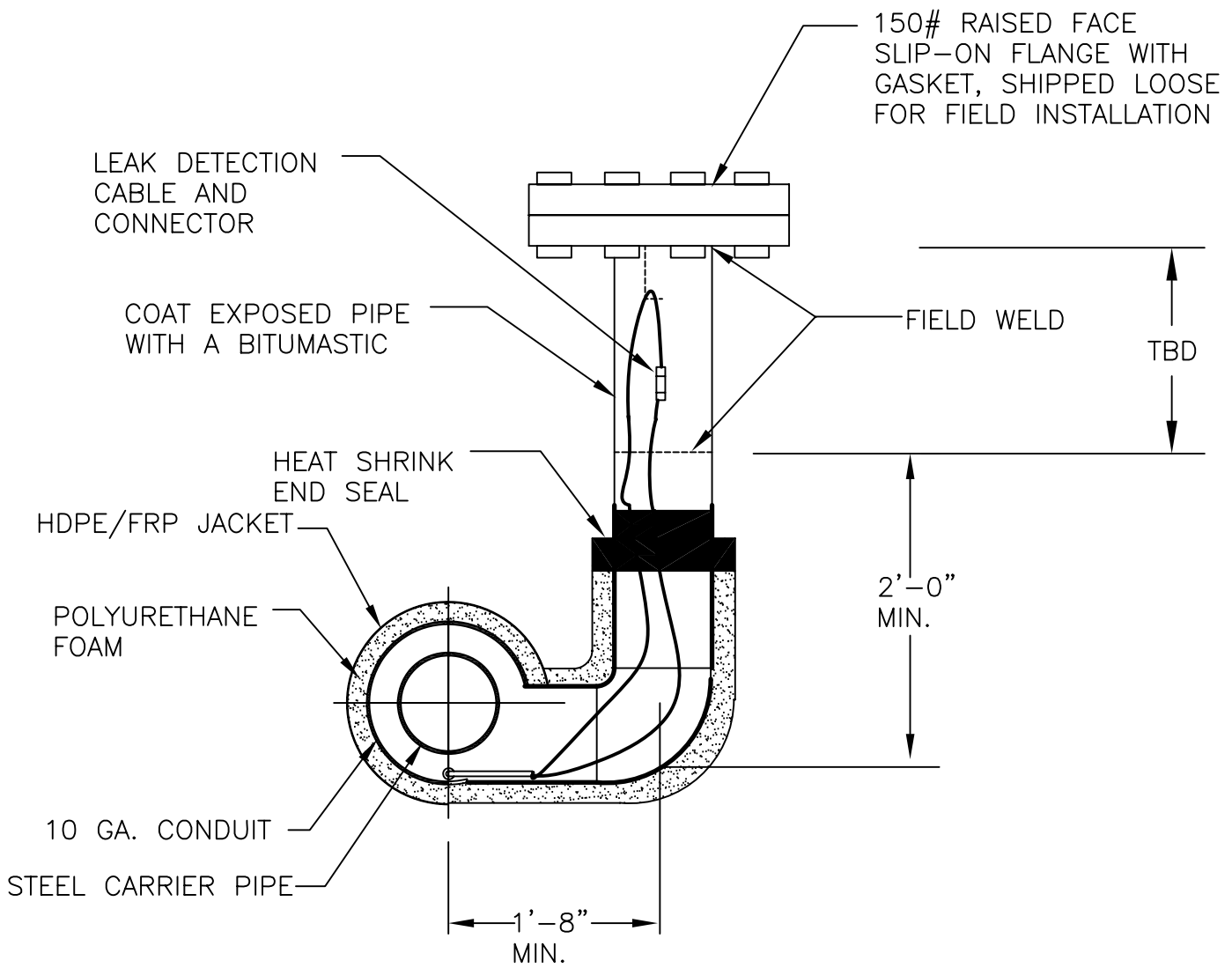
Date: 03/09/06

Dwg. No. SCP-9

Rev.:

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STEEL-CON PLUS PULL PORT TEE DETAIL

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Date: 03/09/06

Dwg. No.: SCP-10

Rev.:

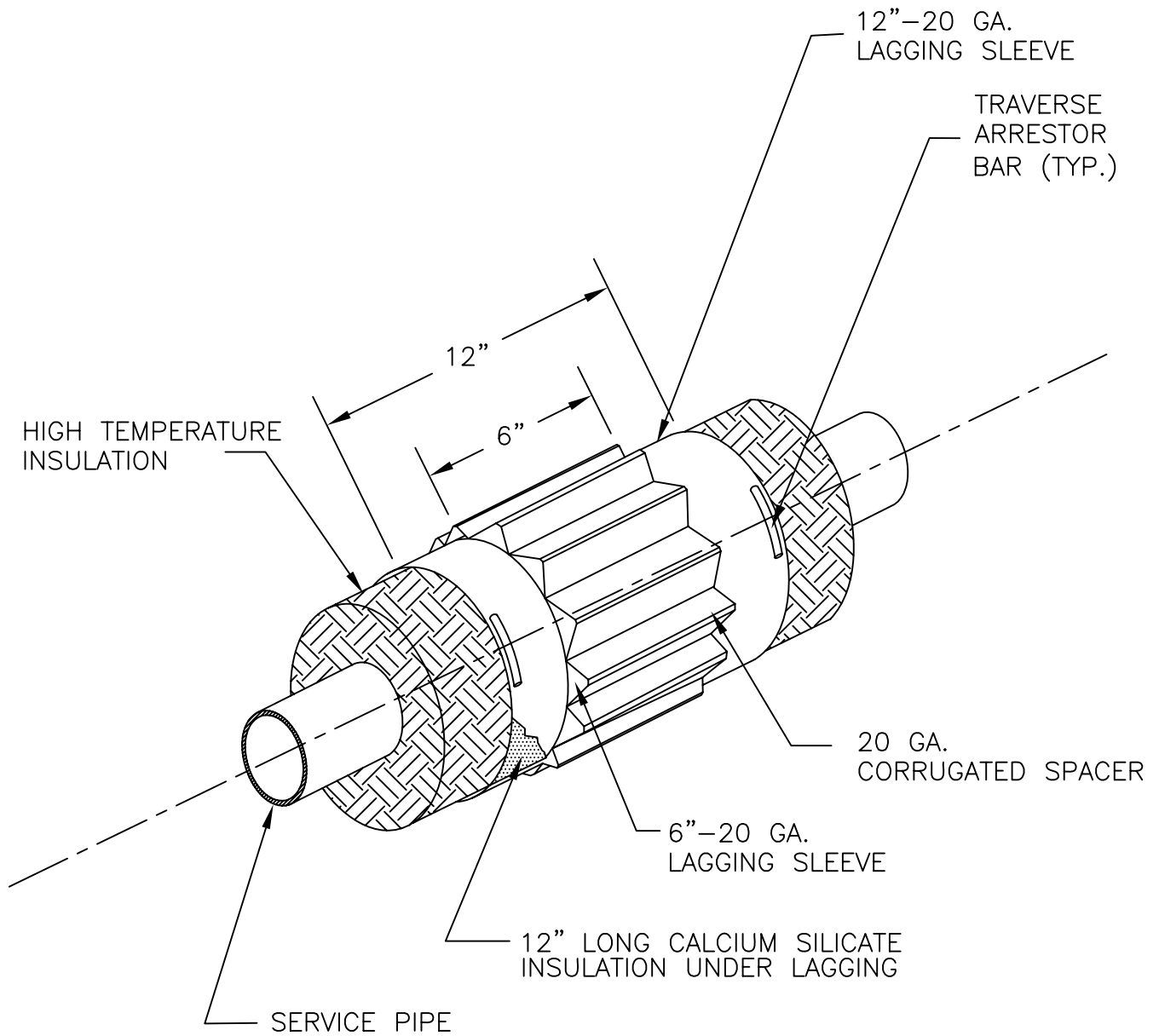


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STEEL-CON PLUS PIPE SUPPORT DETAIL

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Date: 03/09/06

Dwg. No.: SCP-11

Rev.:



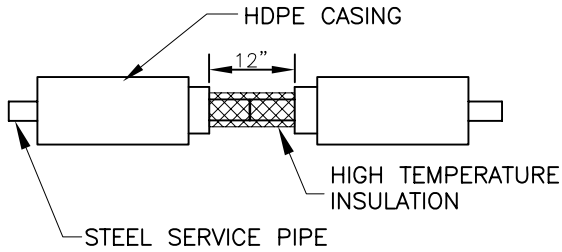
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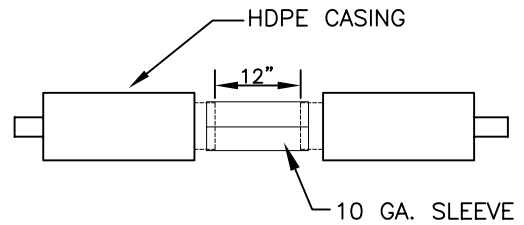
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STEP 1



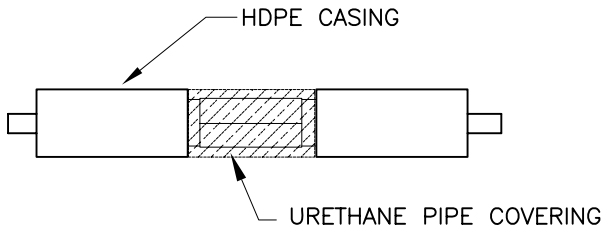
AFTER WELDING AND TESTING SERVICE PIPE AS REQUIRED, APPLY HIGH TEMPERATURE INSULATION TO PIPE AND SECURE IN PLACE WITH TAPE.

STEP 2



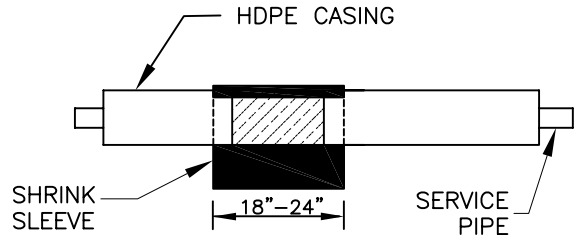
FIT 10 GA. SLEEVE ONTO CONDUIT AND WELD IN PLACE WITH TWO CIRCUMFERENTIAL AND ONE HORIZONTAL WELDS

STEP 3



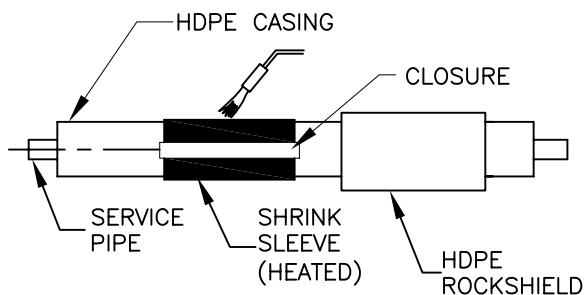
AFTER SLEEVE IS COOL TO THE TOUCH, APPLY URETHANE PIPE COVERING IN PLACE AND SECURE.

STEP 4



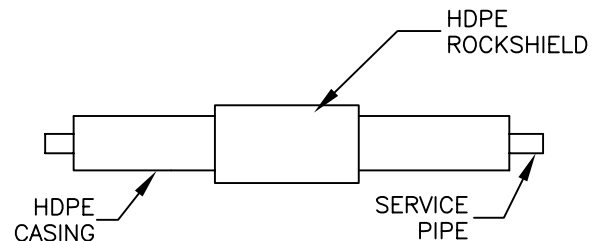
REMOVE RELEASE LINER OF SHRINK SLEEVE AND PLACE AROUND INSULATION. OVERLAP THE SLEEVE AT THE 10 TO 12 O'CLOCK POSITION. GENTLY HEAT BACKING SLEEVE & CLOSURE. PRESS THE CLOSURE FIRMLY INTO PLACE. GENTLY HEAT CLOSURE & PAT DOWN.

STEP 5



WITH LOW YELLOW FLAME, HEAT SHRINK SLEEVE FROM THE MIDDLE TOWARD EACH SIDE OF THE SLEEVE UNTIL RECOVERY IS COMPLETE. SHRINKING HAS BEEN COMPLETED WHEN ADHESIVE OOZES FROM SIDES. AVOID EXCESSIVE HEAT TO OVERLAP AREA.

STEP 6



WHEN SHRINK SLEEVE HAS COOLED DOWN, APPLY HDPE ROCKSHIELD AND SECURE IN PLACE. FIELD JOINT IS NOW COMPLETE.

STEEL-CON PLUS FIELD JOINT DETAIL
WITH HDPE CASING

TRICON STEEL-CON PLUS

Date: 03/09/06

Dwg. No. SCP-12A

Rev.:



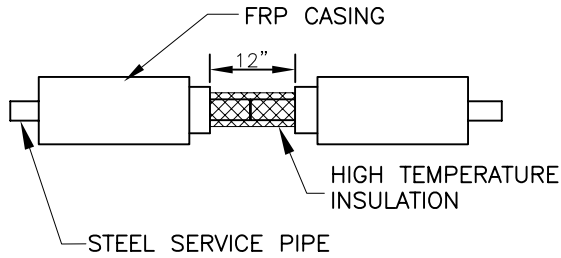
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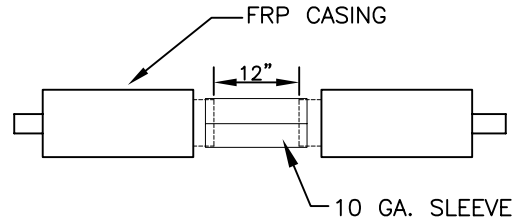
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STEP 1



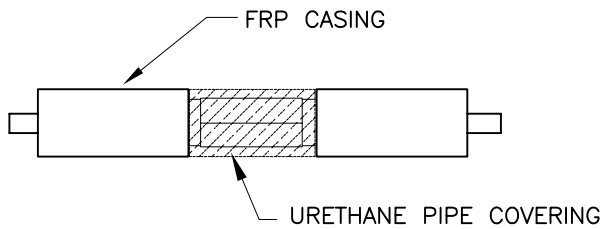
AFTER WELDING AND TESTING SERVICE PIPE AS REQUIRED, APPLY HIGH TEMPERATURE INSULATION TO PIPE AND SECURE IN PLACE WITH TAPE.

STEP 2



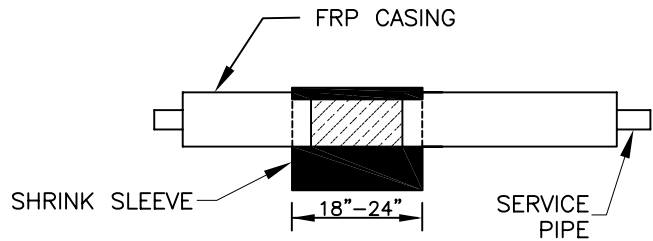
FIT 10 GA. SLEEVE ONTO CONDUIT AND WELD IN PLACE WITH TWO CIRCUMFERENTIAL AND ONE HORIZONTAL WELDS

STEP 3



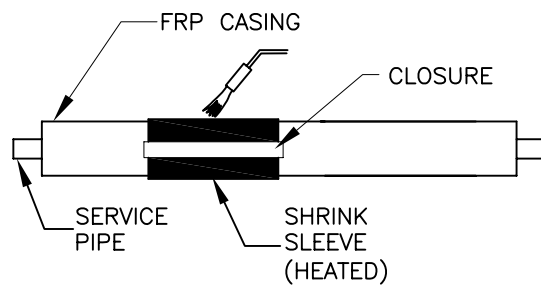
AFTER SLEEVE IS COOL TO THE TOUCH, APPLY URETHANE PIPE COVERING IN PLACE AND SECURE.

STEP 4



REMOVE RELEASE LINER OF SHRINK SLEEVE AND PLACE AROUND INSULATION. OVERLAP THE SLEEVE AT THE 10 TO 12 O'CLOCK POSITION. GENTLY HEAT BACKING SLEEVE & CLOSURE. PRESS THE CLOSURE FIRMLY INTO PLACE. GENTLY HEAT CLOSURE & PAT DOWN.

STEP 5



WITH LOW YELLOW FLAME, HEAT SHRINK SLEEVE FROM THE MIDDLE TOWARD EACH SIDE OF THE SLEEVE UNTIL RECOVERY IS COMPLETE. SHRINKING HAS BEEN COMPLETED WHEN ADHESIVE OOOZES FROM SIDES. AVOID EXCESSIVE HEAT TO OVERLAP AREA.

STEEL-CON PLUS FIELD JOINT DETAIL
WITH FRP CASING

TRICON STEEL-CON PLUS

Date: 03/09/06

Dwg. No. SCP-12B

Rev.:



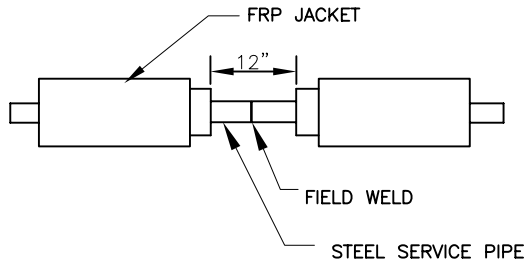
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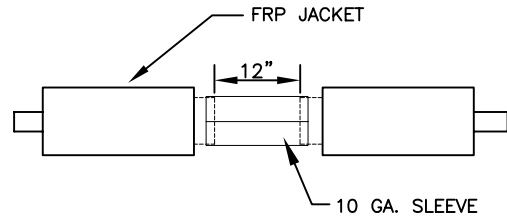
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STEP 1



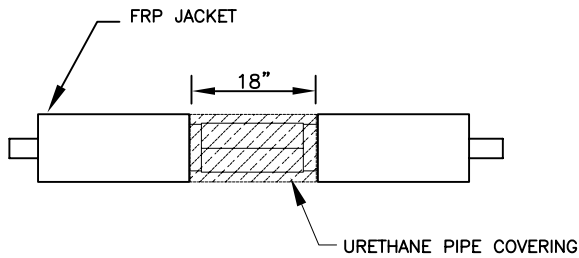
AFTER WELDING AND TESTING SERVICE PIPE AS REQUIRED, APPLY HIGH TEMPERATURE INSULATION TO PIPE AND SECURE IN PLACE WITH TAPE.

STEP 2



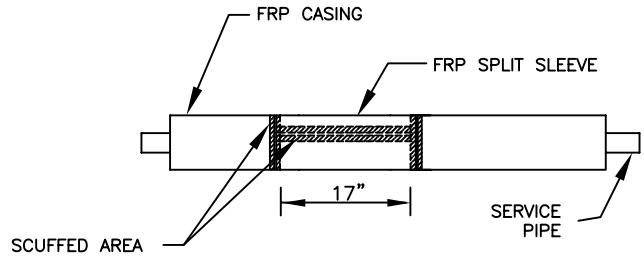
FIT 10 GA. SLEEVE ONTO CONDUIT AND WELD IN PLACE WITH TWO CIRCUMFERENTIAL AND ONE HORIZONTAL WELDS

STEP 3



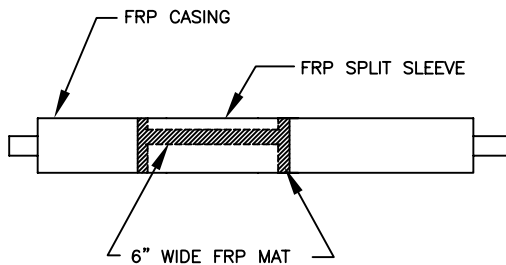
AFTER SLEEVE IS COOL TO THE TOUCH, APPLY URETHANE PIPE COVERING IN PLACE AND SECURE

STEP 4



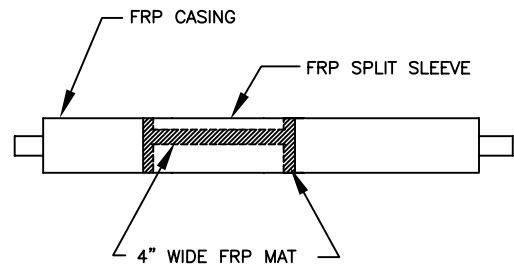
PLACE SPLIT FRP SLEEVE AROUND INSULATION WITH THE HORIZONTAL SPLIT AT THE 10 O'CLOCK POSITION. CREATE A GOOD BINDING SURFACE FOR THE HAND LAY-UP BY SCUFFING THE ENDS OF FRP SPLIT SLEEVE AND JACKET.

STEP 5



TAKE 3 LAYERS OF PRECUT 6" WIDE FIBERGLASS MAT AND SATURATE WITH FRP RESIN. (MIX 1/2 GAL. OF FRP RESIN WITH 1/2 OZ. OF CATALYST AND STIR. IT IS IMPERATIVE THAT YOU HAVE A GOOD MIX BETWEEN RESIN AND CATALYST.) PICK UP THE THREE (3) STRIPS OF SATURATED MAT AND AND PLACE ONE END AT THE 12 O'CLOCK POSITION AND THE OTHER AT THE 6 O'CLOCK POSITION.
Note: Cold temperatures will cause longer curing time.

STEP 6



ROLL INTO PLACE WITH FRP ROLLER UNTIL MATT LIES FLAT AND AIR BUBBLES ARE OUT. REPEAT FOR OTHER SIDE AND FOR OTHER CIRCUMFERENTIAL JOINT. FOR HORIZONTAL JOINT REPEAT PREVIOUS PROCEDURE EXCEPT LAY MATERIAL IN HORIZONTAL POSITION AND ROLL.

STEEL-CON PLUS FIELD JOINT DETAIL
WITH WET FRP HAND LAY-UP

TRICON STEEL-CON PLUS

Date: 03/09/06

Dwg. No. SCP-12C

Rev.:



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