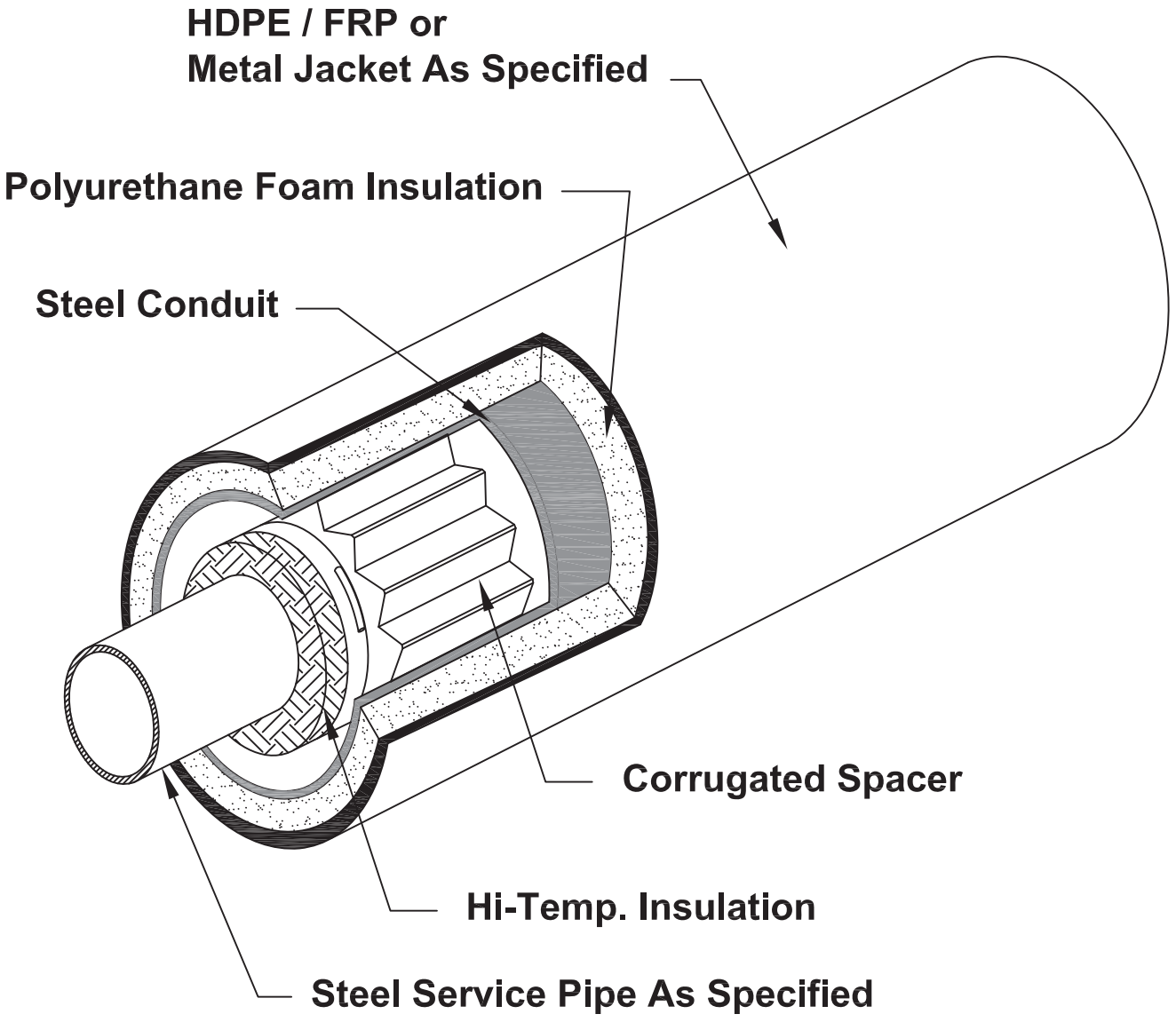
TRICON STEEL-CON PLUS PIPE SYSTEM

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



TRICON
Piping Systems, Inc.®

P.O. Box 361, Canastota, New York 13032
Tel: 315.697.8787 Fax: 315.697.8788

TRICON STEEL-CON PLUS System Specifications

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-F²-°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 or cellular glass. The insulation will be held in place by aluminum 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 .16 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 ½" 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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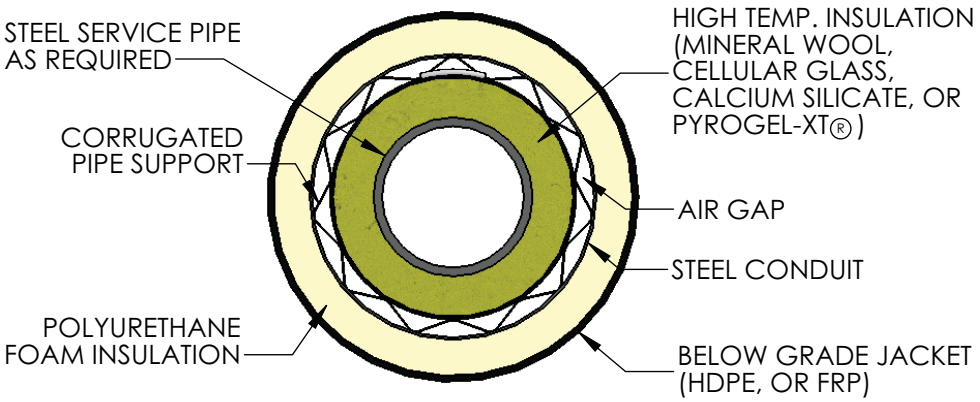

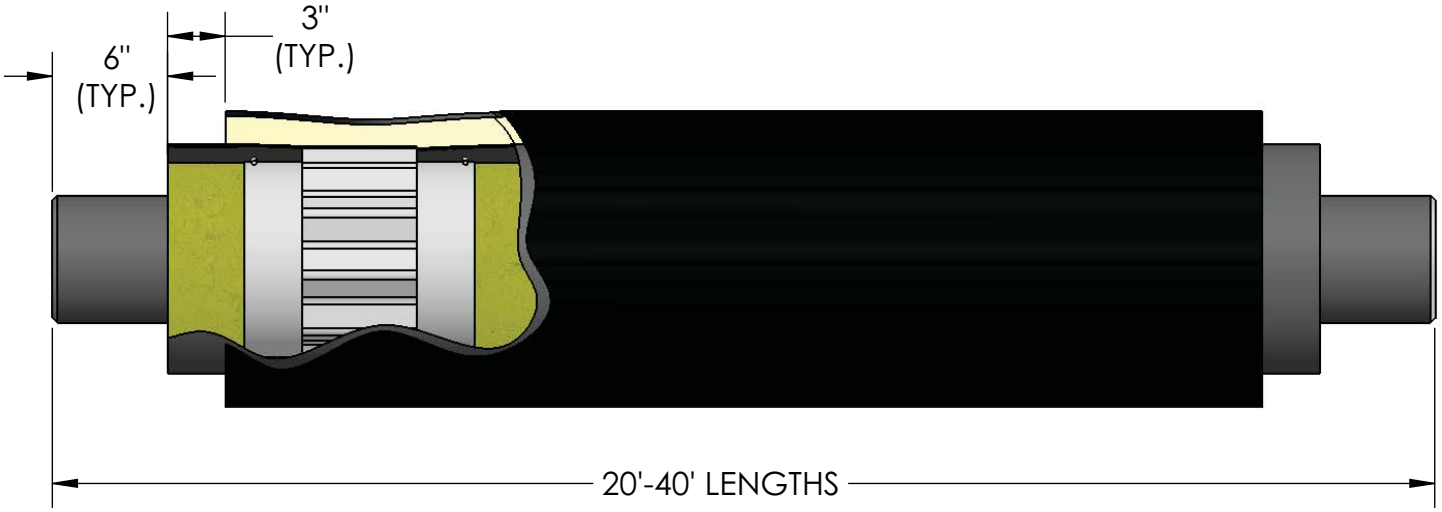

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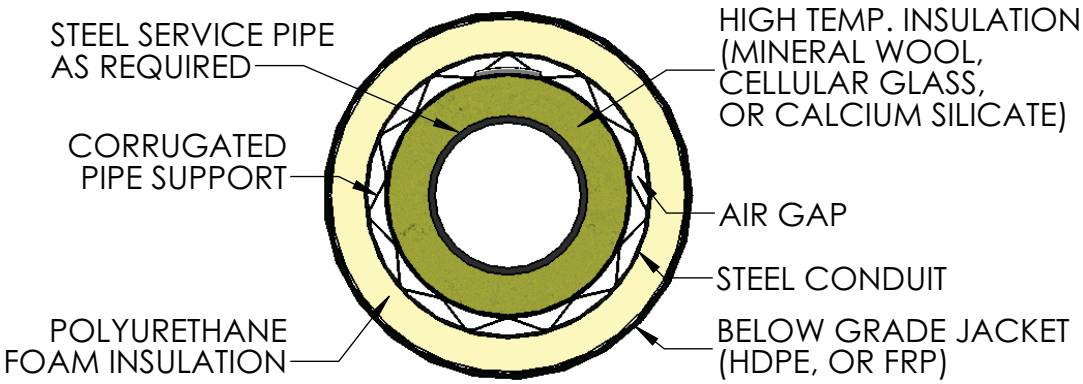
SHEET TITLE
STRAIGHT LENGTH DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-1	1 OF 1



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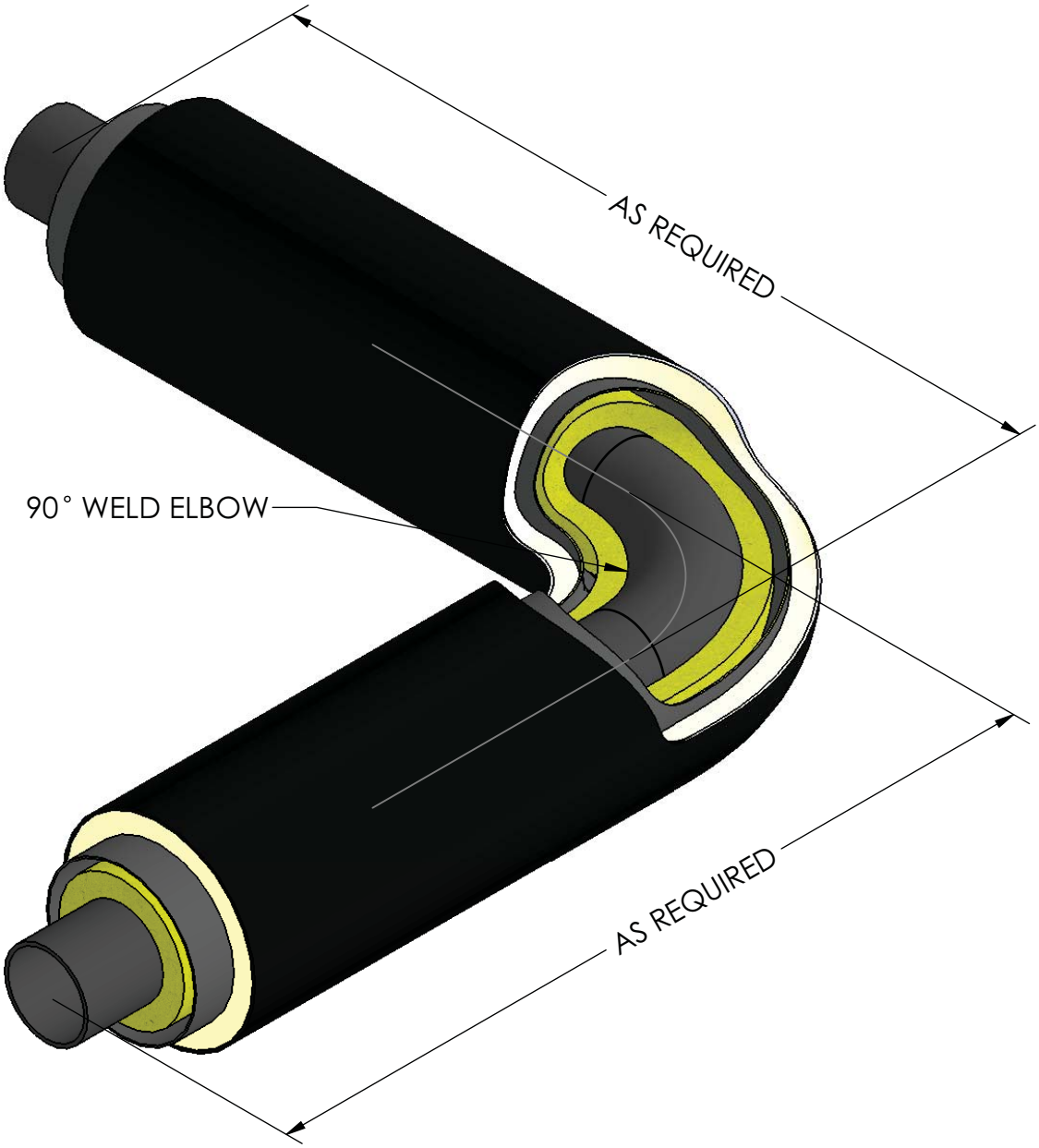

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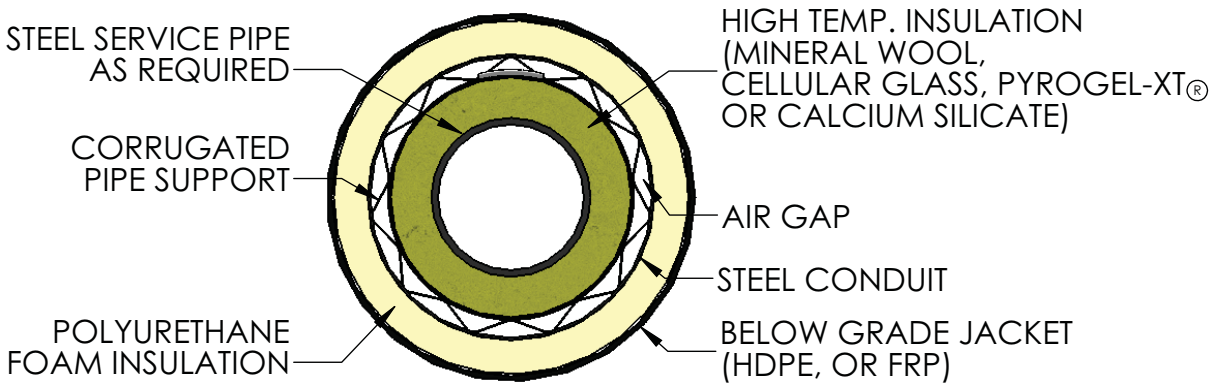
SHEET TITLE
90-DEGREE ELBOW DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-2	1 OF 1



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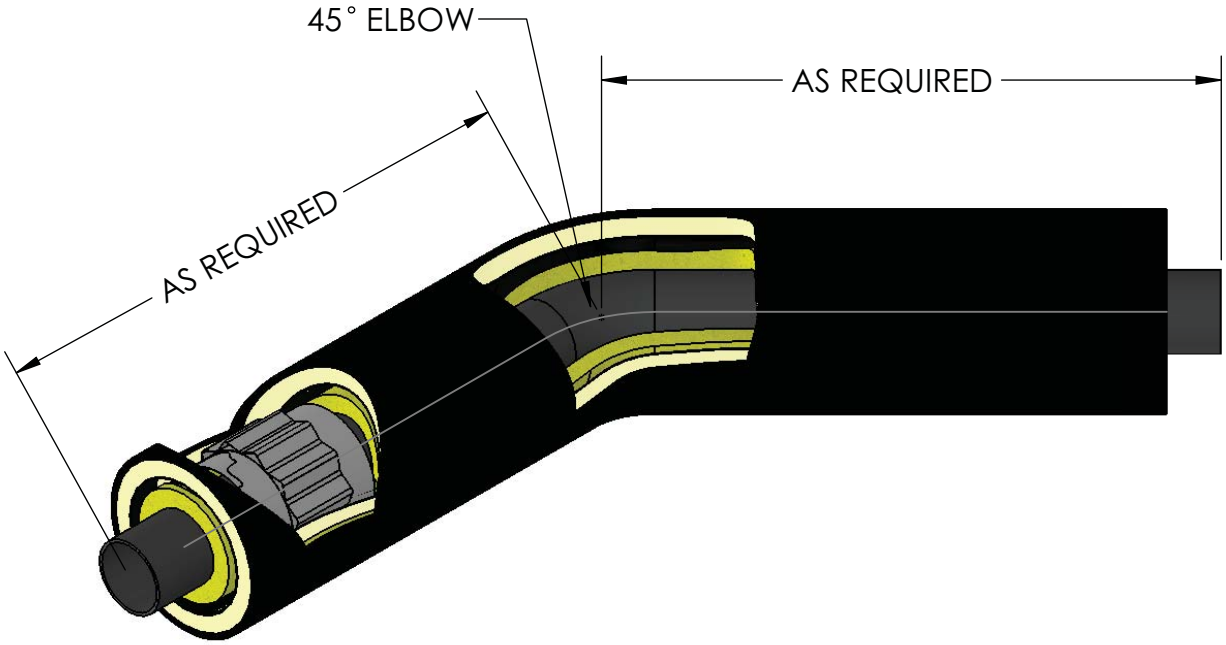

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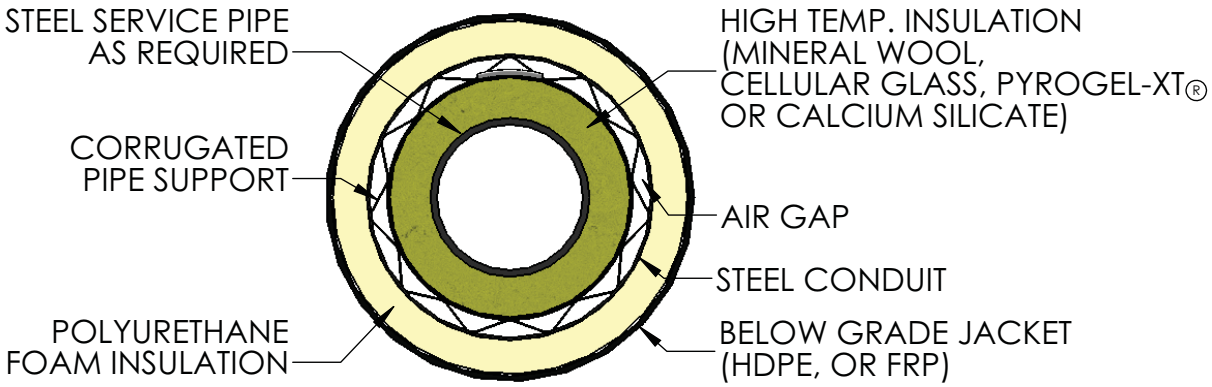
SHEET TITLE
45-DEGREE ELBOW DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-3	1 OF 1



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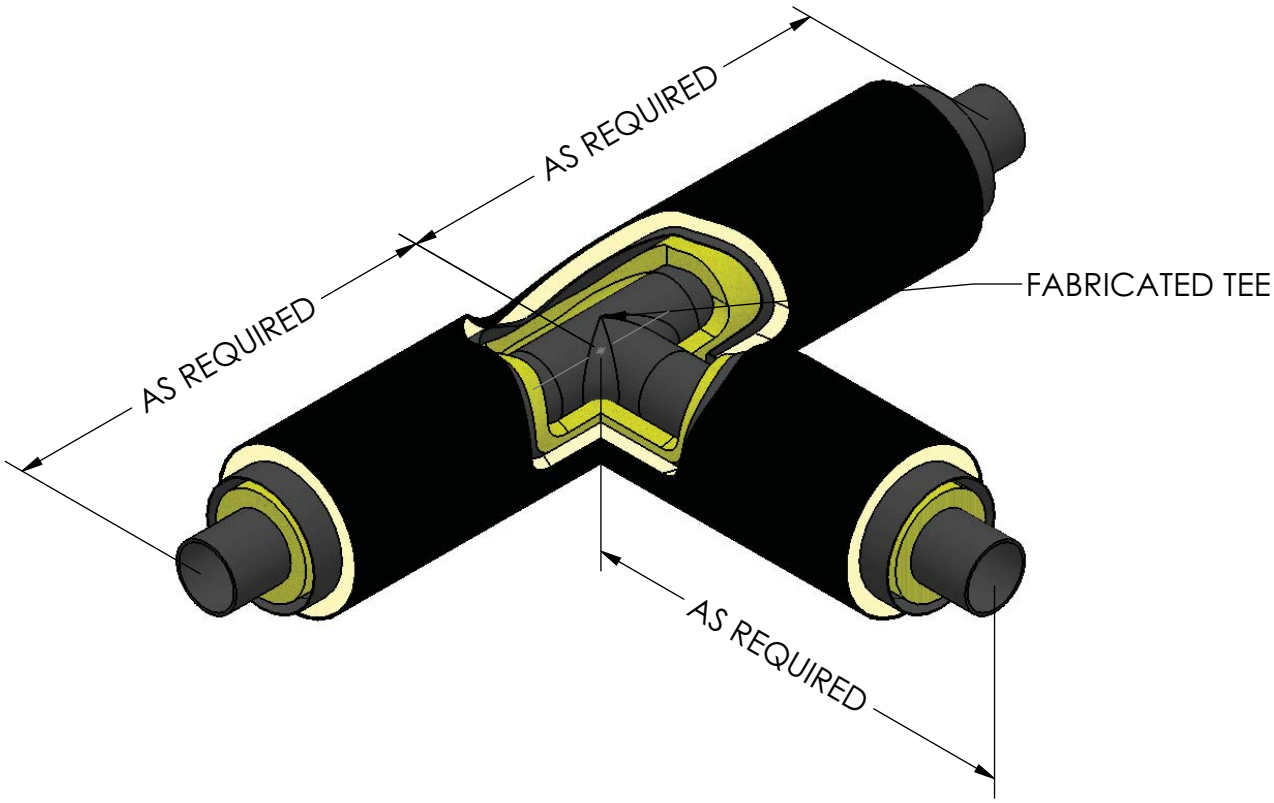

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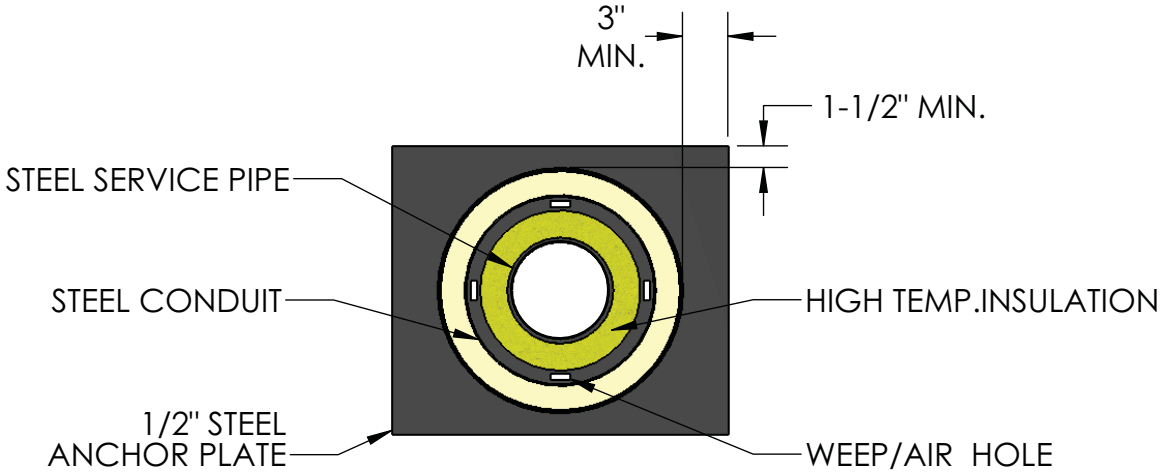
SHEET TITLE
STEEL-CON PLUS TEE DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-4	1 OF 1



END VIEW
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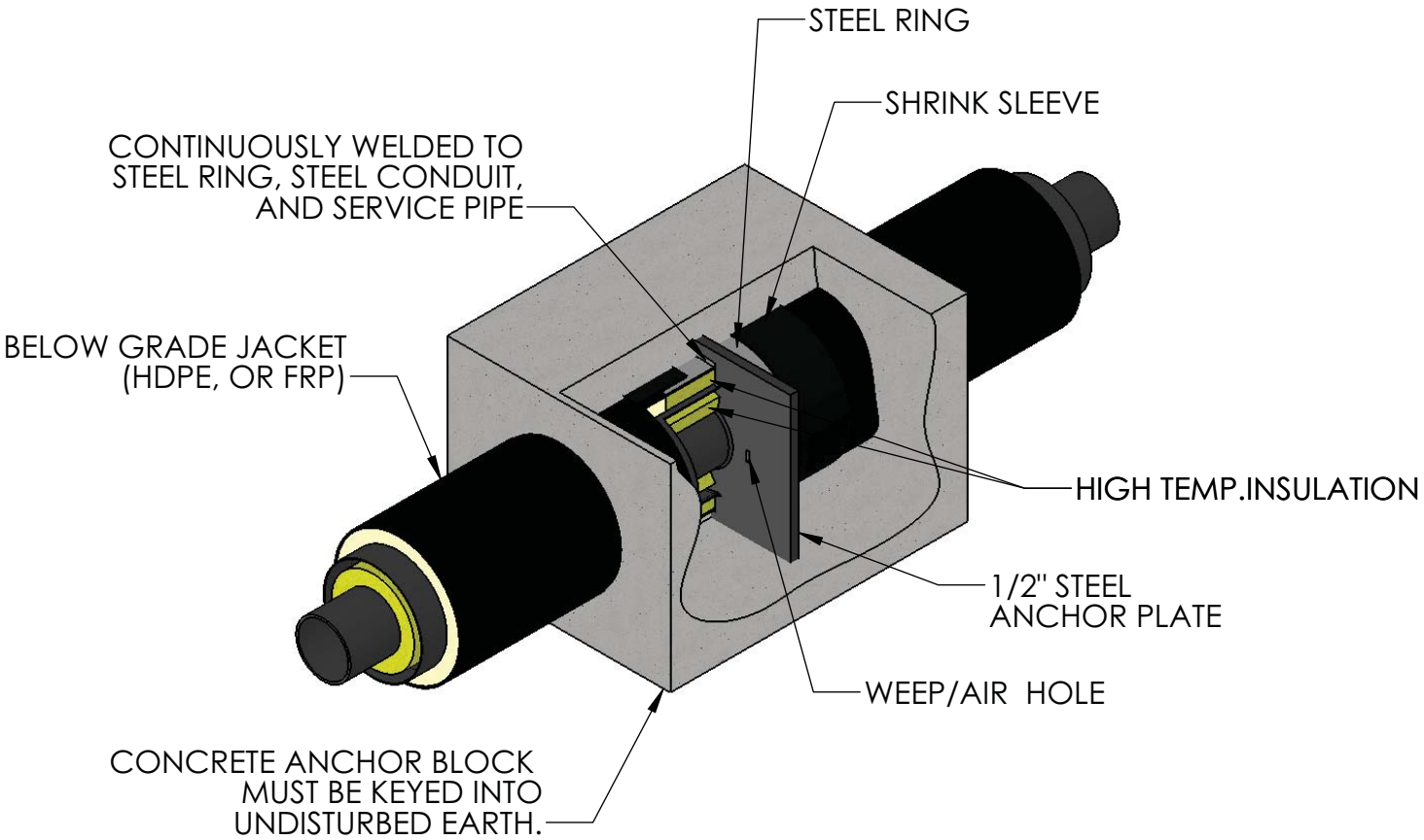

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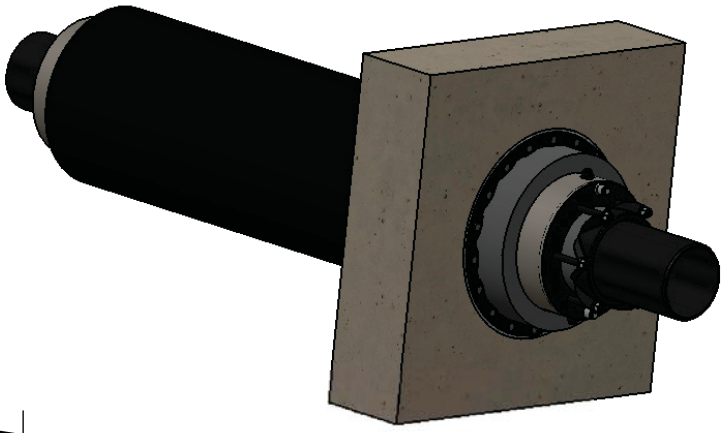
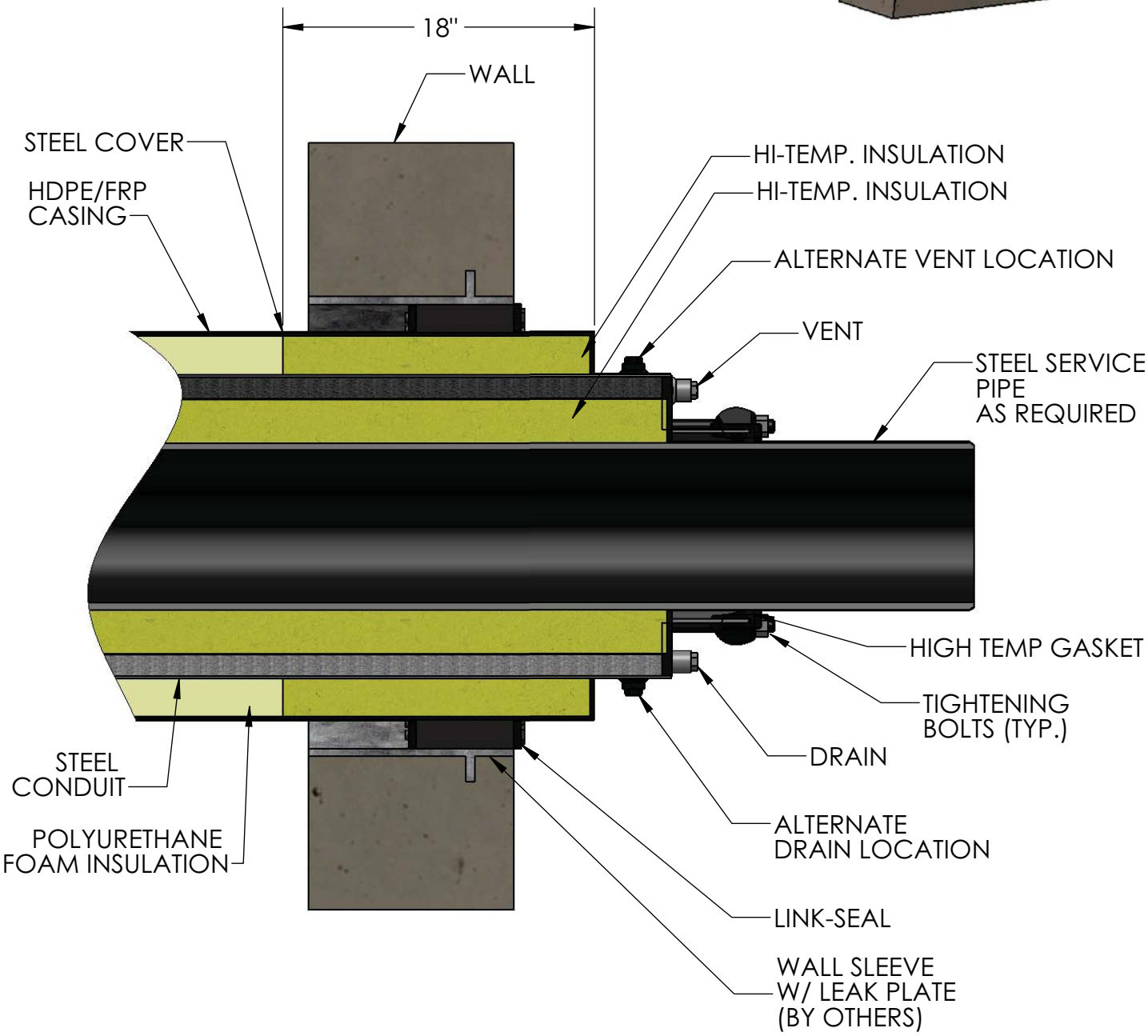
SHEET TITLE
STEEL-CON PLUS ANCHOR DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-5	1 OF 1





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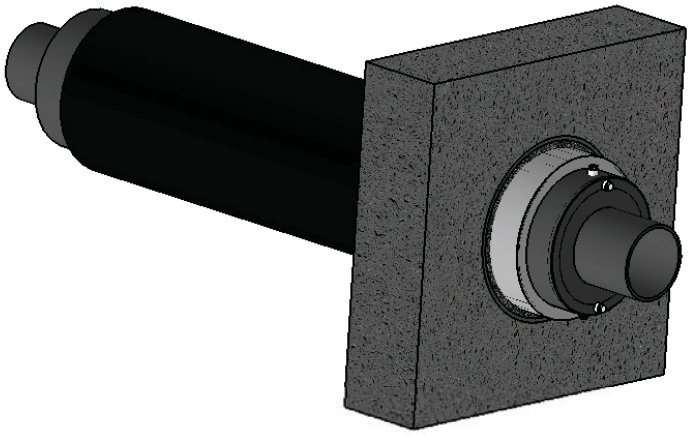
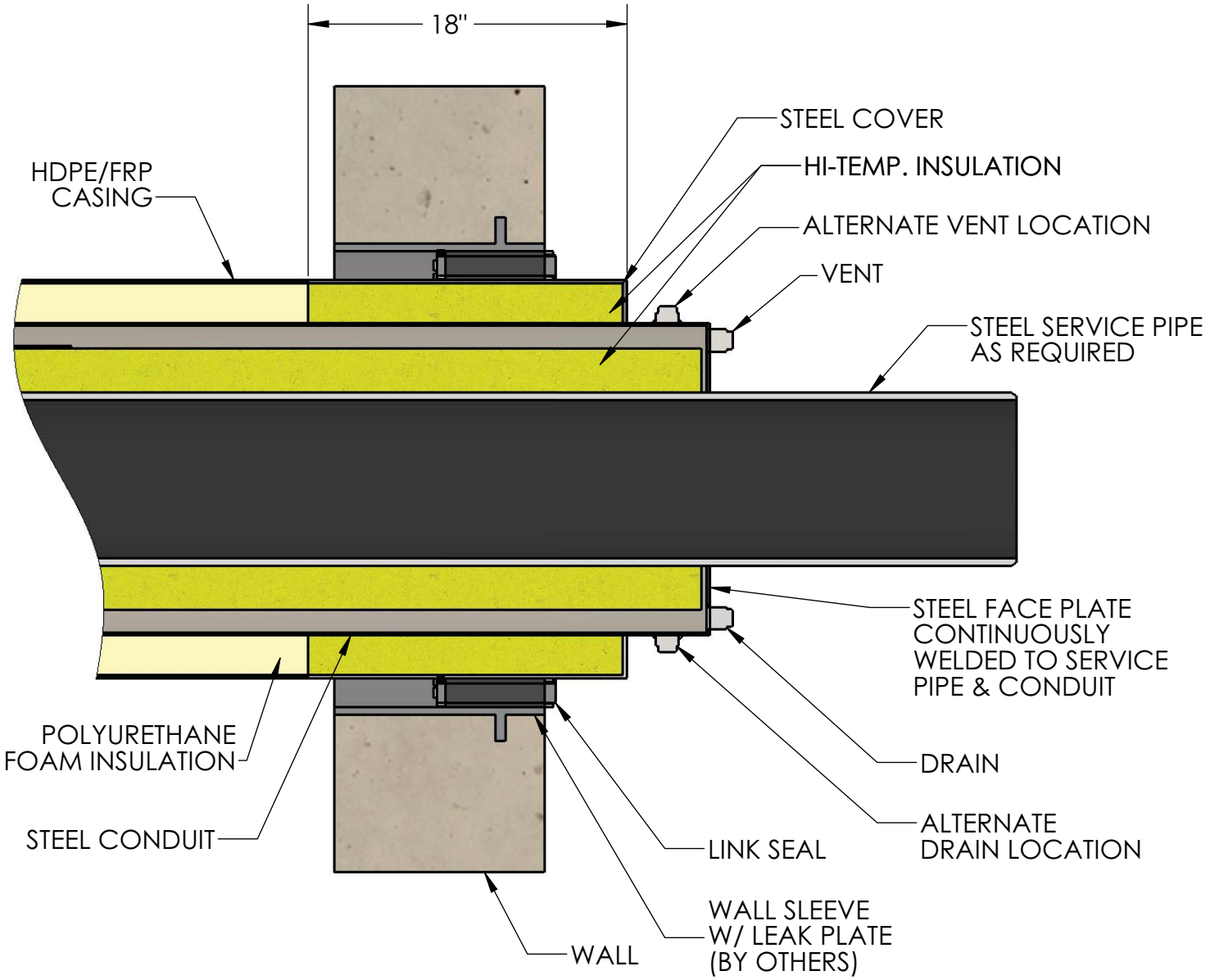
SHEET TITLE
STEEL-CON PLUS GLAND END DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-6	1 OF 1





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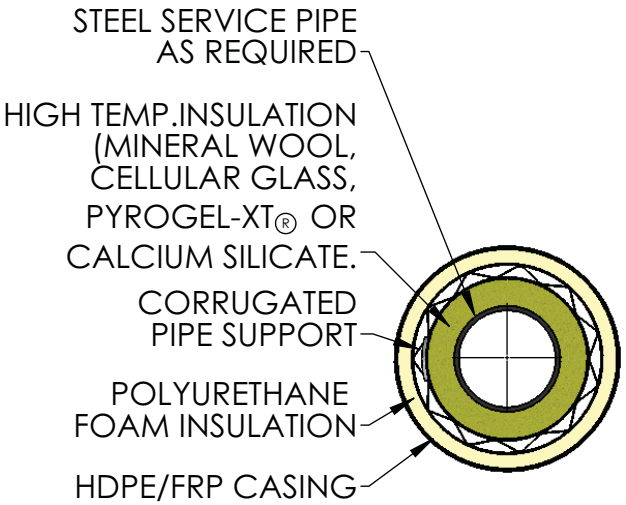
SHEET TITLE: STEEL-CON PLUS WELD END DETAIL

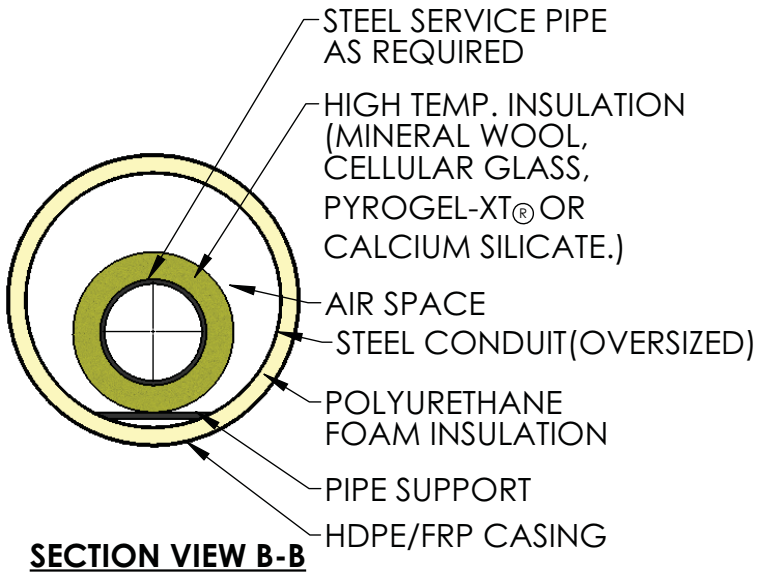
PRODUCT: TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

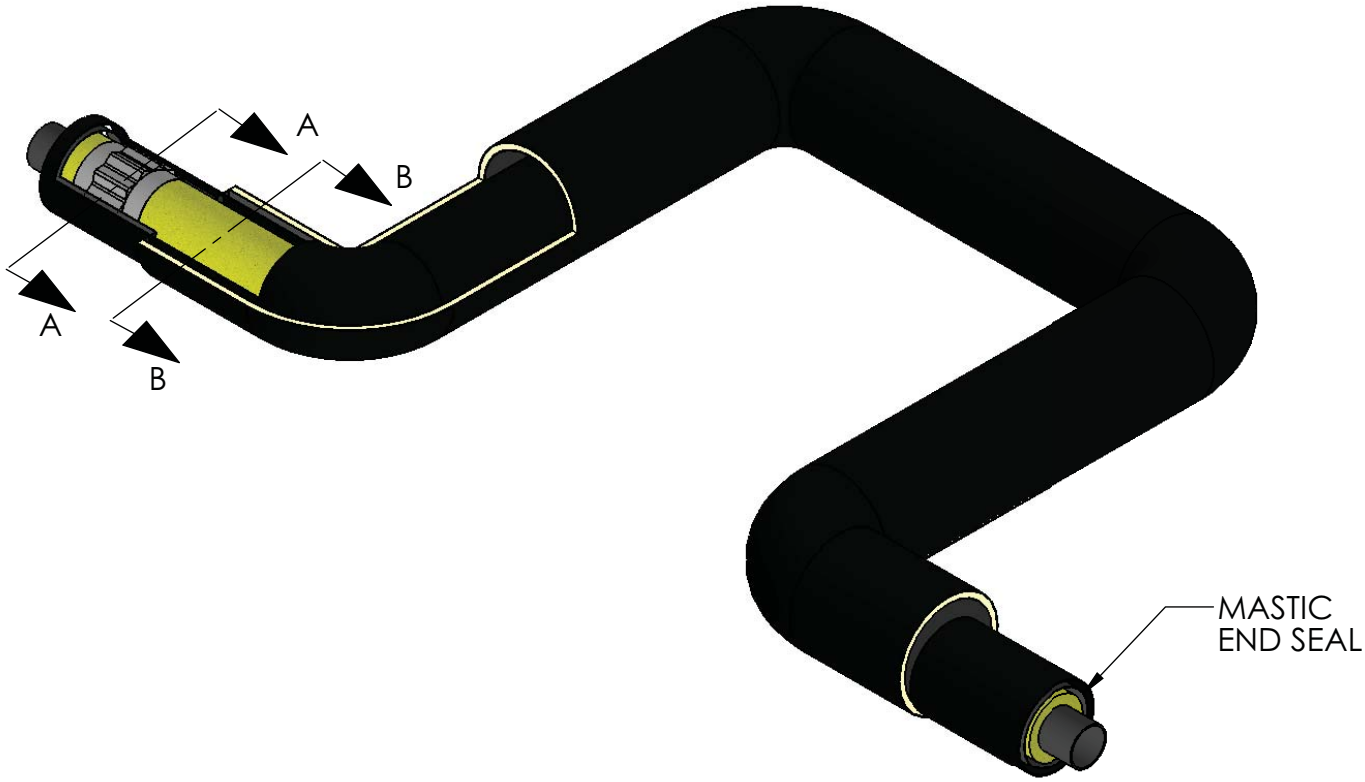
DWG. NO.	SHEET
SCP-7	1 OF 1



SECTION VIEW A-A
NOT TO SCALE



SECTION VIEW B-B
NOT TO SCALE



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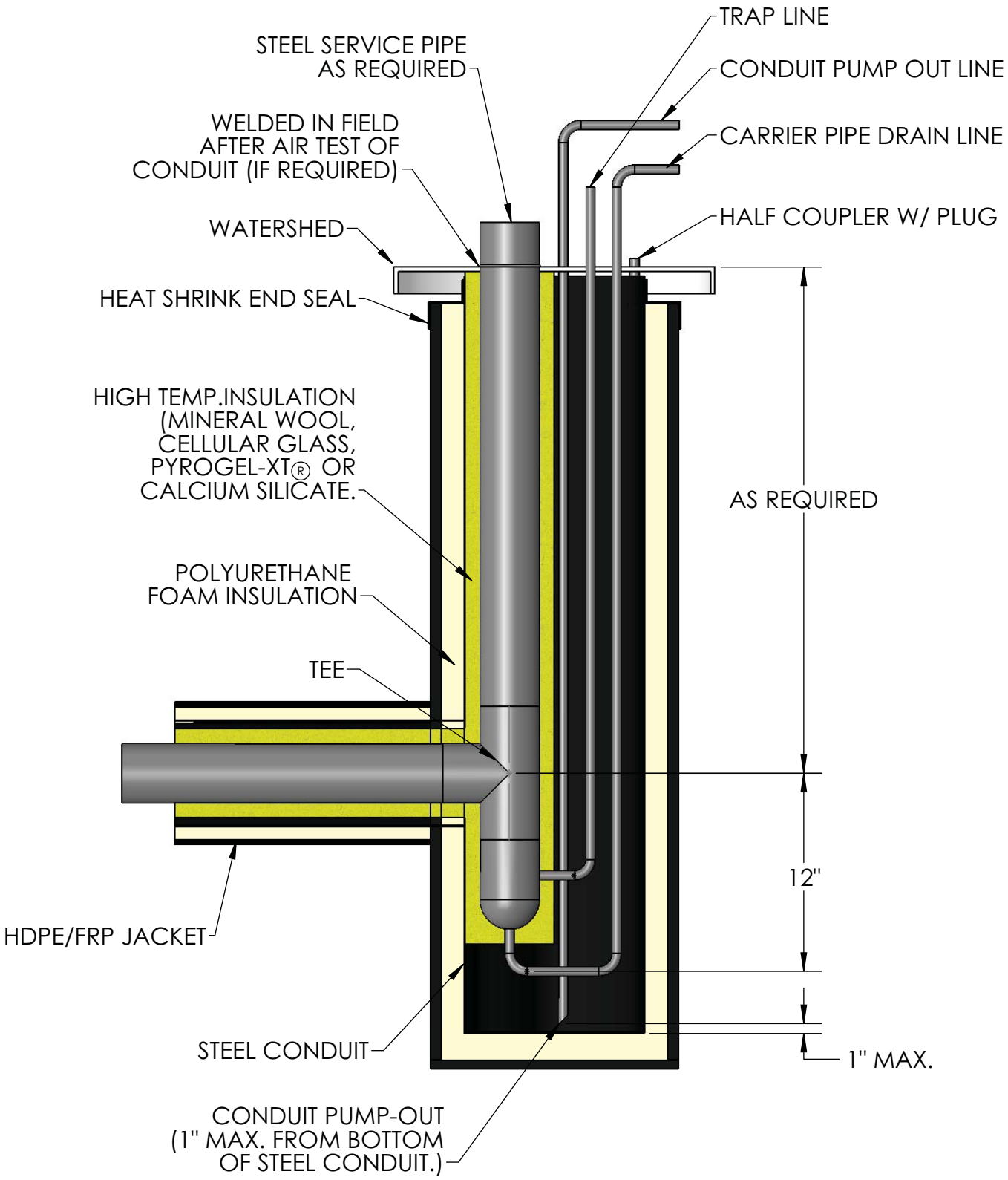
SHEET TITLE
STEEL-CON PLUS EXPANSION LOOP DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-8	1 OF 1



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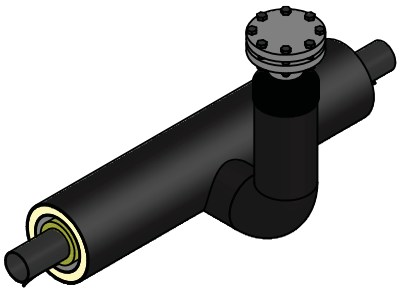
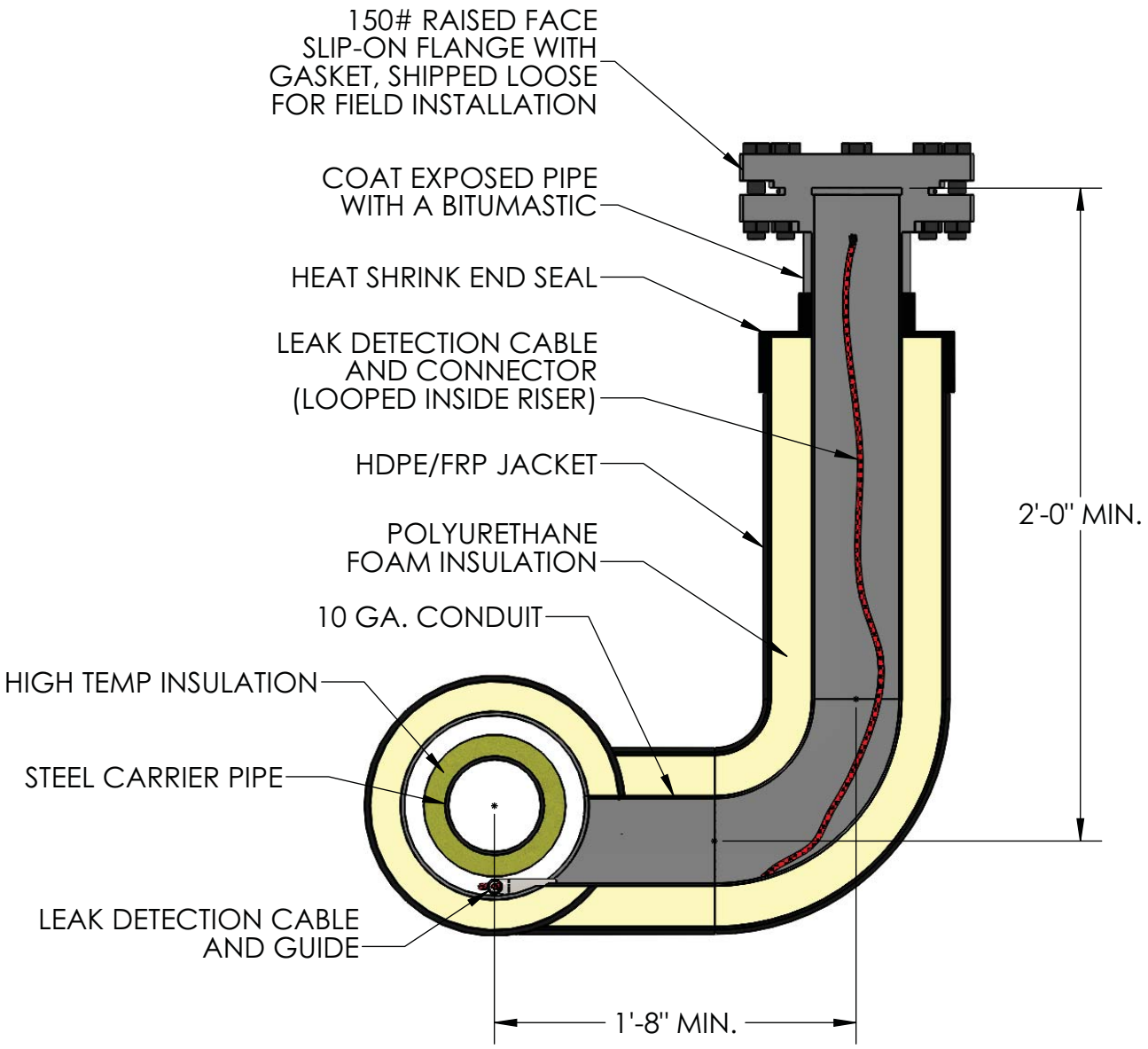
SHEET TITLE
STEEL-CON PLUS DRIP TEE DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-9	1 OF 1





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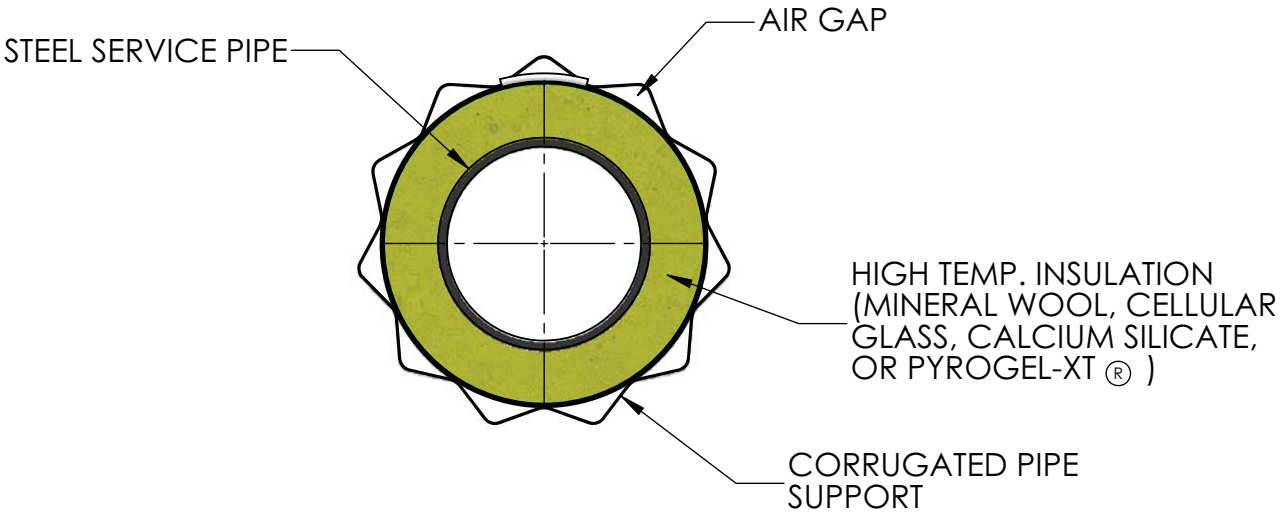
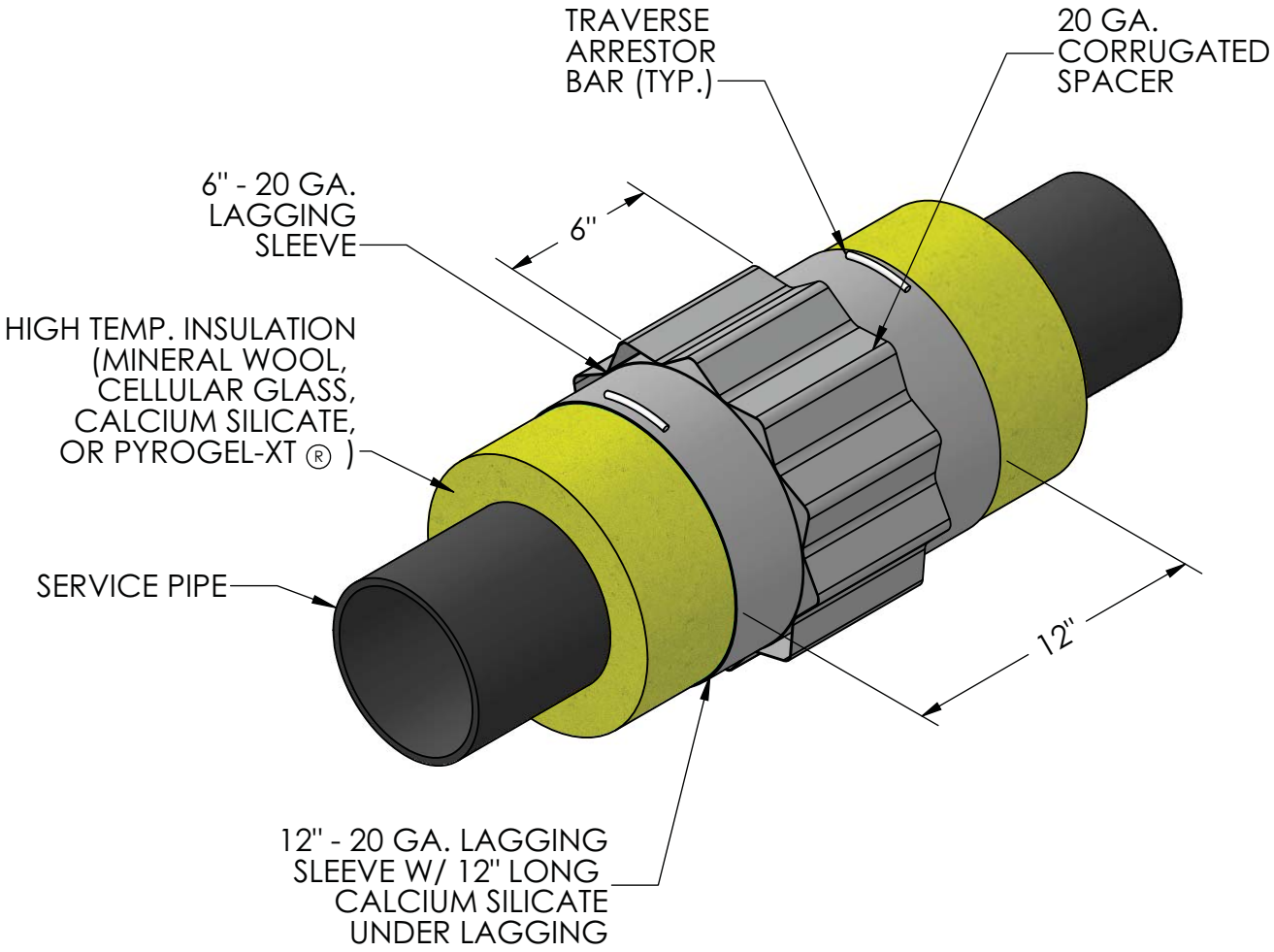
SHEET TITLE: STEEL-CON PLUS PULL PORT TEE DETAIL

PRODUCT: TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-10	1 OF 1





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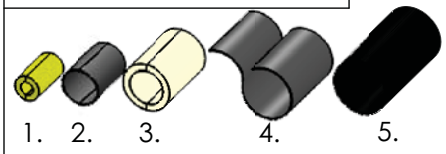
SHEET TITLE
STEEL-CON PLUS CORRUGATED PIPE SUPPORT DETAIL

PRODUCT
TRICON STEEL-CON PLUS

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.	SHEET
SCP-11	1 OF 1

STEP #1: Gather Materials

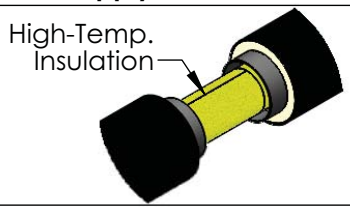


The field joint kit includes:

1. High-temp. insulation
2. Split steel sleeve
3. Urethane pipe covering (3-ft sections)
4. Shrink Sleeve materials
5. Split HDPE Rockshield

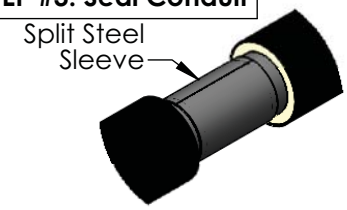
Equipment List:
Hand saw, razor knife, propane tank, torch, and safety glasses.

STEP #2: Apply Inner Insulation



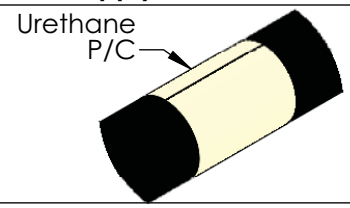
After welding the service pipe and testing all welds as required, apply high-temperature insulation and secure in place with tape.

STEP #3: Seal Conduit



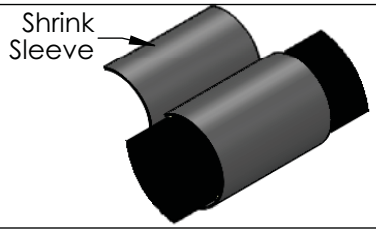
Fit the split sleeve onto conduit and weld in place with two circumferential and two horizontal welds. Pressure test all sleeve welds but do not exceed 15 psi air pressure. Soap test all welds.

STEP #4: Apply Outer Insulation



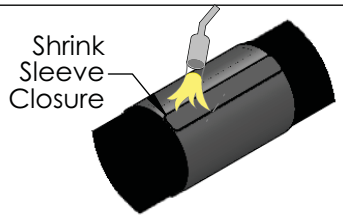
Make sure the pipe and casing are clean and dry. Cut the polyurethane foam half-shells to length using a hand saw. Fit the urethane to contours of service pipe by rotating the half-shells back and forth until they seat properly. Secure the urethane into place.

STEP #5: Apply Shrink Sleeve



Remove release liner and place shrink sleeve around pipe insulation. Gently heat backing of sleeve and closure. Overlap sleeve at the 10 and 2 o'clock positions. Press the closure firmly into place. Gently heat closure and pat down.

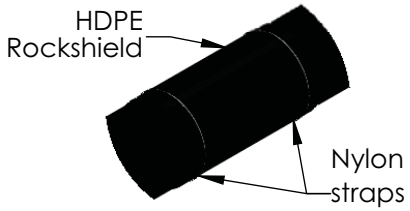
STEP #6: Heat Shrink Sleeve



With a yellow flame, heat the shrink sleeve from the middle toward each side of the sleeve until recovery is complete. Remove any wrinkles or trapped air by working them from the center outward using the roller. Shrinking has been completed when adhesive oozes from the sides.

Note: Avoid excessive heat to overlap area.

STEP #7: Inspect Shrink Sleeve & Apply Rockshield



After shrink sleeve has cooled, inspect the sleeve to ensure full contact with casing and that adhesive has flowed beyond both sleeve edges. Make sure no cracks or holes appear on the sleeve. Install HDPE rockshield over shrink sleeve with a minimum 1" overlap over sleeve and secure in place with nylon straps (zip ties).

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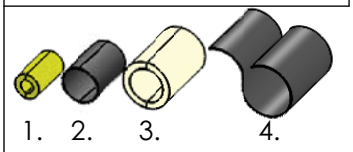
SHEET TITLE
Field Joint Kit (Rigid Foam) with HDPE Casing Detail

PRODUCT
Tricon Steel-Con Plus

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.
SCP-12A

STEP #1: Gather Materials



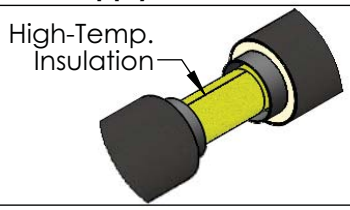
1. 2. 3. 4.

The field joint kit includes:

1. High-temp. insulation
2. Split steel sleeve
3. Urethane pipe covering (3-ft sections)
4. Shrink Sleeve materials

Equipment List:
Hand saw, razor knife, propane tank, torch, and safety glasses.

STEP #2: Apply Inner Insulation

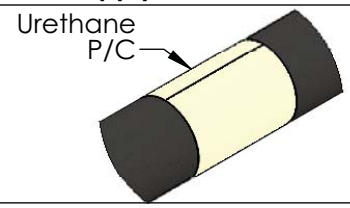


After welding the service pipe and testing all welds as required, apply high-temperature insulation and secure in place with tape.

STEP #3: Seal Conduit

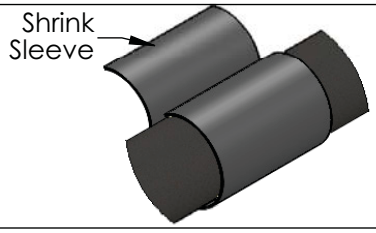
Fit the split sleeve onto conduit and weld in place with two circumferential and two horizontal welds. Pressure test all sleeve welds but do not exceed 15 psi air pressure. Soap test all welds.

STEP #4: Apply Outer Insulation



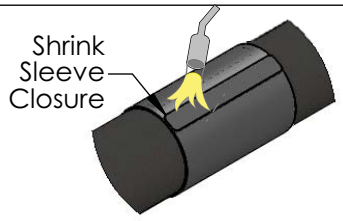
Make sure the pipe and casing are clean and dry. Cut the polyurethane foam half-shells to length using a hand saw. Fit the urethane to contours of service pipe by rotating the half-shells back and forth until they seat properly. Secure the urethane into place.

STEP #5: Apply Shrink Sleeve



Remove release liner and place shrink sleeve around pipe insulation. Gently heat backing of sleeve and closure. Overlap sleeve at the 10 and 2 o'clock positions. Press the closure firmly into place. Gently heat closure and pat down.

STEP #6: Heat Shrink Sleeve



With a yellow flame, heat the shrink sleeve from the middle toward each side of the sleeve until recovery is complete. Remove any wrinkles or trapped air by working them from the center outward using the roller. Shrinking has been completed when adhesive oozes from the sides.

Note: Avoid excessive heat to overlap area.

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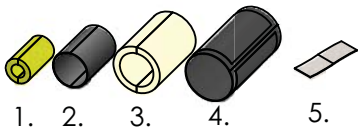
SHEET TITLE
Field Joint Kit (Rigid Foam) with FRP Casing Detail

PRODUCT
Tricon Steel-Con Plus

SIZE	SCALE	DATE
A	NTS	11/01/2016

DWG. NO.
SCP-12B

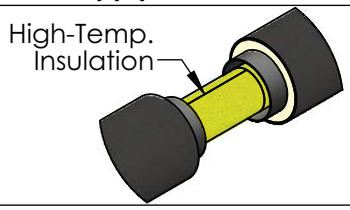
STEP #1: Gather Materials



The field joint kit includes:
1. High-temp. insulation
2. Split steel sleeve
3. Urethane pipe covering (3-ft sections)
4. Scuffed 2 PC FRP Sleeve.
5. FRP Mat

Equipment List:
Hand saw, razor knife, FRP roller, and safety glasses.

STEP #2: Apply Inner Insulation

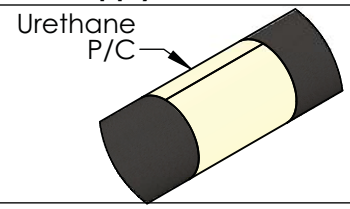


After welding the service pipe and testing all welds as required, apply high-temperature insulation and secure in place with tape.

STEP #3: Seal Conduit

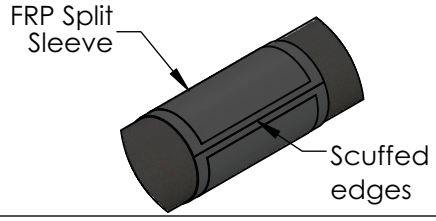
Fit the split sleeve onto conduit and weld in place with two circumferential and two horizontal welds. Pressure test all sleeve welds but do not exceed 15 psi air pressure. Soap test all welds.

STEP #4: Apply Outer Insulation



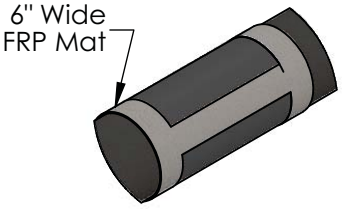
Make sure the pipe and casing are clean and dry. Cut the polyurethane foam half-shells to length using a hand saw. Fit the urethane to contours of service pipe by rotating the half-shells back and forth until they seat properly. Secure the urethane into place.

STEP #5: Apply Split FRP Sleeve



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 the FRP split sleeve and jacket.

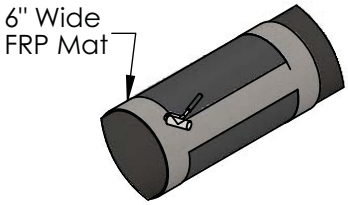
STEP #6: Wrap with FRP Mat



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 3 strips of saturated mat and place 1 end at the 12 o'clock position and the other at the 6 o'clock position.

Note: Cold temperature will cause longer curing time.

STEP #7: Finish wrap, roll out to remove air bubbles



Roll into place with FRP roller untill mat 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.

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SHEET TITLE
Field Joint Kit (Rigid Foam) with FRP Casing Hand Lay-Up Detail

PRODUCT
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DWG. NO.
SCP-12C