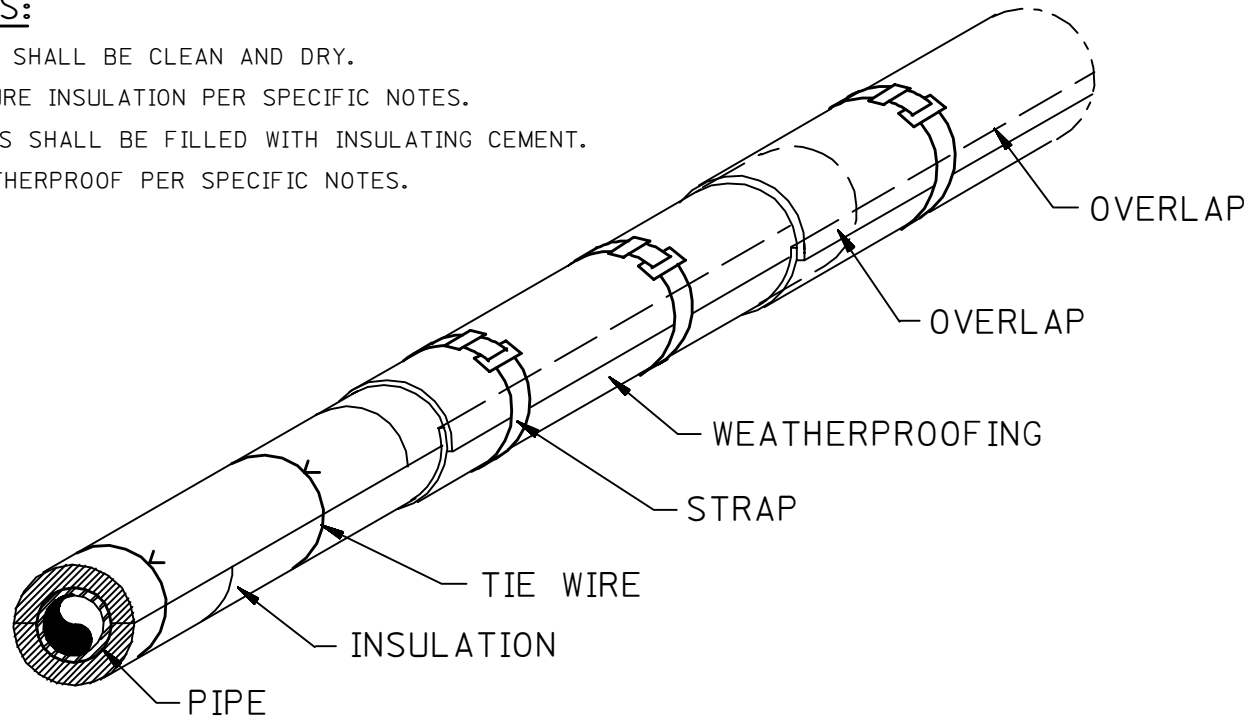


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TON, REV. NO.	TON, SHT. NO.	REVISION NUMBER	INDEX	TON, PLANT NO.

NOTES:

- PIPE SHALL BE CLEAN AND DRY.
- SECURE INSULATION PER SPECIFIC NOTES.
- VOIDS SHALL BE FILLED WITH INSULATING CEMENT.
- WEATHERPROOF PER SPECIFIC NOTES.



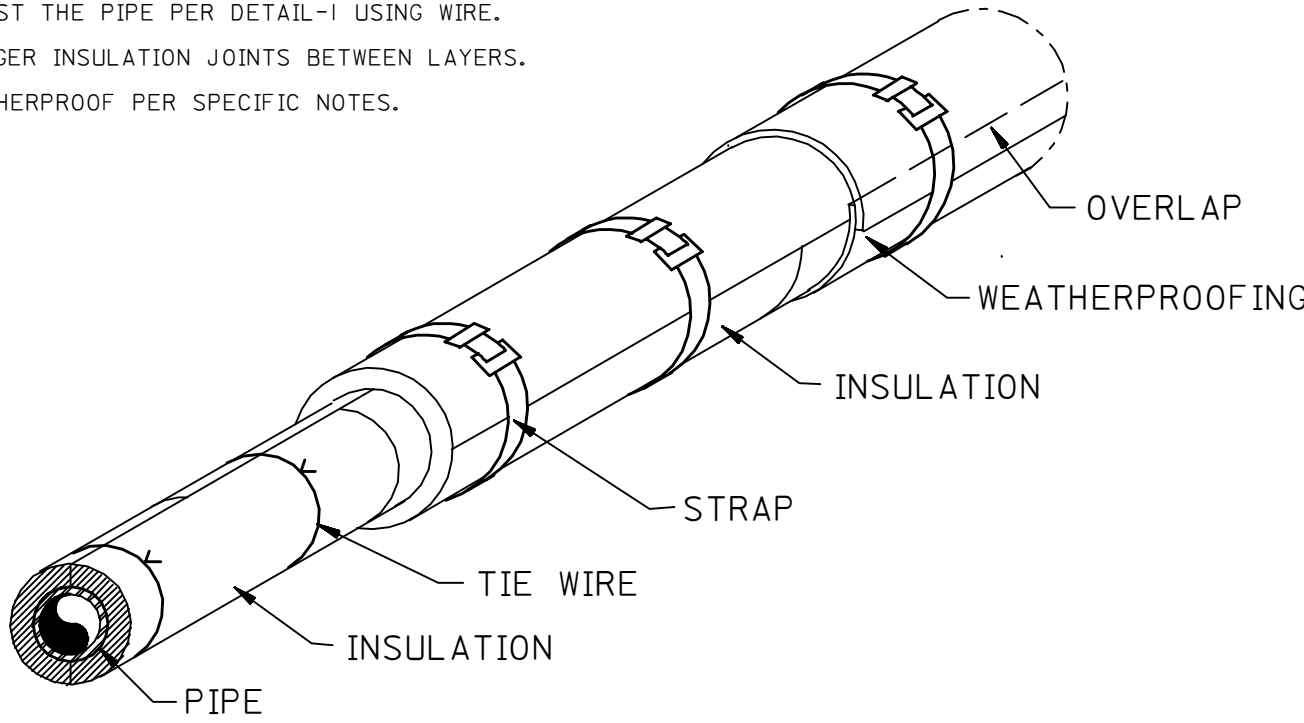
SINGLE LAYER PREFORMED INSULATION

(USE DRAWING AA-036912 FOR 36 INCH NPS PIPE AND ABOVE)

DETAIL 1

NOTES:

- PIPE SHALL BE CLEAN AND DRY.
- SECURE HIGHEST TEMPERATURE RATING INSULATION AGAINST THE PIPE PER DETAIL-1 USING WIRE.
- STAGGER INSULATION JOINTS BETWEEN LAYERS.
- WEATHERPROOF PER SPECIFIC NOTES.

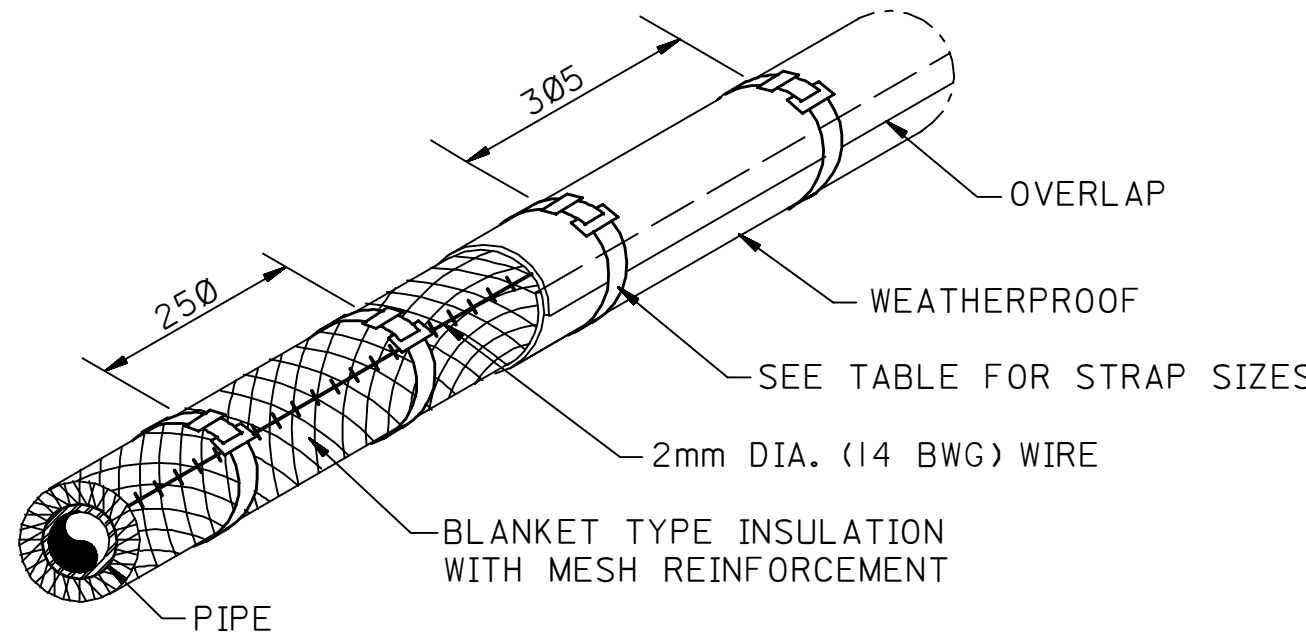


DOUBLE LAYER INSULATION

DETAIL 2

NOTES:

- SECURE BLANKET EDGES WITH 14 GAGE WIRE.
- BLANKET SHALL BE SECURED WITH STRAPS ON 250mm CENTERS.
- WEATHERPROOF PER SPECIFIC NOTES.

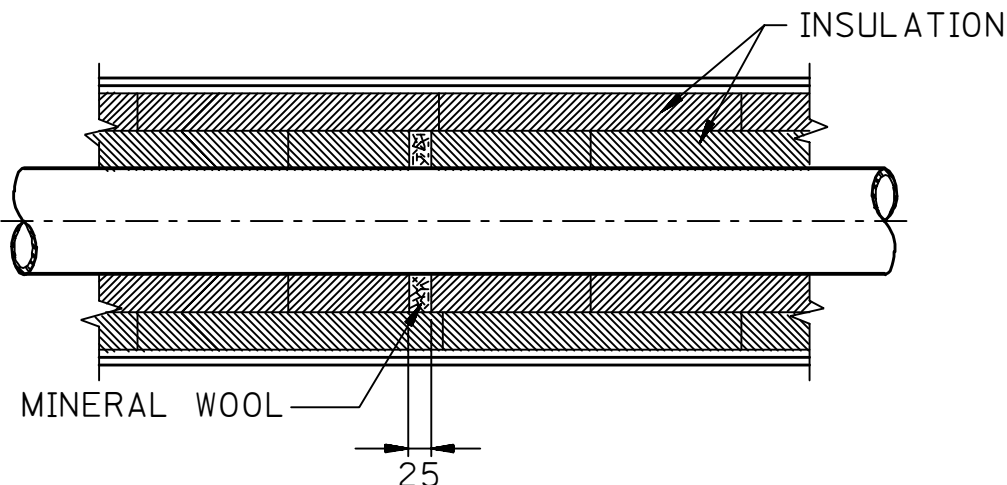


BLANKET TYPE INSULATION

DETAIL 3

NOTES:

- 25mm EXPANSION JOINT SHALL BE PACKED WITH LOOSE MINERAL WOOL.
- WEATHERPROOF PER SPECIFIC NOTES.

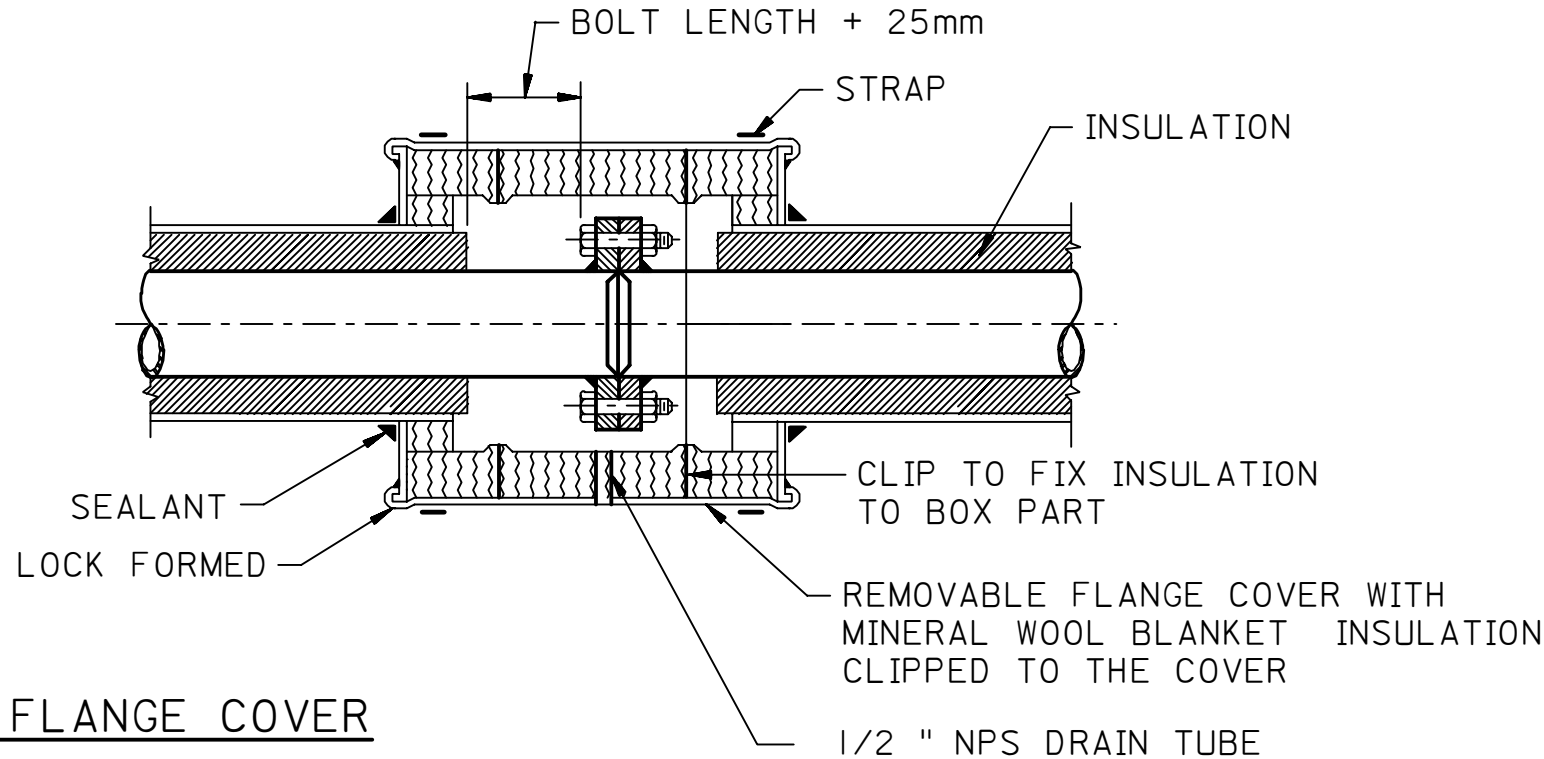


EXPANSION JOINT

DETAIL 4

NOTES:

- METAL FLANGE COVER, SPLIT ON HORIZONTAL CENTERLINE SHALL HAVE A 50mm OVERLAP TO SHED WATER.
- SECURE INSULATION TO METAL COVER (IF REMOVABLE) WITH CLIPS OR ADHESIVE.
- FLANGE COVER SHALL BE SECURED WITH QUICK RELEASE TOGGLES.
- WEATHERPROOF COVER TO METAL JACKET WITH SEALANT.

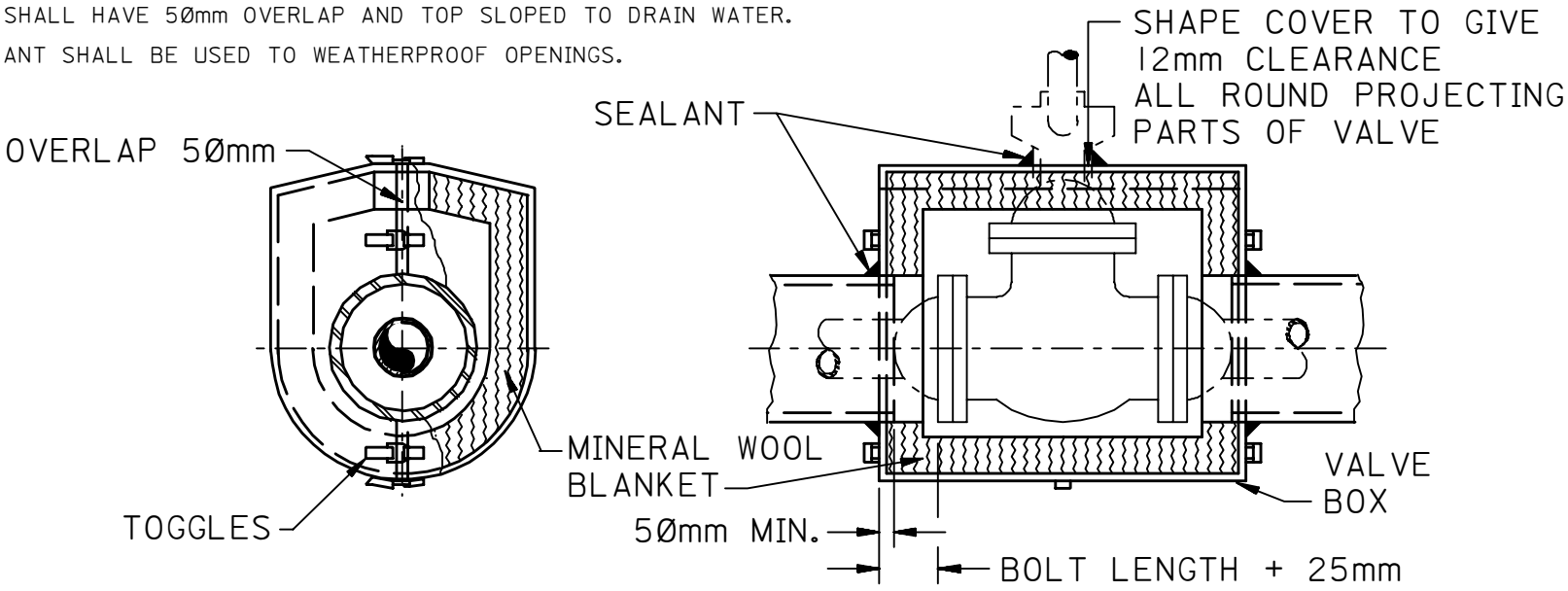


INSULATED FLANGE COVER

DETAIL 5

NOTES:

- VALVE BOX SHALL BE MADE OF GALVANIZED STEEL.
- SECURE INSULATION TO METAL COVER (IF REMOVABLE) WITH CLIPS OR ADHESIVE.
- FLANGE COVER SHALL BE SECURED WITH QUICK RELEASE TOGGLES.
- BOX SHALL HAVE 50mm OVERLAP AND TOP SLOPED TO DRAIN WATER.
- SEALANT SHALL BE USED TO WEATHERPROOF OPENINGS.

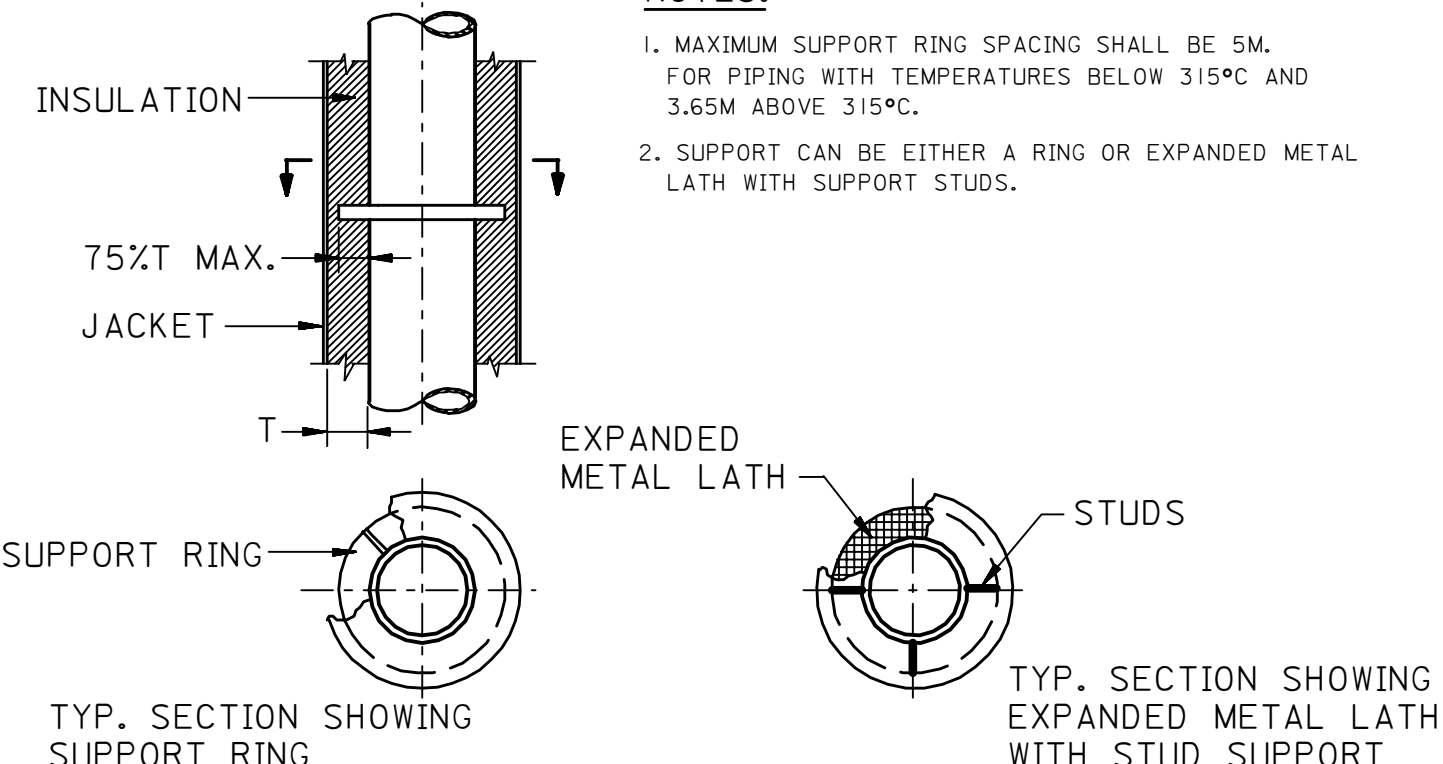


REMOVABLE METAL BOX VALVE COVER

DETAIL 6

NOTES:

- MAXIMUM SUPPORT RING SPACING SHALL BE 5M. FOR PIPING WITH TEMPERATURES BELOW 315°C AND 3.65M ABOVE 315°C.
- SUPPORT CAN BE EITHER A RING OR EXPANDED METAL LATH WITH SUPPORT STUDS.

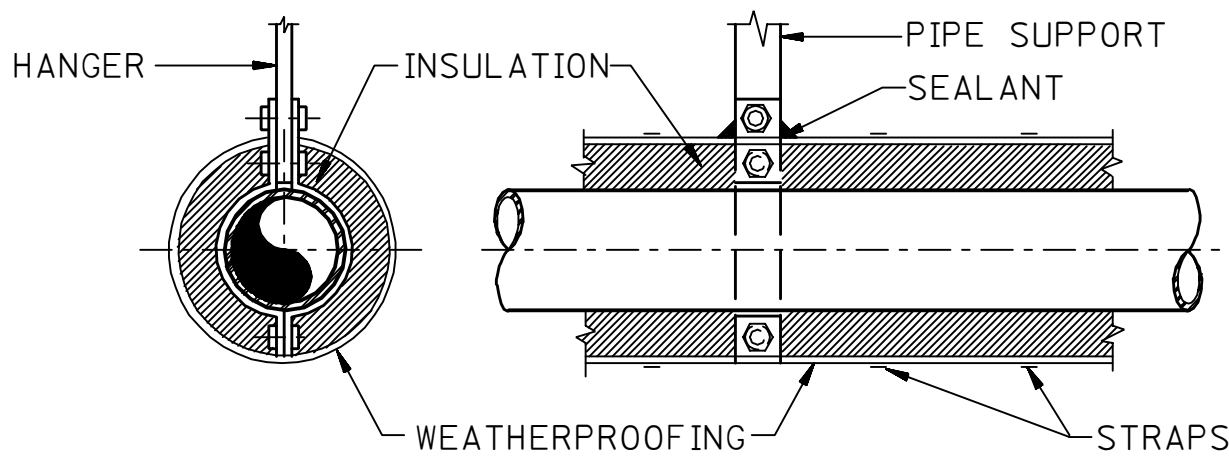


INSULATION SUPPORT ON VERTICAL PIPING

DETAIL 7

NOTES:

- STANDARD OR SPLIT RING HANGERS SHALL BE INSTALLED ON PIPE.
- PROTRUSION THROUGH METAL JACKET SHALL BE SEALED.

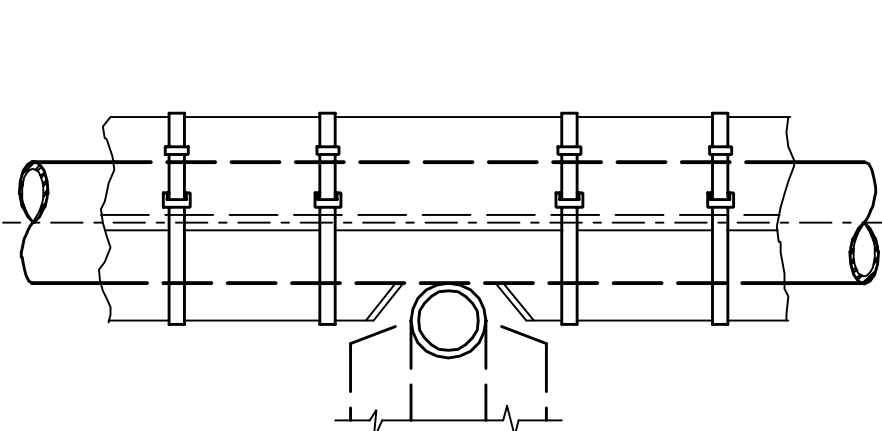


OVERHEAD SUPPORT

DETAIL 8

NOTES:

- METAL JACKET AND INSULATION SHALL BE OMITTED AT PIPE SUPPORT TO ALLOW PIPING MOVEMENT.
- BEVEL INSULATION EDGES AND FINISH WITH INSULATING CEMENT.
- COAT INSULATING CEMENT WITH ALUMINUM PAINT (SAPCS-41)



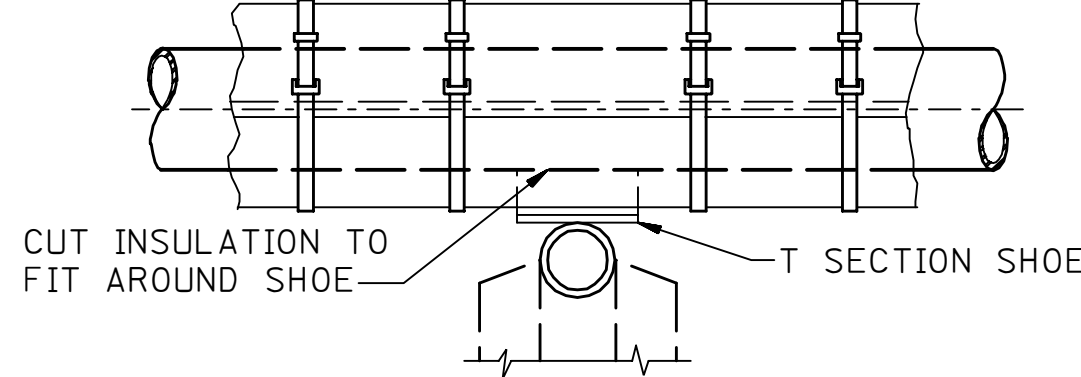
TYPE 1

SUPPORT FOR PIPE

DETAIL 9

NOTES:

- CUT METAL JACKET AND INSULATION TO FIT A PIPE SHOE.
- WEATHERPROOF JOINTS WITH FINISHING CEMENT.



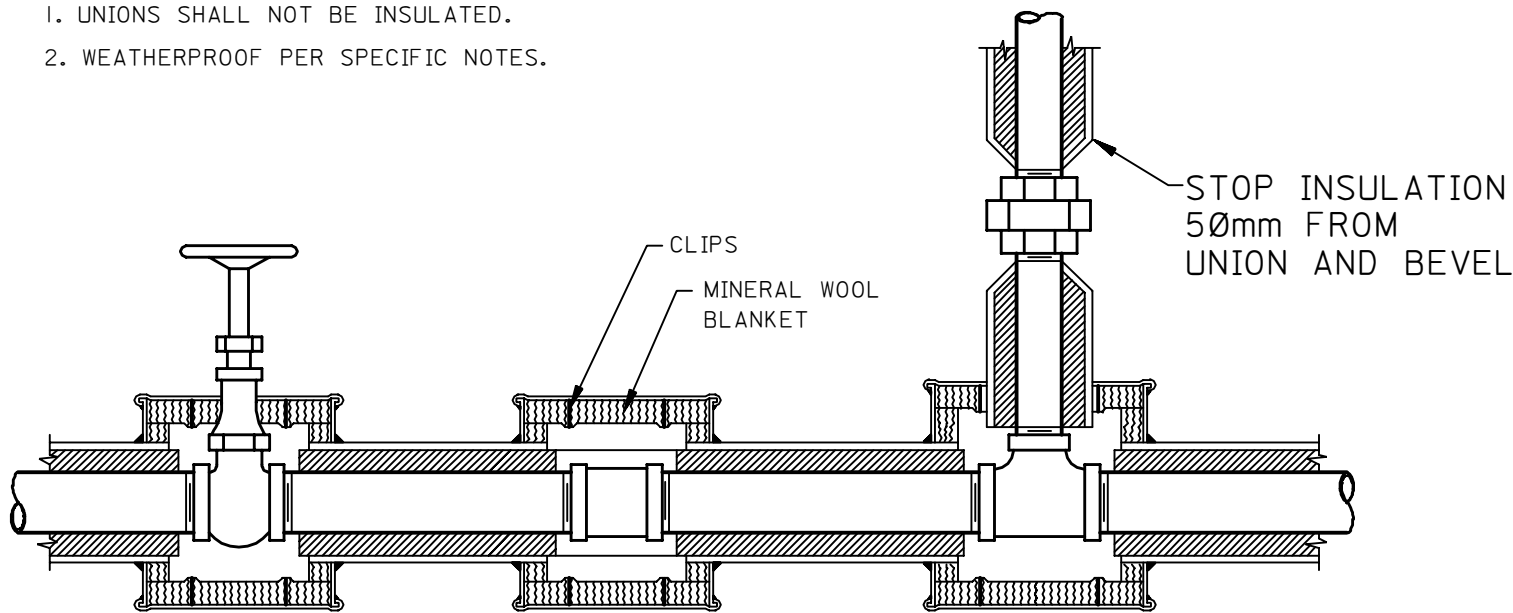
TYPE 2

SUPPORT FOR PIPE ON SHOE

DETAIL 10

NOTES:

- UNIONS SHALL NOT BE INSULATED.
- WEATHERPROOF PER SPECIFIC NOTES.



TYPICAL INSULATION DETAILS OF THREADED FITTINGS AND VALVES

DETAIL 11

INSULATION MATERIALS

INSULATION MATERIAL	TYPE	TEMP. LIMIT °C	DIMENSION	SAMS STOCK NUMBER
CALCIUM SILICATE	TYPE 1	650		32-206-SERIES (TYPE 1 ONLY)
	TYPE 2	816		NOT STOCKED
MINERAL FIBER	BLANKET	870		NOT STOCKED
	BLOCK	980		NOT STOCKED
MINERAL FIBER PIPE PREFORMED		650		32-210-SERIES
MINERAL FIBER	LOOSE			32-180-56900-86101
MINERAL FIBER CEMENT		800	12.5 KG BAG	32-161-067
CELLULAR GLASS (FOAM GLASS)	PREFORMED	870		NOT STOCKED
		430		32-208-SERIES

ACCESSORIES MATERIALS

ACCESSORIES	TYPE	PIPE SIZES	NOMINAL SIZES mm	SAMS STOCK NUMBER
GALVANIZED STEEL WIRE	ASTM A641	< 4" NPS AND INTERLAYER	2 (14 BWG)	
STAINLESS STEEL WIRE	304, 316	< 4" NPS AND INTERLAYER	2 (14 BWG)	
STAINLESS STEEL STRAP		< 36" NPS > 36" NPS	12 x 0.5 20 x 0.5	08-900-516 08-900-519
GALVANIZED MESH				12-692-572
SEALANT	PITTSEAL 444			

WEATHERPROOFING MATERIALS

WEATHERPROOFING	TYPE	PIPE SIZES	NOMINAL THICKNESSES mm	SAMS STOCK NUMBER
ALUMINUM, ALLOY 3003		< 6" NPS	0.5	12-123-SERIES
		6" TO 20" NPS	0.6	
		> 20" NPS	0.8	
ALLOY 6061		< 6" NPS	0.5	12-123-SERIES
		6" TO 20" NPS	0.6	
		> 20" NPS	0.8	
ALUMINIZED STEEL		< 36" NPS	0.45	
		> 36" NPS	0.6	
STAINLESS STEEL		ALL SIZES	0.25	

GENERAL NOTES

- THE MATERIALS SPECIFIED FOR INSULATION, WEATHER-PROOFING, AND ACCESSORIES ARE MANDATORY. ALTERNATIVE MATERIALS MUST MEET THE GENERIC DESCRIPTIONS SPECIFIED IN THE SAUDI ARAMCO MATERIAL STOCK (SAMS) SYSTEM.
- THE INSTALLATION DETAILS SHOWN ARE TYPICAL. ALTERNATIVE INSTALLATION DETAILS ARE ACCEPTABLE PROVIDED THEY COMPLY WITH THE SPECIFIC NOTES.
- CONVENTIONAL UNITS OF MEASUREMENTS MAY BE USED IN LIEU OF THE METRIC MEASUREMENTS SHOWN.
- INSULATION THICKNESSES ARE TO BE IN ACCORDANCE WITH SAES-N-001.

SPECIFIC NOTES

- INSULATED SURFACES SHALL BE CLEAN, DRY, AND ALL PAINT FULLY CURED PRIOR TO INSTALLATION OF INSULATION.
- INSULATION SHALL BE INSTALLED AND SECURED WITH TIGHTLY BUTTED, STAGGERED JOINTS. VOIDS SHALL BE AVOIDED.
- FASTEN INSULATION ON PIPE WITH STRAPS AT APPROXIMATELY 250mm CENTERS, AND FASTEN METAL JACKETING ON INSULATION AT APPROX. 305mm CENTERS.
- INSULATION SYSTEMS REQUIRING FIREPROOFING JACKETS SHALL BE WEATHERPROOFED WITH STAINLESS STEEL, GALVANIZED STEEL OR ALUMINIZED STEEL ONLY.
- WEATHERPROOFING SHALL BE INSTALLED TO DRAIN WATER, OVERLAPPED 50mm AND SECURED WITH STRAPPING AT APPROXIMATELY 305mm CENTERS.
- ALUMINUM METAL JACKETS OR WEATHERPROOFING SHALL BE USED IN NON-FIRE HAZARDOUS AREAS WITHIN PROCESS PLANT BATTERY LIMITS.
- ALUMINUM JACKETS IN COASTAL AND MARINE ENVIRONMENTS SHALL BE ASTM B209 ALLOY 6061.
- STAINLESS STEEL JACKETS IN COASTAL AND MARINE ENVIRONMENTS SHALL BE ASTM A167 TYPE 316 STAINLESS STEEL.
- STRAPS SHALL BE TENSIONED AND SECURED WITH WING-TYPE SEAL FASTENERS.
- CORRUGATED SHEET MAY BE USED FOR DIAMETERS GREATER THAN 915mm.

DRAWING RESPONSIBILITY :
VESSEL STANDARDS COMMITTEE

06	07-30-96	ESSD WAS		COMPLETELY REVISED			
REV. NO.	DATE	BY	JO/EWO	DESCRIPTION	CHKD.	CERT.	APPD.

SAUDI ARABIAN OIL COMPANY

DRAWN BY _____ CHECKED BY _____ SCALE: _____ NONE _____

DATE STARTED _____ DATE COMPLETED _____

OPR'G. DEPT. _____ ENG. DEPT. _____

APP'D. FOR CONST. _____

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED BY _____ DATE _____

INSULATION DETAILS FOR HOT PIPING

STD. DWG. _____ METRIC _____

PLANT NO.	INDEX	DRAWING NUMBER	SHT. NO.	REV. NO.
990	N	AA-036911	001	06