

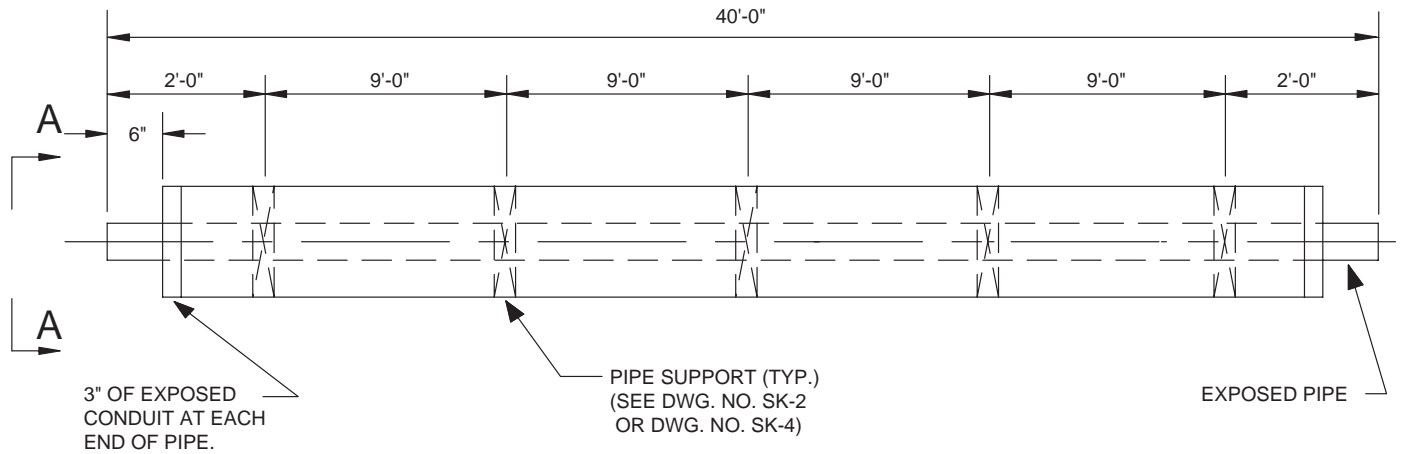


# CLASS "A" STEEL SK-1

CAAD  
4.301

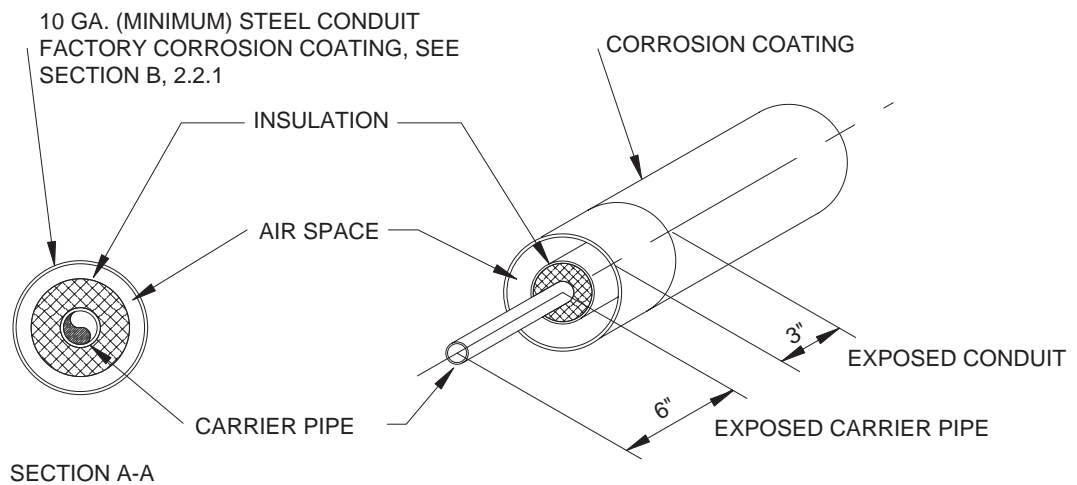
STANDARD CONDUIT LENGTH

3.14.07



MINIMUM GAUGE AND THICKNESS FOR STEEL CASING CONDUIT SYSTEMS		
CASING TYPE	CASING DIAMETER	MIN. WALL THICKNESS
BLACK STEEL	UP THROUGH 26"	0.1345" (10 GAUGE)
SMOOTH WALL	28" THROUGH 36"	0.1943" (6 GAUGE)
	38" THROUGH 42"	0.2242" (4 GAUGE)

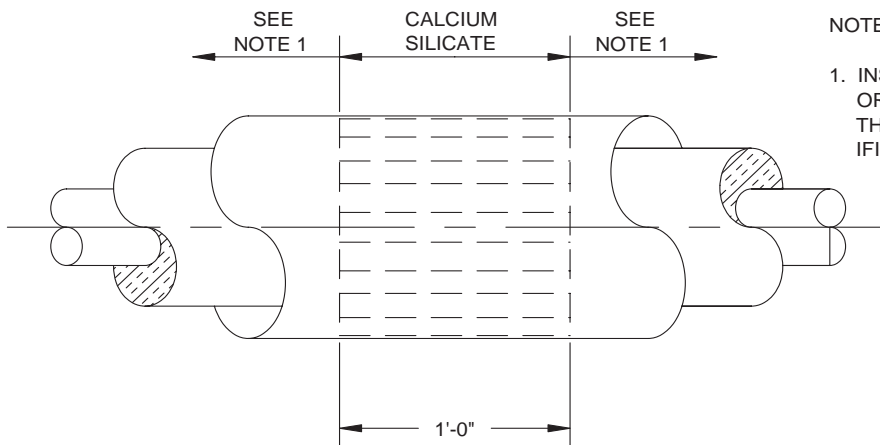
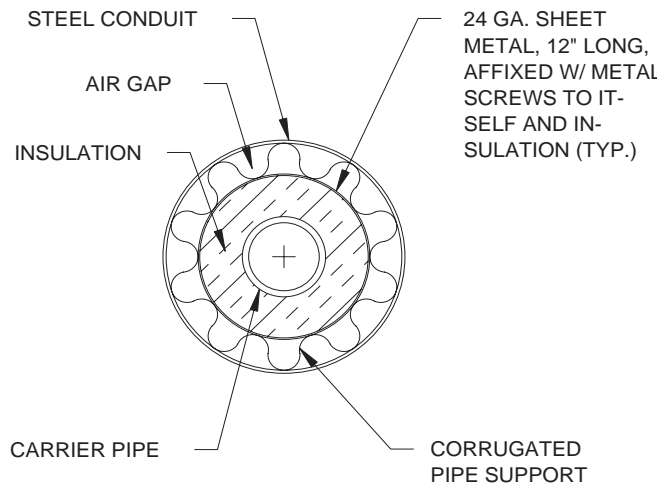
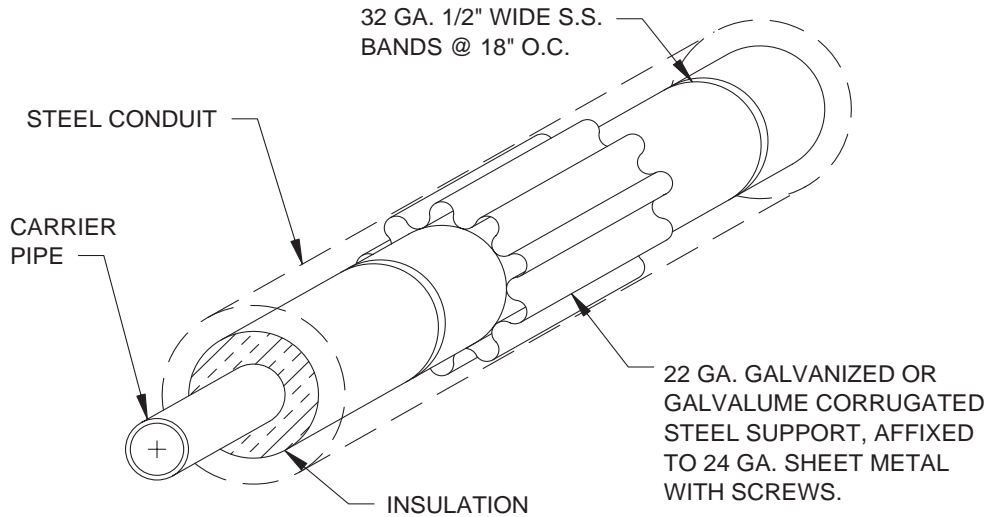
The above thicknesses will support a highway loading H-20, or equivalent, with a minimum of 2' burial and 95% of maximum density compacted backfill in cohesive soils or 70% of relative density compacted backfill for cohesive soils. For special loadings and soil conditions, conduit thickness may change.



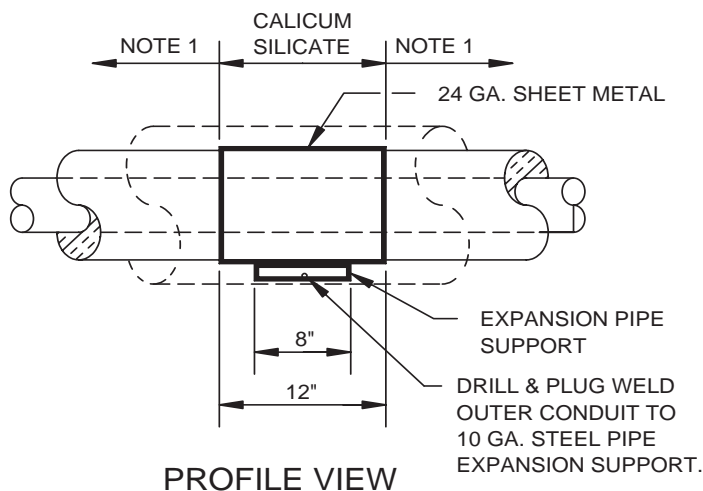
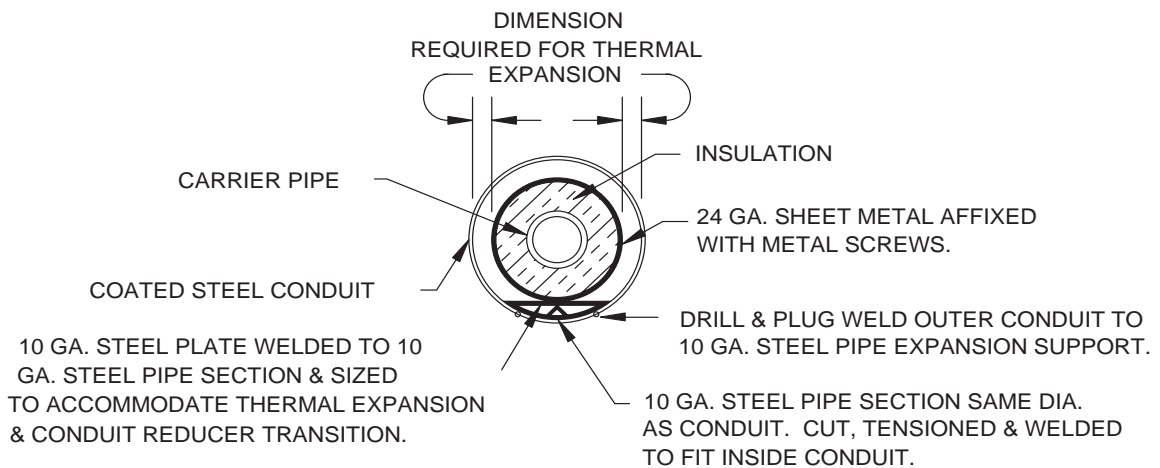
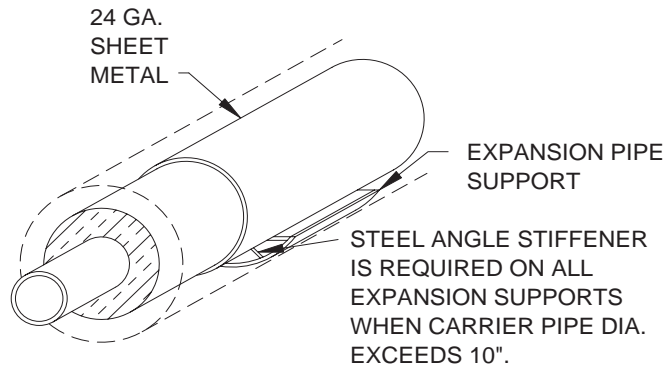
**NOTE:**

This detail shows a single pipe in a conduit. The support spacing dimensions and casing thickness are applicable for a dual pipe system in a single conduit.

### TYPICAL INSTALLED PIPE SUPPORT/ GUIDE

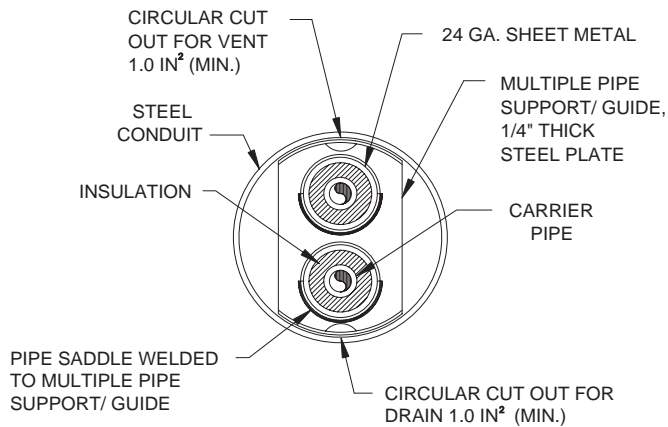
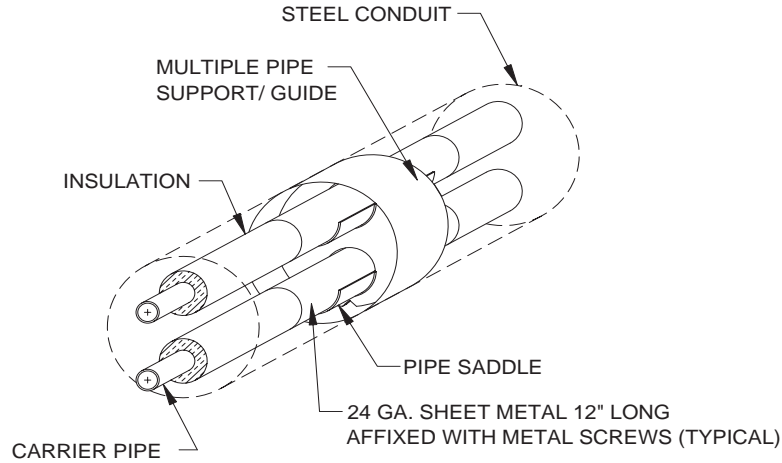


### TYPICAL EXPANSION PIPE SUPPORT

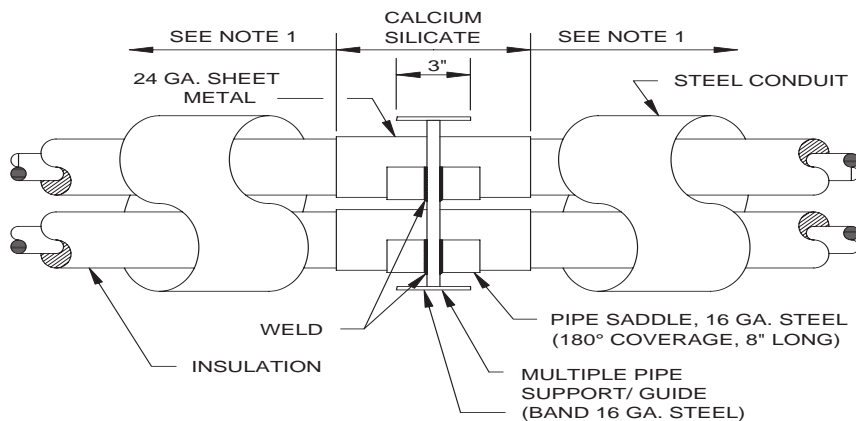
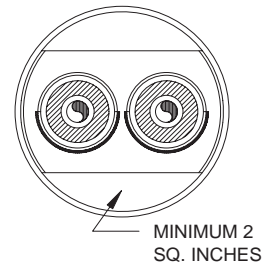

**NOTE:**

1. INSULATION CAN BE MINERAL WOOL OR CALCIUM SILICATE AS PER THE BROCHURE AND PROJECT SPECIFICATIONS.
2. CONDUIT WITH EXPANSION PIPE SUPPORTS SHALL HAVE SHIPPING BARS TACK WELDED ON CARRIER PIPE AND CONDUIT AND SHALL BE PAINTED TO SHOW TOP OF CONDUIT FOR PROPER SHIPPING, HANDLING, AND INSTALLATION.

### TYPICAL INSTALLED PIPE SUPPORT/ GUIDE



#### LATERAL OPTION

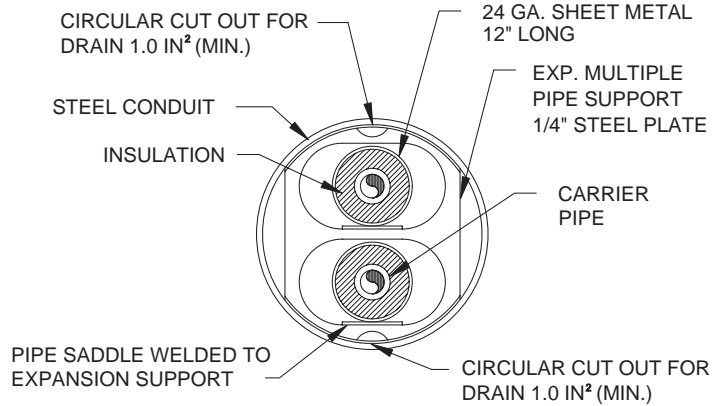


#### PROFILE VIEW

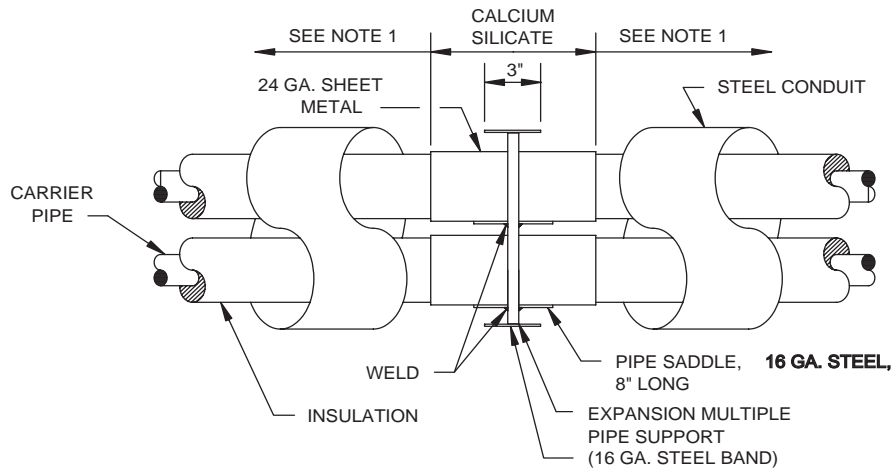
#### NOTE:

1. INSULATION CAN BE MINERAL WOOL OR CALCIUM SILICATE AS PER THE PROJECT SPECIFICATIONS.

### INSTALLED MULTIPLE PIPE SUPPORT



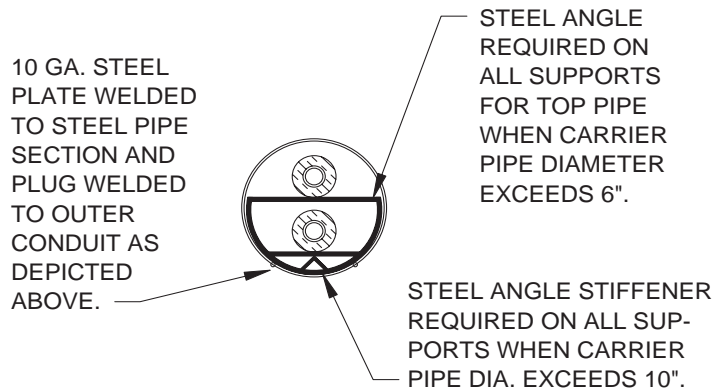
TYPE A EXPANSION SUPPORT



#### PROFILE VIEW

NOTE:

1. INSULATION CAN BE MINERAL WOOL OR CALCIUM SILICATE AS PER THE PROJECT SPECIFICATIONS.
2. DIMENSIONS FOR INSULATION AND MATERIALS AT PIPE SUPPORTS ARE TYPICAL FOR ALL SUPPORT TYPES.

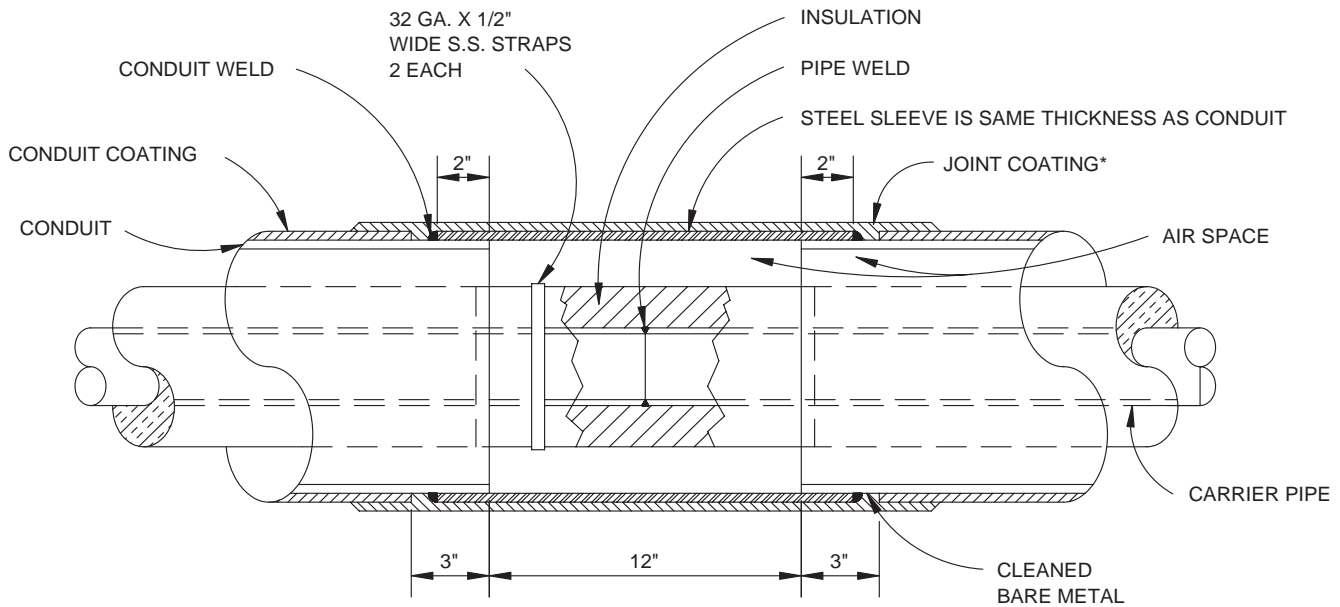


TYPE B EXPANSION SUPPORT



PROFILE VIEW

### CONDUIT CLOSURE

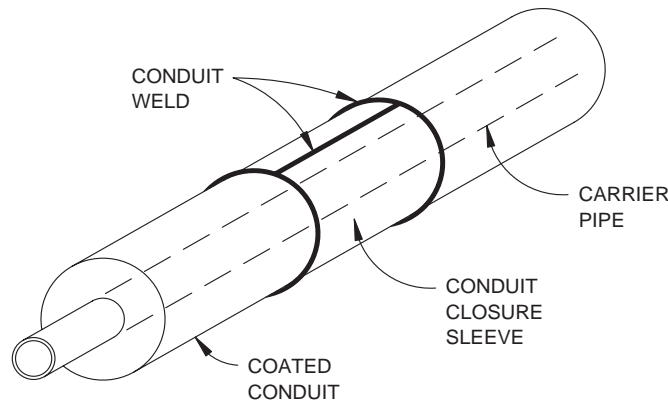


**\* JOINT COATING MATERIALS OPTIONS:**

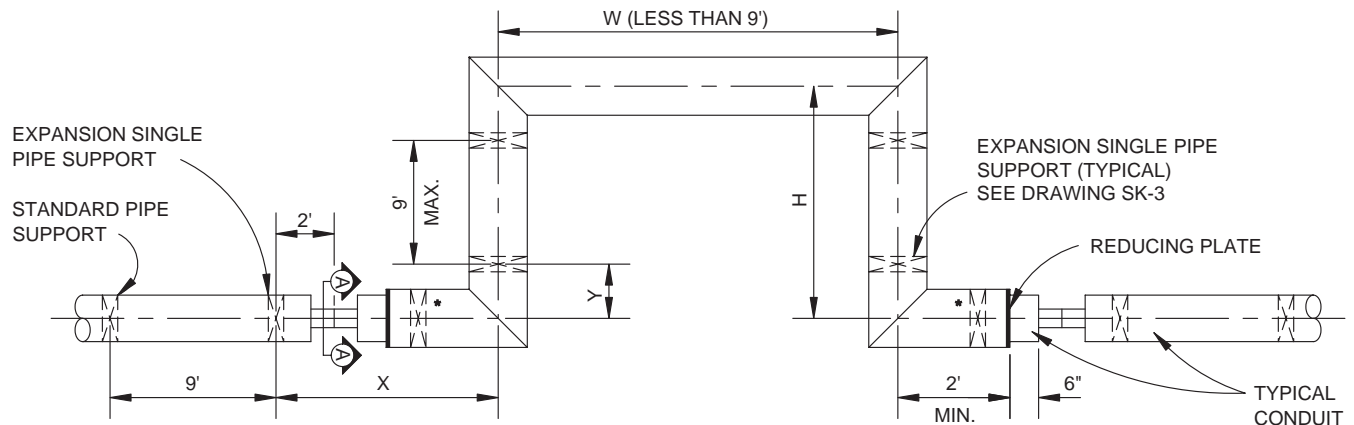
1. CHEMICALLY CURED POLYURETHANE
2. HEAT SHRINKABLE SLEEVE.
3. LIQUID EPOXY COATING

**NOTE:**

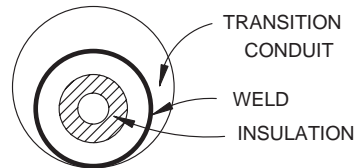
GRIND SHIPPING BARS, (DO NOT TORCH CUT) BETWEEN CARRIER PIPE AND CONDUIT BEFORE MAKING JOINT OR COLD SPRING.



### TYPICAL SINGLE PIPE EXPANSION LOOP DETAIL



\*EXPANSION SINGLE PIPE SUPPORT  
REQ'D WHEN X+Y EXCEEDS 9'.



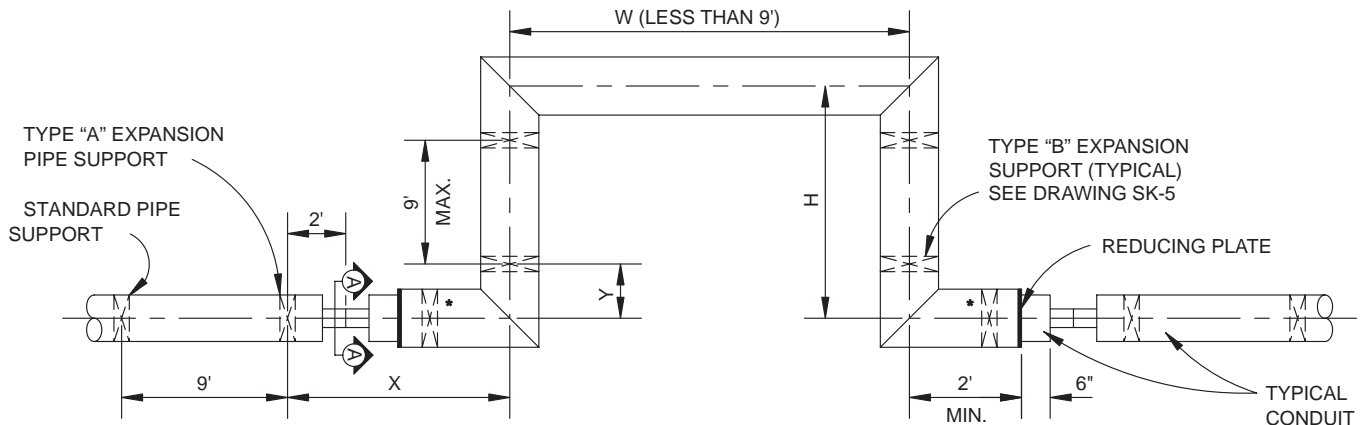
SECTION A-A  
CIRCULAR

OVERSIZED CONDUIT TO BE DESIGNED & UTILIZED TO ENSURE CARRIER PIPE INSULATION WILL NOT CONTACT THE INTERIOR OF THE CASING PIPE DUE TO THERMAL EXPANSION OR CONTRACTION FORCES.

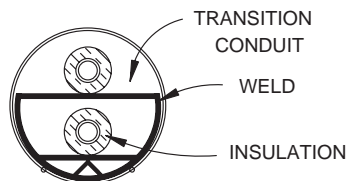
**NOTE:**

1. SIZE OF EXPANSION LOOPS, 'H' & 'W' BASED ON JOB REQUIREMENTS. SEE TABLE 1 OF BROCHURE.
2. SPECIFIC JOBSITE REQUIREMENTS & DIFFERING FIELD CONDITIONS WILL DICTATE WHICH TYPE OF OVERSIZED CONDUIT WILL BE UTILIZED (CIRCULAR OR ELLIPTICAL).
3. EXPANSION TYPE SUPPORTS SHALL BE UTILIZED TO COMPENSATE FOR THE NECESSARY THERMAL EXPANSION WHEREVER A CHANGE OF DIRECTION (90° ELLS, 45° ELLS, ZEES, TEES, LOOPS, ETC.) OCCURS IN THE CONDUIT SYSTEM. THIS INCLUDES EXPANSION SUPPORTS IN EACH LEG AS NECESSARY TO COMPENSATE FOR THERMAL EXPANSION IN BOTH DIRECTIONS.
4. OVERSIZED CONDUIT TO ALLOW FOR MOVEMENT OF PIPE. TRANSITION CONDUIT 10 GA. THICK-WELDED AT BOTH CONDUITS (IF REQUIRED FOR EXPANSION).

## TYPICAL MULTIPLE PIPE EXPANSION LOOP DETAIL



\*TYPE "A" EXPANSION PIPE SUPPORT  
REQ'D WHEN X+Y EXCEEDS 9'.



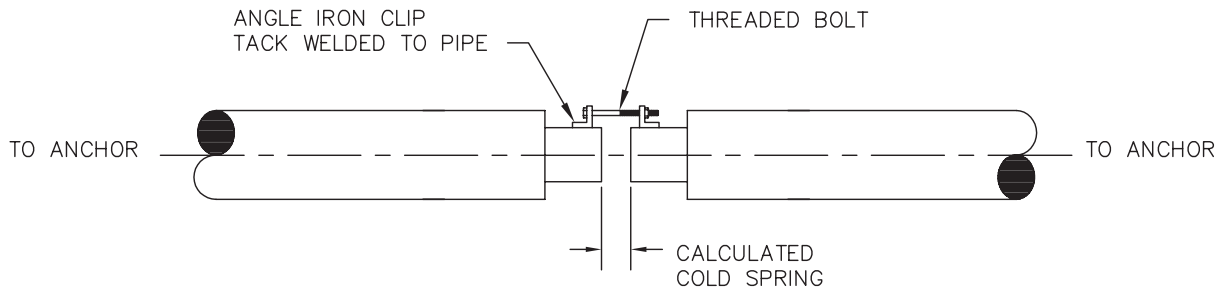
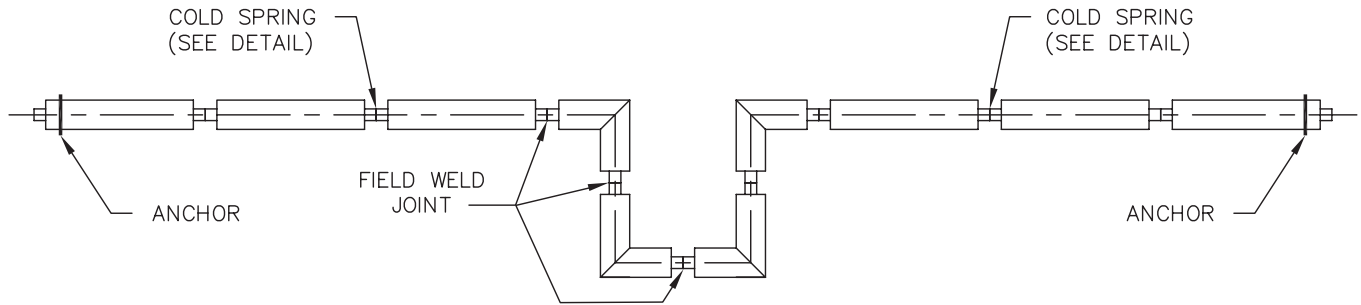
SECTION A-A  
CIRCULAR

OVERSIZED CONDUIT TO BE DESIGNED  
& UTILIZED TO ENSURE CARRIER  
PIPE INSULATION WILL NOT CON-  
TACT THE INTERIOR OF THE  
CASING PIPE DUE TO THERMAL  
EXPANSION OR CONTRACTION  
**FORCES.**

**NOTE:**

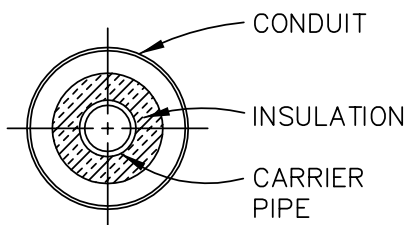
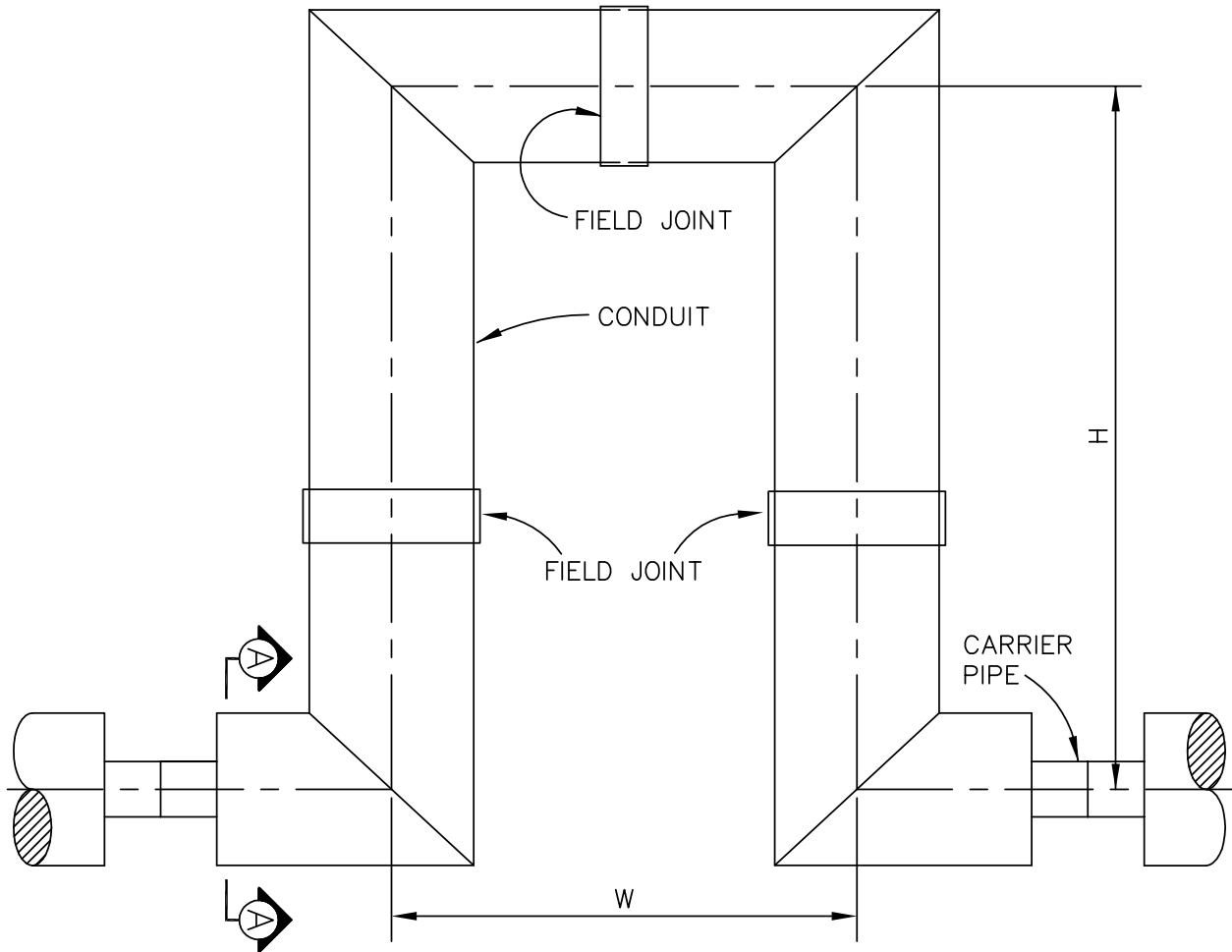
1. SIZE OF EXPANSION LOOPS, 'H' & 'W' BASED ON JOB REQUIREMENTS. SEE TABLE 1 OF BROCHURE.
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3. EXPANSION TYPE SUPPORTS SHALL BE UTILIZED TO COMPENSATE FOR THE NECESSARY THERMAL EXPANSION WHEREVER A CHANGE OF DIRECTION (90° ELLS, 45° ELLS, ZEES, TEES, LOOPS, ETC.) OCCURS IN THE CONDUIT SYSTEM. THIS INCLUDES EXPANSION SUPPORTS IN EACH LEG AS NECESSARY TO COMPENSATE FOR THERMAL EXPANSION IN BOTH DIRECTIONS.
4. OVERSIZED CONDUIT TO ALLOW FOR MOVEMENT OF PIPE. TRANSITION CONDUIT 10 GA. THICK-WELDED AT BOTH CONDUITS (IF REQUIRED FOR EXPANSION).

**TYPICAL COLD SPRING**



**COLD SPRING DETAIL**

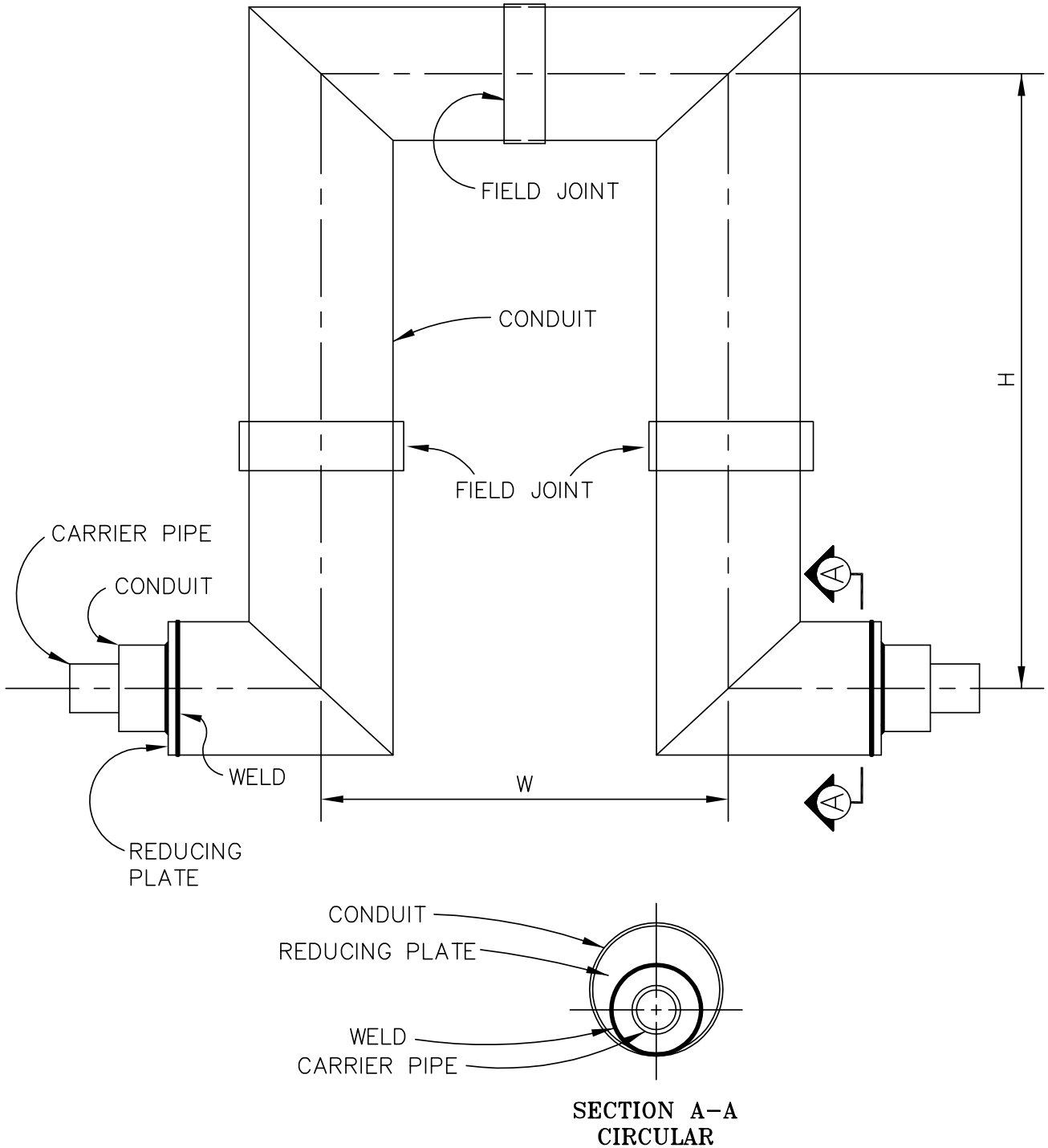
**TYPICAL THREE-PIECE EXPANSION LOOP**



**SECTION A-A  
CIRCULAR**

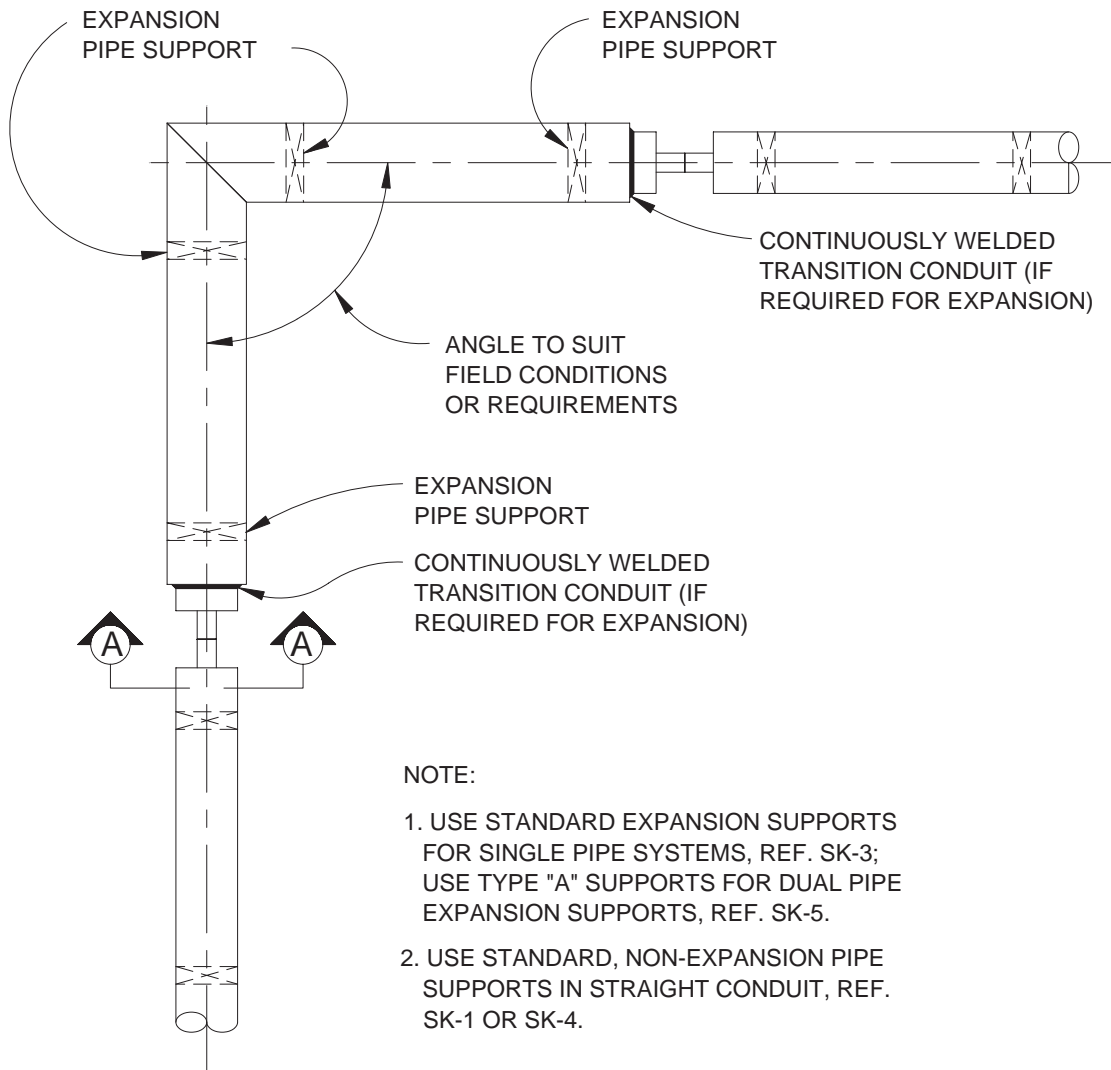
NOTE: DIMENSIONS 'H' AND 'W'  
TO BE SIZED FOR JOB  
REQUIREMENTS.

### TYPICAL THREE-PIECE EXPANSION LOOP WITH ECCENTRIC REDUCER

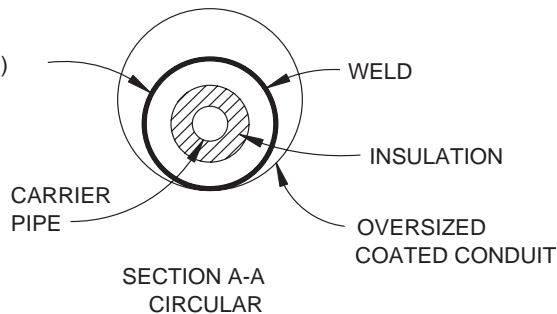


NOTE: DIMENSIONS 'H' AND 'W'  
TO BE SIZED FOR JOB  
REQUIREMENTS.

### TYPICAL EXPANSION ELBOW

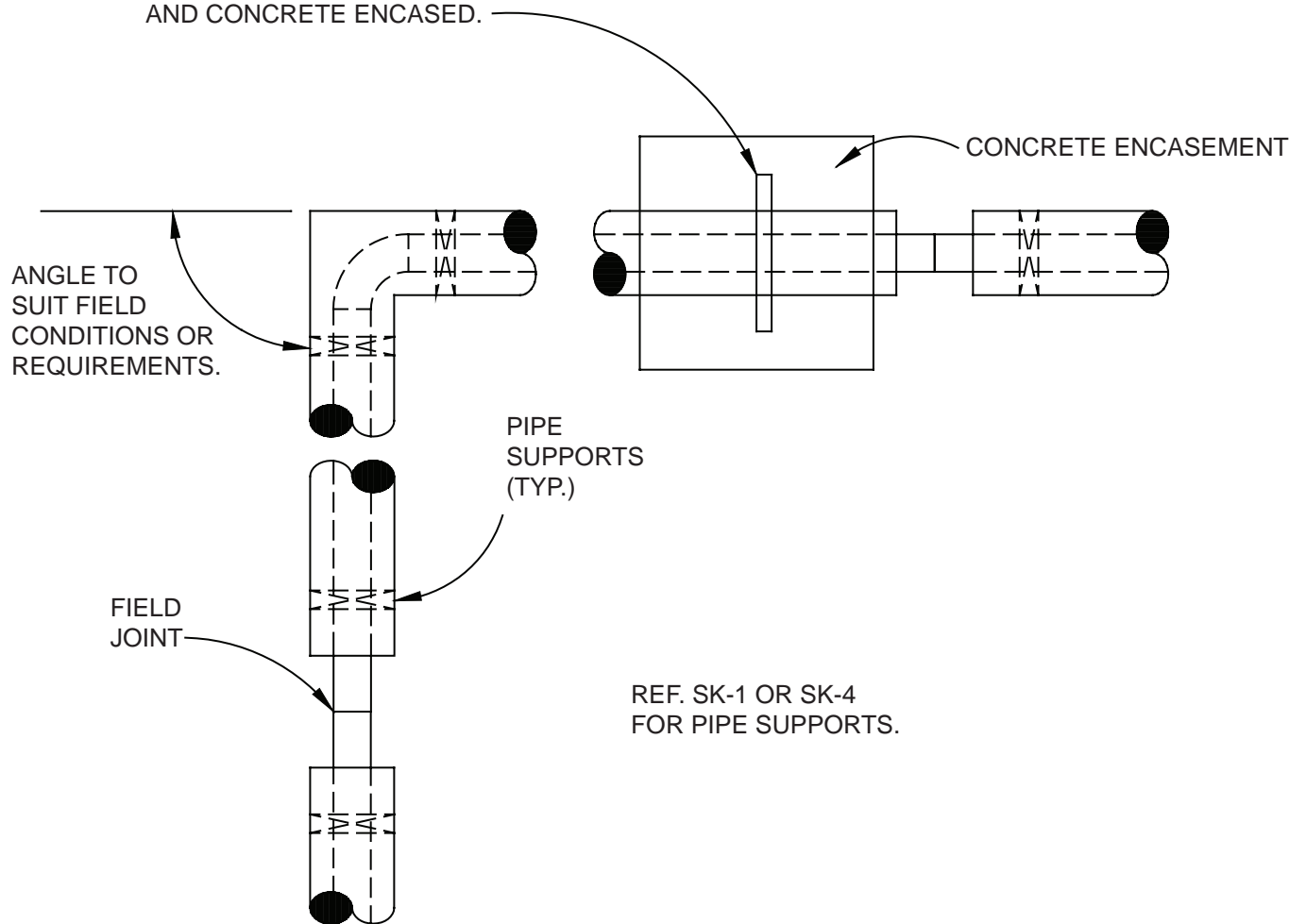


CONTINUOUSLY WELDED TRANSITION CONDUIT (IF REQUIRED FOR EXPANSION)

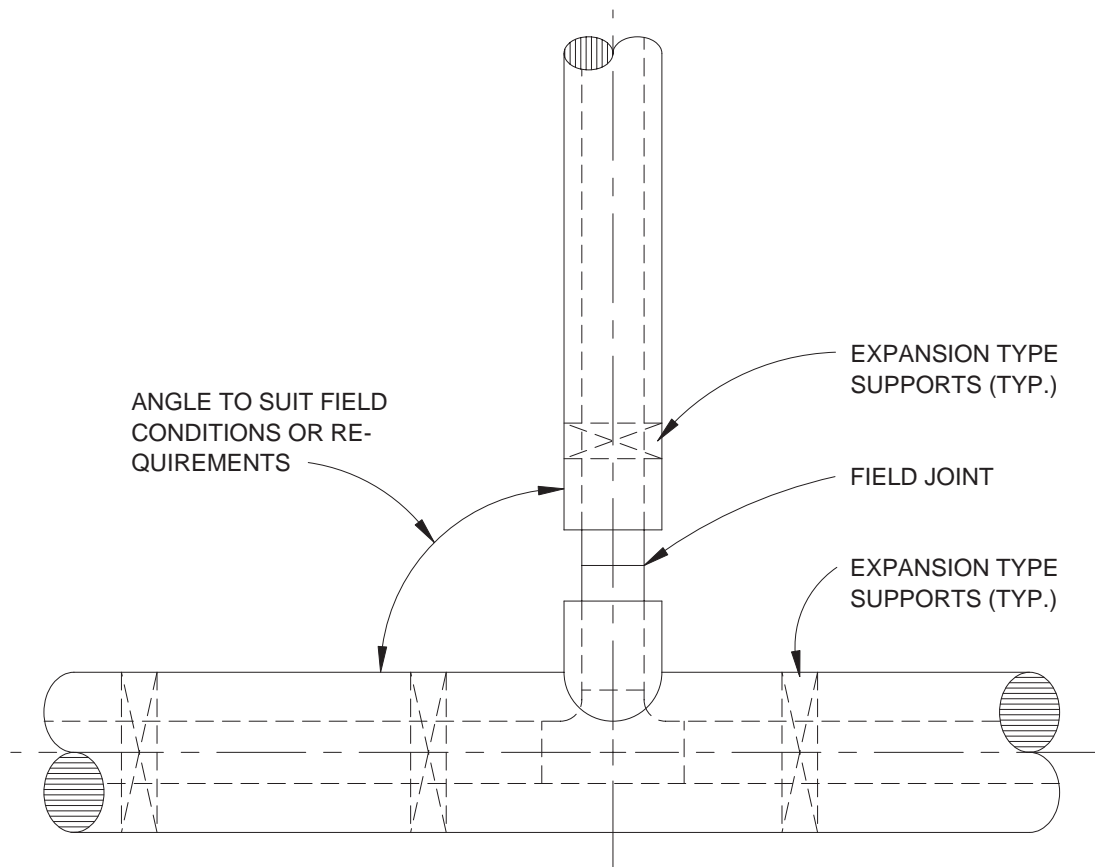


### TYPICAL ANCHORED ELBOW

1/2" ANCHOR PLATE CONTINUOUSLY WELDED TO CARRIER PIPE AND CONDUIT. ANCHOR PLATE TO EXCEED CONDUIT O.D. BY MINIMUM OF 6" AND CONCRETE ENCASED.



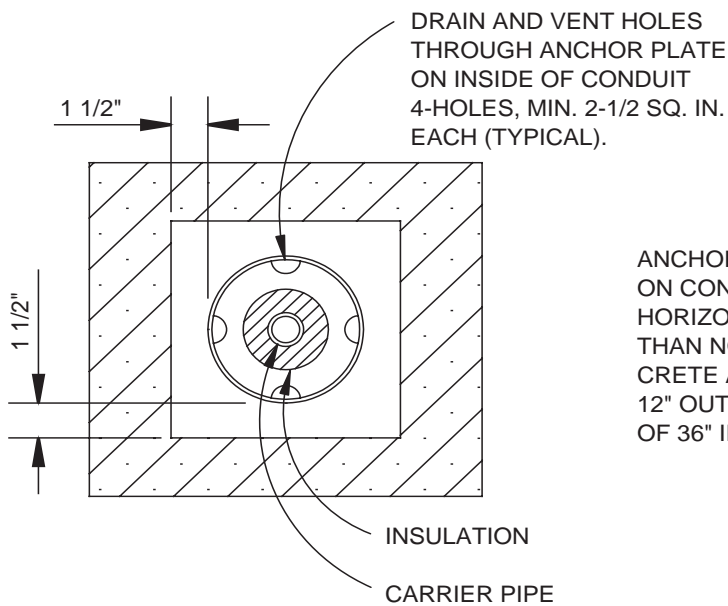
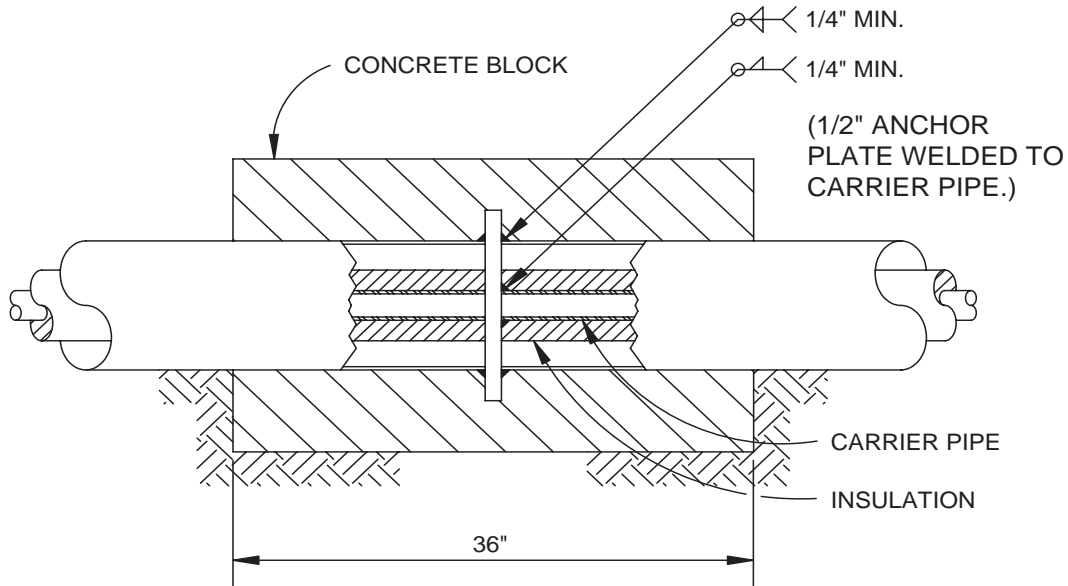
**TYPICAL LIMITED EXPANSION TEE**



NOTE: LIMITED EXPANSION TEE TO BE USED ONLY IN UNUSUAL OR ISOLATED APPLICATIONS SUCH AS WHERE MANHOLES OR OTHER CONNECTION DEVICES ARE PROHIBITIVE. REF. SK-3 OR SK-5 TYPE B EXPANSION SUPPORTS.



### TYPICAL ANCHOR DETAIL



ANCHOR PLATES ARE 1/2" STEEL CENTERED ON CONDUIT WITH DIMENSIONS 1 1/2" LARGER HORIZONTALLY AND 1 1/2" LARGER VERTICALLY THAN NOMINAL CONDUIT DIAMETER. CONCRETE ANCHOR BLOCK EXTENDS MINIMUM OF 12" OUTSIDE ANCHOR PLATE AND IS MINIMUM OF 36" IN LENGTH.



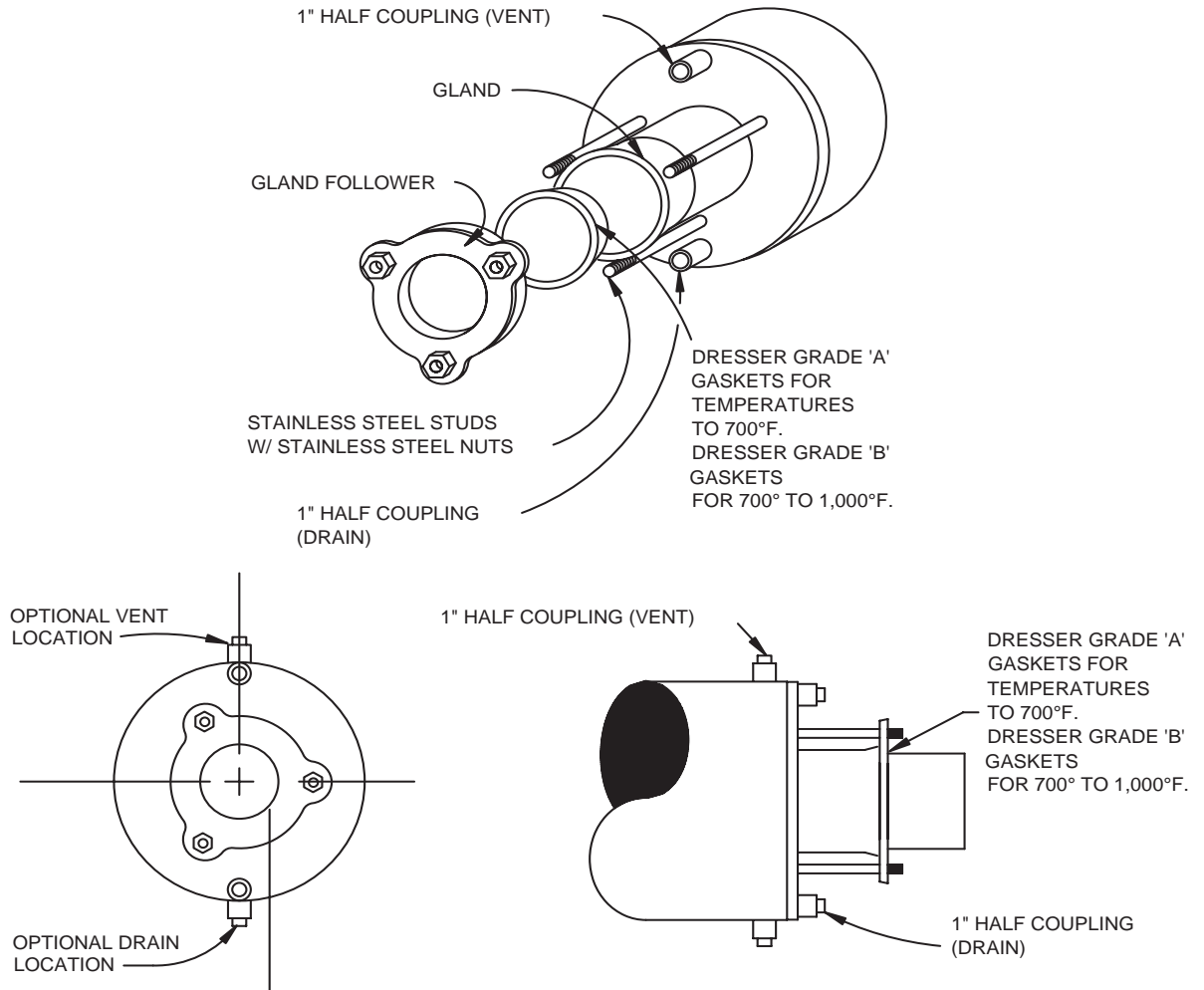
# CLASS "A" STEEL SK-17

CAAD  
4.317

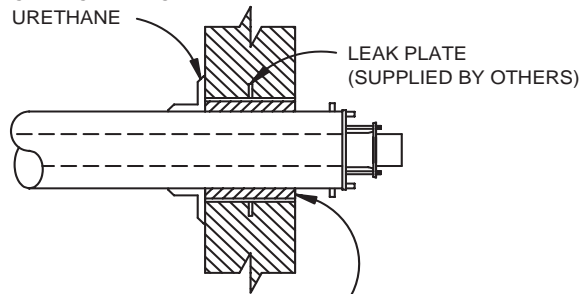
WALL PENETRATION W/ GLAND SEAL & CONDUIT ANCHOR

3.14.07

## TYPICAL MANHOLE WALL/ BLDG. WALL PENETRATION W/ GLAND END SEAL & CONDUIT ANCHOR



SEAL WALL PENETRATION  
W/ 3 COATS OF BITUMINOUS  
MASTIC OR ONE COAT OF  
CHEMICALLY BONDED  
URETHANE



LINK SEAL OR CAULKING  
SEALANT (SUPPLIED BY OTHERS)

ELEVATION

STUD AND NUT TABLE  
FOR VARYING PIPE SIZES

CARRIER PIPE SIZE	NO. OF NUTS AND STUDS
1/2" TO 2"	2
2 1/2" TO 4"	3
5" TO 6"	4
8"	5
10" TO 12"	6



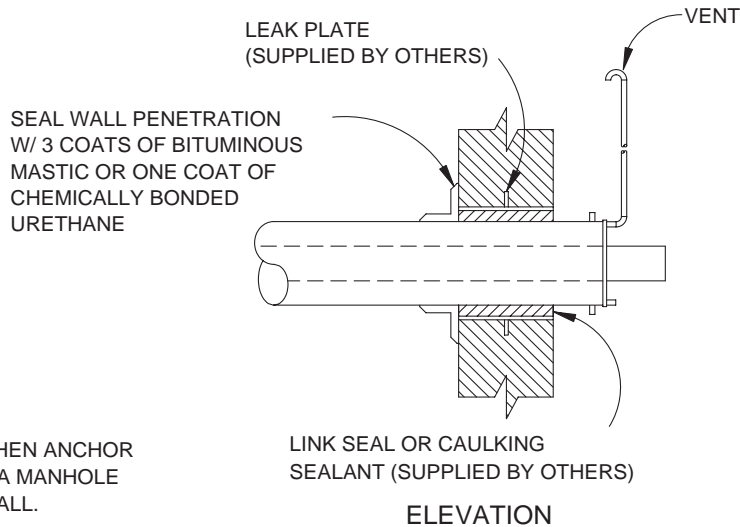
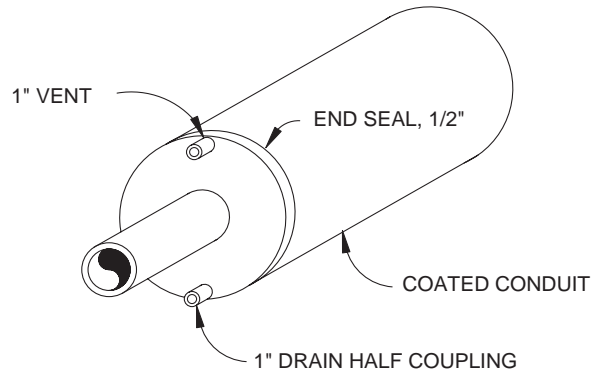
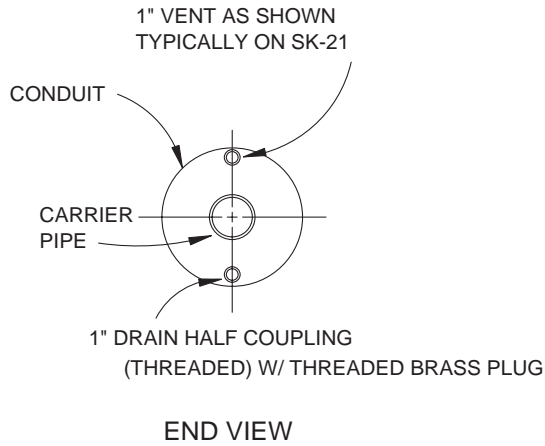
# CLASS "A" STEEL SK-18

CAAD  
4.318

WALL PENETRATION W/ END SEAL & CONDUIT ANCHOR

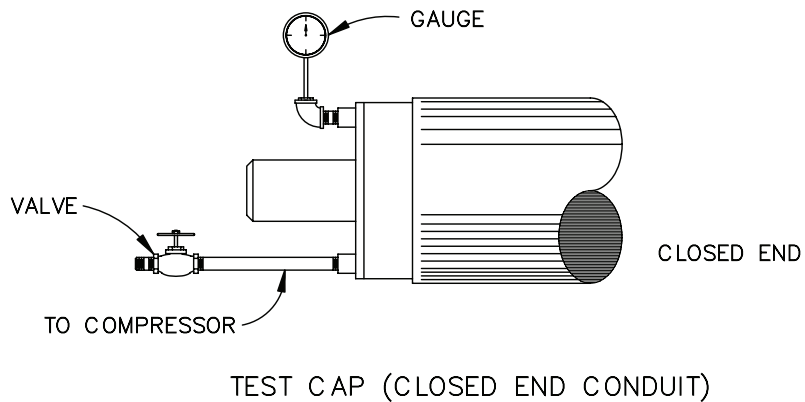
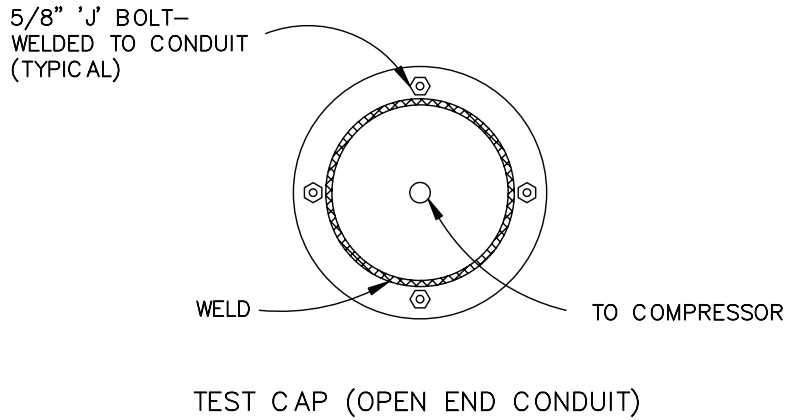
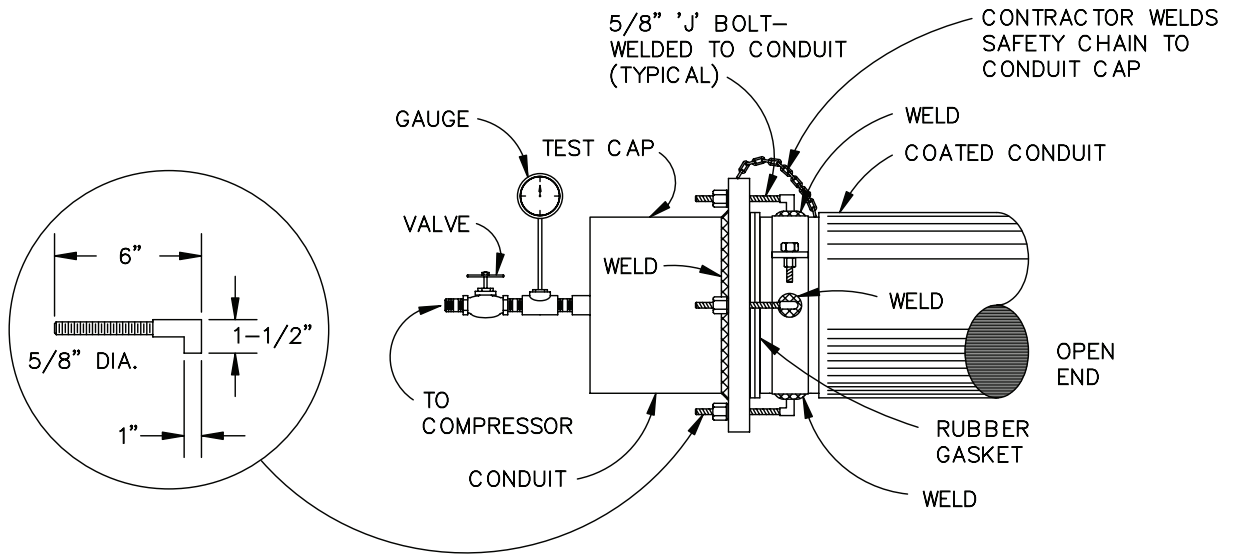
3.14.07

## TYPICAL MANHOLE WALL/ BLDG. WALL PENETRATION W/ END SEAL & CONDUIT ANCHOR

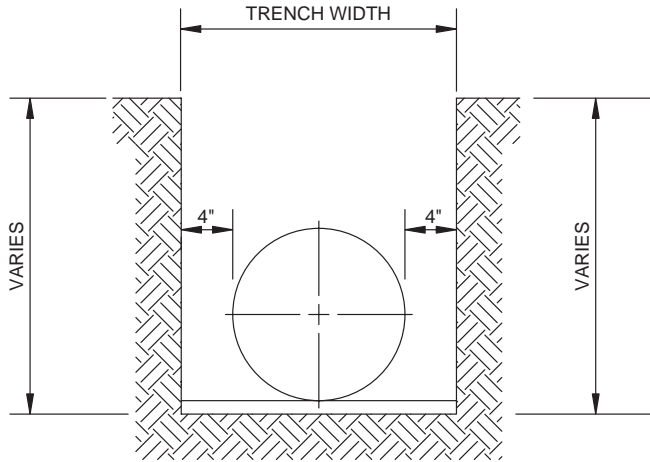


NOTE: USED WHEN ANCHOR  
IS WITHIN 5' OF A MANHOLE  
OR BUILDING WALL.

**TYPICAL CONDUIT AIR TEST**

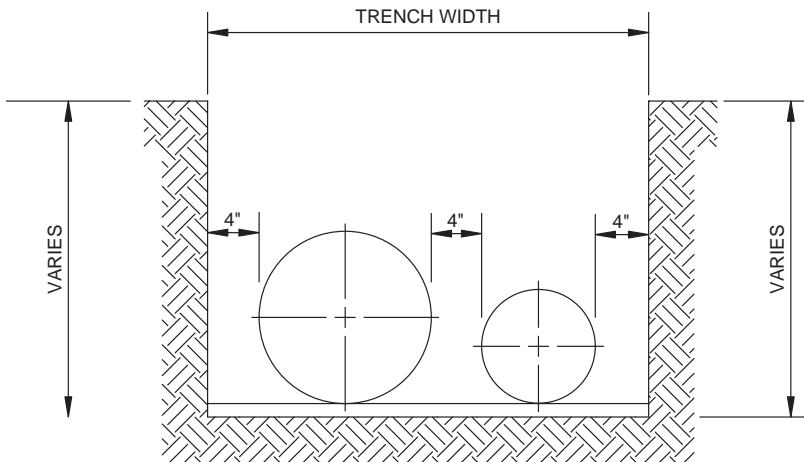


### TYPICAL TRENCH WIDTH



#### SINGLE CONDUIT SYSTEM

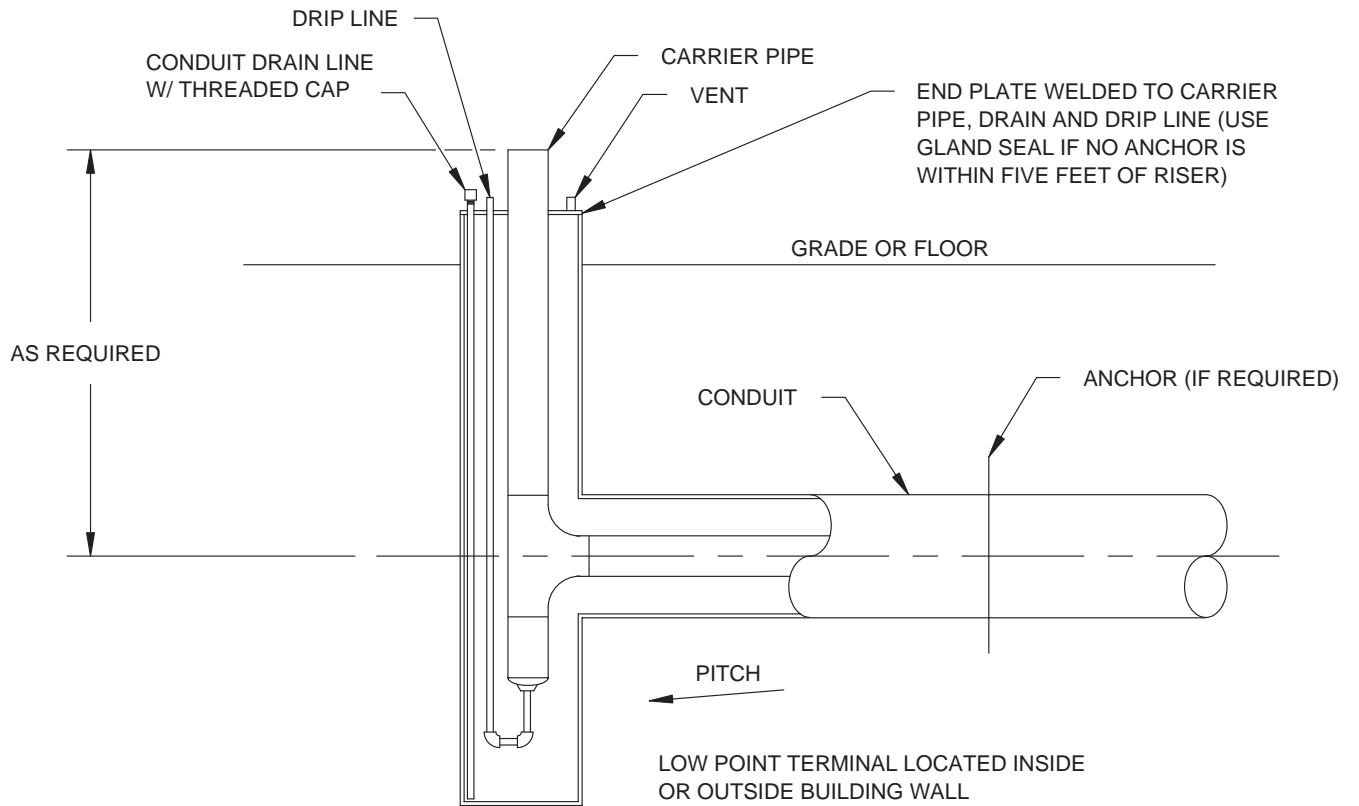
MAX O.D.	TRENCH WIDTH
4"	12"
10"	18"
16"	24"
22"	30"
28"	36"
36"	44"



#### TWO CONDUIT SYSTEM

DETERMINE THE MINIMUM TRENCH WIDTH BY ADDING 12" TO THE NOMINAL PIPE DIAMETERS OF THE PIPE SYSTEM.

### TYPICAL DRIP-TEE RISER



NOTE:

INSULATION NOT SHOWN  
FOR CLARITY.