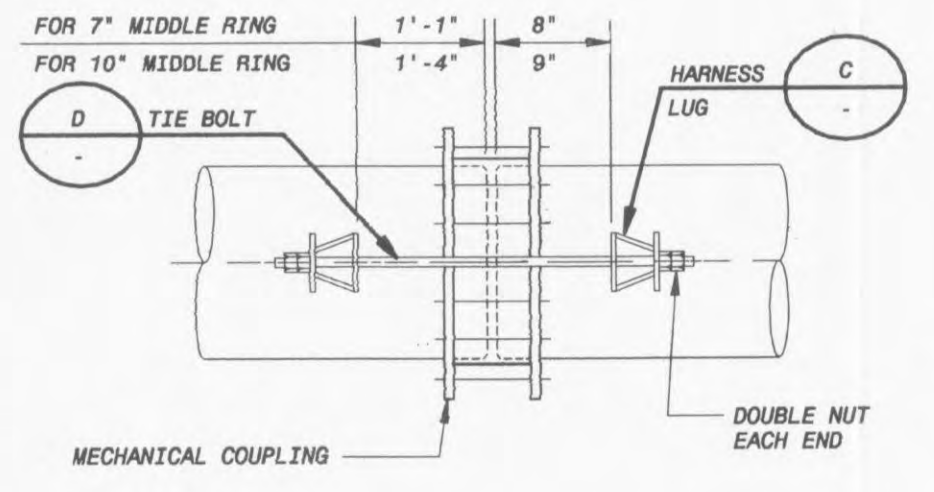
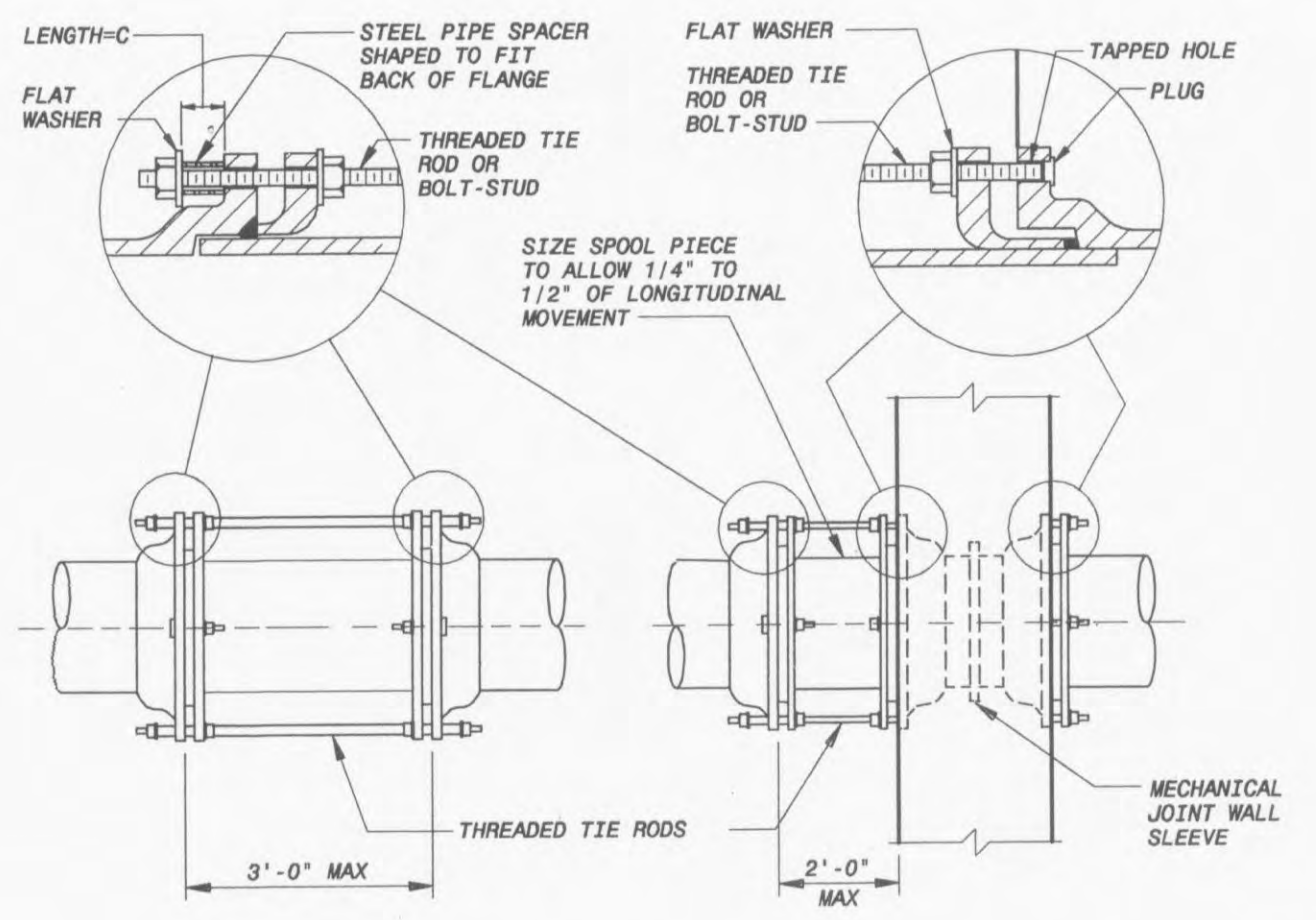


**TYPE RR LUGS**  
NO SCALE



**TYPE P LUGS**  
NO SCALE

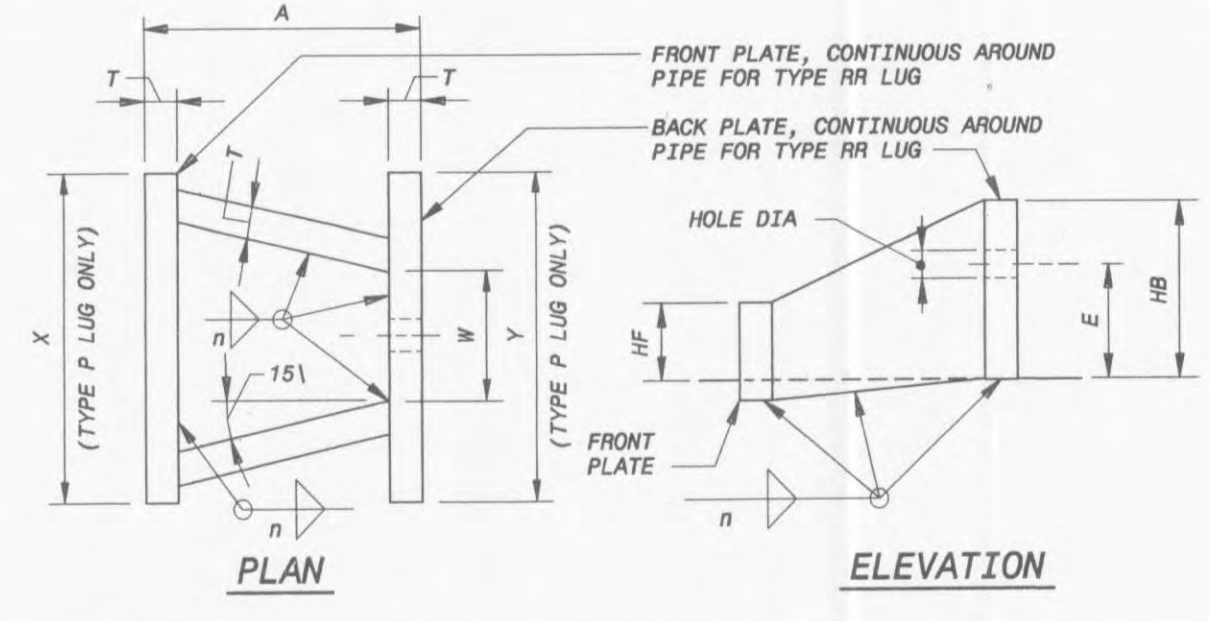
**STEEL PIPE HARNESS MECHANICAL COUPLING (A)**  
NO SCALE



- NOTES:**
- UNLESS OTHERWISE INDICATED, TIE RODS SHALL BE SPACED UNIFORMLY AROUND THE PIPE, BEGINNING WITH THE FIRST TWO AT THE HORIZONTAL CENTERLINE OF THE PIPE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
  - EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON WALL CASTING AND TEE HEAD BOLTS IN OTHER LOCATIONS. ALL BOLT HOLES IN WALL CASTING SHALL BE TAPPED. WALL PIPES SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP (SIDE IN VERTICAL PIPING) CENTERLINE.

PIPE SIZE	TIE ROD DIAMETER	PIPE SPACER DIAMETER	PIPE SPACER LENGTH (C)
4" TO 8"	3/4"	1"	2 1/2"
10" TO 12"	3/4"	1"	2 1/2"
14" TO 24"	3/4"	1"	3 1/2"
30" TO 36"	1"	1 1/4"	4"
42" TO 48"	1 1/4"	1 1/2"	4"

**CIP HARNESS MECHANICAL JOINTS (B)**  
NO SCALE



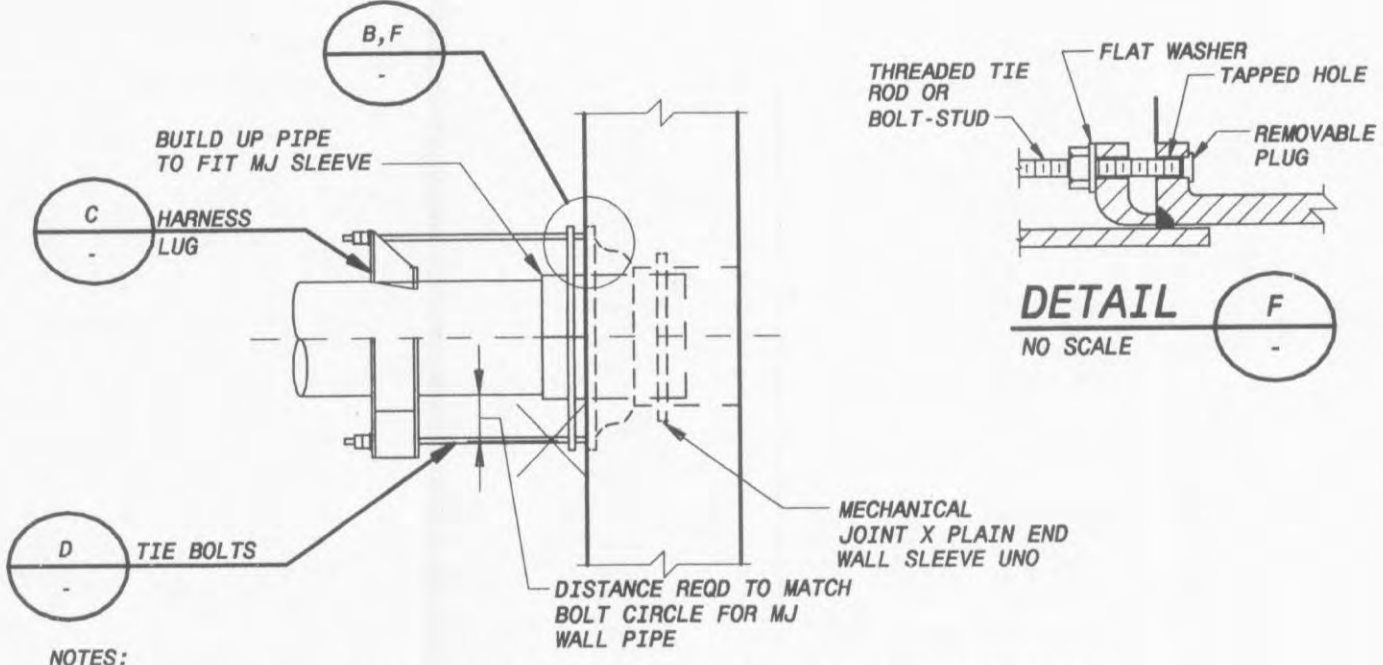
- NOTES:**
- T, t = PIPE WALL THICKNESS
  - FOR HARNESS LUG TYPE RR, THE GUSSET PLATES BETWEEN THE FRONT PLATE AND THE BACK PLATE MAY BE PERPENDICULAR TO THE FRONT AND BACK PLATES WITH A MINIMUM CLEAR DISTANCE BETWEEN EACH PAIR OF GUSSET PLATES OF DIMENSION W.
  - WHEN LUGS ARE USED WITH DETAIL E ON THIS SHEET, THE DIMENSION 'E' SHALL BE ADJUSTED TO MATCH THE BOLT CIRCLE DIAMETER OF MJ PIPE.

DIMENSIONS IN INCHES									
TIE BOLT DIA	T	A	Y	W	X	HB	E	HF	HOLE DIA
5/8	3/8	5	5	1 3/8	5	3 7/8	3	2	3/4
3/4	3/8	5	5	1 1/2	5	4 1/8	3 1/8	2	7/8
7/8	1/2	5 1/2	5	1 5/8	5	4 1/4	3 1/8	2	1
1	1/2	5 3/4	RING	1 3/4	RING	4 1/2	3 1/4	2	1 1/8
1 1/8	1/2	7	RING	1 7/8	RING	4 3/4	3 5/8	2 1/2	1 1/4
1 1/4	5/8	7 1/2	RING	2	RING	5	3 3/4	2 1/2	1 3/8
1 3/8	5/8	8 3/4	RING	2 1/8	RING	5 3/8	3 3/4	2 1/2	1 1/2
1 1/2	3/4	10	RING	2 1/4	RING	5 1/2	3 7/8	2 1/2	1 5/8
1 5/8	3/4	10 3/4	RING	2 3/8	RING	5 5/8	3 7/8	2 1/2	1 3/4
1 3/4	7/8	12	RING	2 1/2	RING	5 7/8	4	2 1/2	1 7/8
1 7/8	7/8	13	RING	2 5/8	RING	6	4	2 1/2	2
2	1	14	RING	2 3/4	RING	6 1/4	4 1/4	2 1/2	2 1/8
2 1/4	1	15 3/4	RING	3	RING	6 3/4	4 5/16	2 1/2	2 3/8

**STEEL PIPE HARNESS LUG DETAIL (C)**  
NO SCALE

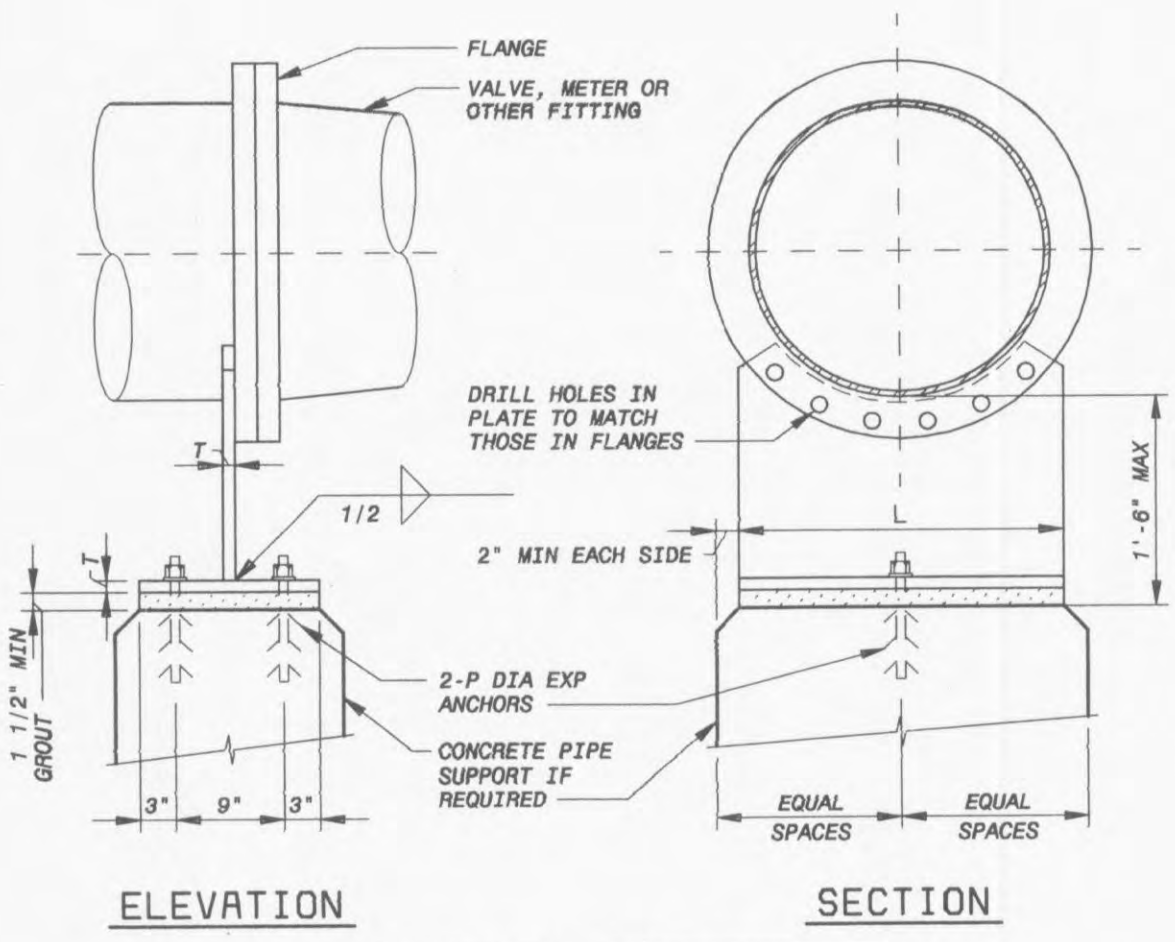
PIPE SIZE (INCHES)	SERVICE	FOR STEEL (NO. - SIZE)	FOR DIP (NO. - SIZE)
36	HIGH SERVICE PUMPING STATION INFLUENT	4-7/8"	4-1"
30	FILTER INFLUENT	4-3/4"	2-1"
24	PLANT INFLUENT	-	8-3/4"
24	ALL OTHER	2-3/4"	4-3/4"
20	RESERVOIR INFLUENT	-	4-3/4"
20	ALL OTHER	2-1 1/8"	6-3/4"
18	ALL PIPE	-	4-3/4"
16	LOW SERVICE PUMP DISCHARGE	2-3/4"	-
16	CARTRIDGE FILTER AND REVERSE OSMOSIS INFLUENT	2-3/4"	-
16	ALL OTHER	2-5/8"	-
16	REVERSE OSMOSIS PERMEATE	2-3/4"	-
14	ALL PIPE	2-5/8"	2-3/4"
12	ALL PIPE	2-5/8"	2-3/4"
10	ALL PIPE	-	2-3/4"
8	ALL PIPE	2-5/8"	2-3/4"
6	ALL PIPE	2-5/8"	4-3/4"
4	SANITARY PUMP DISCHARGE	-	4-3/4"
4	ALL OTHER	2-5/8"	2-3/4"
3	FILTER SURFACE WASH SUPPLY	2-5/8"	-

**TIE BOLT SCHEDULE (D)**  
NO SCALE



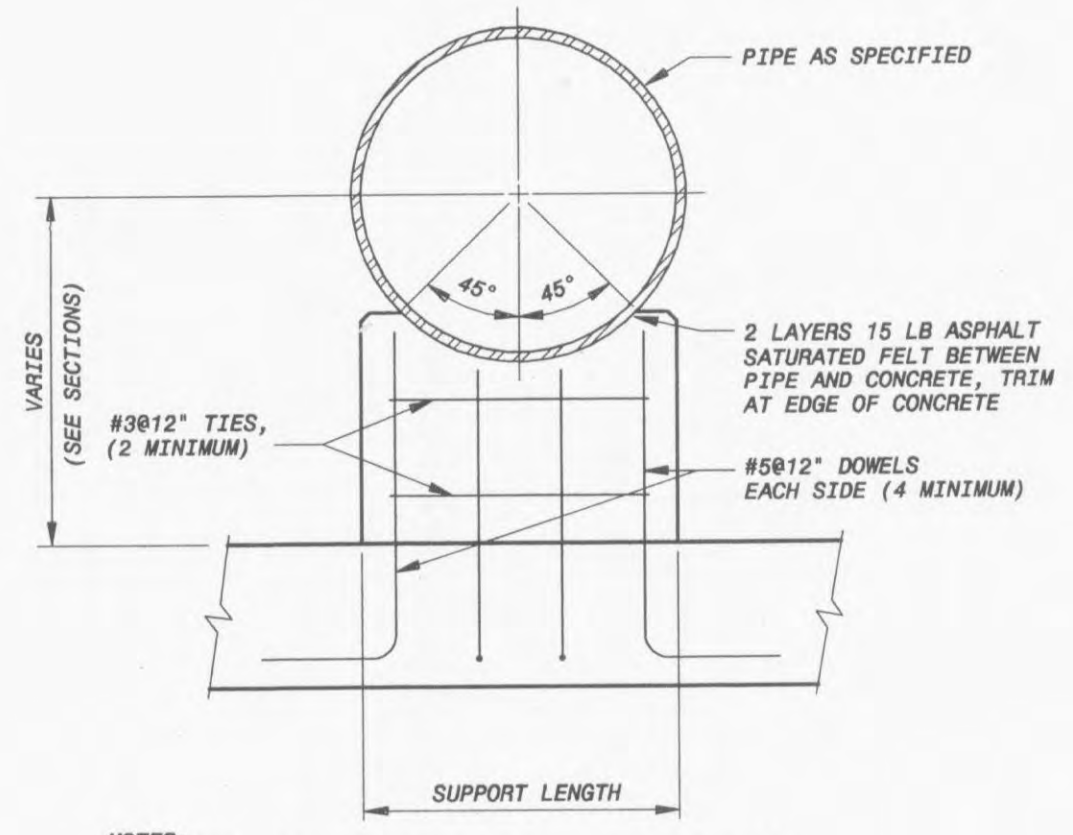
- NOTES:**
- ALL BOLT HOLES IN WALL PIPES SHALL BE TAPPED AND SIZED FOR TIE BOLTS. WALL PIPES SHALL BE ORIENTED SUCH THAT THE BOLT HOLES STRADDLE THE VERTICAL (SIDE IN VERTICAL PIPING) CENTERLINE.

**INTERIOR WALL FITTING FOR STEEL PIPE (PIPE ONE SIDE ONLY) (E)**  
NO SCALE



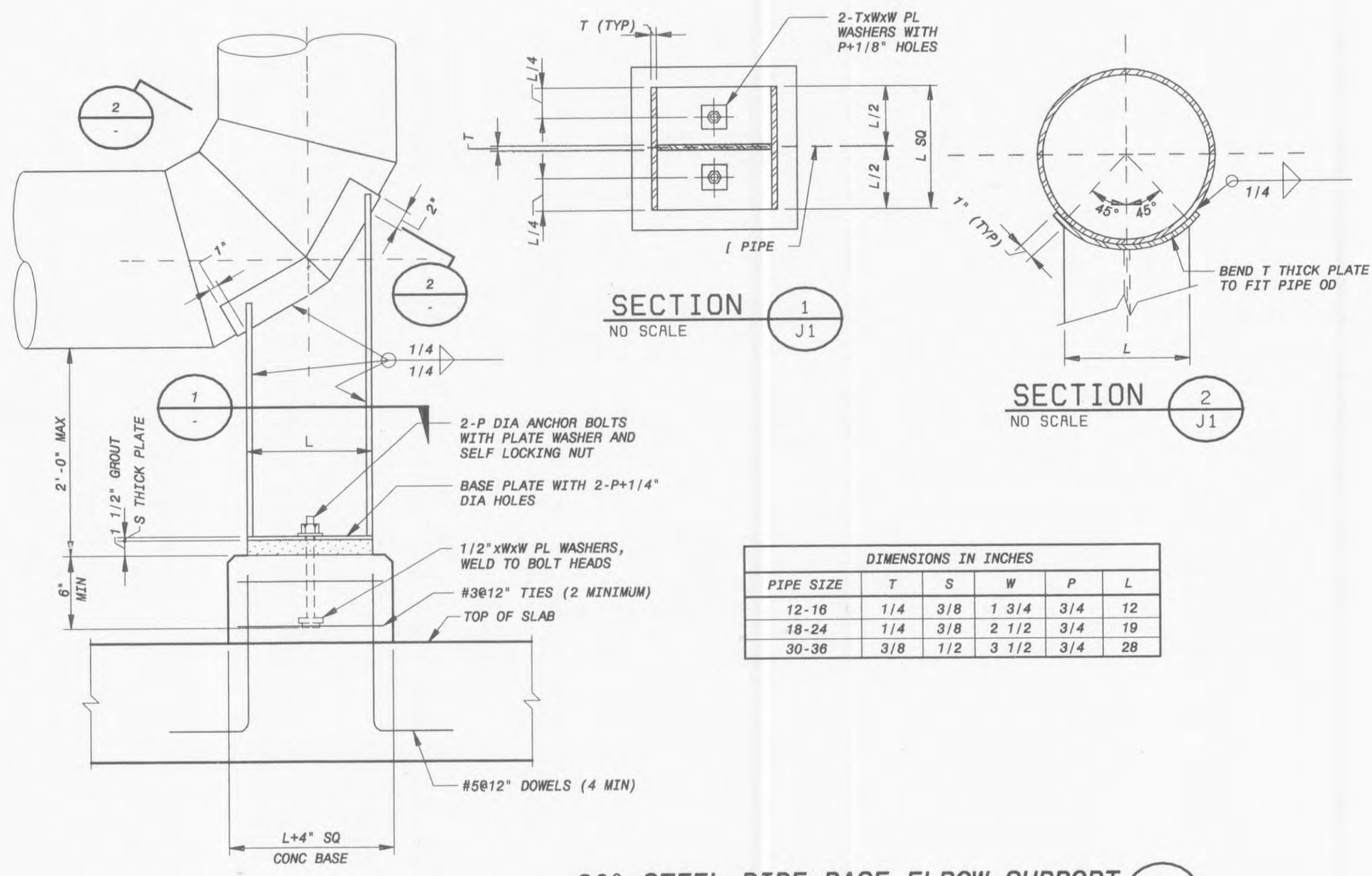
PIPE SIZE	T	P	L
<20	5/8"	5/8"	PIPE OD
20	3/4"	3/4"	18"
24	3/4"	3/4"	21"
30	3/4"	3/4"	27"
36	3/4"	3/4"	33"

**FLANGE PIPE SUPPORT (F)**  
NO SCALE



- NOTES:**
- SUPPORT WIDTH: 8" FOR 12" AND SMALLER PIPE, 12" FOR 14" AND LARGER PIPE.
  - SUPPORT LENGTH = PIPE OD + 4" FOR 12" AND SMALLER PIPE, PIPE OD FOR 14" AND LARGER PIPE.
  - PIPE SUPPORT REQUIRED FOR THE FILTER BYPASS VALVE IN THE EXISTING STRUCTURE WILL REQUIRE THE #5 DOWELS TO BE DRILLED AND GROUTED INTO THE EXISTING SLAB WITH A MINIMUM EMBEDMENT LENGTH OF 15".

**CONCRETE PIPE SUPPORT (G)**  
NO SCALE



DIMENSIONS IN INCHES				
PIPE SIZE	T	S	W	P
12-16	1/4	3/8	1 3/4	3/4
18-24	1/4	3/8	2 1/2	3/4
30-36	3/8	1/2	3 1/2	3/4

**90° STEEL PIPE BASE ELBOW SUPPORT (H)**  
NO SCALE

NO.	BY	DATE	REVISIONS AND RECORD OF ISSUE
2	1		

THIS DRAWING WAS ORIGINALLY APPROVED FOR THE CITY OF FALLON BY JAMES G. WINGER ON 10/08/01 AND SEALED BY JAMES G. WINGER A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF MISSOURI, NO. E-25004.

**BLACK & VEATCH CORPORATION**  
St. Louis, Missouri

**CITY OF O'FALLON, MISSOURI**  
WATER TREATMENT PLANT  
PIPING DETAILS

DESIGNED: JGW  
DETAILED: WMT  
CHECKED: WLK  
APPROVED: JGW  
DATE: 10/08/01

PROJECT NO.  
**97515**  
**J1**  
SHEET  
43 OF 96