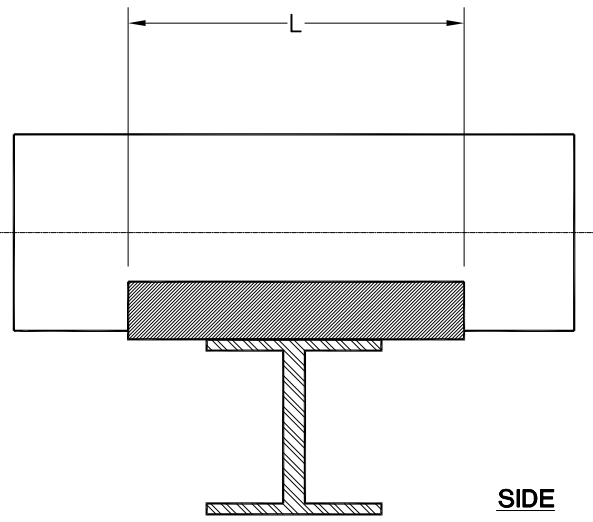
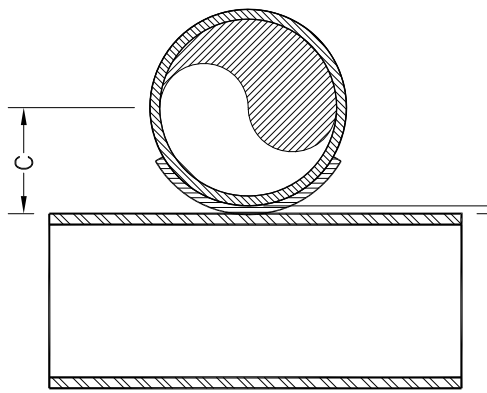


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SIDE



ELEV

0.20 to 0.32" (5 to 8mm) up to 24"ø
 0.32 to 0.42" (8 to 10.5mm) 26" to 60"ø

Nominal Pipe Size	Nominal O.D.		C		L		Minimum L		Weight (lb/kg)	
SERIES 20HV, 20FR-E, 20FR-EC										
1"	1.50"	38mm	0.91"	23mm	6"	152mm	4"	102mm	0.4	0.2
1.5"	2.00"	51mm	1.16"	29mm	6"	152mm	4"	102mm	0.5	0.2
2"	2.50"	64mm	1.41"	36mm	6"	152mm	4"	102mm	0.7	0.3
3"	3.50"	89mm	1.91"	49mm	6"	152mm	4"	102mm	1.0	0.5
4"	4.50"	114mm	2.41"	61mm	6"	152mm	4"	102mm	1.3	0.6
6"	6.63"	168mm	3.47"	88mm	8"	203mm	4"	102mm	2.6	1.2
8"	8.75"	222mm	4.54"	115mm	10"	254mm	4"	102mm	4.2	1.9
10"	10.88"	276mm	5.60"	142mm	12"	305mm	4"	102mm	6.3	2.9
12"	13.00"	330mm	6.66"	169mm	12"	305mm	4"	102mm	7.5	3.4
14"	15.13"	384mm	7.82"	199mm	12"	305mm	4"	102mm	8.9	4.0
16"	17.25"	438mm	8.89"	226mm	12"	305mm	4"	102mm	10.1	4.6
18"	19.38"	492mm	9.95"	253mm	16"	406mm	6"	152mm	15.1	6.9
20"	21.50"	546mm	11.01"	280mm	16"	406mm	6"	152mm	16.7	7.6
24"	25.75"	654mm	13.14"	334mm	16"	406mm	6"	152mm	20.0	9.1
30"	31.50"	800mm	16.12"	409mm	20"	508mm	8"	203mm	46.9	21.3
36"	37.75"	959mm	19.25"	489mm	20"	508mm	8"	203mm	56.1	25.5
42"	43.13"	1096mm	21.93"	557mm	24"	610mm	10"	254mm	78.3	35.6
48"	49.25"	1251mm	25.00"	635mm	24"	610mm	10"	254mm	89.4	40.6
54"										
60"	61.50"	1562mm	31.12"	790mm	24"	610mm	10"	254mm	111.4	50.6

- NOTE 5. $C = 0.5 * \text{Nominal O.D.} + T1$.
- NOTE 4. T1 dimension is from T.O.S. to B.O.P.
- NOTE 3. Wear pad to be centered on structural support.
- NOTE 2. Wear pad to have minimum 120 degrees of contact (max. 180 degrees).
- NOTE 1. Wear pad to be of the same material as the pipe.

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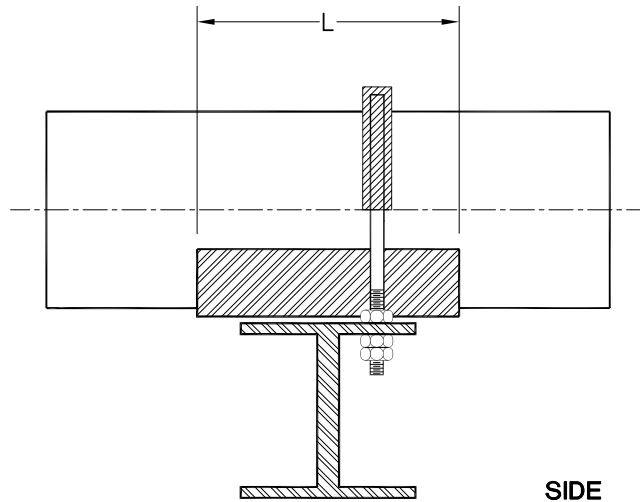
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SCALE: NONE	BATCH:	
DRAWN: KGS	D102904	
CH'KD: KGS	D102904	
		DRAWING: FIG210-20FR-E
		FILENAME: FIG210-20FR-E
SUPPORT TYPE: FRP WEAR PAD		
SUPPORT GROUP: ONEWAY SUPPORT		
FIGURE NUMBER: FIGURE 210 - 20FR-E		

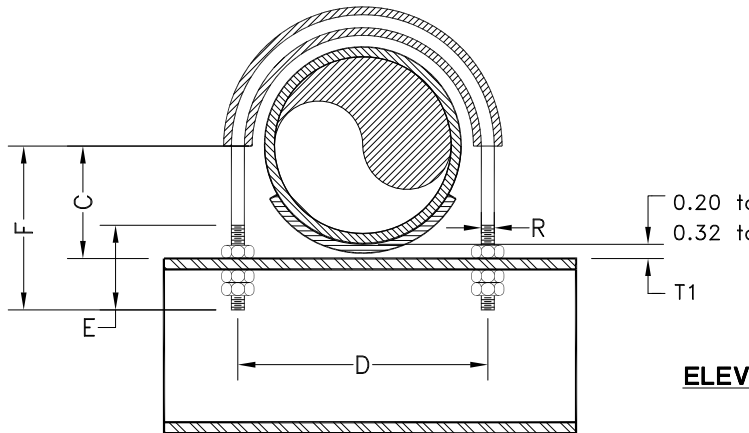
REV	4
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SIDE



ELEV

Nominal Pipe Size	L		R	D +/- 0.12"		E		F	
SERIES 20HV, 20FR-E, 20FR16, 20FR20, 20JF, 110FW, 20C, 20HV-D									
SERIES 20HV-C, 20FR-EC, 20FR16-C, 20FR20-C, 20JF-C, 20HV(FDA)									
1"	6"	152mm	3/8"	2.75"	70mm	3.00"	76mm	2.75"	70mm
1.5"	6"	152mm	3/8"	3.25"	83mm	3.00"	76mm	3.00"	76mm
2"	6"	152mm	3/8"	3.75"	95mm	3.00"	76mm	3.25"	83mm
3"	6"	152mm	1/2"	4.88"	124mm	3.50"	89mm	4.13"	105mm
4"	6"	152mm	1/2"	5.88"	149mm	3.50"	89mm	4.63"	118mm
6"	8"	203mm	5/8"	8.13"	206mm	4.00"	102mm	6.06"	154mm
8"	10"	254mm	5/8"	10.25"	260mm	4.00"	102mm	7.13"	181mm
10"	12"	305mm	3/4"	12.50"	317mm	4.50"	114mm	8.56"	217mm
12"	12"	305mm	7/8"	14.75"	375mm	5.00"	127mm	10.00"	254mm
14"	12"	305mm	7/8"	16.95"	430mm	5.00"	127mm	11.23"	285mm
16"	12"	305mm	7/8"	19.11"	485mm	5.00"	127mm	12.31"	313mm
18"	16"	356mm	1"	21.42"	544mm	5.50"	140mm	13.77"	350mm
20"	16"	356mm	1"	23.38"	594mm	5.50"	140mm	14.75"	375mm
24"	16"	356mm	1"	27.68"	703mm	5.50"	140mm	16.90"	429mm
30"	20"	508mm	1"	33.78"	858mm	5.50"	140mm	19.72"	501mm
36"	20"	508mm	1"	40.06"	1018mm	5.50"	140mm	22.86"	581mm
42"									
48"									

0.20 to 0.32" (5 to 8mm) up to 24"∅
0.32 to 0.42" (8 to 10.5mm) 26" to 60"∅

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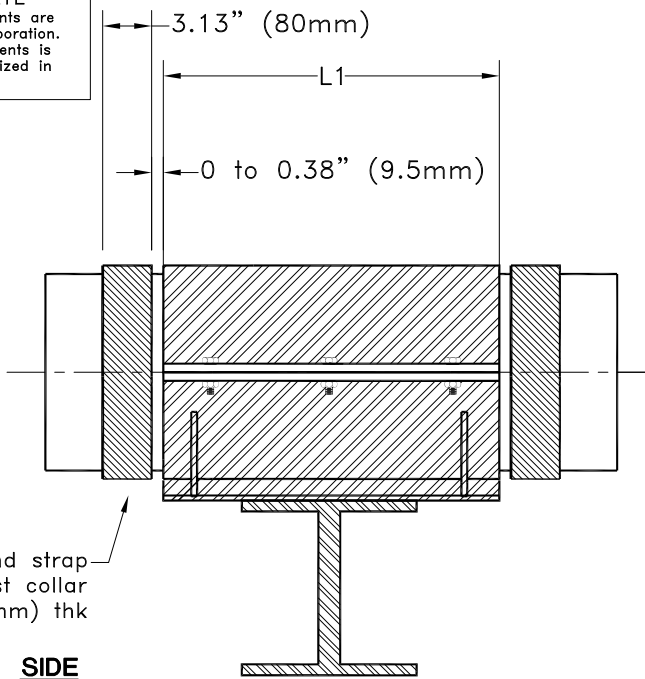
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SCALE:	NONE	BATCH:	
DRAWN:	KGS	D072098	
CH'KD:	KGS	D072098	
		DRAWING:	FIGURE 226
		FILENAME:	FIG226
SUPPORT TYPE:	FRP WEAR PAD W/ RUBBER COATED U-BOLT		
SUPPORT GROUP:	GUIDE		
FIGURE NUMBER:	FIGURE 226		
		REV	10

- NOTE 11. An "extra-long" L dimension of 14" (356mm) may be used up to 16"∅.
NOTE 10. Minimum L dimensions per Fig.210 may also be used.
NOTE 9. $F = C + 1/2in. + 3 * R$ (or use values in table).
NOTE 8. $E = 4 * R + 1 1/2in.$
NOTE 7. $C = 0.5 * Avg O.D. + T1$ (See Fig.210 for C dimensions).
NOTE 6. $D = Pipe O.D. + 2 * T1 + R + 1/4in.$ (or use values in table).
NOTE 5. T1 dimension is from T.O.S. to B.O.P.
NOTE 4. The u-bolt shall not "anchor" the pipe.
NOTE 3. Wear pad to be centered on structural support.
NOTE 2. Wear pad to have minimum 120 degrees of contact (max. 180 degrees).
NOTE 1. Saddle to be of the same material as the pipe.

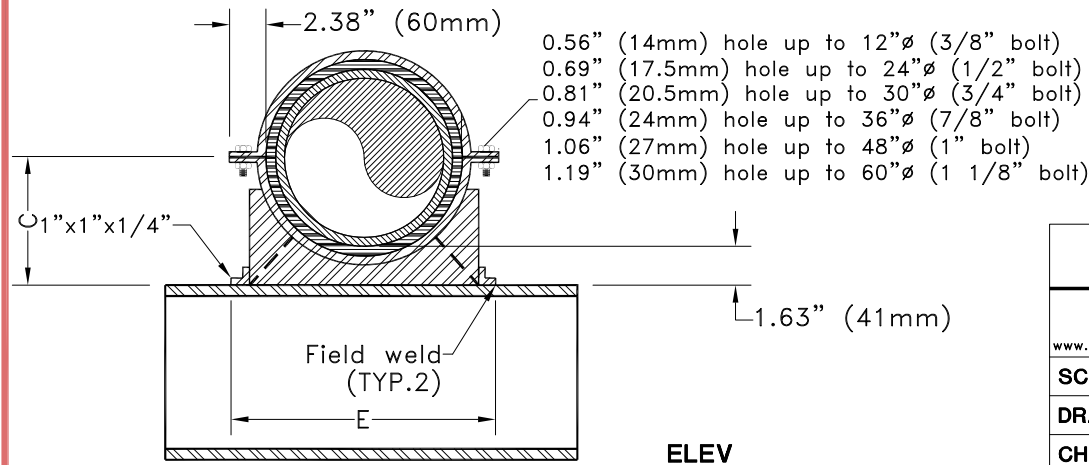
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Butt and strap thrust collar
 0.50" (12.5mm) thk

SIDE

Nominal Pipe Size	Nominal O.D.		L1		C		E	
SERIES 20HV, 20FR-E, 20FR-EC								
6"	6.63"	168mm	8"	203mm	4.95"	126mm	12.00"	305mm
8"	8.75"	222mm	10"	254mm	6.00"	152mm	14.00"	356mm
10"	10.88"	276mm	12"	305mm	7.07"	180mm	16.00"	406mm
12"	13.00"	330mm	12"	305mm	8.13"	207mm	18.00"	458mm
14"	15.13"	384mm	12"	305mm	9.20"	234mm	20.25"	514mm
16"	17.25"	438mm	12"	305mm	10.26"	261mm	22.25"	565mm
18"	19.38"	492mm	16"	406mm	11.32"	288mm	24.50"	622mm
20"	21.50"	546mm	16"	406mm	12.38"	314mm	26.50"	673mm
24"	25.75"	654mm	16"	406mm	14.51"	369mm	30.75"	781mm
30"	31.50"	800mm	20"	508mm	17.38"	441mm	37.25"	946mm
36"	37.75"	959mm	20"	508mm	20.51"	521mm	43.50"	1105mm
42"	43.13"	1096mm	24"	610mm	23.20"	589mm	49.50"	1257mm
48"	49.25"	1251mm	24"	610mm	26.26"	667mm	56.00"	1422mm
54"								
60"	61.50"	1562mm	24"	610mm	32.38"	822mm	68.00"	1727mm



ELEV

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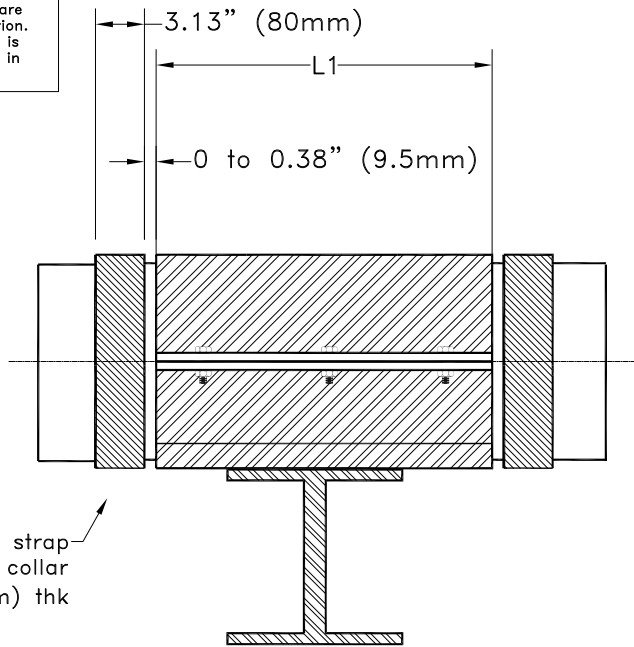
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SCALE:	NONE	BATCH:	
DRAWN:	KGS	D102904	
CH'KD:	KGS	D102904	
		DRAWING:	FIG230 - 20FR-E
		FILENAME:	FIG230 - 20FR-E
SUPPORT TYPE:	STEEL ANCHOR W/ FRP THRUST COLLARS		
SUPPORT GROUP:	ANCHOR		
FIGURE NUMBER:	FIGURE 230 - 20FR-E		

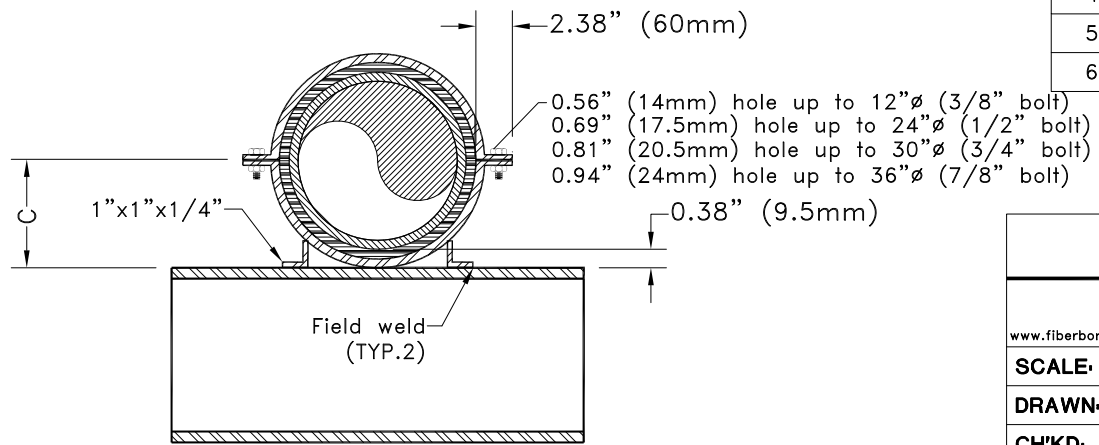
REV	1
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- NOTE 5. Average O.D. is typically 0.03" to 0.10" larger than the nominal O.D.
 NOTE 4. C = 0.5 * Nominal O.D. + 1.63in.
 NOTE 3. Steel saddle includes 1/8in. thick neoprene liner.
 NOTE 2. 1.63in. (41mm) dimension is from T.O.S to B.O.P.
 NOTE 1. Thrust collar may need to be larger depending upon design conditions.

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SIDE



ELEV

- NOTE 5. Average O.D. is typically 0.03" to 0.10" larger than the nominal O.D.
- NOTE 4. C = 0.5 * Nominal O.D. + 0.38in.
- NOTE 3. Steel saddle includes 1/8in. thick neoprene liner.
- NOTE 2. 0.38in. (9.5mm) dimension is from T.O.S. to B.O.P.
- NOTE 1. Thrust collar may need to be larger depending upon design conditions.

Nominal Pipe Size	Nominal O.D.		L1		C	
SERIES 20HV, 20FR-E, 20FR-EC						
2"	2.50"	64mm	6"	152mm	1.63"	41mm
3"	3.50"	89mm	6"	152mm	2.13"	54mm
4"	4.50"	114mm	6"	152mm	2.63"	67mm
6"	6.63"	168mm	8"	203mm	3.70"	94mm
8"	8.75"	222mm	10"	254mm	4.76"	121mm
10"	10.88"	276mm	12"	305mm	5.82"	148mm
12"	13.00"	330mm	12"	305mm	6.88"	175mm
14"	15.13"	384mm	12"	305mm	7.95"	202mm
16"	17.25"	438mm	12"	305mm	9.00"	229mm
18"	19.38"	492mm	12"	305mm	10.06"	256mm
20"	21.50"	546mm	16"	406mm	11.12"	283mm
24"	25.75"	654mm	16"	406mm	13.25"	337mm
30"	31.50"	800mm	20"	508mm	16.13"	410mm
36"	37.75"	959mm	20"	508mm	19.25"	489mm
42"	43.13"	1096mm				
48"	49.25"	1251mm				
54"						
60"	61.50"	1562mm				

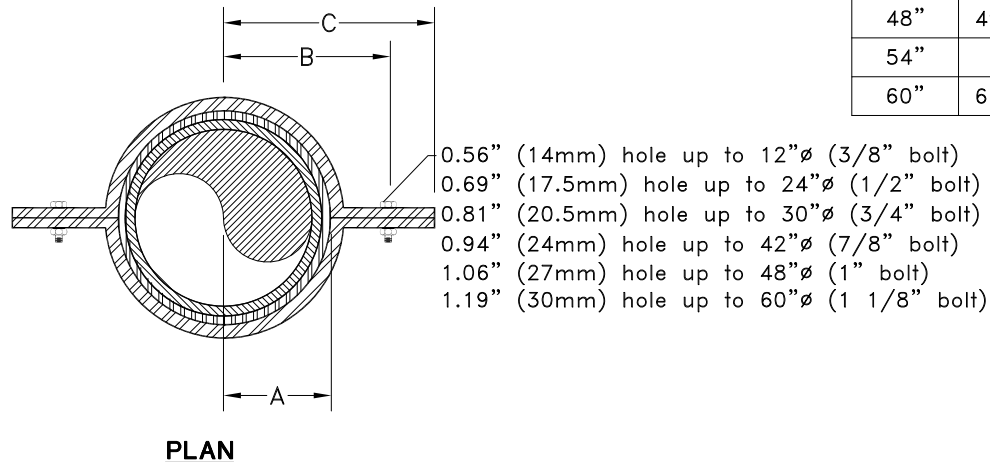
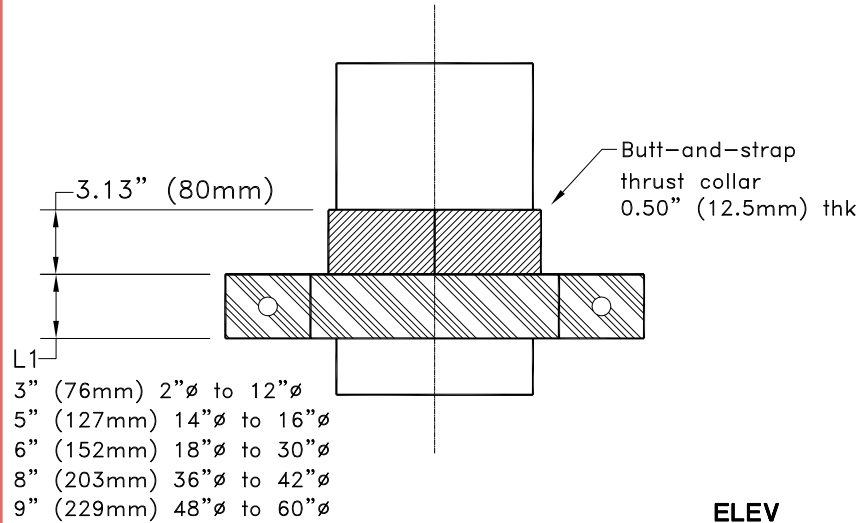
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SCALE:	NONE	BATCH:	
DRAWN:	KGS	D102904	
CH'KD:	KGS	D102904	
		DRAWING:	FIG232 - 20FR-E
		FILENAME:	FIG232 - 20FR-E
SUPPORT TYPE:	SMALL STEEL SHOE W/ THRUST COLLARS		
SUPPORT GROUP:	ANCHOR		
FIGURE NUMBER:	FIGURE 232 - 20FR-E		
			REV 2

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- NOTE 5. 'A' dimension is from pipe centerline to neoprene/steel interface.
NOTE 4. A = 0.5 * Nominal O.D. + 0.13in.
NOTE 3. B = 0.5 * Nominal O.D. + 1.75in.; C = B + 1.25in.
NOTE 2. Steel saddle includes 1/8in. thick neoprene liner.
NOTE 1. A separate bonded collar (two halves) may also be used.

Nominal Pipe Size	Nominal O.D.		A		B		C	
SERIES 20HV, 20FR-E, 20FR-EC								
2"	2.50"	64mm	1.38"	35mm	3.00"	76mm	4.25"	108mm
3"	3.50"	89mm	1.88"	48mm	3.50"	89mm	4.75"	121mm
4"	4.50"	114mm	2.38"	60mm	4.00"	102mm	5.25"	133mm
6"	6.63"	168mm	3.44"	88mm	5.06"	129mm	6.31"	160mm
8"	8.75"	222mm	4.50"	114mm	6.13"	156mm	7.38"	187mm
10"	10.88"	276mm	5.57"	141mm	7.19"	183mm	8.44"	214mm
12"	13.00"	330mm	6.63"	168mm	8.25"	210mm	9.50"	241mm
14"	15.13"	384mm	7.69"	195mm	9.32"	237mm	10.57"	268mm
16"	17.25"	438mm	8.75"	222mm	10.38"	264mm	11.63"	295mm
18"	19.38"	492mm	9.82"	249mm	11.44"	291mm	12.69"	322mm
20"	21.50"	546mm	10.88"	276mm	12.50"	317mm	13.75"	349mm
24"	25.75"	654mm	13.00"	330mm	14.63"	372mm	15.88"	403mm
30"	31.50"	800mm	15.88"	403mm	17.50"	444mm	18.75"	476mm
36"	37.75"	959mm	19.00"	483mm	20.63"	524mm	21.88"	556mm
42"	43.13"	1096mm	21.69"	551mm	23.32"	592mm	24.57"	624mm
48"	49.25"	1251mm	24.75"	629mm	26.38"	670mm	27.63"	702mm
54"								
60"	61.50"	1562mm	30.88"	784mm	32.50"	826mm	33.75"	857mm

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SCALE:	NONE	BATCH:	
DRAWN:	KGS	D061095	
CH'KD:	KGS	C061195	
		DRAWING:	FIG240-20FR-E
		FILENAME:	FIG240-20FR-E
SUPPORT TYPE:	RISER CLAMP W/ THRUST COLLARS		
SUPPORT GROUP:	VERTICAL RISER		
FIGURE NUMBER:	FIGURE 240-20FR-E		

REV
2

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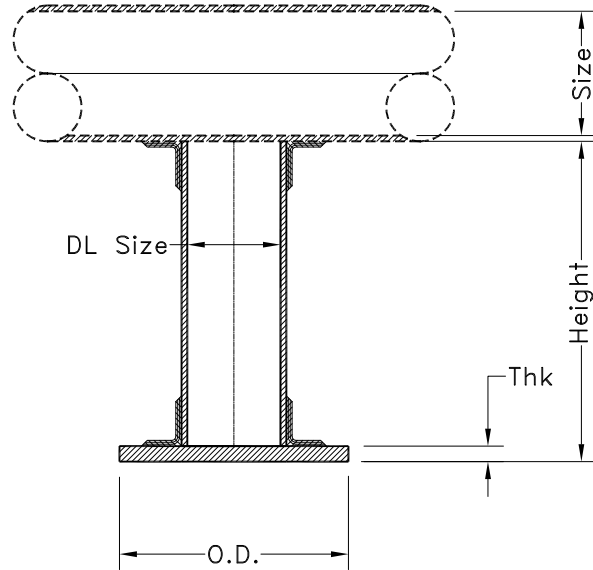


FIG.91 (shop fab'd to a tee or pipe)

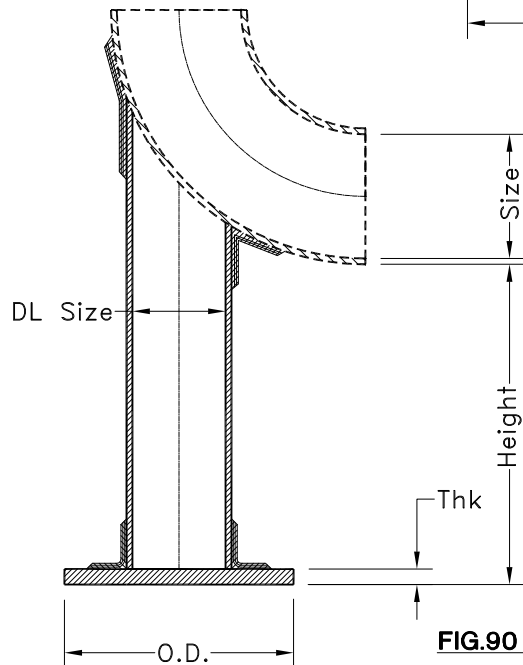


FIG.90 (shop fab'd to an elbow)

Nominal Pipe Size	DL Size	O.D.		Thk	
2"	2"	5"	127mm	1/2"	12.5mm
3"	2"	5"	127mm	1/2"	12.5mm
4"	3"	6"	152mm	1/2"	12.5mm
6"	4"	7"	178mm	1/2"	12.5mm
8"	6"	9"	229mm	1/2"	12.5mm
10"	6"	9"	229mm	1/2"	12.5mm
12"	8"	12"	305mm	1/2"	12.5mm
14"	10"	14"	356mm	1/2"	12.5mm
16"	12"	16"	406mm	1/2"	12.5mm
18"	14"	18"	457mm	1/2"	12.5mm
20"	18"	22"	559mm	1/2"	12.5mm
24"	18"	22"	559mm	1/2"	12.5mm
30"	24"	28"	711mm	3/4"	19mm
36"	24"	28"	711mm	3/4"	19mm
42"	36"	40"	1016mm	3/4"	19mm
48"	36"	40"	1016mm	3/4"	19mm
54"					
60"	48"	52"	1321mm	3/4"	19mm

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SCALE:	NONE	BATCH:	
DRAWN:	KGS	D102904	
CH'KD:	KGS	D102904	
		DRAWING:	FIGURE 90
		FILENAME:	FIG90

SUPPORT TYPE: FRP "DUMMY LEG"

SUPPORT GROUP: DUMMY LEG

FIGURE NUMBER: FIGURE 90 - ALL SERIES

REV
1

- NOTE 4. Fig.90 and Fig.91 are identical except Fig.91 is on a tee or pipe.
- NOTE 3. Maximum recommended length of dummy leg is 3'-0" (914mm).
- NOTE 2. Plate to be shipped loose and field installed. 6" of trim to be included.
- NOTE 1. Dummy leg to be of the same material as the pipe.