

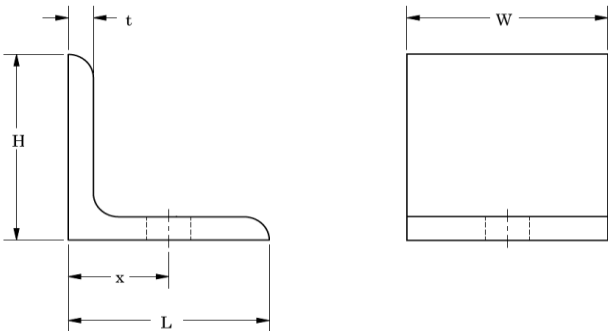
Seismic Leg Clips

Pressure Vessel Design Manual - 4rd Edition - Dennis Moss: Procedure 4-15

Description: Seismic Legs

Leg Data:

	Material
16,600	S [psi] - allowable stress
3	N - number of legs
4.00	L [in] - base length
4.00	W [in] - leg width
4.00	H [in] - height
2.00	x [in] - hole location from back
0.50	t [in] - thickness
0.50	leg [in] - weld leg



Bolt Data:

	Material:
7,000	Sb [psi] - bolt strength
0.75-10 UNC 2A	Bolt - bolt size

Seismic Load Data:

54.00	D [in] - skirt outside diameter
0.375	ts [in] - skirt thickness
11,946.30	Wb [lb] - vessel weight
1,156.00	Ss [lbf] - seismic shear, skirt bottom
6,959.00	Mb [lbf-ft] - bending moment, skirt bottom

Variables:

1	FT [psi] = 1.33*S	1.33*16600 =	22,078
2	FC [psi] = 1.33*S	1.33*16600 =	22,078
3	d [in] = D+(2*x) bolt circlce diameter	54+(2*2) =	58.0000

Anchor Bolts:

4	fs [lb] = (48*Mb)/(d*N)-(Wb/N) tension force per bolt	(48*6959)/(58*3)-(11946.3/3) =	-2062.3759
5	Ab [in²] = Lookup("B1.1Table2", "RootArea", Bolt) bolt root area		0.3024
6	Abr [in²] = fs/Sb required bolt area	-2062.376/7000 =	-0.2946
7	ckAb = Ab>=Abr	0.302>=-0.295 =	Ok

Base Plate:

8	fc [psi] = ((48*Mb)/(π*d²*L))+(Wb/(π*d*L)) bearing presssure (average at bolt circle)		
9		((48+6959)/(π*58²*4))+(11946.3/(π*58*4)) =	16.5564
10	tb [in] = L*SQRT((3*fc)/S) minimum base thickness	4*SQRT((3*16.556)/16600) =	0.2188
11	ckt = t>=tb	0.5>=0.219 =	Ok

Skirt:

12	fLT [lb/in] = ((48*Mb)/(π*D²))+(Wb/(π*D)) axial load, tension		
13		((48*6959)/(π*54²))+(11946.3/(π*54)) =	106.8818
14	fLC [lb/in] = -((48*Mb)/(π*D²))+(Wb/(π*D)) axial load, tension		
15		-((48*6959)/(π*54²))+(11946.3/(π*54)) =	33.9561
16	tsk [in] = MAX(fLT/FT,fLC/FC) min. skirt thickness	MAX(106.882/22078,33.956/22078) =	0.0048
17	cktsk = ts>=tsk	0.375>=0.005 =	Ok

Weld Check:

18	wl [in] = (H+H+W+(leg*2)) weld length	(4+4+4+(0.5*2)) =	13.0000
19	WeldArea [in²] = wl*leg	13*0.5 =	6.5000
20	SSw [psi] = S*0.49 UW-15(c) max weld shear	16600*0.49 =	8,134.00
21	CheckSSW = Ss/WeldArea<=SSw	1156/6.5<=8134 =	Ok