Owner		Doc no-		Rev no	
		Project-		Date	
Client		Title		Qty	
		Tag no			

DESIGN FOR THE ANCHOR CHAIR

(CHAIR DESIGN AS PER AISI E-1, VOLUME II, PART VII)

Anchor Bolt Design Load ,	P	=	187.020000	Mpa	27.1	Ksi
Provided Distance From Outside Of Top Plate To Edge Of Hole,	f	=	98.5	mm	3.88	inch
Ditance Between Vertical Palates,	g	=	100	mm	3.94	inch
Anchor Bold Diameter,	d	=	33	mm	1.30	inch
Anchor Bolt Eccentricity,	e	=	108.5	mm	4.27	inch
Top Plate Width Along The Shell,	a	=	150	mm	5.91	inch
Anchor Chair Height,	h	=	275	mm	10.83	inch
Radius Of Shell To The Centre Line Of Shell Plate,	R	=	5500	mm	216.54	inch
Corroded Bottom Plate Thk,	m	=	6.5	mm	0.26	inch
Top Plate Thickness	c	=	21.7	mm	0.85	inch
Radius Of Shell	w	=	5500	mm	216.54	inch
Bottom Shell Course Thickness (Corroded)	t	=	16.5	mm	0.65	inch
Top plate length	b	=	225	mm	8.86	inch
Anchor bolt diameter	d	=	33	mm	1.30	inch
Vertical plate width (Average)	k	=	153	mm	6.02	inch
Vertical plate thickness	j	=	14	mm	0.55	inch

TOP PLATE DESIGN

Critical stress in top plate , S = $P / (f \times c^2 \times ((0.375 \times g) - (0.22 \times d)))$ = 78.67 Mpa 11.41 ksi

HENCE S < 172 Mpa SAFE

Bending plus direct stress in shell, Sb = $P*e / t^2 * (1.32*Z / (1.43*a*h^2 / (R* t) + (4*a*h^2)^{0.333}) + 0.031 / (R*t)^{0.5})$

= 123.29 Mpa 17.88 ksi

HENCE Sb < 172 Mpa SAFE

Where Reduction Factor = $1/((0.177*a*m/(R*t)^{0.5})*(m/t)^2+1)$ = 0.997

VERTICAL SIDE PLATE

Minimum thickness is greater of 0.5 inch or 0.04 (h-c)

= 0.5 or 0.04 (h - c)

= 0.5 or 0.40

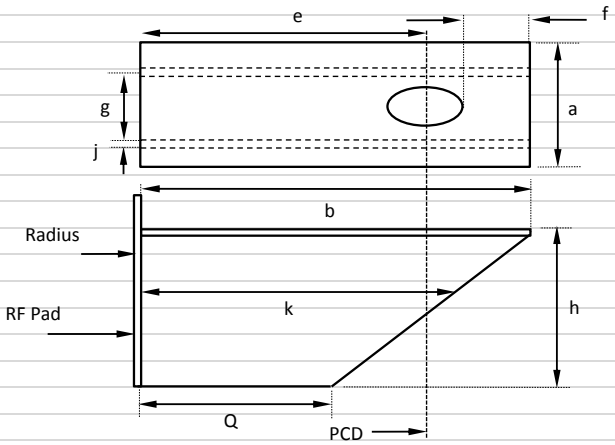
= 0.5 inch

Minimum thickness = 12.7 mm

j k ≥ P / 25

3.32 > 1.08

HENCE J k > P / 25 SAFE



WELD SIZE CALCULATION

Wv	=	P / (a + 2h)	=	6.8	Mpa	0.98 Ksi
W_H	=	$P e / (ah + 0.667 h^2)$	=	5.6	Mpa	0.82 Ksi
W	=	$(Wv^2 + WH^2)^{0.5}$	=	8.8	Mpa	1.28 Ksi

HENCE W 8.81 < 15.65 Mpa SAFE