STRUCTURAL I-BEAM ANCHORS

Design Analysis:

Von Mises stress was used to calculate the safety factor of the anchor with various load requirements. The highest stressed point was the base of the weld at the front edge of the I-Beam.

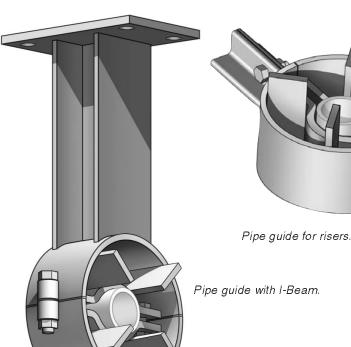
The Pro/MECHANICA® Finite Element Model was used to determine the high stress areas on the anchor and calculate the

safety factor. The model was constrained along the edges of the base plate to simulate the welding of the anchor to the existing structure. This method of constraint was chosen because of the unknown factors in the bolting of the anchor to different structures. All edges of the base plate were constrained in XYZ translation. The model was meshed with "P" elements, which also included the weld geometry.

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MIN PIPE DIA.	ANCHOR			CE (KIPS)				
–	ANCHOR			FORCE (KIPS)				
DIA.		BASE/STRUCTURE TO CENTER OF PIPE						
	MODEL #	12"	18"	24"	36"	48"		
2	PAI-1	1.397	0.951	0.732	0.497	0.371		
2.5	PAI-2	2.338	1.545	1.149	0.76	0.565		
3	PAI-3	3.211	2.15	1.617	1.08	0.812		
3	PAI-4	4.256	2.945	2.293	1.586	1.229		
4	PAI-5	5.143	3.404	2.535	1.678	1.249		
4	PAI-6	10.183	7.089	5.596	3.919	3.072		
6	PAI-7	7.467	4.887	3.6	2.357	1.733		
6	PAI-8	13.388	9.371	7.366	5.137	4.015		
6	PAI-9	18.846	13.178	10.341	7.189	5.629		
8	PAI-10	24.545	16.444	12.393	8.388	6.385		
8	PAI-11	30.912	21.165	16.289	11.135	8.558		
10	PAI-12	31.101	22.319	17.928	12.745	10.153		
10	PAI-13	42.936	30.298	23.979	16.823	13.245		
10	PAI-14	52.225	36.957	29.319	20.595	16.236		
10	PAI-15	62.308	41.328	30.838	20.453	15.261		
16	PAI-16	63.399	53.456	37.304	23.703	16.802		
	2 2.5 3 3 4 4 6 6 6 8 8 10 10	2 PAI-1 2.5 PAI-2 3 PAI-3 3 PAI-4 4 PAI-5 4 PAI-6 6 PAI-7 6 PAI-8 6 PAI-9 8 PAI-10 8 PAI-11 10 PAI-12 10 PAI-13 10 PAI-14 10 PAI-15	2 PAI-1 1.397 2.5 PAI-2 2.338 3 PAI-3 3.211 3 PAI-4 4.256 4 PAI-5 5.143 4 PAI-6 10.183 6 PAI-7 7.467 6 PAI-8 13.388 6 PAI-9 18.846 8 PAI-10 24.545 8 PAI-11 30.912 10 PAI-12 31.101 10 PAI-13 42.936 10 PAI-14 52.225 10 PAI-15 62.308	2 PAI-1 1.397 0.951 2.5 PAI-2 2.338 1.545 3 PAI-3 3.211 2.15 3 PAI-4 4.256 2.945 4 PAI-5 5.143 3.404 4 PAI-6 10.183 7.089 6 PAI-7 7.467 4.887 6 PAI-8 13.388 9.371 6 PAI-9 18.846 13.178 8 PAI-10 24.545 16.444 8 PAI-11 30.912 21.165 10 PAI-12 31.101 22.319 10 PAI-13 42.936 30.298 10 PAI-14 52.225 36.957 10 PAI-15 62.308 41.328	2 PAI-1 1.397 0.951 0.732 2.5 PAI-2 2.338 1.545 1.149 3 PAI-3 3.211 2.15 1.617 3 PAI-4 4.256 2.945 2.293 4 PAI-5 5.143 3.404 2.535 4 PAI-6 10.183 7.089 5.596 6 PAI-7 7.467 4.887 3.6 6 PAI-8 13.388 9.371 7.366 6 PAI-9 18.846 13.178 10.341 8 PAI-10 24.545 16.444 12.393 8 PAI-11 30.912 21.165 16.289 10 PAI-12 31.101 22.319 17.928 10 PAI-13 42.936 30.298 23.979 10 PAI-14 52.225 36.957 29.319 10 PAI-15 62.308 41.328 30.838	2 PAI-1 1.397 0.951 0.732 0.497 2.5 PAI-2 2.338 1.545 1.149 0.76 3 PAI-3 3.211 2.15 1.617 1.08 3 PAI-4 4.256 2.945 2.293 1.586 4 PAI-5 5.143 3.404 2.535 1.678 4 PAI-6 10.183 7.089 5.596 3.919 6 PAI-7 7.467 4.887 3.6 2.357 6 PAI-8 13.388 9.371 7.366 5.137 6 PAI-9 18.846 13.178 10.341 7.189 8 PAI-10 24.545 16.444 12.393 8.388 8 PAI-11 30.912 21.165 16.289 11.135 10 PAI-12 31.101 22.319 17.928 12.745 10 PAI-13 42.936 30.298 23.979 16.823 10		





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