

Appendix: Fillet Welding of Skewed Reinforcing Steel to Steel Plate

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This appendix contains an additional figure for “Fillet Welding of Skewed Reinforcing Steel to Steel Plate,” by Erin D. Pratt, which appears on pages 48-59 in the January–February 2023 issue of *PCI Journal*.

													$\psi =$	45°			$r_{o1} =$	1.817										
													$t =$	0.250	in		$r_{o2} =$	-0.064	in									
													$D_o =$	1.000	in		$X_o =$	-1.239										
																	$Y_o =$	-1.330										
																					Z F	x	y	Z M				
	Length	t (in)	Z-Loss (in)	t_e (in)	r_f (in)	θ_j (deg)	Δ_m (in)	Δ_x (in)	Δ_x/r_f	Δ_i (in)	Δ_x/Δ_m	R_i (k)	R_{ix} (k)	R_{iy} (k)	$R_{ix}Y + R_{iy}X$	$(k\text{-in})$												
1	0.064	0.135	0.000	0.135	2.405	88.09	0.0067	0.0077	0.0032	0.0077	1.1449	1.088	0.932	0.561	0.681													
2	0.064	0.136	0.000	0.136	2.398	84.36	0.0068	0.0079	0.0033	0.0077	1.1224	1.089	0.932	0.562	0.671													
3	0.063	0.137	0.000	0.137	2.384	80.88	0.0070	0.0082	0.0034	0.0076	1.0943	1.087	0.929	0.564	0.651													
4	0.063	0.138	0.000	0.138	2.365	77.74	0.0071	0.0084	0.0036	0.0075	1.0622	1.082	0.922	0.564	0.621													
5	0.062	0.140	0.000	0.140	2.341	74.96	0.0073	0.0087	0.0037	0.0075	1.0277	1.073	0.910	0.563	0.581													
6	0.061	0.141	0.000	0.141	2.314	72.52	0.0074	0.0090	0.0039	0.0074	0.9923	1.059	0.894	0.560	0.535													
7	0.059	0.143	0.000	0.143	2.284	70.38	0.0076	0.0093	0.0041	0.0073	0.9570	1.040	0.874	0.555	0.485													
8	0.058	0.146	0.000	0.146	2.252	68.48	0.0078	0.0096	0.0043	0.0072	0.9224	1.019	0.851	0.549	0.433													
9	0.056	0.148	0.000	0.148	2.219	66.77	0.0080	0.0099	0.0045	0.0071	0.8889	0.997	0.827	0.542	0.382													
10	0.055	0.150	0.000	0.150	2.186	65.21	0.0081	0.0102	0.0047	0.0070	0.8567	0.974	0.802	0.535	0.332													
11	0.053	0.152	0.000	0.152	2.152	63.76	0.0083	0.0105	0.0049	0.0069	0.8258	0.953	0.779	0.529	0.284													
12	0.052	0.154	0.000	0.154	2.118	62.40	0.0085	0.0107	0.0051	0.0068	0.7958	0.935	0.758	0.524	0.239													
13	0.051	0.156	0.000	0.156	2.085	61.09	0.0087	0.0110	0.0053	0.0067	0.7668	0.920	0.740	0.521	0.197													
14	0.050	0.159	0.000	0.159	2.052	59.83	0.0089	0.0114	0.0055	0.0065	0.7383	0.908	0.724	0.520	0.158													
15	0.049	0.161	0.000	0.161	2.018	58.58	0.0091	0.0117	0.0058	0.0064	0.7102	0.901	0.711	0.521	0.121													
16	0.049	0.164	0.000	0.164	1.985	57.34	0.0093	0.0120	0.0061	0.0063	0.6823	0.898	0.702	0.525	0.085													
17	0.049	0.167	0.000	0.167	1.952	56.09	0.0095	0.0124	0.0064	0.0062	0.6542	0.900	0.696	0.532	0.051													
18	0.049	0.171	0.000	0.171	1.919	54.82	0.0098	0.0128	0.0067	0.0061	0.6260	0.907	0.692	0.542	0.017													
19	0.049	0.174	0.000	0.174	1.886	53.51	0.0101	0.0133	0.0071	0.0060	0.5973	0.919	0.692	0.555	-0.017													
20	0.050	0.179	0.000	0.179	1.852	52.14	0.0104	0.0138	0.0075	0.0059	0.5681	0.936	0.695	0.572	-0.052													
21	0.050	0.183	0.000	0.183	1.818	50.71	0.0108	0.0144	0.0079	0.0058	0.5384	0.958	0.701	0.592	-0.087													
22	0.051	0.189	0.000	0.189	1.783	49.18	0.0112	0.0151	0.0085	0.0057	0.5081	0.986	0.709	0.617	-0.124													
23	0.053	0.195	0.000	0.195	1.747	47.56	0.0117	0.0159	0.0091	0.0056	0.4772	1.019	0.718	0.647	-0.164													
24	0.054	0.202	0.000	0.202	1.711	45.81	0.0122	0.0169	0.0099	0.0055	0.4458	1.057	0.729	0.681	-0.205													
25	0.056	0.210	0.000	0.210	1.674	43.92	0.0129	0.0180	0.0107	0.0053	0.4142	1.101	0.740	0.720	-0.249													
26	0.057	0.219	0.000	0.219	1.636	41.88	0.0136	0.0193	0.0118	0.0052	0.3826	1.149	0.750	0.764	-0.295													
27	0.059	0.229	0.000	0.229	1.597	39.71	0.0145	0.0208	0.0130	0.0051	0.3514	1.202	0.758	0.814	-0.341													
28	0.061	0.240	0.000	0.240	1.558	37.47	0.0155	0.0225	0.0144	0.0050	0.3211	1.257	0.762	0.870	-0.387													
29	0.064	0.252	0.000	0.252	1.519	35.31	0.0166	0.0244	0.0161	0.0048	0.2927	1.317	0.761	0.934	-0.432													
30	0.066	0.265	0.000	0.265	1.480	33.61	0.0177	0.0264	0.0178	0.0047	0.2674	1.384	0.757	1.010	-0.473													
31	0.068	0.278	0.000	0.278	1.443	33.07	0.0186	0.0279	0.0194	0.0046	0.2471	1.465	0.751	1.105	-0.510													
32	0.070	0.291	0.000	0.291	1.409	34.83	0.0192	0.0284	0.0202	0.0045	0.2341	1.575	0.749	1.236	-0.548													
33	0.072	0.304	0.000	0.304	1.379	40.14	0.0192	0.0273	0.0198	0.0044	0.2296	1.733	0.760	1.425	-0.590													
34	0.073	0.314	0.000	0.314	1.354	49.78	0.0186	0.0250	0.0185	0.0043	0.2330	1.944	0.784	1.680	-0.638													
35	0.074	0.321	0.000	0.321	1.337	63.68	0.0176	0.0221	0.0166	0.0043	0.2424	2.179	0.817	1.970	-0.687													
36	0.075	0.325	0.000	0.325	1.328	80.81	0.0165	0.0194	0.0146	0.0042	0.2561	2.358	0.847	2.194	-0.723													
											2.107			$r_{cr} =$	0.0032			28.153	28.153	0.001								
																	28.153	28.153										
																	Pn =	39.814	k									

Figure A.1. Spreadsheet example illustrating the instantaneous center of rotation design method. Note: R_{ix} = component of R_i in the X direction; R_{iy} = component of R_i in the Y direction; 1 in. = 25.4 mm; 1 kip = 4.448 kN.