

The specimen details

Diameter of bolt	d (mm)	20
Diameter of bolt hole	$d_0$ (mm)	22
End distance	$e_1$ (mm)	60
Edge distance	$e_2$ (mm)	55
Spacing between centres of bolts in the direction of load transfer	$p_1$ (mm)	70
	$p_2$ (mm)	133.4
Spacing between rows of bolts	$p_3$ (mm)	90
Thickness of end plate	$t_p$ (mm)	10
Horizontal distance of lever arm	$B_L$ (mm)	490
Vertical distance of lever arm	$D_L$ (mm)	51.7

Steel Grade		S275	S355
Dimension of Members		UB305x16 5x40	UC254x25 4x89
Depth of Section	D (mm)	303.4	260.3
Width of Section	B (mm)	165	256.3
Thickness of Web	t (mm)	6	10.3
Thickness of Flange	T (mm)	10.2	17.3
Root Radius	r (mm)	8.9	12.7
Depth between Fillets	d (mm)	265.2	200.3

Nominal Temperature

550°C

Time (minute)	Thermocouple Average(°C)	Jack Displacement (mm)	Load Angle $\alpha$ (°)	Beam Rotation (°)	Column Rotation (°)	Connection Rotation (°)	Force Rotation (°)	F3 from F1 (kN)	F3 from F2 (kN)	F3 Average (kN)	Tension (kN)	Shear (kN)	Moment (kN*m)
0	544.660	2.769											
1	544.773	2.773											
2	544.795	2.751											
3	544.936	2.768	41.17	0.000	0.000	0.000	72.887	-23.20	-20.11	-21.66	-16.30	-14.26	-8104.73
4	544.996	4.257	41.27	0.000	0.066	-0.066	72.785	-18.73	-16.05	-17.39	-13.07	-11.47	-6521.19
5	545.134	5.896	41.24	0.055	0.082	-0.027	72.755	-14.58	-12.85	-13.72	-10.31	-9.04	-5140.16
6	545.201	7.468	41.18	0.108	0.175	-0.067	72.763	-10.95	-9.81	-10.38	-7.82	-6.84	-3887.48
7	545.279	9.064	41.16	0.174	0.237	-0.063	72.724	-7.58	-7.84	-7.71	-5.81	-5.07	-2885.39
8	545.417	10.675	41.19	0.207	0.264	-0.057	72.659	-4.63	-4.63	-4.63	-3.48	-3.05	-1733.57
9	545.439	12.245	41.17	0.258	0.310	-0.052	72.628	-1.99	-2.65	-2.32	-1.74	-1.53	-867.32
10	545.538	13.924	41.23	0.264	0.301	-0.037	72.557	-1.41	-1.69	-1.55	-1.17	-1.02	-581.38
11	545.621	15.499	41.45	0.291	0.331	-0.040	72.317	-1.31	-2.05	-1.68	-1.26	-1.11	-631.97
12	545.685	17.136	41.68	0.326	0.333	-0.007	72.048	-1.21	-1.82	-1.51	-1.13	-1.01	-571.62
13	545.859	18.742	41.82	0.320	0.347	-0.027	71.919	-0.78	-0.92	-0.85	-0.63	-0.56	-320.17
14	545.892	20.093	41.80	0.404	0.360	0.044	71.853	0.20	-0.04	0.08	0.06	0.05	31.04
15	545.998	21.202	41.84	0.413	0.415	-0.002	71.800	1.55	0.71	1.13	0.84	0.75	427.17
16	546.048	22.661	41.84	0.450	0.471	-0.021	71.767	3.56	2.91	3.23	2.41	2.16	1223.28
17	546.054	24.182	41.85	0.502	0.534	-0.032	71.701	5.93	6.03	5.98	4.46	3.99	2265.72
18	546.196	25.552	41.82	0.537	0.566	-0.029	71.696	8.31	7.49	7.90	5.89	5.27	2989.62
19	546.264	27.105	41.76	0.644	0.616	0.028	71.652	10.73	10.57	10.65	7.95	7.09	4026.43
20	546.306	28.570	41.72	0.711	0.655	0.056	71.625	13.55	12.79	13.17	9.83	8.76	4975.17
21	546.445	30.107	41.72	0.754	0.697	0.057	71.583	16.09	15.37	15.73	11.74	10.47	5942.33
22	546.462	31.613	41.67	0.827	0.733	0.094	71.562	19.02	18.09	18.56	13.86	12.34	7003.89

## 27 November 2007 End-plate Test Result

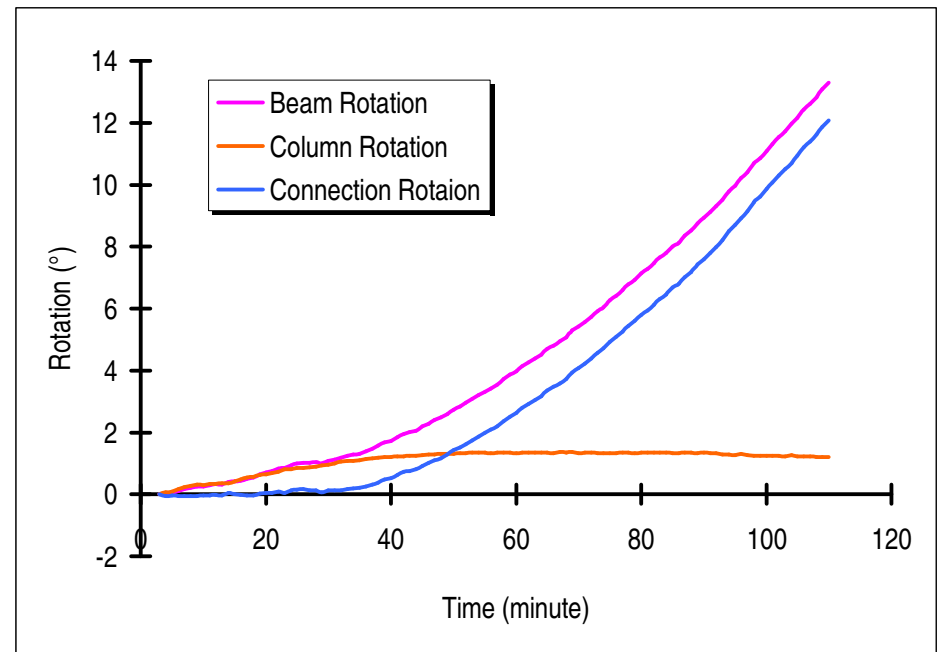
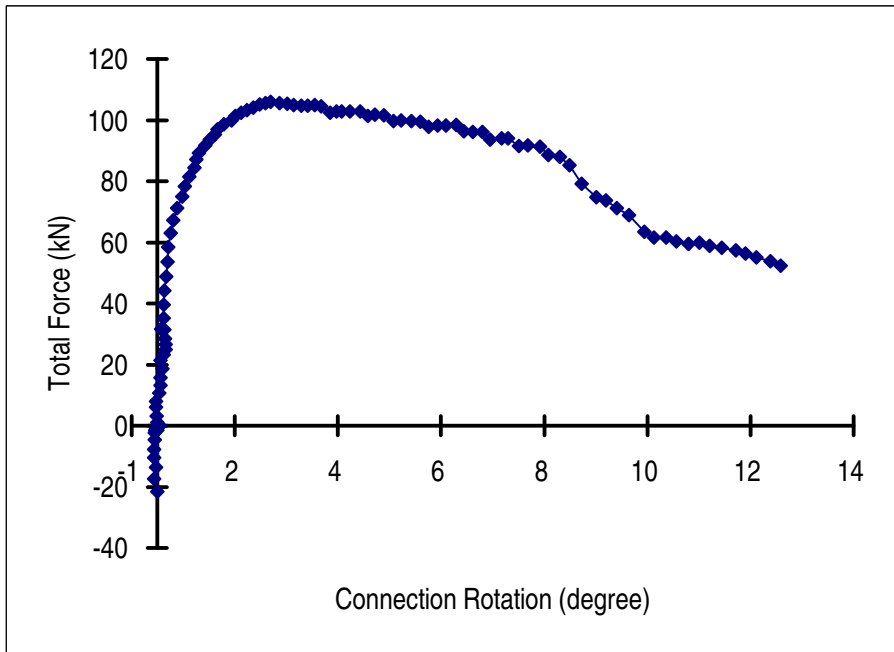
23	546.621	33.214	41.68	0.855	0.802	0.053	71.517	21.45	21.23	21.34	15.94	14.19	8056.01
24	546.643	34.519	41.61	0.939	0.818	0.121	71.508	23.59	22.85	23.22	17.36	15.42	8755.71
25	546.744	35.849	41.55	1.000	0.845	0.155	71.507	25.15	24.79	24.97	18.69	16.56	9404.79
26	546.845	37.049	41.54	1.017	0.853	0.164	71.498	26.96	26.23	26.59	19.91	17.64	10016.08
27	546.799	38.187	41.54	1.021	0.881	0.140	71.494	28.85	28.08	28.47	21.31	18.88	10722.41
28	546.972	39.565	41.56	1.040	0.903	0.137	71.454	32.03	30.87	31.45	23.53	20.86	11848.87
29	547.000	40.477	41.57	1.005	0.935	0.070	71.481	32.15	31.04	31.59	23.64	20.96	11905.12
30	547.116	41.902	41.53	1.073	0.951	0.122	71.453	35.67	34.90	35.29	26.42	23.40	13287.74
31	547.242	43.367	41.49	1.122	1.002	0.120	71.447	39.89	39.23	39.56	29.64	26.21	14886.42
32	547.220	44.857	41.44	1.188	1.056	0.132	71.431	44.64	43.65	44.15	33.10	29.21	16596.99
33	547.329	46.378	41.43	1.237	1.070	0.167	71.388	49.42	47.98	48.70	36.52	32.23	18307.99
34	547.375	47.892	41.43	1.286	1.085	0.201	71.341	54.51	52.80	53.66	40.23	35.50	20169.63
35	547.460	49.437	41.45	1.310	1.101	0.209	71.292	59.24	57.47	58.35	43.74	38.63	21944.76
36	547.550	50.966	41.44	1.395	1.143	0.252	71.224	63.76	62.11	62.94	47.18	41.65	23661.80
37	547.481	52.432	41.40	1.475	1.163	0.312	71.182	68.16	66.26	67.21	50.42	44.45	25252.55
38	547.550	54.008	41.35	1.566	1.188	0.378	71.135	72.24	70.17	71.20	53.45	47.04	26731.84
39	547.647	55.562	41.30	1.686	1.204	0.482	71.068	75.92	74.03	74.98	56.33	49.49	28123.29
40	547.617	57.060	41.29	1.730	1.203	0.527	71.035	79.34	77.40	78.37	58.89	51.71	29390.20
41	547.755	58.660	41.19	1.854	1.233	0.621	71.011	82.41	80.37	81.39	61.25	53.60	30470.22
42	547.790	60.310	41.18	1.949	1.229	0.720	70.925	85.20	83.44	84.32	63.46	55.52	31562.05
43	547.902	61.881	41.17	2.012	1.253	0.759	70.876	87.99	86.06	87.03	65.51	57.28	32567.52
44	547.966	63.441	41.15	2.062	1.253	0.809	70.846	90.34	88.07	89.20	67.17	58.69	33371.21
45	547.986	65.011	41.06	2.188	1.266	0.922	70.804	92.58	90.73	91.65	69.11	60.21	34238.36
46	548.067	66.541	40.96	2.286	1.278	1.008	70.813	94.63	92.55	93.59	70.68	61.35	34896.91
47	548.089	68.038	40.93	2.395	1.284	1.111	70.729	96.53	94.18	95.36	72.04	62.47	35540.20
48	548.191	69.551	40.87	2.483	1.314	1.169	70.699	98.26	95.74	97.00	73.35	63.47	36114.64
49	548.248	71.103	40.83	2.599	1.309	1.290	70.629	99.98	97.26	98.62	74.63	64.48	36691.07
50	548.339	72.697	40.73	2.736	1.299	1.437	70.586	101.39	98.50	99.94	75.73	65.22	37121.85
51	548.473	74.404	40.66	2.843	1.332	1.511	70.549	102.58	100.20	101.39	76.91	66.07	37612.51
52	548.500	75.972	40.58	2.961	1.336	1.625	70.511	103.84	100.98	102.41	77.78	66.62	37938.22

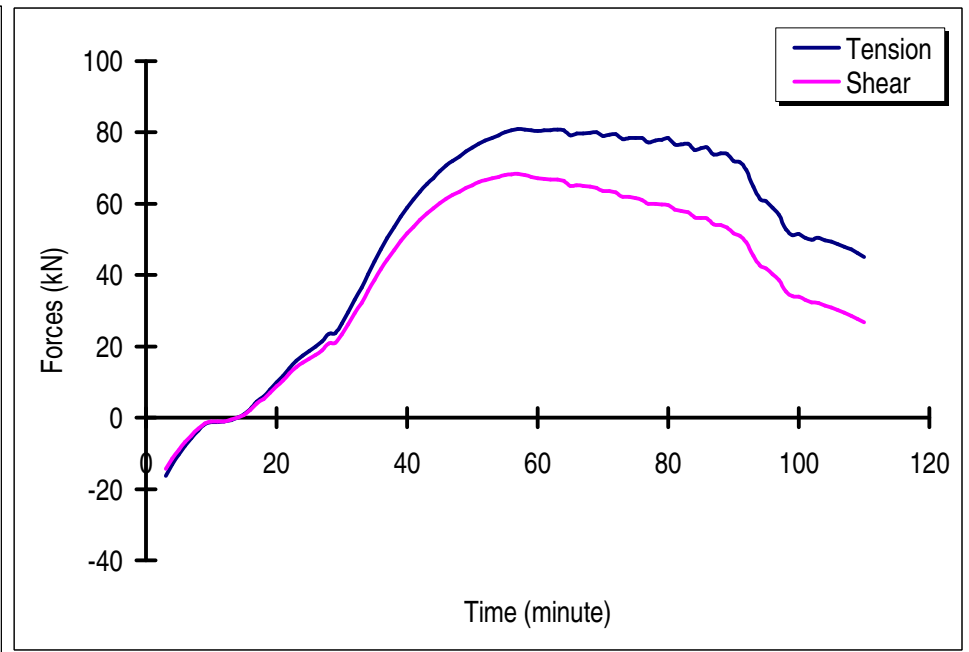
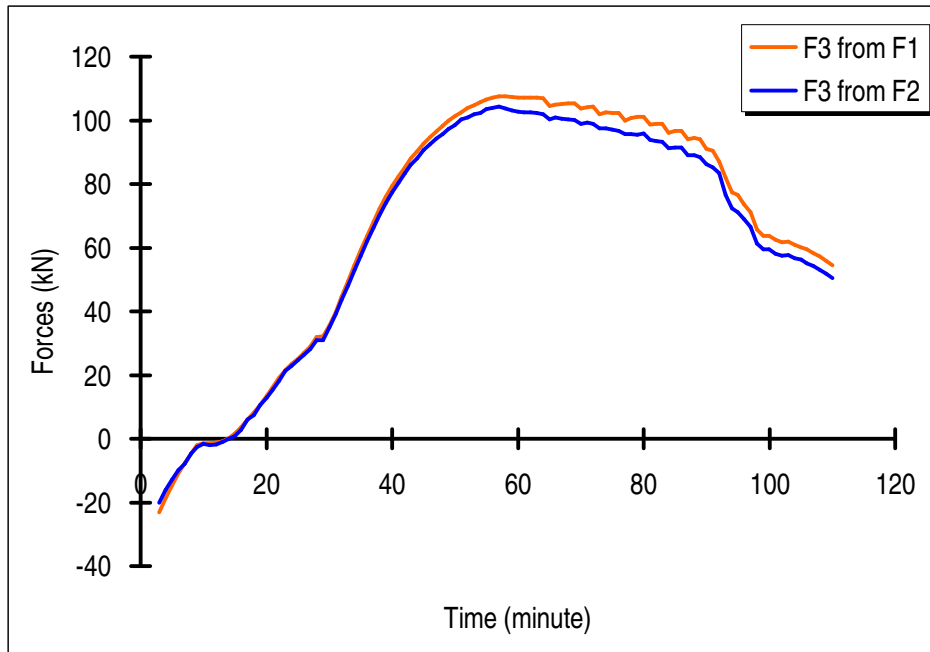
27 November 2007 End-plate Test Result

53	548.659	77.598	40.51	3.081	1.345	1.736	70.465	104.75	101.83	103.29	78.53	67.09	38213.91
54	548.750	79.144	40.43	3.202	1.344	1.858	70.424	105.66	102.35	104.01	79.17	67.45	38424.54
55	548.739	80.873	40.34	3.320	1.339	1.981	70.392	106.59	103.60	105.10	80.10	68.03	38769.03
56	548.859	82.491	40.24	3.426	1.327	2.099	70.384	107.18	103.96	105.57	80.58	68.20	38876.39
57	548.919	84.124	40.19	3.547	1.349	2.198	70.316	107.58	104.26	105.92	80.91	68.35	38967.19
58	549.037	85.765	40.05	3.721	1.349	2.372	70.287	107.48	103.79	105.64	80.87	67.97	38764.00
59	549.106	87.327	39.94	3.863	1.351	2.512	70.253	107.32	103.16	105.24	80.69	67.56	38545.06
60	549.149	88.889	39.87	3.972	1.337	2.635	70.211	107.04	102.68	104.86	80.48	67.22	38359.03
61	549.309	90.466	39.76	4.142	1.347	2.795	70.148	107.11	102.51	104.81	80.57	67.04	38266.89
62	549.327	92.012	39.63	4.263	1.345	2.918	70.165	107.09	102.46	104.78	80.70	66.82	38159.71
63	549.346	93.645	39.53	4.397	1.348	3.049	70.128	107.24	102.40	104.82	80.85	66.71	38107.72
64	549.447	95.262	39.44	4.521	1.346	3.175	70.097	106.99	102.00	104.49	80.70	66.38	37924.58
65	549.408	96.944	39.41	4.695	1.346	3.349	69.949	104.61	100.39	102.50	79.19	65.07	37183.61
66	549.482	98.540	39.30	4.811	1.335	3.476	69.940	105.02	100.83	102.92	79.64	65.19	37264.23
67	549.493	100.140	39.19	4.941	1.365	3.576	69.921	105.10	100.42	102.76	79.64	64.94	37130.73
68	549.563	101.774	39.07	5.075	1.346	3.729	69.911	105.33	100.40	102.86	79.86	64.83	37083.56
69	549.657	103.287	38.87	5.291	1.362	3.929	69.898	105.36	100.17	102.77	80.02	64.49	36910.48
70	549.615	104.935	38.81	5.423	1.338	4.085	69.817	103.75	98.80	101.28	78.91	63.48	36339.57
71	549.699	106.642	38.68	5.565	1.344	4.221	69.812	104.17	99.34	101.75	79.44	63.59	36417.67
72	549.760	108.259	38.49	5.733	1.348	4.385	69.834	104.25	98.86	101.55	79.49	63.20	36217.40
73	549.792	109.957	38.46	5.907	1.333	4.574	69.685	101.93	97.40	99.67	78.04	61.99	35527.55
74	549.803	111.551	38.31	6.050	1.325	4.725	69.693	102.45	97.42	99.94	78.42	61.95	35522.31
75	549.818	113.111	38.08	6.261	1.333	4.928	69.709	102.36	97.13	99.75	78.51	61.53	35303.32
76	549.971	114.745	37.92	6.416	1.320	5.096	69.715	102.26	96.68	99.47	78.47	61.14	35097.59
77	549.920	116.428	37.84	6.608	1.346	5.262	69.603	100.00	95.63	97.81	77.24	60.01	34459.88
78	549.997	118.019	37.66	6.783	1.344	5.439	69.607	100.64	95.77	98.20	77.74	60.01	34478.95
79	550.137	119.533	37.49	6.935	1.337	5.598	69.629	101.01	95.55	98.28	77.98	59.82	34390.16
80	550.149	121.174	37.25	7.130	1.343	5.787	69.675	101.09	95.83	98.46	78.38	59.60	34292.00
81	550.219	122.696	37.25	7.287	1.343	5.944	69.519	98.73	93.83	96.28	76.64	58.27	33530.78
82	550.165	124.225	37.07	7.459	1.339	6.120	69.529	98.82	93.39	96.10	76.68	57.92	33350.22

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83	550.183	125.787	36.82	7.646	1.344	6.302	69.584	98.85	93.31	96.08	76.91	57.59	33183.62
84	550.323	127.548	36.81	7.797	1.351	6.446	69.447	96.12	91.29	93.71	75.02	56.15	32355.09
85	550.412	129.190	36.58	7.997	1.322	6.675	69.478	96.72	91.37	94.04	75.52	56.04	32322.51
86	550.502	130.904	36.40	8.140	1.336	6.804	69.517	96.74	91.50	94.12	75.76	55.85	32230.18
87	550.570	132.499	36.28	8.354	1.343	7.011	69.417	94.05	89.11	91.58	73.82	54.19	31288.49
88	550.590	134.124	36.10	8.519	1.339	7.180	69.439	94.42	88.96	91.69	74.09	54.02	31208.47
89	550.586	135.765	35.81	8.756	1.334	7.422	69.493	94.11	88.37	91.24	74.00	53.38	30871.65
90	550.495	137.415	35.66	8.926	1.344	7.582	69.465	91.15	86.18	88.67	72.04	51.69	29913.22
91	550.519	139.072	35.45	9.121	1.318	7.803	69.487	90.54	85.29	87.91	71.62	50.99	29526.67
92	550.568	140.600	35.31	9.310	1.319	7.991	69.439	86.95	83.46	85.21	69.53	49.24	28533.21
93	550.656	142.396	35.05	9.513	1.291	8.222	69.489	81.96	76.50	79.23	64.86	45.50	26392.61
94	550.749	144.124	34.83	9.784	1.279	8.505	69.444	77.36	72.34	74.85	61.44	42.75	24814.44
95	550.768	145.807	34.60	9.961	1.263	8.698	69.493	76.50	71.14	73.82	60.77	41.92	24356.09
96	550.863	147.561	34.39	10.216	1.304	8.912	69.453	73.57	68.96	71.26	58.81	40.25	23404.00
97	550.827	149.217	34.10	10.410	1.266	9.144	69.543	71.18	66.45	68.82	56.98	38.58	22461.84
98	550.890	150.964	33.83	10.690	1.249	9.441	69.535	65.70	61.36	63.53	52.78	35.37	20614.82
99	550.960	152.602	33.68	10.865	1.241	9.624	69.508	63.74	59.42	61.58	51.24	34.15	19916.89
100	550.972	154.213	33.37	11.094	1.236	9.858	69.591	63.74	59.54	61.64	51.48	33.91	19799.66
101	551.092	155.758	33.13	11.314	1.247	10.067	69.606	62.53	58.18	60.36	50.54	32.99	19285.52
102	551.097	157.399	32.90	11.536	1.241	10.295	69.623	61.65	57.43	59.54	49.99	32.34	18921.85
103	551.158	158.970	32.61	11.732	1.226	10.506	69.713	61.90	57.75	59.82	50.39	32.24	18888.81
104	551.307	160.620	32.30	11.969	1.267	10.702	69.786	60.91	56.58	58.75	49.66	31.39	18417.37
105	551.208	162.333	32.10	12.170	1.226	10.944	69.788	60.13	56.26	58.20	49.30	30.92	18159.86
106	551.317	163.984	31.77	12.433	1.215	11.218	69.850	59.43	55.13	57.28	48.70	30.16	17738.66
107	551.437	165.745	31.53	12.623	1.226	11.397	69.897	58.38	54.22	56.30	47.99	29.45	17338.30
108	551.416	167.483	31.28	12.819	1.203	11.616	69.954	57.27	53.06	55.17	47.15	28.64	16887.52
109	551.508	169.115	30.94	13.084	1.203	11.881	70.034	55.98	51.77	53.87	46.21	27.70	16355.47
110	551.410	170.846	30.65	13.291	1.208	12.083	70.110	54.41	50.45	52.43	45.10	26.73	15808.31







Photographs after Test

