

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
	UB305x16 5x40	UC254x254 x89
Dimension of Members		
Depth of Section	D (mm)	303.4
Width of Section	B (mm)	165
Thickness of Web	t (mm)	6
Thickness of Flange	T (mm)	10.2
Root Radius	r (mm)	8.9
Depth between Fillets	d (mm)	265.2

Nominal Temperature

20°C

Time (minute)	Thermocouple Average(°C)	Jack Displacement (mm)	Load Angle α (°)	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	21.531	-0.006											
1	21.408	0.008											
2	21.521	-0.009											
3	21.506	-0.012											
4	21.532	-0.015	54.73	0.000	0.000	0.000	59.217	0.28	0.89	0.59	0.34	0.48	264.75
5	21.546	1.003	54.81	0.005	0.008	-0.003	59.145	1.38	3.81	2.60	1.50	2.12	1174.17
6	21.483	2.266	54.87	0.034	0.047	-0.013	59.082	5.93	7.87	6.90	3.97	5.64	3121.90
7	21.402	3.599	54.93	0.059	0.076	-0.017	59.018	9.44	10.80	10.12	5.81	8.28	4581.41
8	21.413	5.032	54.99	0.094	0.106	-0.012	58.960	13.28	15.16	14.22	8.16	11.65	6441.77
9	21.395	6.415	55.05	0.128	0.135	-0.007	58.905	17.33	19.41	18.37	10.53	15.06	8327.68
10	21.486	7.759	55.11	0.171	0.169	0.002	58.845	21.93	24.62	23.28	13.32	19.09	10558.05
11	21.407	9.173	55.14	0.207	0.215	-0.008	58.809	27.42	29.17	28.29	16.17	23.22	12838.18
12	21.424	10.815	55.20	0.249	0.258	-0.009	58.755	33.23	35.00	34.12	19.47	28.01	15489.63
13	21.539	14.836	55.22	0.283	0.284	-0.001	58.728	36.80	38.67	37.74	21.52	31.00	17138.81
14	21.555	16.326	55.28	0.332	0.319	0.013	58.671	43.87	45.13	44.50	25.35	36.58	20223.06
15	21.593	16.943	55.33	0.380	0.376	0.004	58.619	49.92	52.22	51.07	29.05	42.00	23220.38
16	21.602	18.777	55.36	0.430	0.409	0.021	58.587	56.59	58.06	57.32	32.58	47.17	26074.54
17	21.631	20.306	55.41	0.470	0.451	0.019	58.545	63.35	65.05	64.20	36.45	52.85	29213.82
18	21.608	21.859	55.43	0.543	0.500	0.043	58.517	70.28	72.08	71.18	40.38	58.61	32399.36
19	21.588	47.599	55.49	0.602	0.548	0.054	58.464	77.00	78.83	77.92	44.15	64.20	35487.28
20	21.602	48.977	55.49	0.659	0.594	0.065	58.457	83.61	84.97	84.29	47.75	69.46	38392.83
21	21.535	50.465	55.53	0.721	0.635	0.086	58.419	90.51	91.19	90.85	51.42	74.90	41397.97
22	21.483	51.892	55.53	0.780	0.680	0.100	58.424	96.87	97.75	97.31	55.08	80.22	44338.14

28 February 2008 End-plate Test Result

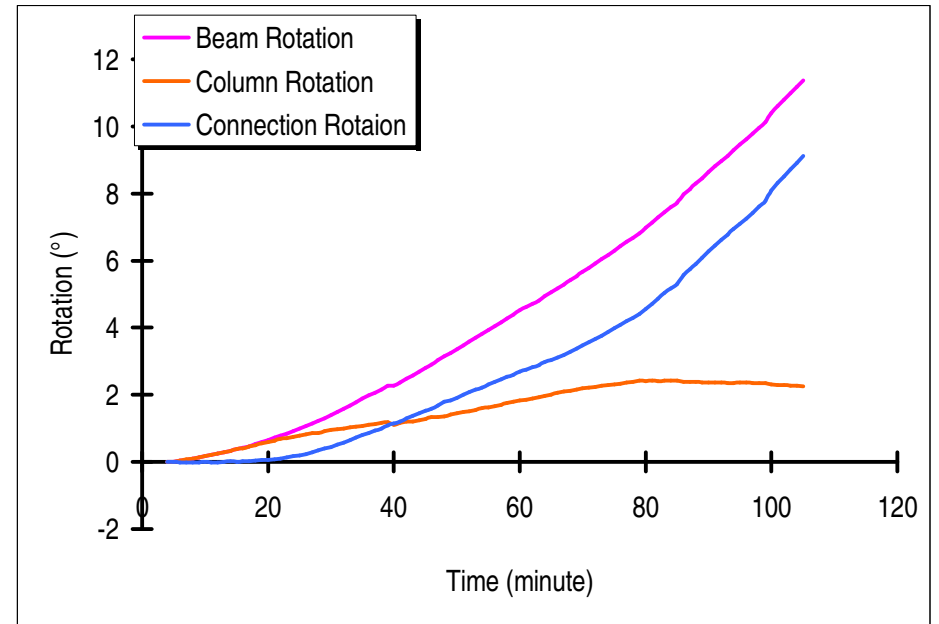
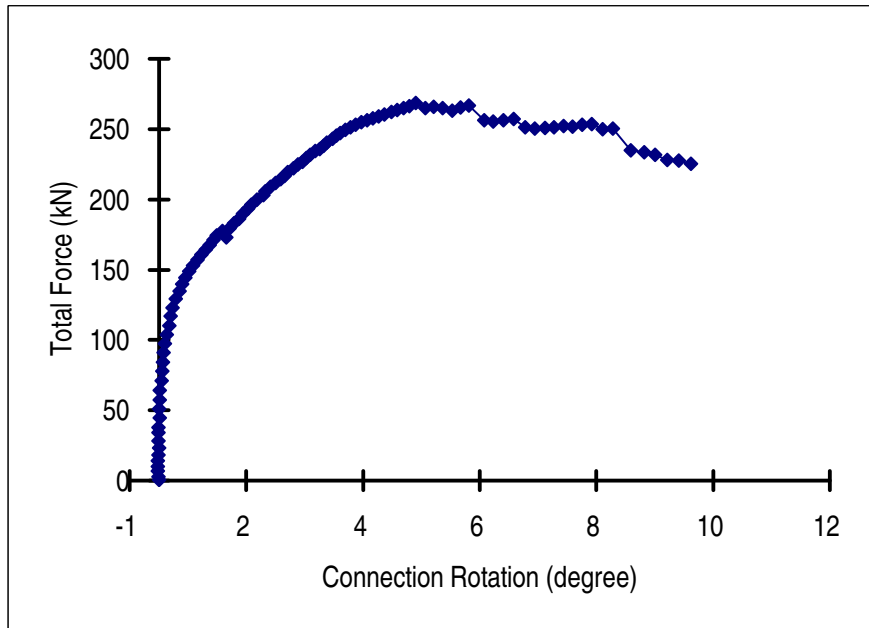
23	21.463	53.300	55.53	0.851	0.710	0.141	58.420	103.14	104.11	103.63	58.65	85.43	47219.40
24	21.575	54.662	55.54	0.925	0.743	0.182	58.411	109.50	110.85	110.17	62.34	90.84	50206.55
25	21.571	56.104	55.57	0.989	0.788	0.201	58.381	115.98	117.99	116.98	66.14	96.49	53326.08
26	21.565	57.474	55.61	1.065	0.825	0.240	58.342	122.51	123.61	123.06	69.51	101.55	56119.16
27	21.526	58.915	55.64	1.146	0.852	0.294	58.306	128.30	129.86	129.08	72.84	106.56	58888.19
28	21.602	60.373	55.66	1.225	0.870	0.355	58.291	133.98	135.21	134.60	75.93	111.14	61414.89
29	21.591	61.894	55.67	1.305	0.909	0.396	58.278	139.09	140.52	139.81	78.84	115.46	63800.09
30	21.458	63.399	55.66	1.399	0.949	0.450	58.293	144.02	144.47	144.24	81.37	119.10	65814.32
31	21.582	64.912	55.70	1.488	0.967	0.521	58.253	148.30	149.81	149.06	84.00	123.13	68040.33
32	21.569	66.386	55.72	1.581	0.997	0.584	58.231	152.63	153.07	152.85	86.09	126.30	69788.40
33	21.484	67.940	55.75	1.687	1.028	0.659	58.198	156.67	157.03	156.85	88.27	129.65	71637.29
34	21.519	69.493	55.75	1.773	1.046	0.727	58.199	160.16	161.17	160.66	90.42	132.81	73379.42
35	21.509	71.072	55.75	1.882	1.078	0.804	58.205	163.54	164.88	164.21	92.43	135.73	74994.55
36	21.546	72.570	55.77	1.980	1.110	0.870	58.180	166.99	167.89	167.44	94.19	138.44	76489.55
37	21.471	74.123	55.81	2.066	1.132	0.934	58.137	170.59	171.47	171.03	96.10	141.48	78164.92
38	21.464	75.660	55.86	2.165	1.170	0.995	58.092	174.08	174.61	174.34	97.85	144.29	79715.84
39	21.406	77.199	55.89	2.274	1.188	1.086	58.065	177.54	177.68	177.61	99.61	147.04	81232.22
40	21.345	78.896	56.02	2.269	1.116	1.153	57.930	171.87	174.56	173.21	96.81	143.63	79334.54
41	21.253	80.282	56.06	2.369	1.158	1.211	57.886	178.63	180.06	179.35	100.12	148.80	82181.68
42	21.355	81.763	56.06	2.489	1.196	1.293	57.886	182.27	183.68	182.98	102.15	151.81	83845.40
43	21.323	83.317	56.06	2.583	1.208	1.375	57.892	186.15	186.63	186.39	104.07	154.63	85402.96
44	21.202	84.823	56.08	2.689	1.243	1.446	57.867	189.60	189.73	189.67	105.83	157.40	86927.22
45	21.229	86.449	56.09	2.810	1.282	1.528	57.863	192.72	193.86	193.29	107.84	160.41	88590.17
46	21.182	87.931	56.13	2.909	1.329	1.580	57.820	196.42	195.98	196.20	109.34	162.90	89964.00
47	21.146	89.516	56.12	3.033	1.346	1.687	57.829	199.77	199.74	199.76	111.35	165.84	91586.89
48	21.177	91.054	56.14	3.154	1.358	1.796	57.813	202.77	202.90	202.83	113.02	168.43	93011.67
49	21.250	92.415	56.15	3.244	1.415	1.829	57.803	205.66	206.27	205.96	114.73	171.05	94457.73
50	21.216	93.977	56.13	3.368	1.457	1.911	57.820	208.44	209.40	208.92	116.43	173.47	95796.46
51	21.209	95.627	56.10	3.482	1.483	1.999	57.850	210.81	212.45	211.63	118.04	175.66	97009.92
52	21.230	97.092	56.12	3.595	1.508	2.087	57.829	213.56	215.21	214.39	119.51	177.99	98293.78

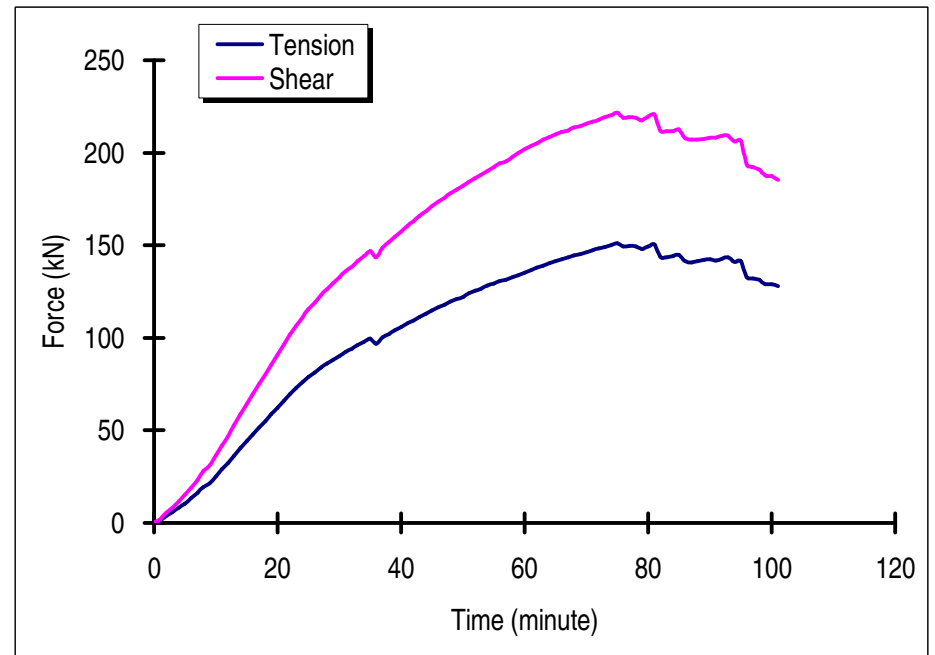
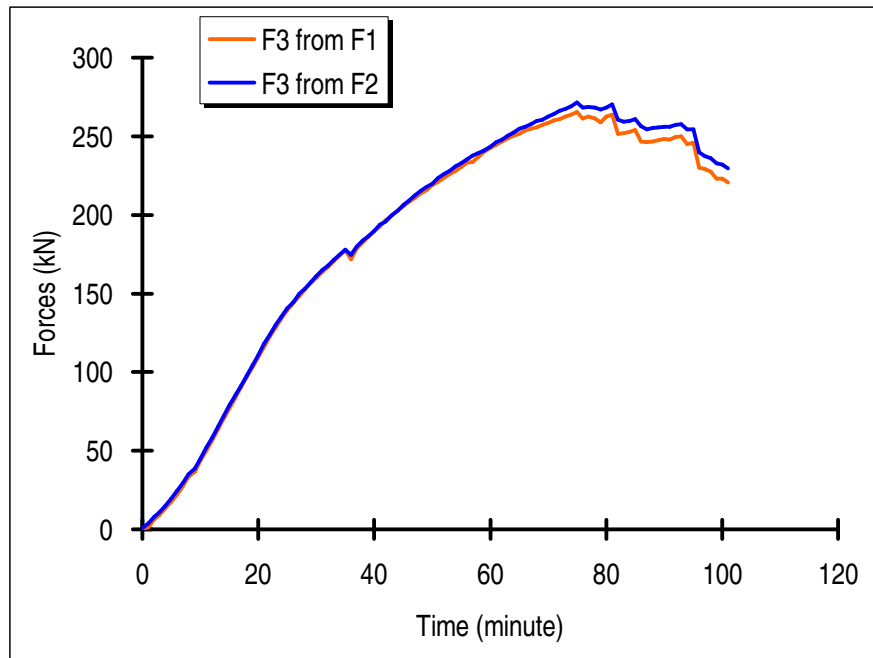
28 February 2008 End-plate Test Result

53	21.221	98.461	56.08	3.706	1.556	2.150	57.867	215.87	217.95	216.91	121.03	180.00	99411.07
54	21.179	99.903	56.14	3.819	1.611	2.208	57.806	219.00	219.75	219.38	122.22	182.18	100606.09
55	21.274	101.201	56.09	3.935	1.627	2.308	57.860	220.94	223.48	222.21	123.97	184.42	101847.89
56	21.172	102.618	56.10	4.051	1.663	2.388	57.855	223.54	225.91	224.73	125.36	186.52	103006.17
57	21.165	103.965	56.09	4.169	1.703	2.466	57.864	225.84	227.89	226.87	126.58	188.27	103977.61
58	21.214	105.382	56.04	4.283	1.753	2.530	57.909	228.05	230.78	229.41	128.15	190.28	105094.58
59	21.145	106.646	56.06	4.389	1.798	2.591	57.889	230.53	232.64	231.58	129.29	192.13	106109.23
60	21.131	107.962	56.11	4.514	1.831	2.683	57.839	233.12	235.39	234.25	130.62	194.46	107388.83
61	21.078	109.051	56.06	4.609	1.852	2.757	57.888	233.67	237.56	235.61	131.54	195.47	107957.59
62	21.042	110.364	56.12	4.723	1.896	2.827	57.827	237.10	239.31	238.20	132.78	197.77	109213.57
63	21.113	111.581	56.19	4.817	1.937	2.880	57.765	240.02	241.05	240.53	133.86	199.85	110352.88
64	21.103	112.935	56.19	4.949	1.971	2.978	57.765	242.65	243.49	243.07	135.27	201.95	111515.31
65	21.148	114.313	56.15	5.051	2.011	3.040	57.800	244.59	246.21	245.40	136.69	203.80	112542.16
66	21.097	115.906	56.11	5.179	2.065	3.114	57.844	246.67	247.76	247.22	137.86	205.21	113324.59
67	21.133	117.445	56.10	5.288	2.093	3.195	57.851	248.54	250.44	249.49	139.16	207.08	114358.69
68	21.188	118.933	56.06	5.414	2.128	3.286	57.892	250.21	252.40	251.31	140.32	208.49	115141.48
69	21.253	120.464	55.99	5.534	2.158	3.376	57.964	251.44	254.64	253.04	141.55	209.74	115846.10
70	21.286	121.928	55.97	5.661	2.188	3.474	57.978	253.45	256.22	254.83	142.60	211.20	116651.34
71	21.304	123.449	55.92	5.788	2.217	3.571	58.027	254.63	257.56	256.09	143.49	212.12	117168.65
72	21.372	124.955	55.90	5.913	2.240	3.673	58.049	255.81	259.89	257.85	144.56	213.52	117945.80
73	21.435	126.461	55.88	6.045	2.276	3.769	58.074	257.19	260.69	258.94	145.26	214.36	118410.48
74	21.398	127.965	55.84	6.163	2.293	3.870	58.113	258.63	262.53	260.58	146.33	215.61	119112.21
75	21.448	129.422	55.82	6.298	2.314	3.984	58.132	260.00	264.07	262.04	147.22	216.77	119754.09
76	21.536	130.952	55.76	6.427	2.338	4.089	58.190	260.92	266.08	263.50	148.26	217.84	120351.22
77	21.583	132.504	55.78	6.558	2.362	4.196	58.167	262.36	267.56	264.96	148.99	219.10	121044.57
78	21.528	134.084	55.72	6.682	2.392	4.290	58.231	263.91	269.13	266.52	150.12	220.22	121674.97
79	21.544	135.749	55.70	6.818	2.416	4.402	58.248	265.53	271.30	268.41	151.25	221.74	122518.45
80	21.586	137.277	55.69	6.978	2.413	4.565	58.261	261.45	268.14	264.80	149.26	218.72	120850.19
81	21.628	138.833	55.67	7.129	2.418	4.711	58.279	262.46	268.84	265.65	149.81	219.38	121216.85
82	21.663	140.432	55.66	7.283	2.414	4.869	58.288	261.39	268.37	264.88	149.41	218.72	120852.88

28 February 2008 End-plate Test Result

83	21.626	142.017	55.80	7.450	2.420	5.030	58.147	259.09	267.18	263.13	147.89	217.64	120235.83
84	21.694	143.508	55.79	7.594	2.427	5.167	58.163	262.38	268.41	265.40	149.22	219.47	121248.68
85	21.668	144.991	55.75	7.735	2.424	5.311	58.200	263.65	270.28	266.96	150.25	220.67	121917.55
86	21.461	146.872	55.84	7.972	2.393	5.579	58.114	251.74	260.45	256.10	143.82	211.90	117061.76
87	21.536	148.393	55.82	8.125	2.390	5.735	58.134	251.87	259.35	255.61	143.61	211.45	116813.50
88	21.333	150.037	55.75	8.295	2.392	5.903	58.198	252.83	259.60	256.22	144.19	211.79	117012.26
89	21.163	151.647	55.70	8.452	2.374	6.078	58.250	253.98	260.81	257.40	145.05	212.64	117487.32
90	21.200	153.482	55.77	8.646	2.369	6.277	58.176	246.60	256.31	251.46	141.43	207.91	114865.10
91	21.138	155.156	55.77	8.812	2.368	6.444	58.180	246.27	254.50	250.39	140.85	207.02	114371.40
92	20.939	156.799	55.68	8.976	2.362	6.614	58.266	246.80	255.08	250.94	141.47	207.26	114519.83
93	20.777	158.322	55.62	9.127	2.354	6.773	58.329	247.36	255.64	251.50	142.01	207.57	114700.37
94	20.707	159.922	55.60	9.290	2.354	6.936	58.347	248.23	256.15	252.19	142.47	208.09	114992.31
95	20.642	161.787	55.71	9.457	2.362	7.095	58.241	247.79	255.89	251.84	141.88	208.06	114959.94
96	20.682	163.350	55.65	9.614	2.362	7.252	58.297	249.36	257.17	253.26	142.89	209.10	115543.80
97	20.618	164.936	55.56	9.781	2.358	7.423	58.387	249.83	257.50	253.67	143.45	209.21	115616.42
98	20.691	166.665	55.62	9.962	2.357	7.605	58.332	245.06	254.55	249.80	141.07	206.16	113922.58
99	20.799	168.325	55.56	10.128	2.351	7.777	58.390	245.96	254.51	250.24	141.52	206.37	114049.56
100	20.780	170.166	55.58	10.406	2.314	8.092	58.366	230.18	239.60	234.89	132.76	193.77	107082.90
101	20.759	171.760	55.53	10.606	2.292	8.314	58.416	229.22	237.49	233.36	132.06	192.39	106327.48
102	20.690	173.355	55.50	10.797	2.288	8.509	58.454	227.48	235.91	231.69	131.25	190.94	105527.72
103	20.687	175.123	55.54	10.997	2.278	8.719	58.406	223.11	232.69	227.90	128.94	187.92	103853.37
104	20.569	176.773	55.47	11.179	2.273	8.906	58.476	222.88	231.92	227.40	128.89	187.35	103548.47
105	20.562	178.400	55.41	11.380	2.255	9.125	58.536	220.73	229.76	225.25	127.86	185.44	102501.60





Photograph after Test

