

# COMPFIRE

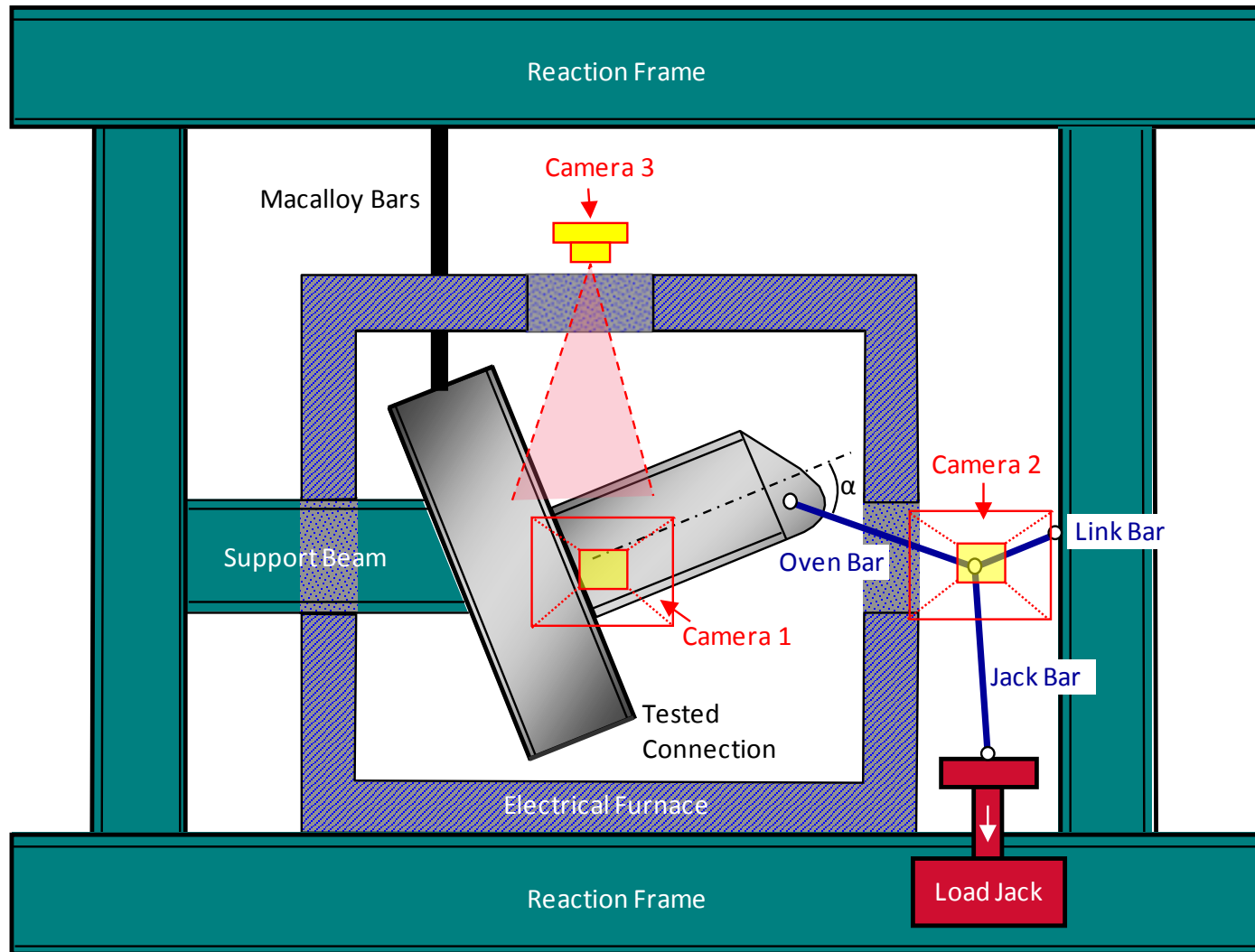
PE-UKPFC150\_550\_55\_13-01-2011

13 January 2011 Reverse-Channel Connection to Partially-Encased H-Section Column Test Result

RFSR-CT-2009-0021

Design of joints to composite columns for improved fire robustness

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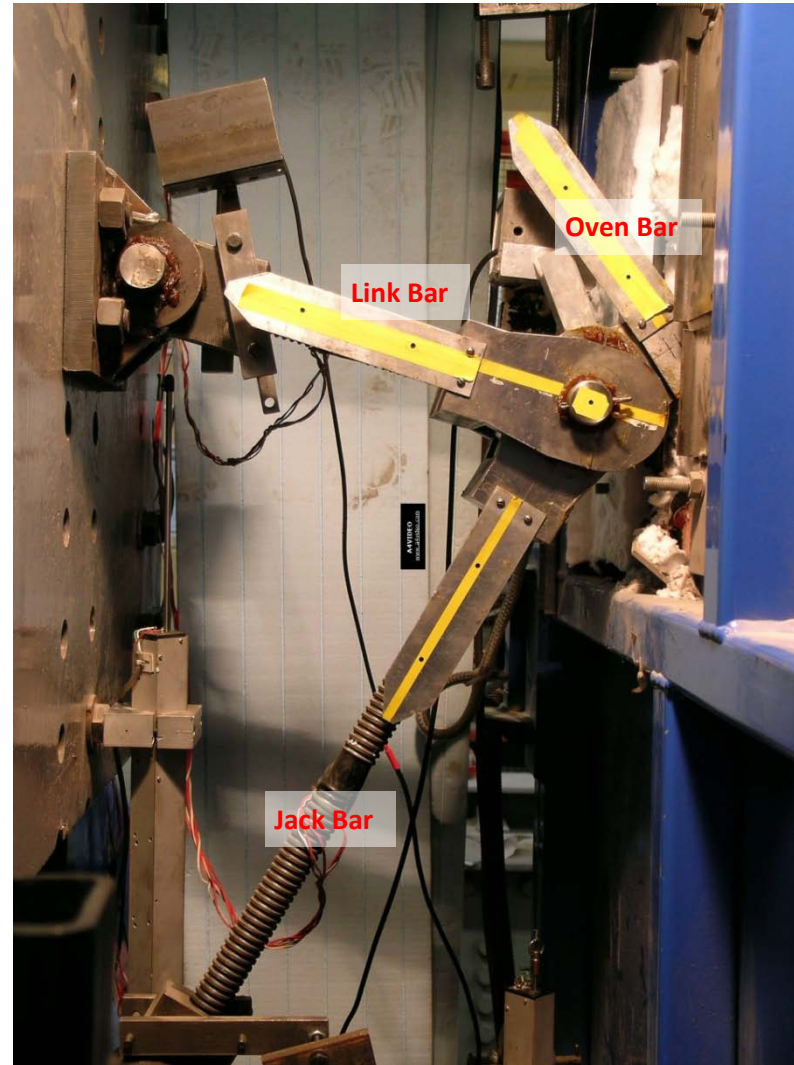
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View of Camera 1



View of Camera 3

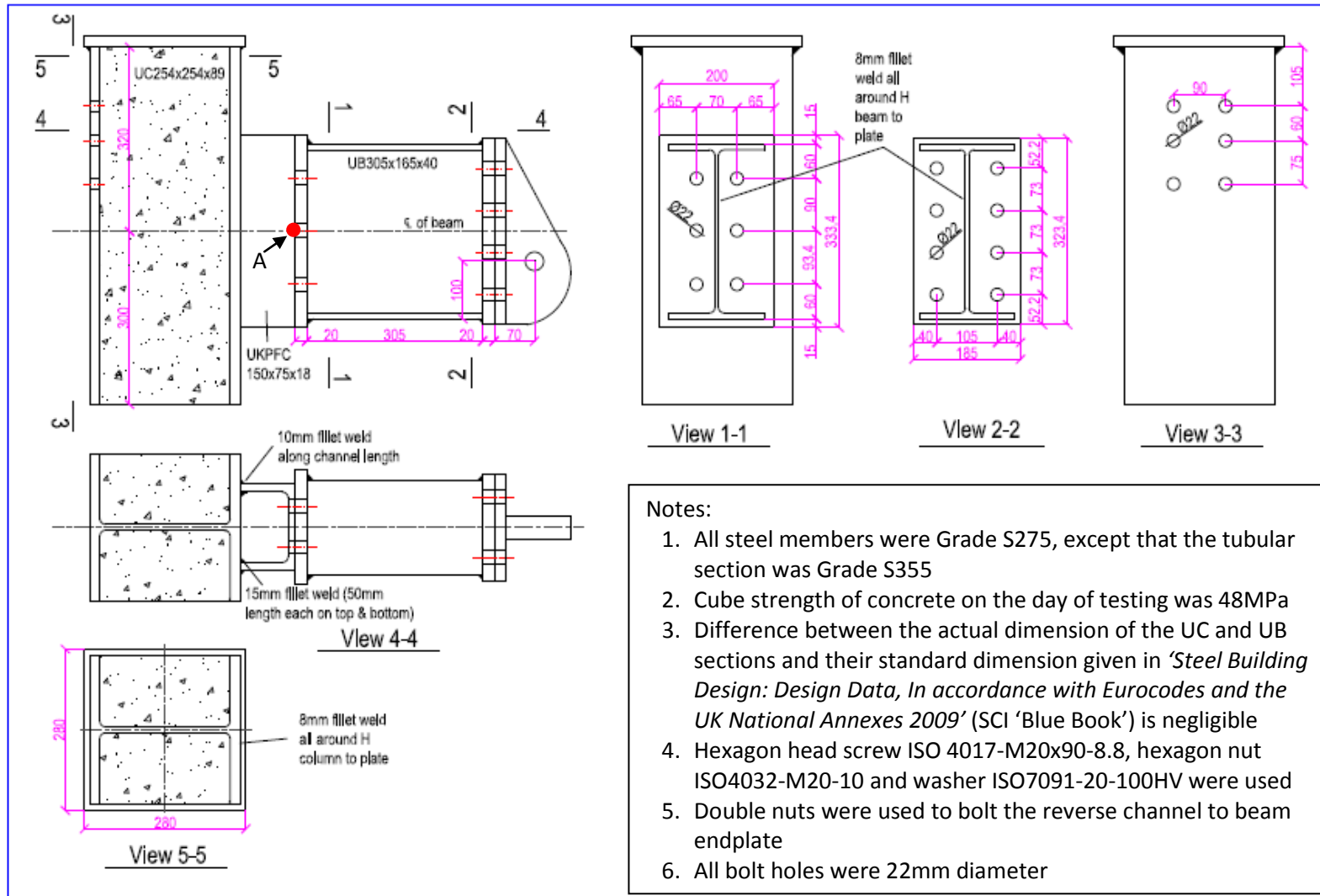


View of Camera 2

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Nominal Temperature: 550°C

Time	Temperature*	Jack Displacement	Load Angle	Beam Rotation	Column Rotation	Connection Rotation	Oven Bar Force	Tension	Shear	Moment**
(minute)	Average (°C)	(mm)	$\alpha$ (°)	(°)	(°)	(°)	(kN)	(kN)	(kN)	(kNm)
0	546.54	0.00	50.61	0.00	0.00	0.00	-18.11	-11.49	-13.99	-5.21
1	546.64	1.38	50.43	0.18	0.18	0.00	-14.04	-8.95	-10.83	-4.03
2	546.79	2.91	50.35	0.26	0.24	0.03	-9.84	-6.28	-7.58	-2.82
3	546.96	4.38	50.29	0.32	0.27	0.05	-5.38	-3.44	-4.14	-1.54
4	547.06	5.97	50.26	0.35	0.30	0.05	-2.49	-1.59	-1.92	-0.71
5	547.25	7.81	50.23	0.38	0.32	0.06	-1.32	-0.84	-1.01	-0.38
6	547.37	8.96	50.21	0.40	0.32	0.07	-0.57	-0.36	-0.44	-0.16
7	547.51	10.31	50.20	0.41	0.34	0.07	0.73	0.46	0.56	0.21
8	547.68	11.67	50.15	0.44	0.37	0.07	2.77	1.78	2.13	0.79
9	547.80	13.33	50.13	0.47	0.39	0.08	4.05	2.60	3.11	1.16
10	547.93	15.18	50.08	0.50	0.41	0.09	6.56	4.21	5.03	1.87
11	548.06	16.84	50.01	0.56	0.44	0.13	9.64	6.19	7.38	2.74
12	548.19	18.53	49.98	0.60	0.46	0.14	11.28	7.25	8.64	3.21
13	548.32	20.85	49.92	0.63	0.47	0.16	13.08	8.42	10.01	3.72
14	548.44	22.16	49.90	0.66	0.49	0.17	14.93	9.62	11.42	4.24
15	548.60	23.47	49.86	0.69	0.50	0.19	16.64	10.73	12.72	4.73
16	548.73	24.88	49.80	0.75	0.52	0.23	19.30	12.46	14.74	5.47
17	548.89	26.39	49.75	0.79	0.56	0.24	22.24	14.37	16.98	6.30
18	548.99	27.86	49.67	0.87	0.59	0.28	25.46	16.48	19.41	7.20
19	549.10	29.27	49.59	0.95	0.61	0.34	28.66	18.58	21.82	8.09
20	549.24	30.82	49.52	1.01	0.64	0.37	31.97	20.76	24.32	9.02
21	549.38	32.27	49.44	1.09	0.66	0.43	35.28	22.94	26.80	9.94

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22	549.51	33.76	49.37	1.16	0.68	0.48	38.74	25.23	29.40	10.90
23	549.66	35.30	49.29	1.23	0.70	0.53	42.00	27.39	31.83	11.80
24	549.76	36.82	49.19	1.33	0.71	0.62	45.44	29.70	34.40	12.74
25	549.93	38.44	49.10	1.42	0.74	0.68	48.66	31.86	36.78	13.62
26	550.01	40.10	49.00	1.51	0.77	0.74	51.85	34.01	39.13	14.48
27	550.14	41.63	48.90	1.61	0.80	0.82	54.57	35.87	41.13	15.21
28	550.24	43.22	48.77	1.74	0.81	0.92	57.24	37.72	43.05	15.91
29	550.35	44.68	48.66	1.85	0.84	1.01	59.67	39.42	44.80	16.55
30	550.51	46.21	48.55	1.96	0.84	1.11	61.65	40.81	46.20	17.06
31	550.70	47.80	48.42	2.08	0.86	1.22	64.11	42.55	47.96	17.70
32	550.83	49.38	48.33	2.18	0.88	1.30	65.92	43.83	49.24	18.17
33	550.97	51.02	48.17	2.33	0.89	1.44	67.75	45.18	50.48	18.61
34	551.04	52.65	48.06	2.44	0.91	1.52	69.51	46.46	51.70	19.05
35	551.18	54.26	47.92	2.57	0.93	1.65	71.15	47.69	52.81	19.45
36	551.30	55.75	47.79	2.70	0.94	1.76	72.66	48.82	53.82	19.81
37	551.39	57.36	47.65	2.84	0.95	1.88	74.51	50.19	55.07	20.26
38	551.50	58.95	47.51	2.98	0.96	2.02	75.99	51.33	56.04	20.60
39	551.60	60.59	47.37	3.12	0.98	2.13	77.58	52.55	57.08	20.97
40	551.70	62.06	47.23	3.26	1.00	2.25	78.76	53.48	57.81	21.23
41	551.83	63.77	47.09	3.39	1.01	2.38	79.86	54.37	58.49	21.46
42	551.89	65.33	46.95	3.53	1.03	2.50	80.75	55.12	59.01	21.64
43	552.04	66.83	46.79	3.69	1.03	2.66	80.90	55.39	58.97	21.61
44	552.12	68.44	46.63	3.85	1.03	2.82	80.34	55.17	58.40	21.39
45	552.23	69.92	46.47	4.01	1.04	2.97	80.27	55.29	58.20	21.29
46	552.38	71.49	46.32	4.16	1.04	3.12	80.27	55.44	58.05	21.22
47	552.44	73.09	46.12	4.36	1.03	3.32	77.89	53.99	56.14	20.51
48	552.61	74.67	45.94	4.54	1.03	3.51	75.54	52.54	54.28	19.81

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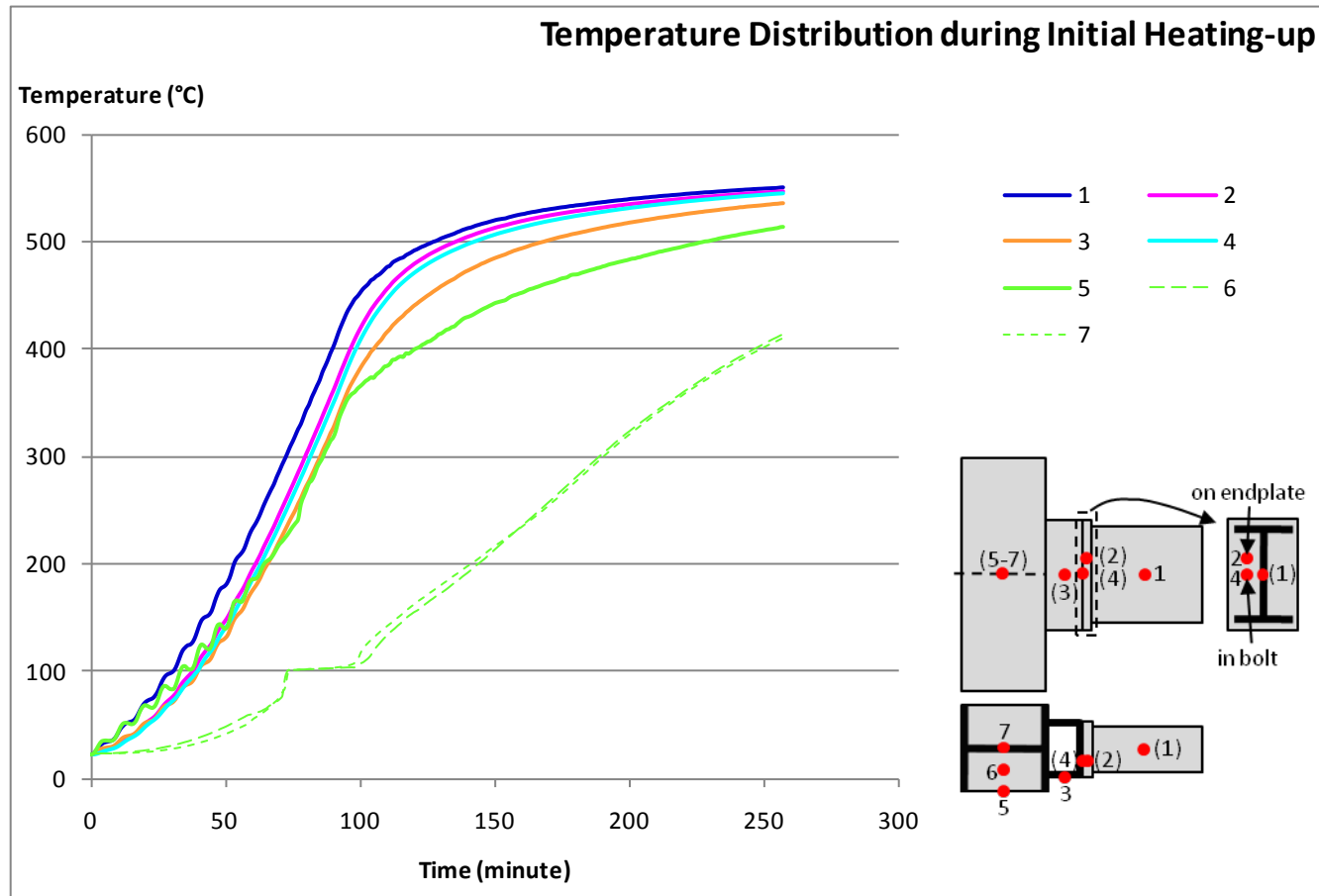
49	552.71	76.12	45.76	4.72	1.03	3.69	74.90	52.25	53.66	19.57
50	552.85	77.58	45.59	4.89	1.02	3.87	74.34	52.02	53.11	19.35
51	552.91	79.21	45.40	5.07	1.03	4.04	73.12	51.34	52.07	18.95
52	553.08	80.84	45.21	5.26	1.02	4.24	70.20	49.46	49.82	18.12
53	553.21	82.59	45.00	5.48	1.00	4.48	65.21	46.11	46.11	16.75
54	553.37	84.45	44.67	5.80	0.93	4.87	50.03	35.58	35.17	12.76
55	553.47	85.98	44.47	6.00	0.92	5.08	47.77	34.09	33.46	12.12
56	553.57	87.58	44.29	6.18	0.92	5.26	47.21	33.80	32.96	11.93
57	553.66	89.28	44.11	6.36	0.91	5.44	46.29	33.24	32.22	11.65
58	553.78	90.83	43.90	6.56	0.91	5.66	44.67	32.19	30.98	11.19
59	553.87	92.38	43.66	6.80	0.89	5.90	41.51	30.03	28.66	10.34
60	553.96	93.94	43.46	6.99	0.88	6.11	39.07	28.35	26.87	9.69

\* Average temperature of the beam web, endplate, reverse channel and bolt

\*\* Moment about Point A on the specimen drawing

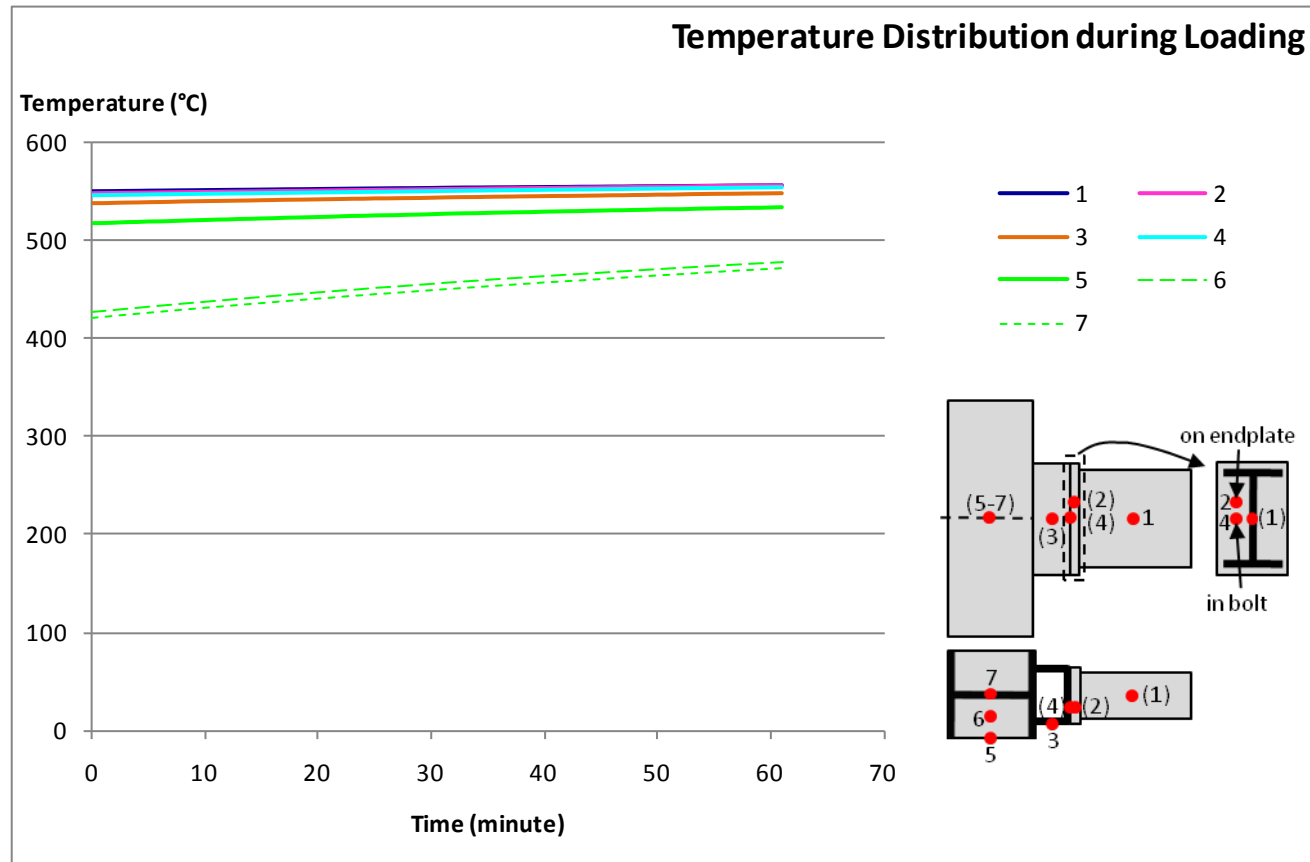
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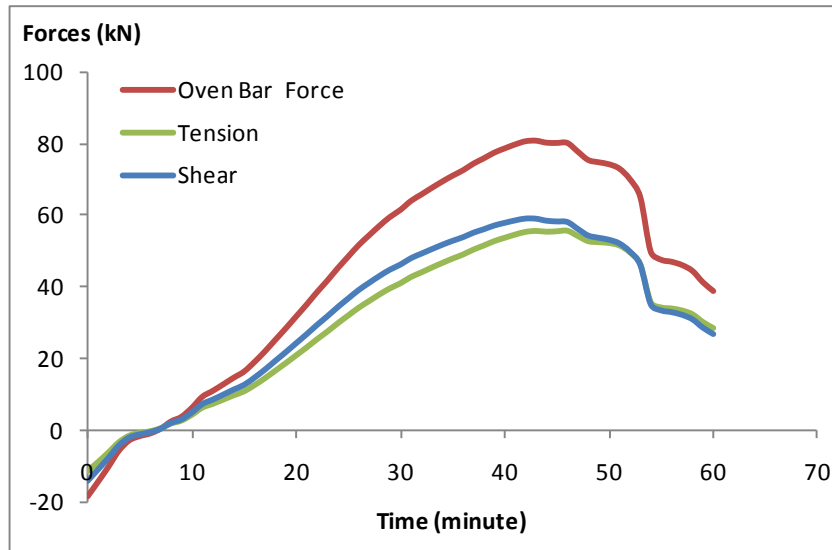
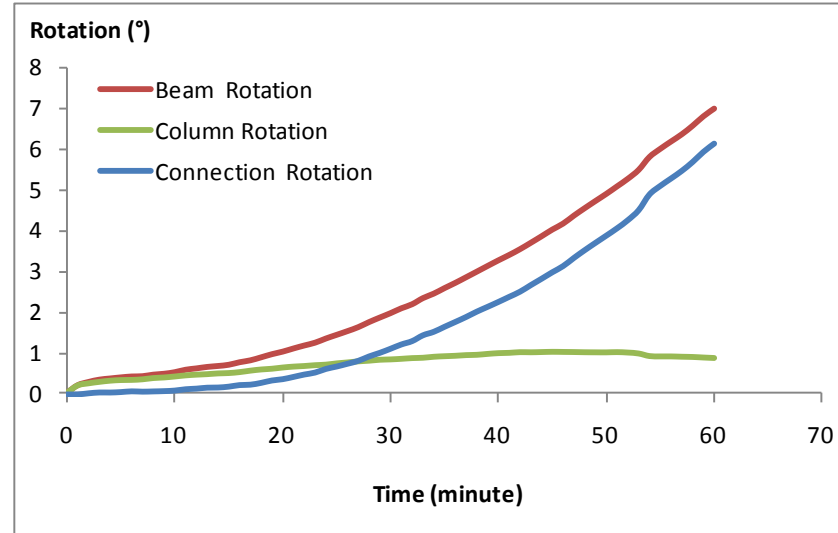
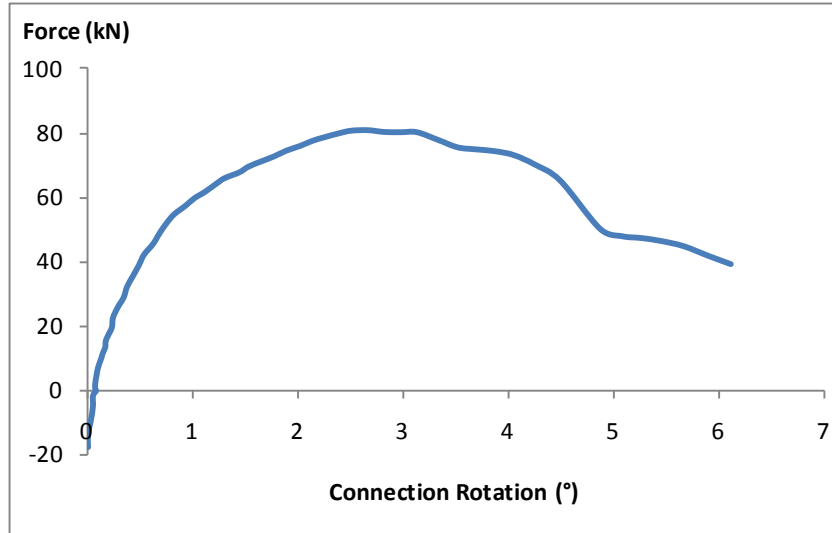




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## Photographs after Test



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