[1] SW+CM 1: Modal, Direction X, Factor = 1

a) Code data

Code: FEMA 440 (Equivalent Linear)
Demand spectrum: ASCE 7-10

Effective damping calculation parameters					
A	B	C	D	E	F
4.900	-1.100	14.000	0.320	19.000	0.640

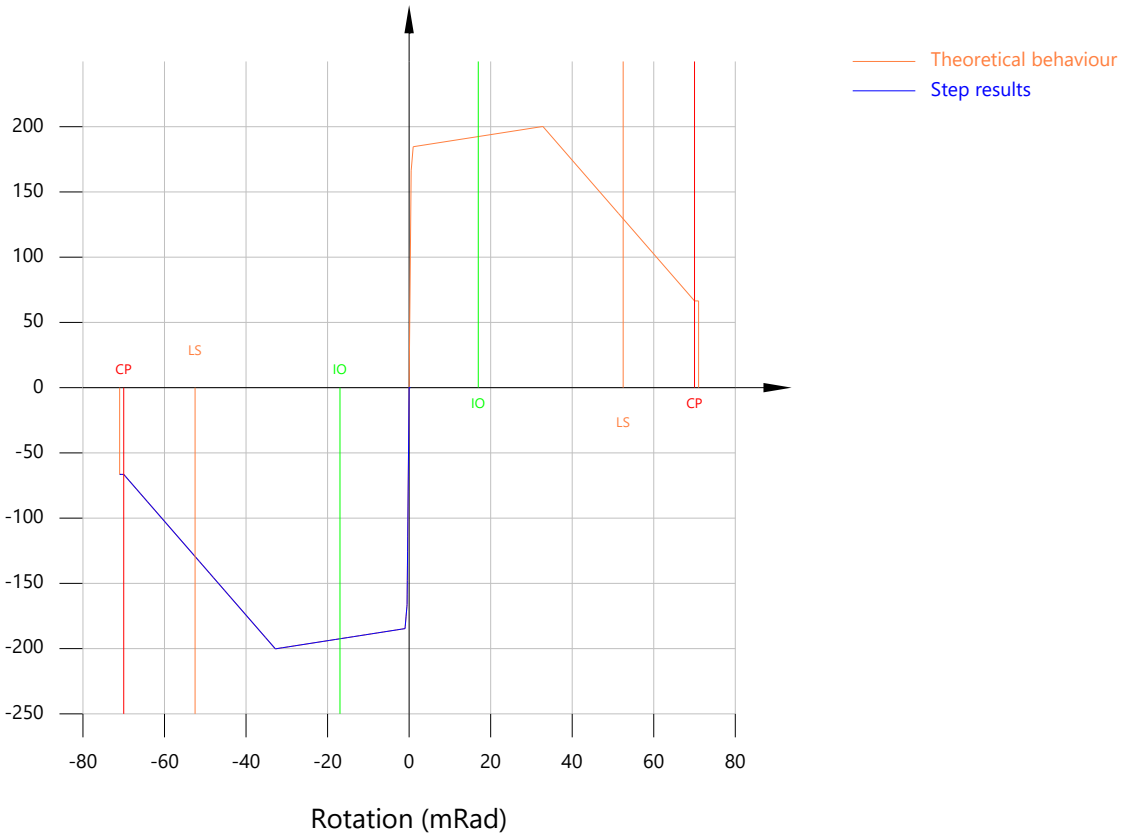
Effective period calculation parameters					
G	H	I	J	K	L
0.200	-0.038	0.280	0.130	0.890	0.050

b) Analysis parameters

Limit displacement (mm)	Monitored displacement	Control node
650	Dx	N74

c) Hinge 1 (Ry, AISC 342-22, C3.6)

Moment (kN·m)



Rotation (mRad)

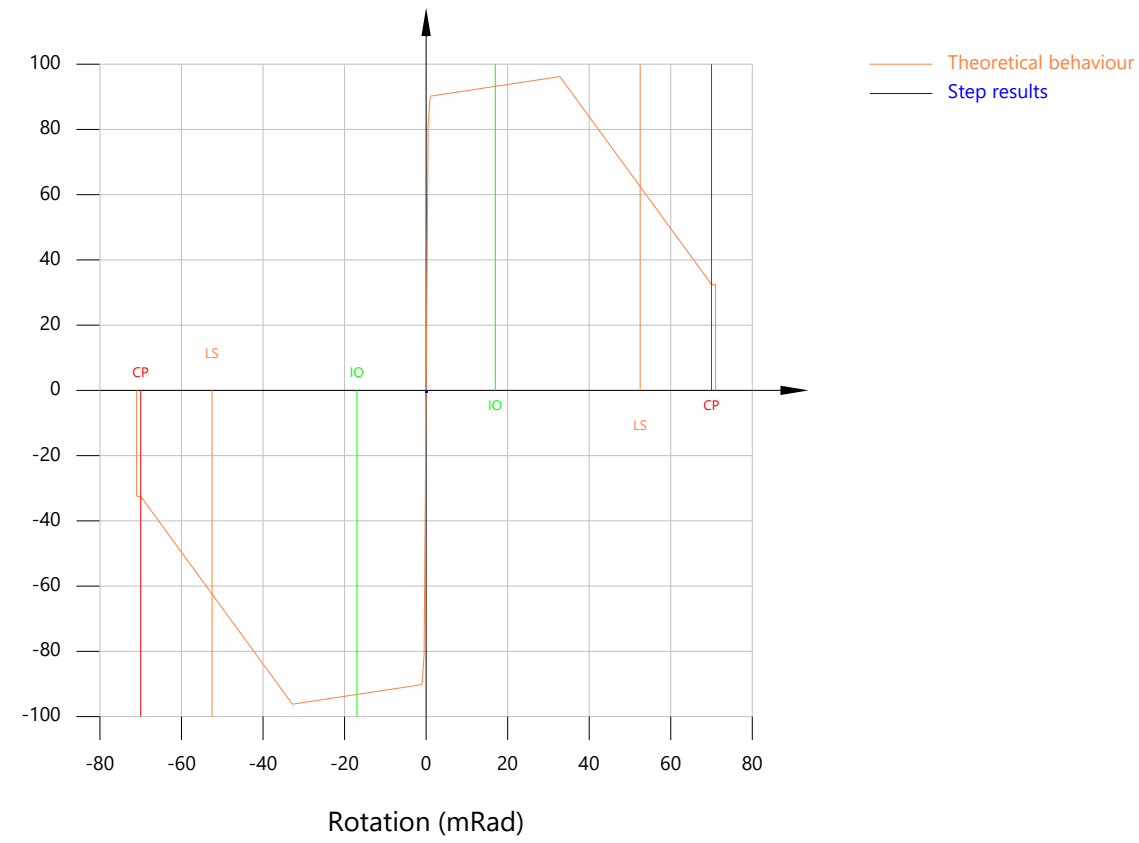
Hinge properties		
Property	Value	Units
Table	C3.6 (Columns subjected to flexure with axial compression or tension)	--
Axial force	-235.87164	kN

Hinge properties		
Property	Value	Units
Section compactness (AISC 342-22 Tabla D1.1b)	It is part of a moment-resisting frame	--
Load-bearing capacity between points C and E	Decreases gradually from C to E	--
Plastic moment (+/-)	184.654 / 184.654	kN·m
Plastic rotation (+/-)	1.000 / 1.000	rad
Load-bearing capacity beyond point E	Considered to be zero	--
B (+/-)	0.0005, 0.9 / 0.0005, 0.9	--
BC (+/-)	0.001, 1 / 0.001, 1	--
C (+/-)	0.0328082, 1.0841 / 0.0328082, 1.0841	--
CD (+/-)	0.0514041, 0.722081 / 0.0514041, 0.722081	--
D (+/-)	0.07, 0.360064 / 0.07, 0.360064	--
E (+/-)	0.071, 0.360064 / 0.071, 0.360064	--

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
1	0.00	0.00000	Elastic behaviour	AB
2	-0.03	-10.18278	Elastic behaviour	AB
3	-0.07	-21.68991	Elastic behaviour	AB
4	-0.10	-33.19704	Elastic behaviour	AB
5	-0.13	-44.71398	Elastic behaviour	AB
6	-0.17	-56.22111	Elastic behaviour	AB
7	-0.20	-67.72824	Elastic behaviour	AB
8	-0.24	-79.24518	Elastic behaviour	AB
9	-0.27	-90.75231	Elastic behaviour	AB
10	-0.31	-102.25944	Elastic behaviour	AB
11	-0.34	-113.77638	Elastic behaviour	AB
12	-0.38	-125.28351	Elastic behaviour	AB
13	-0.41	-136.65330	Elastic behaviour	AB
14	-0.44	-147.68955	Elastic behaviour	AB
15	-0.48	-158.21568	Elastic behaviour	AB
16	-0.54	-167.61366	Elastic behaviour	AB
17	-0.75	-175.57938	Elastic behaviour	AB
18	-0.96	-183.12327	Elastic behaviour	AB
19	-1.93	-185.10489	Elastic behaviour	BC
20	-3.09	-185.67387	Elastic behaviour	BC
21	-4.69	-186.45867	Elastic behaviour	BC
22	-6.25	-187.21404	Elastic behaviour	BC
23	-7.74	-187.94979	Elastic behaviour	BC
24	-9.22	-188.66592	Elastic behaviour	BC
25	-10.67	-189.37224	Elastic behaviour	BC
26	-12.14	-190.08837	Elastic behaviour	BC
27	-13.62	-190.81431	Elastic behaviour	BC
28	-15.08	-191.53044	Elastic behaviour	BC
29	-16.54	-192.24657	Elastic behaviour	BC
30	-18.00	-192.95289	Immediate occupancy	BC
31	-19.47	-193.66902	Immediate occupancy	BC
32	-20.93	-194.38515	Immediate occupancy	BC
33	-22.38	-195.09147	Immediate occupancy	BC
34	-23.83	-195.79779	Immediate occupancy	BC
35	-25.28	-196.50411	Immediate occupancy	BC
36	-26.72	-197.21043	Immediate occupancy	BC

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
37	-28.16	-197.90694	Immediate occupancy	BC
38	-29.59	-198.61326	Immediate occupancy	BC
39	-31.02	-199.30977	Immediate occupancy	BC
40	-32.41	-199.98666	Immediate occupancy	BC
41	-35.21	-191.55987	Immediate occupancy	CD
42	-38.56	-179.49357	Immediate occupancy	CD
43	-43.22	-162.73809	Immediate occupancy	CD
44	-43.74	-160.90362	Immediate occupancy	CD
45	-44.41	-158.47074	Immediate occupancy	CD
46	-45.31	-155.24325	Immediate occupancy	CD
47	-46.21	-152.01576	Immediate occupancy	CD
48	-47.10	-148.78827	Immediate occupancy	CD
49	-48.00	-145.56078	Immediate occupancy	CD
50	-48.90	-142.34310	Immediate occupancy	CD
51	-49.80	-139.11561	Immediate occupancy	CD
52	-50.69	-135.88812	Immediate occupancy	CD
53	-51.59	-132.66063	Immediate occupancy	CD
54	-52.49	-129.43314	Immediate occupancy	CD
55	-62.36	-93.95037	Life safety	CD
56	-63.26	-90.71307	Life safety	CD
57	-64.16	-87.47577	Life safety	CD
58	-65.06	-84.23847	Life safety	CD
59	-65.96	-81.00117	Life safety	CD
60	-66.86	-77.76387	Life safety	CD
61	-67.76	-74.52657	Life safety	CD
62	-68.67	-71.25984	Life safety	CD
63	-69.58	-67.98330	Life safety	CD
64	-70.19	-66.49218	Collapse prevention	DE
65	-70.55	-66.49218	Collapse prevention	DE
66	-70.91	-66.49218	Collapse prevention	DE
67	-70.92	-66.49218	Collapse prevention	DE

d) Hinge 1 (Rz, AISC 342-22, C3.6)



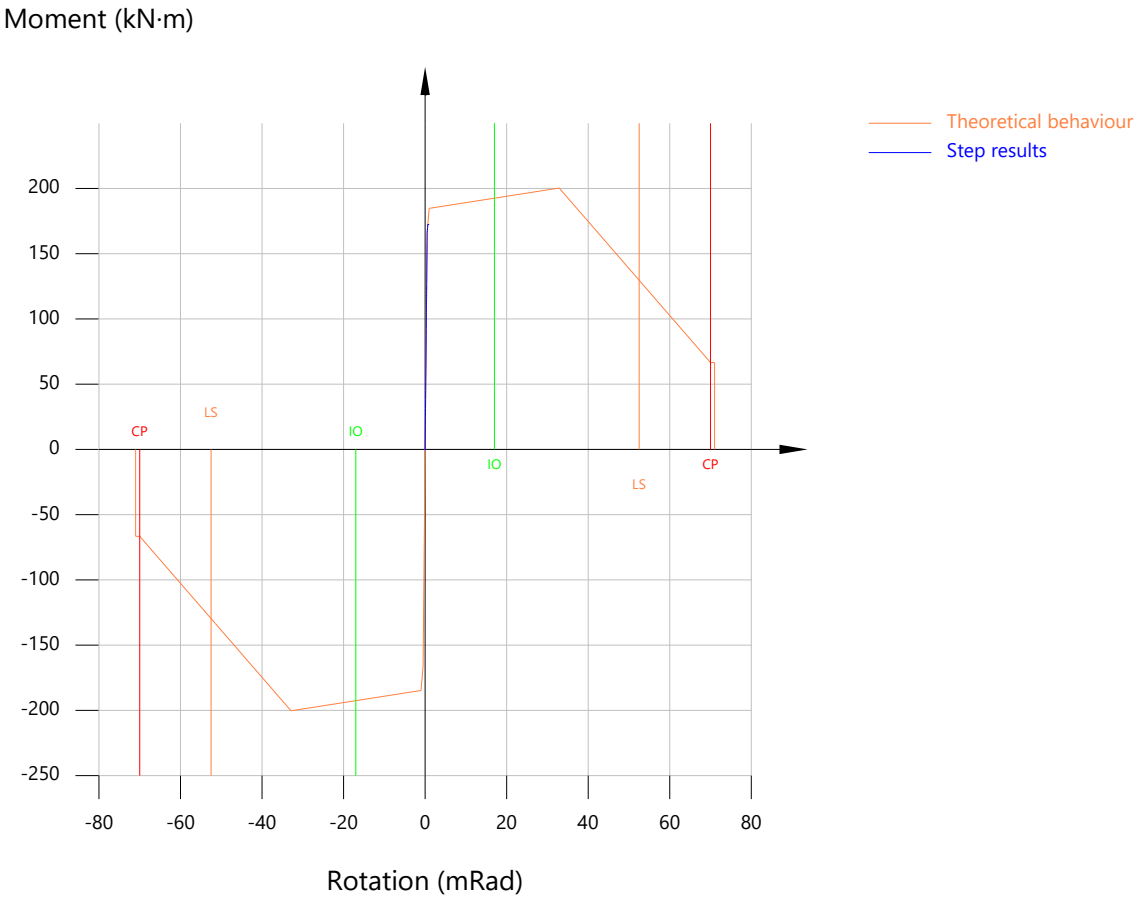
Hinge properties		
Property	Value	Units
Table	C3.6 (Columns subjected to flexure with axial compression or tension)	--
Axial force	-235.87164	kN
Section compactness (AISC 342-22 Tabla D1.1b)	It is part of a moment-resisting frame	--
Load-bearing capacity between points C and E	Decreases gradually from C to E	--
Plastic moment (+/-)	90.196 / 90.196	kN·m
Plastic rotation (+/-)	1.000 / 1.000	rad
Load-bearing capacity beyond point E	Considered to be zero	--
B (+/-)	0.0005, 0.9 / 0.0005, 0.9	--
BC (+/-)	0.001, 1 / 0.001, 1	--
C (+/-)	0.0328082, 1.06656 / 0.0328082, 1.06656	--
CD (+/-)	0.0514041, 0.71331 / 0.0514041, 0.71331	--
D (+/-)	0.07, 0.360064 / 0.07, 0.360064	--
E (+/-)	0.071, 0.360064 / 0.071, 0.360064	--

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
1	0.00	0.00000	Elastic behaviour	AB
2	0.00	-0.51012	Elastic behaviour	AB
3	0.00	-0.51012	Elastic behaviour	AB
4	0.00	-0.51012	Elastic behaviour	AB
5	0.00	-0.51012	Elastic behaviour	AB
6	0.00	-0.51012	Elastic behaviour	AB

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
7	0.00	-0.51012	Elastic behaviour	AB
8	0.00	-0.51012	Elastic behaviour	AB
9	0.00	-0.51993	Elastic behaviour	AB
10	0.00	-0.51993	Elastic behaviour	AB
11	0.00	-0.51993	Elastic behaviour	AB
12	0.00	-0.51993	Elastic behaviour	AB
13	0.00	-0.51993	Elastic behaviour	AB
14	0.00	-0.51993	Elastic behaviour	AB
15	0.00	-0.51993	Elastic behaviour	AB
16	0.00	-0.51012	Elastic behaviour	AB
17	0.00	-0.51012	Elastic behaviour	AB
18	0.00	-0.51012	Elastic behaviour	AB
19	0.00	-0.51012	Elastic behaviour	AB
20	0.00	-0.51012	Elastic behaviour	AB
21	0.00	-0.51012	Elastic behaviour	AB
22	0.00	-0.51012	Elastic behaviour	AB
23	0.00	-0.51012	Elastic behaviour	AB
24	0.00	-0.51012	Elastic behaviour	AB
25	0.00	-0.51012	Elastic behaviour	AB
26	0.00	-0.51012	Elastic behaviour	AB
27	0.00	-0.51012	Elastic behaviour	AB
28	0.00	-0.51012	Elastic behaviour	AB
29	0.00	-0.51012	Elastic behaviour	AB
30	0.00	-0.51012	Elastic behaviour	AB
31	0.00	-0.51012	Elastic behaviour	AB
32	0.00	-0.51012	Elastic behaviour	AB
33	0.00	-0.51012	Elastic behaviour	AB
34	0.00	-0.51012	Elastic behaviour	AB
35	0.00	-0.51012	Elastic behaviour	AB
36	0.00	-0.51012	Elastic behaviour	AB
37	0.00	-0.51012	Elastic behaviour	AB
38	0.00	-0.51012	Elastic behaviour	AB
39	0.00	-0.51012	Elastic behaviour	AB
40	0.00	-0.51012	Elastic behaviour	AB
41	0.00	-0.51012	Elastic behaviour	AB
42	0.00	-0.51012	Elastic behaviour	AB
43	0.00	-0.51012	Elastic behaviour	AB
44	0.00	-0.51012	Elastic behaviour	AB
45	0.00	-0.51012	Elastic behaviour	AB
46	0.00	-0.51012	Elastic behaviour	AB
47	0.00	-0.51012	Elastic behaviour	AB
48	0.00	-0.51012	Elastic behaviour	AB
49	0.00	-0.51012	Elastic behaviour	AB
50	0.00	-0.51012	Elastic behaviour	AB
51	0.00	-0.51012	Elastic behaviour	AB
52	0.00	-0.51012	Elastic behaviour	AB
53	0.00	-0.51012	Elastic behaviour	AB
54	0.00	-0.51012	Elastic behaviour	AB
55	0.00	-0.51012	Elastic behaviour	AB
56	0.00	-0.51012	Elastic behaviour	AB
57	0.00	-0.51012	Elastic behaviour	AB

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
58	0.00	-0.51012	Elastic behaviour	AB
59	0.00	-0.51012	Elastic behaviour	AB
60	0.00	-0.51012	Elastic behaviour	AB
61	0.00	-0.51012	Elastic behaviour	AB
62	0.00	-0.51012	Elastic behaviour	AB
63	0.00	-0.51012	Elastic behaviour	AB
64	0.00	-0.51012	Elastic behaviour	AB
65	0.00	-0.51012	Elastic behaviour	AB
66	0.00	-0.51012	Elastic behaviour	AB
67	0.00	-0.51012	Elastic behaviour	AB

e) Hinge 2 (Ry, AISC 342-22, C3.6)



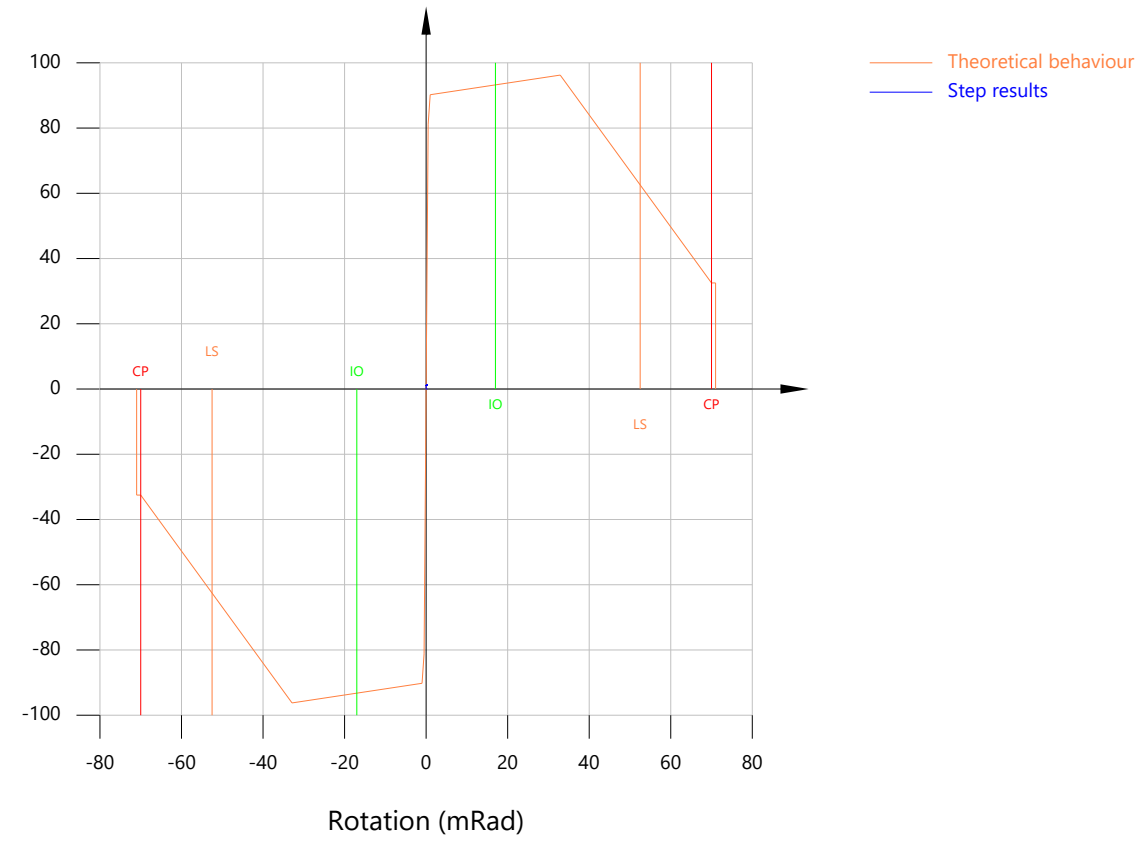
Hinge properties		
Property	Value	Units
Table	C3.6 (Columns subjected to flexure with axial compression or tension)	--
Axial force	-233.70363	kN
Section compactness (AISC 342-22 Tabla D1.1b)	It is part of a moment-resisting frame	--
Load-bearing capacity between points C and E	Decreases gradually from C to E	--
Plastic moment (+/-)	184.743 / 184.743	kN·m
Plastic rotation (+/-)	1.000 / 1.000	rad
Load-bearing capacity beyond point E	Considered to be zero	--
B (+/-)	0.0005, 0.9 / 0.0005, 0.9	--
BC (+/-)	0.001, 1 / 0.001, 1	--

Hinge properties		
Property	Value	Units
C (+/-)	0.0328885, 1.0843 / 0.0328885, 1.0843	--
CD (+/-)	0.0514442, 0.722368 / 0.0514442, 0.722368	--
D (+/-)	0.07, 0.360431 / 0.07, 0.360431	--
E (+/-)	0.071, 0.360431 / 0.071, 0.360431	--

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
1	0.00	0.00000	Elastic behaviour	AB
2	0.01	4.24773	Elastic behaviour	AB
3	0.03	11.04606	Elastic behaviour	AB
4	0.05	17.84439	Elastic behaviour	AB
5	0.07	24.64272	Elastic behaviour	AB
6	0.09	31.43124	Elastic behaviour	AB
7	0.11	38.22957	Elastic behaviour	AB
8	0.14	45.02790	Elastic behaviour	AB
9	0.16	51.82623	Elastic behaviour	AB
10	0.18	58.62456	Elastic behaviour	AB
11	0.20	65.42289	Elastic behaviour	AB
12	0.22	72.22122	Elastic behaviour	AB
13	0.24	78.44076	Elastic behaviour	AB
14	0.25	83.64987	Elastic behaviour	AB
15	0.26	87.04413	Elastic behaviour	AB
16	0.27	89.29062	Elastic behaviour	AB
17	0.27	90.79155	Elastic behaviour	AB
18	0.28	91.95894	Elastic behaviour	AB
19	0.28	92.65545	Elastic behaviour	AB
20	0.28	93.06747	Elastic behaviour	AB
21	0.29	96.01047	Elastic behaviour	AB
22	0.29	97.55064	Elastic behaviour	AB
23	0.30	98.72784	Elastic behaviour	AB
24	0.30	99.89523	Elastic behaviour	AB
25	0.30	101.02338	Elastic behaviour	AB
26	0.31	102.20058	Elastic behaviour	AB
27	0.31	103.52493	Elastic behaviour	AB
28	0.32	104.82966	Elastic behaviour	AB
29	0.32	106.12458	Elastic behaviour	AB
30	0.32	107.42931	Elastic behaviour	AB
31	0.33	108.72423	Elastic behaviour	AB
32	0.33	110.00934	Elastic behaviour	AB
33	0.33	111.27483	Elastic behaviour	AB
34	0.34	112.53051	Elastic behaviour	AB
35	0.34	113.77638	Elastic behaviour	AB
36	0.35	114.99282	Elastic behaviour	AB
37	0.35	116.17983	Elastic behaviour	AB
38	0.35	117.36684	Elastic behaviour	AB
39	0.36	118.55385	Elastic behaviour	AB
40	0.36	119.63295	Elastic behaviour	AB
41	0.36	120.73167	Elastic behaviour	AB
42	0.37	121.83039	Elastic behaviour	AB
43	0.38	125.62686	Elastic behaviour	AB
44	0.38	126.16641	Elastic behaviour	AB

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
45	0.38	127.10817	Elastic behaviour	AB
46	0.39	128.60910	Elastic behaviour	AB
47	0.39	130.11003	Elastic behaviour	AB
48	0.40	131.61096	Elastic behaviour	AB
49	0.40	133.11189	Elastic behaviour	AB
50	0.40	134.61282	Elastic behaviour	AB
51	0.41	136.11375	Elastic behaviour	AB
52	0.41	137.61468	Elastic behaviour	AB
53	0.42	139.11561	Elastic behaviour	AB
54	0.42	140.61654	Elastic behaviour	AB
55	0.47	157.12677	Elastic behaviour	AB
56	0.48	158.62770	Elastic behaviour	AB
57	0.48	160.13844	Elastic behaviour	AB
58	0.49	161.64918	Elastic behaviour	AB
59	0.49	163.15011	Elastic behaviour	AB
60	0.50	164.66085	Elastic behaviour	AB
61	0.50	166.17159	Elastic behaviour	AB
62	0.54	167.59404	Elastic behaviour	AB
63	0.57	169.00668	Elastic behaviour	AB
64	0.61	170.24274	Elastic behaviour	AB
65	0.64	171.32184	Elastic behaviour	AB
66	0.67	172.40094	Elastic behaviour	AB
67	0.67	172.43037	Elastic behaviour	AB

f) Hinge 2 (Rz, AISC 342-22, C3.6)



Hinge properties		
Property	Value	Units
Table	C3.6 (Columns subjected to flexure with axial compression or tension)	--
Axial force	-233.70363	kN
Section compactness (AISC 342-22 Tabla D1.1b)	It is part of a moment-resisting frame	--
Load-bearing capacity between points C and E	Decreases gradually from C to E	--
Plastic moment (+/-)	90.217 / 90.217	kN·m
Plastic rotation (+/-)	1.000 / 1.000	rad
Load-bearing capacity beyond point E	Considered to be zero	--
B (+/-)	0.0005, 0.9 / 0.0005, 0.9	--
BC (+/-)	0.001, 1 / 0.001, 1	--
C (+/-)	0.0328885, 1.06672 / 0.0328885, 1.06672	--
CD (+/-)	0.0514442, 0.713575 / 0.0514442, 0.713575	--
D (+/-)	0.07, 0.360431 / 0.07, 0.360431	--
E (+/-)	0.071, 0.360431 / 0.071, 0.360431	--

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
1	0.00	0.00000	Elastic behaviour	AB
2	0.01	1.11834	Elastic behaviour	AB
3	0.01	1.12815	Elastic behaviour	AB
4	0.01	1.12815	Elastic behaviour	AB
5	0.01	1.12815	Elastic behaviour	AB
6	0.01	1.12815	Elastic behaviour	AB
7	0.01	1.13796	Elastic behaviour	AB
8	0.01	1.13796	Elastic behaviour	AB
9	0.01	1.13796	Elastic behaviour	AB
10	0.01	1.13796	Elastic behaviour	AB
11	0.01	1.13796	Elastic behaviour	AB
12	0.01	1.14777	Elastic behaviour	AB
13	0.01	1.14777	Elastic behaviour	AB
14	0.01	1.14777	Elastic behaviour	AB
15	0.01	1.13796	Elastic behaviour	AB
16	0.01	1.12815	Elastic behaviour	AB
17	0.01	1.11834	Elastic behaviour	AB
18	0.01	1.11834	Elastic behaviour	AB
19	0.01	1.11834	Elastic behaviour	AB
20	0.01	1.11834	Elastic behaviour	AB
21	0.01	1.10853	Elastic behaviour	AB
22	0.01	1.11834	Elastic behaviour	AB
23	0.01	1.11834	Elastic behaviour	AB
24	0.01	1.11834	Elastic behaviour	AB
25	0.01	1.11834	Elastic behaviour	AB
26	0.01	1.11834	Elastic behaviour	AB
27	0.01	1.11834	Elastic behaviour	AB
28	0.01	1.11834	Elastic behaviour	AB
29	0.01	1.11834	Elastic behaviour	AB
30	0.01	1.10853	Elastic behaviour	AB
31	0.01	1.10853	Elastic behaviour	AB
32	0.01	1.10853	Elastic behaviour	AB
33	0.01	1.10853	Elastic behaviour	AB

Step results				
Step	Rotation (mRad)	Moment (kN·m)	Acceptance criteria	Span
34	0.01	1.10853	Elastic behaviour	AB
35	0.01	1.10853	Elastic behaviour	AB
36	0.01	1.10853	Elastic behaviour	AB
37	0.01	1.10853	Elastic behaviour	AB
38	0.01	1.10853	Elastic behaviour	AB
39	0.01	1.10853	Elastic behaviour	AB
40	0.01	1.10853	Elastic behaviour	AB
41	0.01	1.11834	Elastic behaviour	AB
42	0.01	1.11834	Elastic behaviour	AB
43	0.01	1.11834	Elastic behaviour	AB
44	0.01	1.11834	Elastic behaviour	AB
45	0.01	1.11834	Elastic behaviour	AB
46	0.01	1.11834	Elastic behaviour	AB
47	0.01	1.11834	Elastic behaviour	AB
48	0.01	1.11834	Elastic behaviour	AB
49	0.01	1.11834	Elastic behaviour	AB
50	0.01	1.11834	Elastic behaviour	AB
51	0.01	1.11834	Elastic behaviour	AB
52	0.01	1.11834	Elastic behaviour	AB
53	0.01	1.11834	Elastic behaviour	AB
54	0.01	1.11834	Elastic behaviour	AB
55	0.01	1.10853	Elastic behaviour	AB
56	0.01	1.10853	Elastic behaviour	AB
57	0.01	1.10853	Elastic behaviour	AB
58	0.01	1.10853	Elastic behaviour	AB
59	0.01	1.10853	Elastic behaviour	AB
60	0.01	1.10853	Elastic behaviour	AB
61	0.01	1.10853	Elastic behaviour	AB
62	0.01	1.10853	Elastic behaviour	AB
63	0.01	1.10853	Elastic behaviour	AB
64	0.01	1.10853	Elastic behaviour	AB
65	0.01	1.10853	Elastic behaviour	AB
66	0.01	1.10853	Elastic behaviour	AB
67	0.01	1.10853	Elastic behaviour	AB