



File Name: SkyCiv Bike Frame  
 Job Name: SkyCiv Bike Frame  
 Designer: Sam Carigliano  
 Job Description: First draft of Bike Frame - 30x5 pipe (Aluminium)

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 JOB SETUP  
 =====

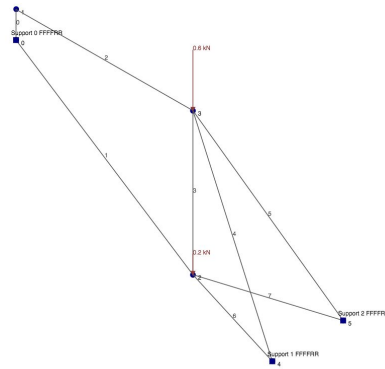
Length Units: m  
 Section Length Units: mm  
 Force Units: kN  
 Moment and Torsion Units: kNm  
 Material Strength Units: MPa  
 Material Density Units: kg/m<sup>3</sup>  
 Translation Units: mm  
 Stress Units: MPa

Nodes: 6  
 Members: 8  
 Supports: 3  
 Sections: 1

Point Loads: 2  
 Distributed Loads: 0  
 Moments: 0

Units: metric  
 Maximum Decimal Places: 3  
 Evaluation Points: 4  
 General Constraint: RRRRRR  
 Total Degrees of Freedom: 24

Self Weight: OFF  
 Load Combinations: OFF



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 NODE COORDINATES (m)  
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Node	X Coord	Y Coord	Z Coord
0	0.000	0.325	0.000
1	0.000	0.400	0.000
2	0.500	0.000	0.000
3	0.500	0.400	0.000
4	0.825	0.000	0.100
5	0.825	0.000	-0.100

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 MEMBERS (m)  
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F=Fixed, R=Released

Member	Node A	Node B	Section	Angle	Node A Fixity	Node B Fixity	Length
0	0	1	0	0.000	FFFFFF	FFFFFF	0.075
1	0	2	0	0.000	FFFFFF	FFFFFF	0.596
2	1	3	0	0.000	FFFFFF	FFFFFF	0.500
3	3	2	0	0.000	FFFFFF	FFFFFF	0.400
4	3	4	0	0.000	FFFFFF	FFFFFF	0.525
5	3	5	0	0.000	FFFFFF	FFFFFF	0.525
6	4	2	0	0.000	FFFFFF	FFFFFF	0.340
7	2	5	0	0.000	FFFFFF	FFFFFF	0.340

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 SUPPORTS  
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F=Fixed, R=Released

Node	Restraint Code
0	FFFFRR
4	FFFFRR
5	FFFFRR

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 SECTIONS (MPa, kg/m<sup>3</sup> mm, mm<sup>2</sup>, mm<sup>4</sup>)  
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Section	Type	Young's Modulus	Density	Poisson's Ratio	Area	Y-Axis MoI	Z-Axis MoI	Torsion Constant
0	-	69000.000	2700.000	0.320	215.984	20586.022	20586.022	41172.044

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 POINT LOADS (kN)  
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Load Group	Node	Member	Position	X Magnitude	Y Magnitude	Z Magnitude
0	3			0.000	-0.600	0.000
0	2			0.000	-0.200	0.000

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 BILL OF MATERIALS (m, kg)  
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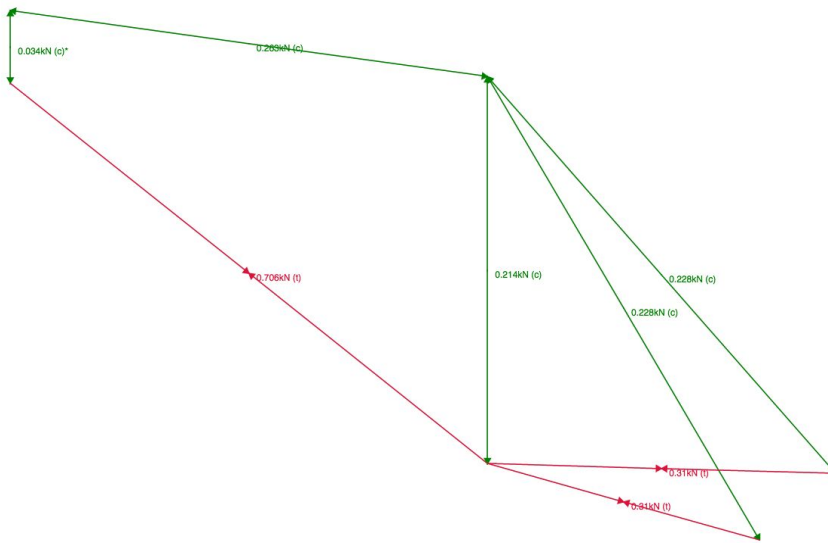
Section	Quantity	Unit Length	Total Length	Unit Mass	Total Mass
0	1	0.075	0.075	0.044	0.044
0	1	0.596	0.596	0.348	0.348
0	1	0.500	0.500	0.292	0.292
0	1	0.400	0.400	0.233	0.233
0	2	0.525	1.050	0.306	0.612
0	2	0.340	0.680	0.198	0.397
					1.925

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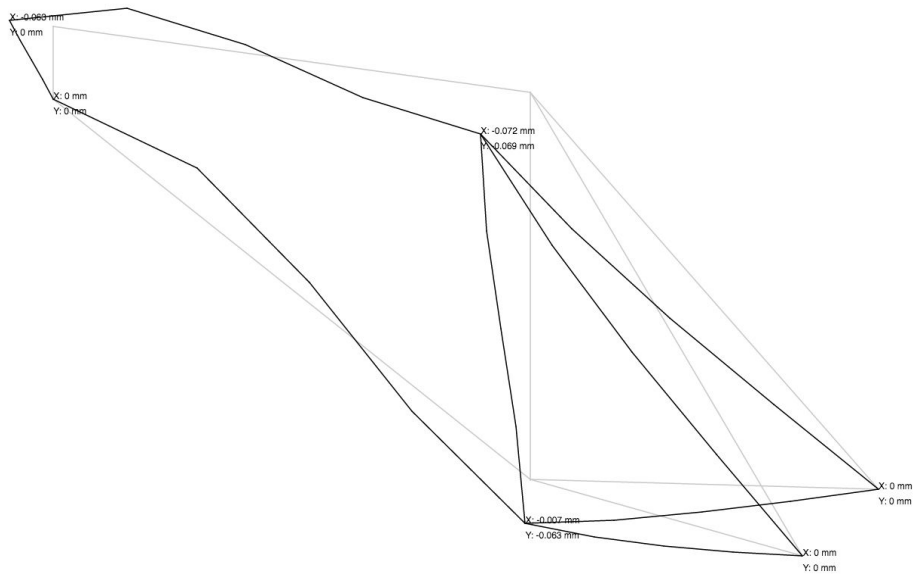
USER DEFINED SCREENSHOTS

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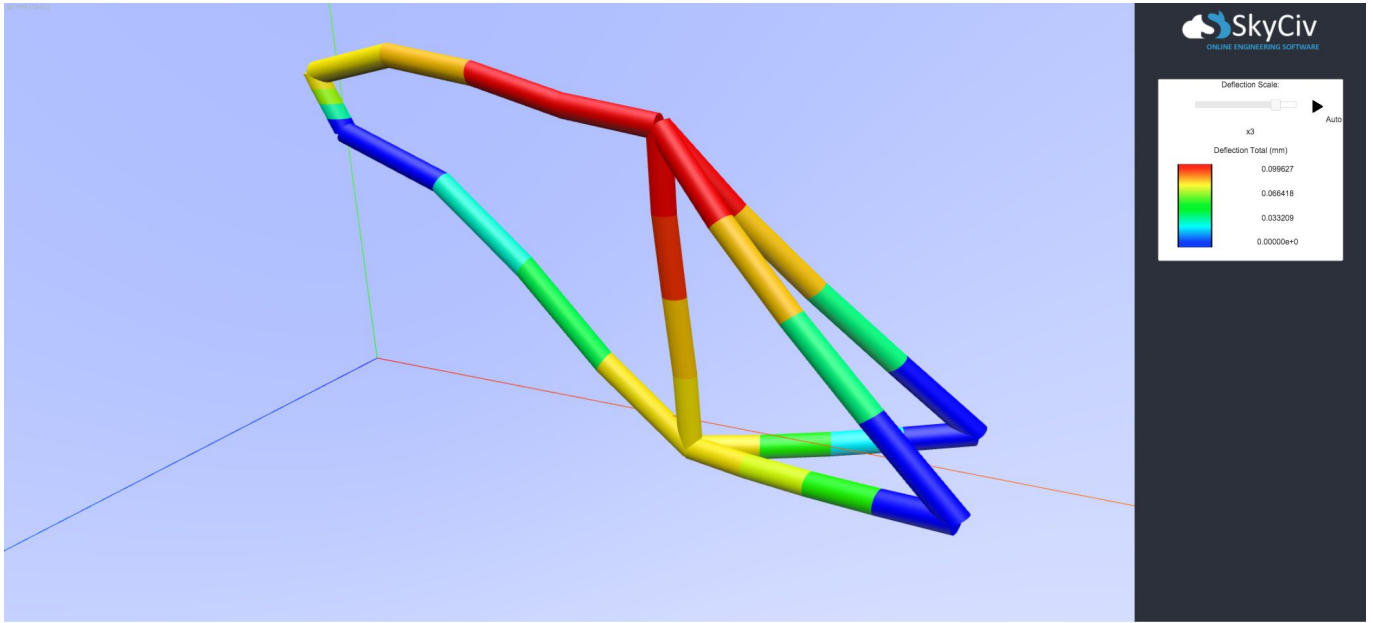
Axial Wireframe.jpg



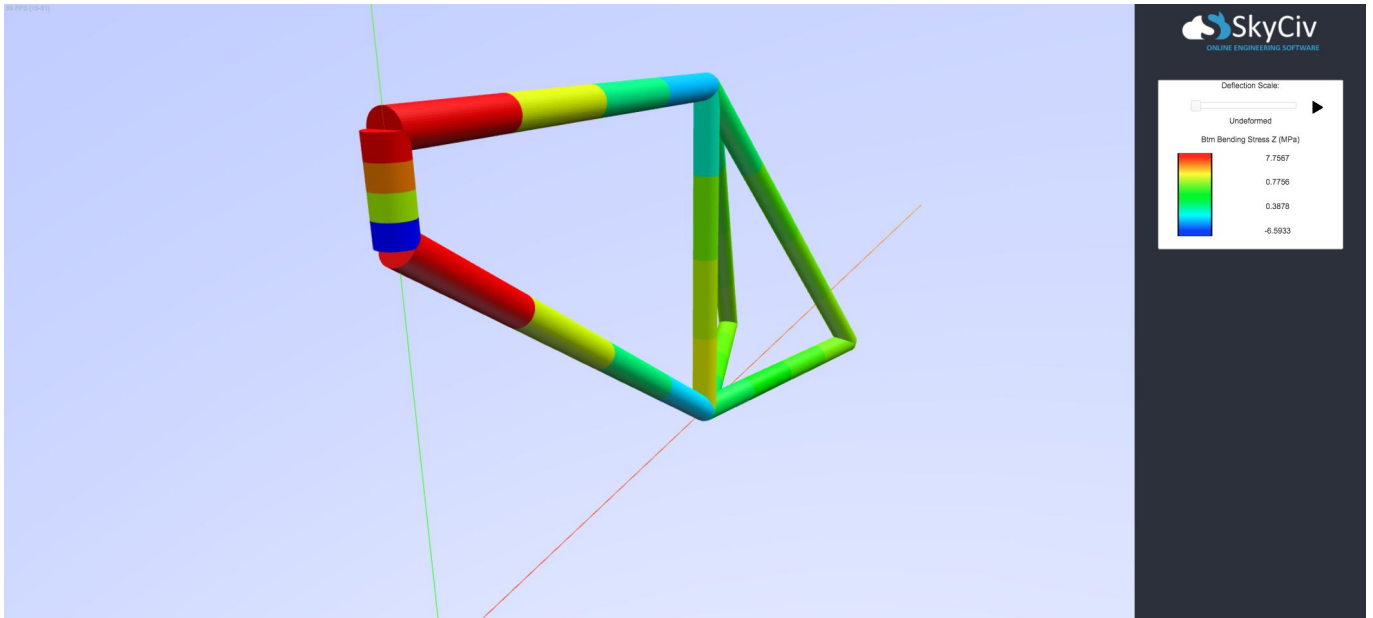
Deflection Wireframe.jpg



Deflection.jpg



Bending Stress (Z).jpg



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DIRECT RESULTS (AT USER DEFINED NODES)

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NODE REACTIONS (kN, kNm)

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Node	X Force	Y Force	Z Force	X Moment	Y Moment	Z Moment
0	-0.316	0.440	-0.000	0.000	0.000	0.000
4	0.158	0.180	0.048	0.000	0.000	0.000
5	0.158	0.180	-0.048	-0.000	0.000	0.000
Reaction Sum	-0.000	0.800	0.000	0.000	0.000	0.000
Load Sum	0.000	-0.800	0.000	0.000	0.000	0.000
Equilibrium	-0.000	0.000	0.000			

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INTERNAL MEMBER FORCES AND MOMENTS (kN, kNm)

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Member	Node	Axial Force	Y Shear	Z Shear	X Torsion	Y Moment	Z Moment
0	0	0.034	-0.263	-0.000	0.000	0.000	0.009
	1	0.034	-0.263	-0.000	-0.000	-0.000	-0.011
1	0	-0.706	0.025	-0.000	-0.000	0.000	-0.009
	2	-0.706	0.025	0.000	-0.000	-0.000	0.006
2	1	0.263	0.034	-0.000	-0.000	0.000	-0.011
	3	0.263	0.034	0.000	-0.000	0.000	0.006
3	3	0.214	-0.014	-0.000	0.000	0.000	0.003
	2	0.214	-0.014	-0.000	-0.000	-0.000	-0.003
4	3	0.228	-0.004	0.000	-0.000	-0.000	0.002
	4	0.228	-0.004	0.000	-0.000	-0.000	-0.000
5	3	0.228	-0.004	-0.000	0.000	0.000	0.002
	5	0.228	-0.004	-0.000	0.000	0.000	-0.000
6	4	-0.310	0.004	0.000	-0.000	0.000	0.000
	2	-0.310	0.004	0.000	-0.000	0.000	0.002
7	2	-0.310	-0.004	-0.000	0.000	0.000	0.002
	5	-0.310	-0.004	-0.000	0.000	0.000	0.000

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DISPLACEMENTS (mm, rad)

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Node	X Translation	Y Translation	Z Translation	Total Translation	X Rotation	Y Rotation	Z Rotation
0	0.000	0.000	0.000	0.000	0.000	0.000	0.001
1	-0.063	-0.000	0.000	0.063	-0.000	0.000	0.001
2	-0.007	-0.063	0.000	0.064	0.000	-0.000	0.000
3	-0.072	-0.069	-0.000	0.100	0.000	0.000	-0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	-0.000	0.000

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BUCKLING (kN, m)

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Note: A buckling load factor of less than 1 indicates that the member will buckle.

The lowest buckling load factor is: >500

Member	Mode	Load Factor	Critical Load	Effective Length	Buckling Axis (Local)	Buckling?
0	1	>500	5086.308	0.053	z	-
1	1	>500	80.451	0.417	z	-
2	1	>500	224.306	0.250	z	-
3	1	>500	350.478	0.200	z	-
4	1	455.145	103.802	0.367	z	-
5	1	455.145	103.802	0.367	z	-
6	1	>500	247.442	0.238	z	-

7	1	>500	247.442	0.238	z	-
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INTERMEDIATE RESULTS (MID-MEMBER)

INTERNAL MEMBER FORCES AND MOMENTS (m, kN, kNm)

# = Minimum, \* = Maximum

Member	Station Location	Axial Force	Y Shear	Z Shear	X Torsion	Y Moment	Z Moment
0	0.000	0.034	-0.263	-0.000	0.000	0.000	0.009*
0	0.019	0.034	-0.263	-0.000	-0.000	0.000	0.004
0	0.038	0.034	-0.263	0.000	0.000	-0.000	-0.001
0	0.056	0.034	-0.263	-0.000	-0.000	0.000	-0.006
0	0.075	0.034	-0.263	-0.000	-0.000	-0.000	-0.011#
1	0.000	-0.706	0.025	-0.000	-0.000	0.000	-0.009#
1	0.149	-0.706	0.025	-0.000	0.000	0.000	-0.005
1	0.298	-0.706	0.025	0.000	0.000	-0.000	-0.002
1	0.447	-0.706	0.025	0.000	-0.000	-0.000	0.002
1	0.596	-0.706	0.025	0.000	-0.000	-0.000	0.006*
2	0.000	0.263	0.034	-0.000	-0.000	0.000	-0.011#
2	0.125	0.263	0.034	0.000	-0.000	-0.000	-0.006
2	0.250	0.263	0.034	-0.000	0.000	0.000	-0.002
2	0.375	0.263	0.034	0.000	-0.000	-0.000	0.002
2	0.500	0.263	0.034	0.000	-0.000	0.000	0.006*
3	0.000	0.214	-0.014	-0.000	0.000	0.000	0.003*
3	0.100	0.214	-0.014	-0.000	-0.000	0.000	0.002
3	0.200	0.214	-0.014	0.000	0.000	-0.000	0.000
3	0.300	0.214	-0.014	-0.000	-0.000	0.000	-0.001
3	0.400	0.214	-0.014	-0.000	-0.000	-0.000	-0.003#
4	0.000	0.228	-0.004	0.000	-0.000	-0.000	0.002*
4	0.131	0.228	-0.004	0.000	-0.000	-0.000	0.001
4	0.263	0.228	-0.004	0.000	-0.000	-0.000	0.001
4	0.394	0.228	-0.004	0.000	-0.000	-0.000	0.000#
4	0.525	0.228	-0.004	0.000	-0.000	-0.000	-0.000#
5	0.000	0.228	-0.004	-0.000	0.000	0.000	0.002*
5	0.131	0.228	-0.004	-0.000	0.000	0.000	0.001
5	0.263	0.228	-0.004	-0.000	0.000	0.000	0.001
5	0.394	0.228	-0.004	-0.000	0.000	0.000	0.000#
5	0.525	0.228	-0.004	-0.000	0.000	0.000	-0.000#
6	0.000	-0.310	0.004	0.000	-0.000	0.000	0.000#
6	0.085	-0.310	0.004	0.000	-0.000	0.000	0.000#
6	0.170	-0.310	0.004	0.000	-0.000	0.000	0.001
6	0.255	-0.310	0.004	0.000	-0.000	0.000	0.001
6	0.340	-0.310	0.004	0.000	-0.000	0.000	0.002*
7	0.000	-0.310	-0.004	-0.000	0.000	0.000	0.002*
7	0.085	-0.310	-0.004	-0.000	0.000	0.000	0.001
7	0.170	-0.310	-0.004	-0.000	0.000	0.000	0.001
7	0.255	-0.310	-0.004	-0.000	0.000	0.000	0.000#
7	0.340	-0.310	-0.004	-0.000	0.000	0.000	0.000#

DISPLACEMENTS (m, mm, rad)

# = Minimum, \* = Maximum

Member	Station Location	Global X Translation	Global Y Translation	Global Z Translation	Total Translation	Global X Rotation	Global Y Rotation	Global Z Rotation
0	0.000	0.000#	0.000	0.000	0.000#	0.000	0.000	0.001
0	0.019	-0.015	-0.000	-0.000	0.015	-0.000	-0.000	0.001
0	0.038	-0.032	-0.000	0.000	0.032	0.000	0.000	0.001
0	0.056	-0.048	-0.000	-0.000	0.048	-0.000	-0.000	0.001
0	0.075	-0.063*	-0.000	0.000	0.063*	-0.000	0.000	0.001
1	0.000	0.000#	0.000#	0.000	0.000#	0.000	0.000	0.001*
1	0.149	0.036*	0.042	-0.000	0.055	0.000	0.000	0.000#
1	0.298	0.025	0.013	0.000	0.028	-0.000	-0.000	-0.000#
1	0.447	0.001	-0.038	-0.000	0.038	-0.000	-0.000	-0.000#
1	0.596	-0.007	-0.063*	0.000	0.064*	0.000	-0.000	0.000#
2	0.000	-0.063#	-0.000#	0.000	0.063#	-0.000	0.000	0.001*
2	0.125	-0.065	0.041	0.000	0.077	-0.000	0.000	-0.000#
2	0.250	-0.067	0.012	-0.000	0.068	0.000	-0.000	-0.000#
2	0.375	-0.070	-0.041	0.000	0.081	-0.000	-0.000	-0.000#
2	0.500	-0.072*	-0.069*	-0.000	0.100*	0.000	0.000	-0.000#

3	0.000	-0.072*	-0.069*	-0.000	0.100*	0.000	0.000	-0.000
3	0.100	-0.063	-0.068	-0.000	0.093	0.000	0.000	0.000
3	0.200	-0.043	-0.066	0.000	0.079	-0.000	-0.000	0.000
3	0.300	-0.021	-0.065	-0.000	0.068	0.000	0.000	0.000
3	0.400	-0.007#	-0.063#	0.000	0.064#	0.000	-0.000	0.000
4	0.000	-0.072*	-0.069*	-0.000#	0.100*	0.000	0.000	-0.000
4	0.131	-0.067	-0.062	0.000#	0.091	-0.000	0.000	0.000
4	0.263	-0.050	-0.046	0.000#	0.068	-0.000	0.000	0.000
4	0.394	-0.026	-0.024	0.001*	0.035	-0.000	0.000	0.000
4	0.525	0.000#	0.000#	0.000#	0.000#	0.000	0.000	0.000
5	0.000	-0.072*	-0.069*	-0.000#	0.100*	0.000	0.000	-0.000
5	0.131	-0.067	-0.062	-0.000#	0.091	0.000	-0.000	0.000
5	0.263	-0.050	-0.046	-0.000#	0.068	0.000	-0.000	0.000
5	0.394	-0.026	-0.024	-0.001*	0.035	0.000	-0.000	0.000
5	0.525	0.000#	0.000#	0.000#	0.000#	0.000	-0.000	0.000
6	0.000	0.000#	0.000#	0.000	0.000#	0.000	0.000	0.000
6	0.085	-0.002	-0.021	0.000	0.021	-0.000	0.000	0.000
6	0.170	-0.004	-0.040	0.000	0.040	-0.000	0.000	0.000
6	0.255	-0.006	-0.055	0.000	0.055	-0.000	0.000	0.000
6	0.340	-0.007*	-0.063*	0.000	0.064*	0.000	-0.000	0.000
7	0.000	-0.007*	-0.063*	0.000	0.064*	0.000	-0.000	0.000
7	0.085	-0.006	-0.055	-0.000	0.055	0.000	-0.000	0.000
7	0.170	-0.004	-0.040	-0.000	0.040	0.000	-0.000	0.000
7	0.255	-0.002	-0.021	-0.000	0.021	0.000	-0.000	0.000
7	0.340	0.000#	0.000#	0.000	0.000#	0.000	-0.000	0.000

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STRESSES (m, MPa)  
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# = Minimum, \* = Maximum

Member	Station Location	Axial	Shear Y Shear Z	Top Mom Z Btm Mom Z	Top Mom Y Btm Mom Y	Ax + Top Mom Z Ax + Btm Mom Z	Ax + Top Mom Y Ax + Btm Mom Y
0	0.000	0.158	-2.418	6.593	0.000	6.752	0.158
			-0.000	-6.593	-0.000	-6.435	0.158
0	0.019	0.158	-2.418	3.006	0.000	3.164	0.158
			-0.000	-3.006	-0.000	-2.847	0.158
0	0.038	0.158	-2.418	-0.582	-0.000	-0.424	0.158
			0.000	0.582	0.000	0.740	0.158
0	0.056	0.158	-2.418	-4.169	0.000	-4.011	0.158
			-0.000	4.169	-0.000	4.328	0.158
0	0.075	0.158	-2.418	-7.757	-0.000	-7.598	0.158
			-0.000	7.757	0.000	7.915	0.158
1	0.000	-3.269	0.227	-6.593	0.000	-9.862	-3.269
			-0.000	6.593	-0.000	3.324	-3.269
1	0.149	-3.269	0.227	-3.916	0.000	-7.185	-3.269
			-0.000	3.916	-0.000	0.647	-3.269
1	0.298	-3.269	0.227	-1.240	-0.000	-4.509	-3.269
			0.000	1.240	0.000	-2.029	-3.269
1	0.447	-3.269	0.227	1.436	-0.000	-1.833	-3.269
			0.000	-1.436	0.000	-4.705	-3.269
1	0.596	-3.269	0.227	4.113	-0.000	0.844	-3.269
			0.000	-4.113	0.000	-7.382	-3.269
2	0.000	1.216	0.315	-7.757	0.000	-6.541	1.216
			-0.000	7.757	-0.000	8.972	1.216
2	0.125	1.216	0.315	-4.644	-0.000	-3.428	1.216
			0.000	4.644	0.000	5.859	1.216
2	0.250	1.216	0.315	-1.531	0.000	-0.315	1.216
			-0.000	1.531	-0.000	2.747	1.216
2	0.375	1.216	0.315	1.582	-0.000	2.798	1.216
			0.000	-1.582	0.000	-0.366	1.216
2	0.500	1.216	0.315	4.695	0.000	5.910	1.216
			0.000	-4.695	-0.000	-3.479	1.216
3	0.000	0.989	-0.131	2.250	0.000	3.239	0.989
			-0.000	-2.250	-0.000	-1.261	0.989
3	0.100	0.989	-0.131	1.212	0.000	2.201	0.989
			-0.000	-1.212	-0.000	-0.223	0.989
3	0.200	0.989	-0.131	0.174	-0.000	1.163	0.989
			0.000	-0.174	0.000	0.815	0.989
3	0.300	0.989	-0.131	-0.864	0.000	0.125	0.989
			-0.000	0.864	-0.000	1.853	0.989
3	0.400	0.989	-0.131	-1.902	-0.000	-0.913	0.989
			-0.000	1.902	0.000	2.891	0.989
4	0.000	1.056	-0.033	1.214	-0.220	2.270	0.836
			0.004	-1.214	0.220	-0.158	1.276

4	0.131	1.056	-0.033	0.867	-0.178	1.923	0.878
			0.004	-0.867	0.178	0.188	1.234
4	0.263	1.056	-0.033	0.521	-0.136	1.577	0.920
			0.004	-0.521	0.136	0.535	1.192
4	0.394	1.056	-0.033	0.174	-0.094	1.230	0.962
			0.004	-0.174	0.094	0.882	1.150
4	0.525	1.056	-0.033	-0.173	-0.052	0.883	1.004
			0.004	0.173	0.052	1.228	1.108
5	0.000	1.056	-0.033	1.214	0.220	2.270	1.276
			-0.004	-1.214	-0.220	-0.158	0.836
5	0.131	1.056	-0.033	0.867	0.178	1.923	1.234
			-0.004	-0.867	-0.178	0.188	0.878
5	0.263	1.056	-0.033	0.521	0.136	1.577	1.192
			-0.004	-0.521	-0.136	0.535	0.920
5	0.394	1.056	-0.033	0.174	0.094	1.230	1.150
			-0.004	-0.174	-0.094	0.882	0.962
5	0.525	1.056	-0.033	-0.173	0.052	0.883	1.108
			-0.004	0.173	-0.052	1.228	1.004
6	0.000	-1.436	0.038	0.104	0.017	-1.332	-1.419
			0.001	-0.104	-0.017	-1.539	-1.453
6	0.085	-1.436	0.038	0.356	0.025	-1.080	-1.410
			0.001	-0.356	-0.025	-1.792	-1.461
6	0.170	-1.436	0.038	0.608	0.033	-0.827	-1.402
			0.001	-0.608	-0.033	-2.044	-1.469
6	0.255	-1.436	0.038	0.861	0.042	-0.575	-1.394
			0.001	-0.861	-0.042	-2.296	-1.477
6	0.340	-1.436	0.038	1.113	0.050	-0.323	-1.386
			0.001	-1.113	-0.050	-2.548	-1.486
7	0.000	-1.436	-0.038	1.113	0.050	-0.323	-1.386
			-0.001	-1.113	-0.050	-2.548	-1.486
7	0.085	-1.436	-0.038	0.861	0.042	-0.575	-1.394
			-0.001	-0.861	-0.042	-2.296	-1.477
7	0.170	-1.436	-0.038	0.608	0.033	-0.827	-1.402
			-0.001	-0.608	-0.033	-2.044	-1.469
7	0.255	-1.436	-0.038	0.356	0.025	-1.080	-1.410
			-0.001	-0.356	-0.025	-1.792	-1.461
7	0.340	-1.436	-0.038	0.104	0.017	-1.332	-1.419
			-0.001	-0.104	-0.017	-1.539	-1.453

END