

Supplementary data

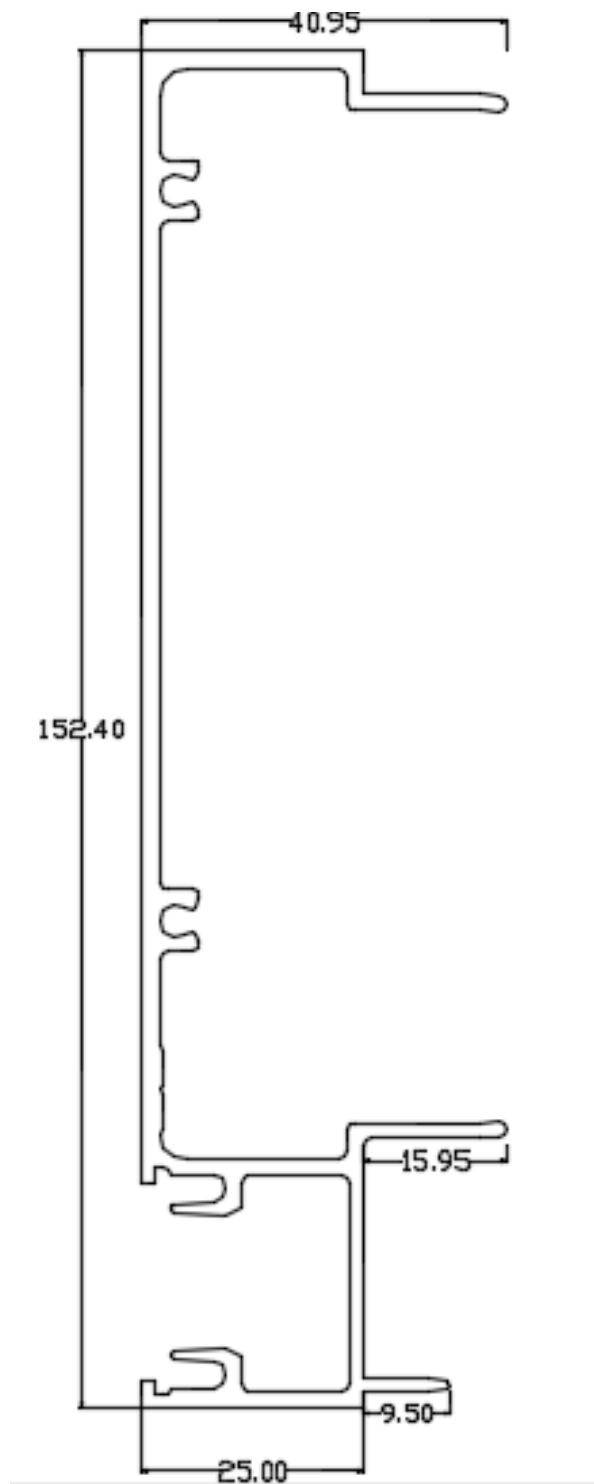


Figure A.1: Original 650-027 male mullion section

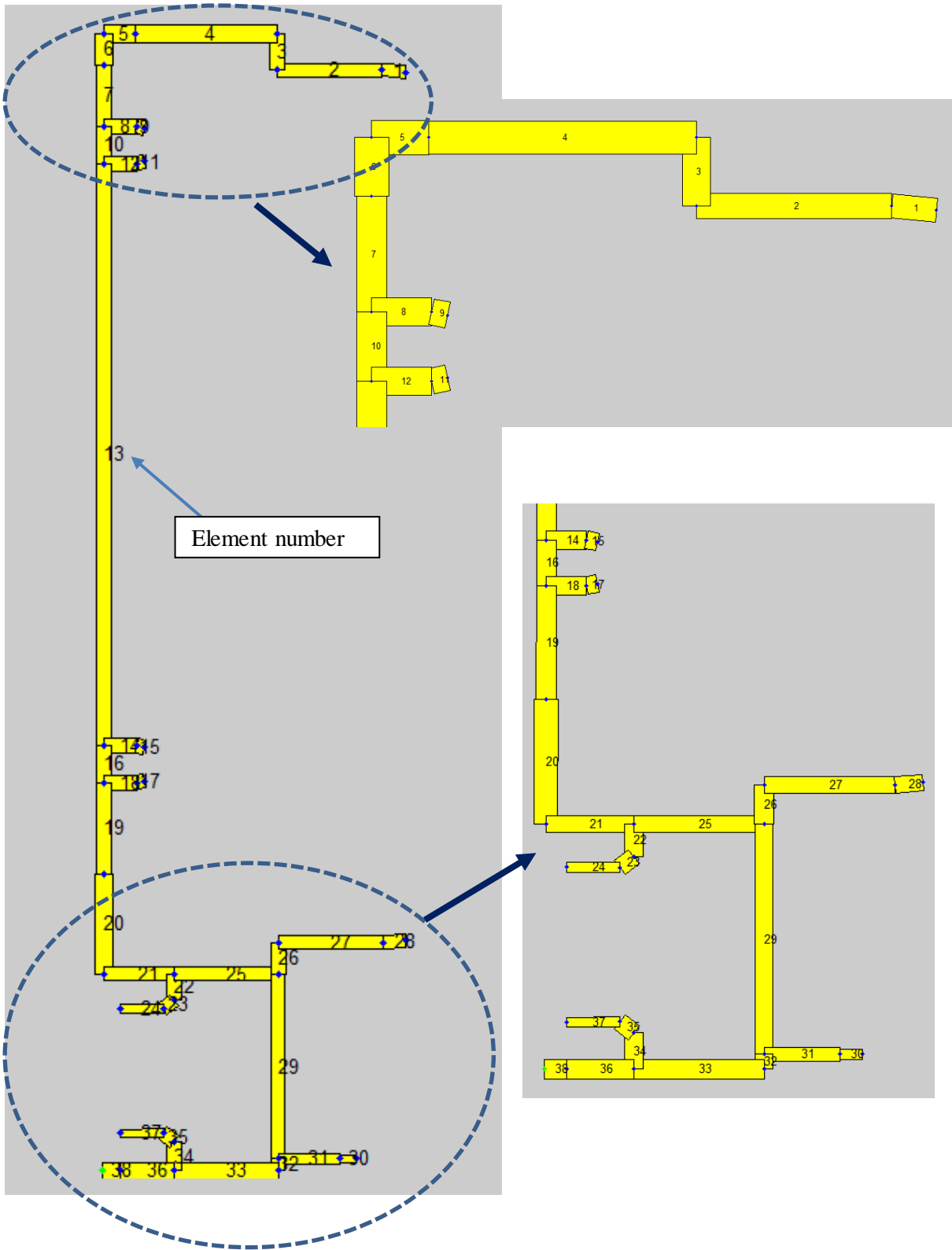
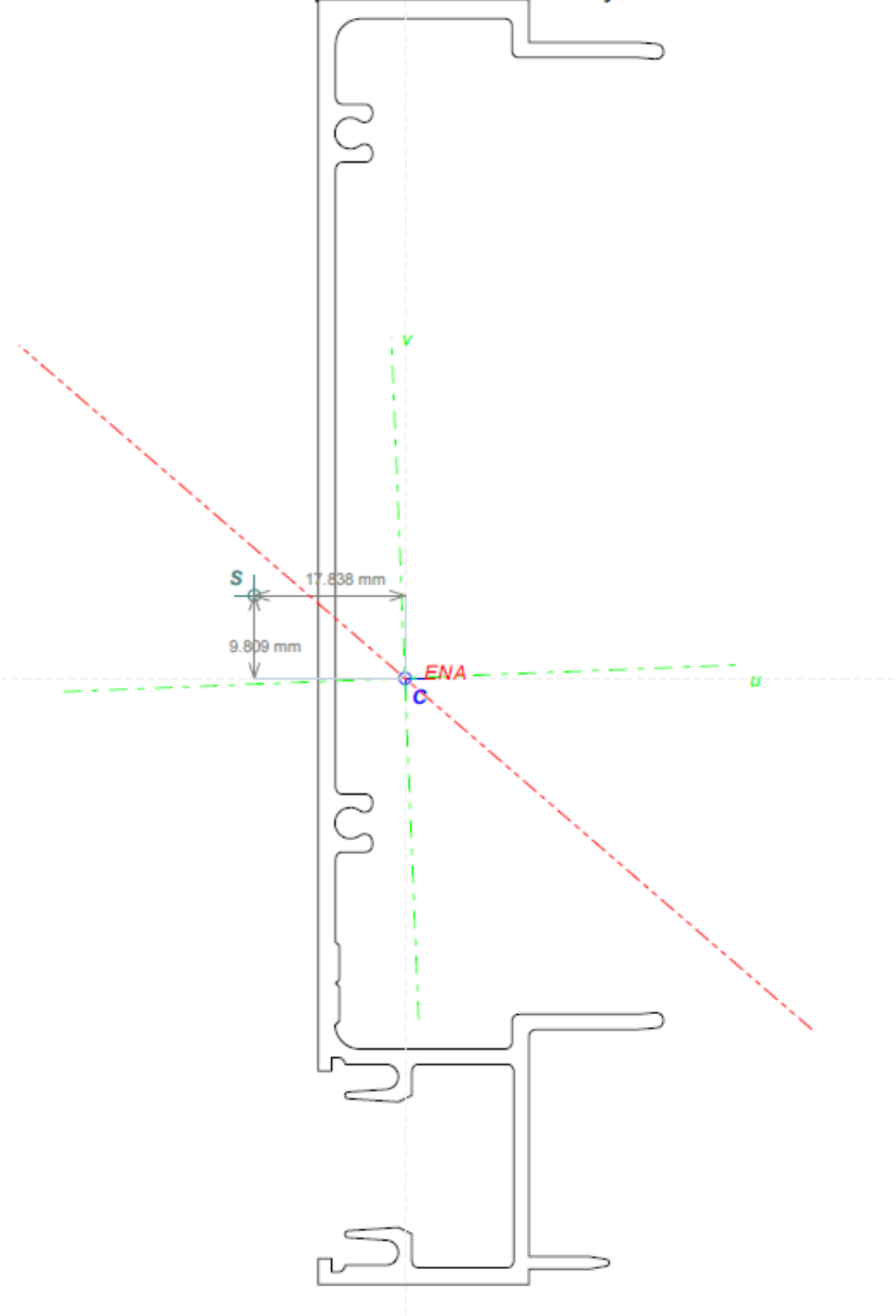


Figure A.2: 650-027 male mullion model in CUFSM

Table A.1: Element thicknesses of the 650-027 male mullion

Element	Thickness (mm)	Element	Thickness (mm)
1	1.69	20	2.50
2	1.80	21	1.80
3	2.00	22	2.01
4	2.30	23	1.83
5	2.44	24	1.07
6	2.44	25	1.80
7	2.10	26	2.00
8	1.98	27	1.80
9	1.85	28	1.71
10	2.10	29	1.80
11	1.85	30	1.07
12	1.98	31	1.50
13	2.10	32	1.80
14	1.98	33	2.00
15	1.85	34	2.01
16	2.10	35	1.83
17	1.85	36	2.00
18	1.98	37	1.07
19	2.10	38	2.00

Section Properties and Stresses Analysis - Results



Section Properties and Stresses Analysis Results

	Axes X-Y	Centroidal Axes	Principal Axes		Elastic Neutral Axis
Ix (mm ⁴)	+17.903E+05	+17.903E+05	+17.931E+05	In (mm ⁴)	+97.158E+04
Iy (mm ⁴)	+79.201E+03	+79.201E+03	+76.349E+03	ENA Angle(°)	-41.434E+00
Ixy (mm ⁴)	-89.909E+03	-89.909E+03	+78.870E-14	Y top (mm)	+76.381E+00
Io (mm ⁴)	+18.895E+05	+18.895E+05	+18.895E+05	Y bot (mm)	+80.645E+00
rx (mm)	+54.053E+00	+54.053E+00	+54.096E+00	Sx top (mm ³)	+12.720E+03
ry (mm)	+11.369E+00	+11.369E+00	+11.163E+00	Sx bot (mm ³)	+16.021E+03
ro (mm)	+55.236E+00	+55.236E+00	+55.236E+00	X right (mm)	+84.040E+00
Y top (mm)		+80.593E+00	+80.946E+00	X left (mm)	+81.056E+00
Y bot (mm)		+71.797E+00	+72.337E+00	Sy right (mm ³)	+14.021E+03
Sx top (mm ³)		+22.214E+03	+22.152E+03	Sy left (mm ³)	+14.706E+03
Sx bot (mm ³)		+24.935E+03	+24.788E+03	Zpx (mm ³)	+20.834E+03
X right (mm)		+30.645E+00	+33.648E+00	Zpy (mm ³)	+21.080E+03
X left (mm)		+10.302E+00	+13.219E+00	Max Mx (N.mm)	+35.084E+05
Sy right (mm ³)		+25.844E+02	+22.890E+02	Max My (N.mm)	+38.871E+05
Sy left (mm ³)		+76.881E+02	+57.756E+02	Mpx (N.mm)	+57.462E+05
Zpx (mm ³)		+29.527E+03	+29.586E+03	Mpy (N.mm)	+58.141E+05
Zpy (mm ³)		+55.389E+02	+52.745E+02	SFx	+16.379E-01
Max Mx (N.mm)		+61.268E+05	+61.098E+05	SFy	+15.035E-01
Max My (N.mm)		+71.282E+04	+62.583E+04	Torque Max (N.mm)	+47.163E+03
Mpx (N.mm)		+81.440E+05	+81.603E+05		
Mpy (N.mm)		+15.277E+05	+14.548E+05	Buckling	
SFx		+13.292E-01	+13.356E-01	βx (monosymmetry)	-70.800E-01 mm
SFy		+21.432E-01	+23.246E-01	βy (monosymmetry)	+11.892E+01 mm
IMax (mm ⁴)			+17.931E+05	Cx Stability	+22.312E+06 mm ⁵
IMin (mm ⁴)			+76.349E+03	Cy Stability	+65.992E+05 mm ⁵
Theta (Deg)			+23.357E-01	β Torsional-flexural	+88.094E-02
				a Torsional-Bending	+95.263E+01 mm
Area	+61.274E+01 mm ²		Composite Section		
Mass/L	+16.618E-04 kg/ mm		Ref. Aluminium 606	+68.953E+03 MPa	
Xc	+10.914E-06 mm		Transf. Area	+61.274E+01 mm ²	
Yc	+25.871E-14 mm		Xcc	+10.914E-06 mm	
NA (Deg)	-41.43 Deg		Ycc	+28.801E-14 mm	
PNA (x,y)	(-8.93,-10.11)				
Torsion and Shear			Stresses	Yield & Max/Min	
J(Torsion)	+91.053E+01 mm ⁴		Sig-yield T	+27.581E+01 MPa	
Cw(Warping)	+31.064E+07 mm ⁶		Sig-yield C	-27.581E+01 MPa	
Xs (Shear)	-17.801E+00 mm		Tau yield	+20.686E+01 MPa	
Ys (Shear)	+97.716E-01 mm		Sig-x max T)	+58.939E-04 MPa	
Ax	+23.613E+01 mm ²		Sig-x max C)	-46.797E-04 MPa	
Kx	+38.537E-02		Fpt	+84.500E+03 N	
Ay	+30.164E+01 mm ²		Fpc	+84.500E+03 N	
Ky	+49.228E-02		Np Col. Capacity	+00.000E+00 N	
Ios	+21.221E+05 mm ⁴		Loads		
ros	+58.850E+00 mm		Moment Mx	+10.000E+01 N.mm	
Swx	-47.050E+04 mm ⁵		Moment My	+00.000E+00 N.mm	
Swy	+31.185E+06 mm ⁵		Axial N [0,0]	+00.000E+00 N	
Dsc	+20.307E+00 mm		Torque Tz	+10.000E+01 N.mm	
			Bimoment Bw	+10.000E+03 N.mm ²	
			Shear Vx	+10.000E+01 N	
			Shear Vy	+10.000E+01 N	