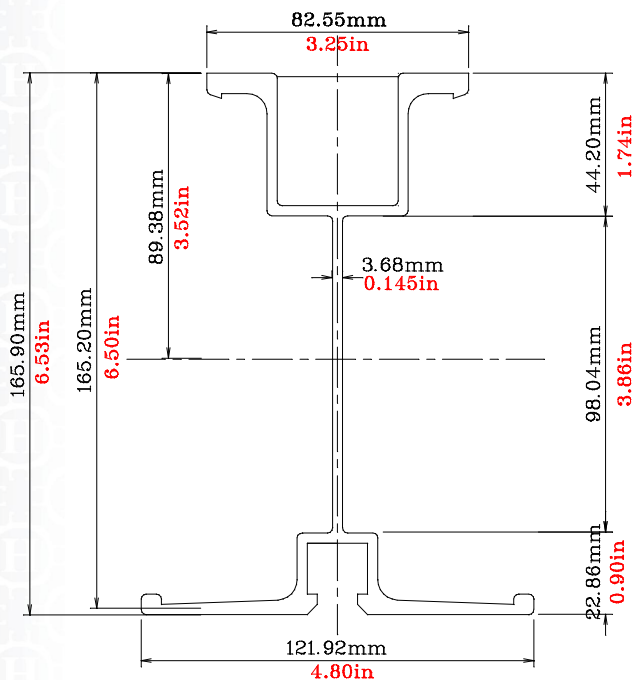


## 650 BEAM -- Structural Properties



Overall Height .....	165 mm.....	6.50 in
Base Width.....	122 mm.....	4.80 in
Top Width.....	83 mm.....	3.25 in
Cross Sectional Area (excluding nailer).....	1781 mm <sup>2</sup> .....	2.76 in <sup>2</sup>
Nominal Weight (excluding nailer).....	4.84 kg/m.....	3.25 lb/ft
(including nailer).....	6 kg/m.....	4 lb/ft
Distance of Neutral Axis from Top.....	89 mm .....	3.52 in
Moment of Inertia <b>I<sub>x-x</sub></b> .....	7.43E6 mm <sup>4</sup> .....	17.84 in <sup>4</sup>
Moment of Inertia <b>I<sub>y-y</sub></b> .....	1.13E6 mm <sup>4</sup> .....	2.71 in <sup>4</sup>
Section Modulus <b>S<sub>xt</sub></b> .....	83.08E3 mm <sup>3</sup> .....	5.07 in <sup>3</sup>
<b>S<sub>xb</sub></b> .....	97.01E3 mm <sup>3</sup> .....	5.92 in <sup>3</sup>
Section Modulus <b>S<sub>y</sub></b> .....	18.52E3 mm <sup>3</sup> .....	1.13 in <sup>3</sup>
Radius of Gyration <b>r<sub>x</sub></b> .....	65 mm .....	2.54 in
Radius of Gyration <b>r<sub>y</sub></b> .....	25 mm.....	0.99 in
Modulus of Elasticity <b>E</b> .....	7.03E4 kN/mm <sup>2</sup> .....	10.2E6 psi

### Standard Lengths

2743mm	9.0ft
3200mm	10.5ft
3658mm	12.0ft
4267mm	14.0ft
4877mm	16.0ft
5486mm	18.0ft
6401mm	21.0ft

### NOTES:

1. Allowable design values are based on a 2.20 Factor of Safety.
2. Allowable Reaction and Shear values are based on Alcan's *Strength of Aluminum*, 4th edition.
3. Interior reaction length of bearing: 127mm (5in).
4. Exterior reaction length of bearing: 64mm (2.5in).



## 650 BEAM -- Design Data

### Alloy Properties

Ultimate Tensile Stress	$F_u$	.....	290E3 kN/m <sup>2</sup>	.....	42 ksi
Yield Stress	$F_y$	.....	255E3 kN/m <sup>2</sup>	.....	37 ksi
Shear Yield Stress	$F_{sy}$	.....	155E3 kN/m <sup>2</sup>	.....	22 ksi
Ultimate Bearing Stress	$F_b$	.....	580E3 kN/m <sup>2</sup>	.....	84 ksi

### Local Buckling of Bottom Flange

Ultimate Bending Moment	.....	24.74 kNm	.....	18.25 k ft
Allowable Bending Moment	.....	11.30 kNm	.....	8.30 k ft

### Local Buckling of Top Flange

Ultimate Bending Moment	.....	21.20 kNm	.....	15.63 k ft
Allowable Bending Moment	.....	9.64 kNm	.....	7.11 k ft

### Allowable Reactions and Shears

Interior Reaction (Full Bearing)	.....	69.97 kN	.....	15.73 kips
Exterior Reaction (Partial Bearing)	.....	34.96 kN	.....	7.86 kips
Concentrated Load	.....	69.97 kN	.....	15.73 kips
Shear	.....	43.73 kN	.....	9.83 kips



## 650 BEAM -- Load Charts

[Calculated Values -- to be confirmed by tests]

### Notes:

1. Deflection limited to L/360.
2. Factor of Safety 2.2:1 included.
3. Design Load = Dead Load + Live Load.
4. Cantilevers are not to exceed 30% of adjacent span and not more than 915mm (3ft).
5. Consult Hi-Lite Engineering Department for other stringer configurations

**Allowable UDL. (kN/m)**

Span m	1 Span	2 Spans	3 Spans
0.6	82.58	66.07	75.08
0.9	55.06	44.05	50.05
1.2	41.29	33.03	37.54
1.5	33.00	26.43	30.03
1.8	19.10	22.02	25.03
2.1	12.03	18.88	21.45
2.4	8.06	16.52	15.24
2.7	5.66	13.63	10.70
3.0	4.12	9.94	7.80
3.3	3.10	7.46	5.86
3.6	2.39	5.75	4.51
3.9	1.88	4.52	3.55
4.2	1.50	3.62	2.84
4.5	1.22	2.94	2.31

**Allowable UDL. (plf)**

Span ft	1 Span	2 Spans	3 Spans
2	5570	4456	5064
3	3713	2971	3376
4	2785	2228	2532
5	2157	1782	2025
6	1248	1485	1688
7	786	1273	1447
8	527	1114	996
9	370	891	699
10	270	649	510
11	203	488	383
12	156	376	295
13	123	296	232
14	98	237	186
15	80	192	151

