

Member Size	406x178	60
D =	406.4	mm
T =	12.8	mm
t =	7.9	
b/T =	5.84	
d/t =	45.6	
ry (Radius of Gyration) =	16.8	
Sx (Plastic Modulus) =	1060	cm ³
Ix (Second Moment of Area) =	21600	m ⁴ 1200 cm ⁴
Beam Length =	6	m
Continuous Load	14.5	kN/m
Each Point Load		kN
Total Load on Beam =	87	kN
Unfactored Imposed Load	4	kN/m

Maximum Shear at Ra & Rb		
Continuous load =	87 kNm	
Point Load =	0.00 kNm	No. of Point load = 0
Total Shear = Ra = Rb =	43.50	kNm

Maximum Bending Moment at Mid Point		
Bending Moment for Continuous Load =	65.25 kN	Point Load Distance from Mid Point to 1st Point Load a =
Bending Moment for Point Load =	0 kN	
Total Bending Moment (M) =	65.25	

From Table 11, BS5950 = $\epsilon = \sqrt{\text{Grade}/P_y}$				
	T = <16MM	P _y = 275	T = 16 - 40MM	P _y = 265
$\epsilon =$	1.00			
b/T < 9 ϵ =	5.84	<	9.00	Flange is plastic
d/t < 80 ϵ =	45.6	<	80.00	Flange is plastic
Shear Strength				
d/t < 70 ϵ =	45.6	<	70.00	Shear Buckling is not considered

Shear capacity of Section (Pv)	
Pv=0.6 Py t D	529.74 kN

Check Fv < 0.6Pv	
Fv =	43.50 kN
0.6Pv =	317.85 kN
Shear Capacity Utilisation = 13.69%	
Low Shear Load	

Moment Capacity of Section (Mc)	
Mc= pySx	291.50 kNm
Additional Moment to Self Weight (Msw)	
Msw = 1.4wl ² /8	3.78 kNm
Total Moment (Mt)	
Mt = M+Msw	69.03

Check MT < Mc	
Mt	69.03 kN
Mc	291.50 kN
Moment Capacity Utilisation = 23.68%	
Section Suitable for Moment Capacity	

Deflection Check	
E =	205
Δmax =	0.00002 m
Δmax =	0.02 mm

Deflection Check = SPAN/360 > Δmax	
SPAN/360 =	16.67 mm
Δmax =	0.0 mm
Deflection Utilisation = 0.09%	
Selection Suitable	