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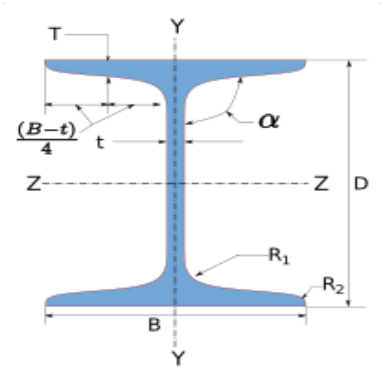
1 Input Parameters

Module		Beam Coverplate Weld Connection	
MainModule		Moment Connection	
Moment(kNm)*		100.0	
Shear(kN)*		10.0	
Axial (kN) *		10.0	
Section			
	Beam Section *	MB 600	
	Material *	E 250 (Fe 410 W)A	
	Ultimate strength, fu (MPa)	410	
	Yield Strength , fy (MPa)	250	
	Mass 121.0	Iz(mm4)	902480000.0
	Area(mm2) - A 15419.999999999998	Iy(mm4)	24790000.0
	D(mm) 600.0	rz(mm)	242.0
	B(mm) 210.0	ry(mm)	40.099999999999994
	t(mm) 12.0	Zz(mm3)	3008300.0
	T(mm) 20.3	Zy(mm3)	236000.0
	FlangeSlope 98	Zpz(mm3)	3454600.0
	R1(mm) 20.0	Zpy(mm3)	236000.0
	R2(mm) 10.0		
Weld Details			
Weld Type		Fillet	
Type of weld fabrication		Shop Weld	
Material grade overwrite (MPa) Fu		410.0	

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2 Design Checks

2.1 Member Capacity

Check	Required	Provided	Remarks
Axial Capacity Ac (kN)		$Ac = \frac{A * f_y}{\gamma_{m0} * 1000}$ $= \frac{15419.999999999998 * 250}{1.1 * 1000}$ $= 3504.55$	
Shear Capacity Sc (kN)		$S_c = \frac{A_v * f_y}{\sqrt{3} * \gamma_{mo} * 1000}$ $= \frac{559.4 * 12.0 * 250}{\sqrt{3} * 1.1 * 1000}$ $= 880.82657$	
Plastic Moment Capacity Pmc (kNm)		$Pmc = \frac{\beta_b * Z_p * fy}{\gamma_{mo} * 1000000}$ $= \frac{1 * 938785 * 250}{1.1 * 1000000}$ $= 213.36$	
Moment Deformation Criteria Mdc (kNm)		$Mdc = \frac{1.5 * Z_e * fy}{1.1}$ $= \frac{1.5 * 3008300.0 * 250}{1.1}$ $= 1025.56$	
Moment Capacity Mc (kNm)		$M_c = min(Pmc, Mdc)$ $= min(213.36, 1025.56)$ $= 213.36$	

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2.2 Load Consideration

Check	Required	Provided	Remarks
Axial Load Au (kN)	$Ac_{min} = 0.3 * A_c$ $= 0.3 * 3504.55$ $= 1051.36$	$Au = max(A, Ac_{min})$ $= max(10.0, 1051.36)$ $= 1051.36$	Pass
Shear Load Vu (kN)	$Sc_{min} = 0.6 * A_c$ $= 0.6 * 880.83$ $= 528.5$	$Vu = max(V, Vc_{min})$ $= max(10.0, 528.5)$ $= 528.5$	Pass
Moment Load Mu (kNm)	$Mc_{min} = 0.5 * M_c$ $= 0.5 * 213.36$ $= 106.68$	$Mu = max(M, Mc_{min})$ $= max(100.0, 106.68)$ $= 106.68$	Pass
Forces Carried by Web		$A_w = Axial\ force\ in\ web$ $= \frac{(D - 2 * T) * t * Au}{A}$ $= \frac{(600.0 - 2 * 20.3) * 12.0 * 1051.36}{15419.999999999998}$ $= 457.69$ $M_w = Moment\ in\ web$ $= \frac{Z_w * Mu}{Z}$ $= \frac{938785 * 106.68}{3454600.0}$ $= 28.99$	
Forces Carried by Flange		$A_f = Axial\ force\ in\ flange$ $= \frac{Au * B * T}{A}$ $= \frac{1051.36 * 210.0 * 20.3}{15419.999999999998}$ $= 290.66$ $M_f = Moment\ in\ flange$ $= Mu - M_w$ $= 106.68 - 28.99$ $= 77.69$ $F_f = flange\ force$ $= \frac{M_f * 1000}{D - T} + A_f$ $= \frac{77.69}{600.0 - 20.3} + 290.66$ $= 424.68$	

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2.3 Weld Design Checks

Check	Required	Provided	Remarks
Min Weld Size (mm)	$Thickness\ of\ Thicker\ part$ $= max(20.3, 28.0)$ $= 28.0$ $IS800:2007\ cl.10.5.2.3\ Table21,$ $t_{w_{min}} = 6$	16	Pass
Max Weld Size (mm)	$Thickness\ of\ Thinner\ part$ $= Min(20.3, 28.0) = 20.3$ $t_{w_{max}} = 20.3$	16	Pass
Flange Weld Strength (N/mm)	$Stress = \frac{F_f * 1000}{F_{rl}}$ $= \frac{424.68 * 1000}{540}$ $= 786.437897319835$	2120.95	Pass

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2.4 Flange Plate Check

Check	Required	Provided	Remarks
Min. Plate Height (mm)	50	$b_{fp} = B - 2 * sp$ $= 210.0 - 2 * 21$ $= 165$	Pass
Max. Plate Height (mm)	$b_{fp} = B - 2 * sp$ $= 210.0 - 2 * 21$ $= 165$	165	Pass
Min. Plate Length (mm)	165	$l_{fp} = [2 * (l_w + 2 * s) + g]$ $= [2 * (2052 * 16) + 10.0]$ $= 480$	Pass

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3 3D View

Figure 1: 3D View