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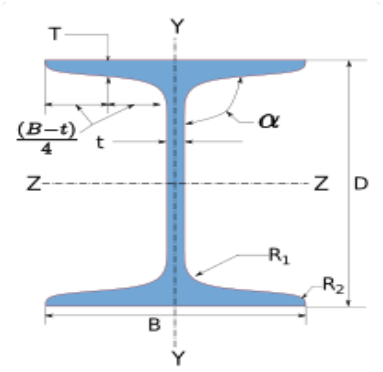
1 Input Parameters

Module		Beam Coverplate Weld Connection	
MainModule		Moment Connection	
Moment(kNm)*		10.0	
Shear(kN)*		10.0	
Axial (kN) *		10.0	
Section			
			
Beam Section *		UB 1016 x 305 x 314	
Material *		E 250 (Fe 410 W)A	
Ultimate strength, fu (MPa)		410	
Yield Strength , fy (MPa)		250	
Mass	314.3	Iz(mm4)	6442110000.0
Area(mm2) - A	40040.0	Iy(mm4)	162190000.0
D(mm)	1000.0	rz(mm)	401.0
B(mm)	300.0	ry(mm)	64.0
t(mm)	19.1	Zz(mm3)	12884000.0
T(mm)	35.9	Zy(mm3)	1081000.0
FlangeSlope	90	Zpz(mm3)	14851000.0
R1(mm)	30.0	Zpy(mm3)	1081000.0
R2(mm)	0.0		
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)		$Ac = \frac{A * f_y}{\gamma_{m0} * 1000}$ $= \frac{40040.0 * 250}{1.1 * 1000}$ $= 9100.0$	
Shear Capacity Sc (kN)		$S_c = \frac{A_v * f_y}{\sqrt{3} * \gamma_{mo} * 1000}$ $= \frac{928.2 * 19.1 * 250}{\sqrt{3} * 1.1 * 1000}$ $= 2326.27807$	
Plastic Moment Capacity Pmc (kNm)		$Pmc = \frac{\beta_b * Z_p * fy}{\gamma_{mo} * 1000000}$ $= \frac{1 * 4113926 * 250}{1.1 * 1000000}$ $= 934.98$	
Moment Deformation Criteria Mdc (kNm)		$Mdc = \frac{1.5 * Z_e * fy}{1.1}$ $= \frac{1.5 * 12884000.0 * 250}{1.1}$ $= 4392.27$	
Moment Capacity Mc (kNm)		$M_c = min(Pmc, Mdc)$ $= min(934.98, 4392.27)$ $= 934.98$	

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2.2 Load Consideration

Check	Required	Provided	Remarks
Axial Load Au (kN)	$Ac_{min} = 0.3 * A_c$ $= 0.3 * 9100.0$ $= 2730.0$	$Au = max(A, Ac_{min})$ $= max(10.0, 2730.0)$ $= 2730.0$	Pass
Shear Load Vu (kN)	$Sc_{min} = 0.6 * A_c$ $= 0.6 * 2326.28$ $= 1395.77$	$Vu = max(V, Vc_{min})$ $= max(10.0, 1395.77)$ $= 1395.77$	Pass
Moment Load Mu (kNm)	$Mc_{min} = 0.5 * M_c$ $= 0.5 * 934.98$ $= 467.49$	$Mu = max(M, Mc_{min})$ $= max(10.0, 467.49)$ $= 467.49$	Pass
Forces Carried by Web		$A_w = Axial\ force\ in\ web$ $= \frac{(D - 2 * T) * t * Au}{A}$ $= \frac{(1000.0 - 2 * 35.9) * 19.1 * 2730.0}{40040.0}$ $= 1208.77$ $M_w = Moment\ in\ web$ $= \frac{Z_w * Mu}{Z}$ $= \frac{4113926 * 467.49}{14851000.0}$ $= 129.5$	
Forces Carried by Flange		$A_f = Axial\ force\ in\ flange$ $= \frac{Au * B * T}{A}$ $= \frac{2730.0 * 300.0 * 35.9}{40040.0}$ $= 734.32$ $M_f = Moment\ in\ flange$ $= Mu - M_w$ $= 467.49 - 129.5$ $= 337.99$ $F_f = flange\ force$ $= \frac{M_f * 1000}{D - T} + A_f$ $= \frac{337.99}{1000.0 - 35.9} + 734.32$ $= 1084.89$	

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2.3 Weld Design Checks

Check	Required	Provided	Remarks
Min Weld Size (mm)	$Thickness\ of\ Thicker\ part$ $= max(35.9, 30.0)$ $= 35.9$ $IS800:2007\ cl.10.5.2.3\ Table21,$ $t_{w_{min}} = 10$	16	Pass
Max Weld Size (mm)	$Thickness\ of\ Thinner\ part$ $= Min(35.9, 30.0) = 30.0$ $t_{w_{max}} = 30.0$	16	Pass
Flange Weld Strength (N/mm)	$Stress = \frac{F_f * 1000}{F_{rl}}$ $= \frac{1084.89 * 1000}{755}$ $= 1436.945708605001$	2120.95	Pass

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2.4 Flange Plate Check-Outside/Inside

Check	Required	Provided	Remarks
Min. Plate Height (mm)	50	$b_{fp} = B - 2 * sp$ $= 300.0 - 2 * 21$ $= 255$	Pass
Min. Plate Length (mm)	255	$l_{fp} = [2 * (l_w + 2 * s) + g]$ $= [2 * (2652 * 16) + 10.0]$ $= 605$	Pass
Min. Inner Plate Height (mm)	50	$b_{ifp} = \frac{B - 4 * sp - t_w - 2 * r_1}{2}$ $= \frac{300.0 - 4 * 21 - 19.1 - 2 * 30.0}{2}$ $= 65$	Pass
Max. Inner Plate Height (mm)	$b_{ifp} = \frac{B - 4 * sp - t_w - 2 * r_1}{2}$ $= \frac{300.0 - 4 * 21 - 19.1 - 2 * 30.0}{2}$ $= 65$	65	Pass
Min. Inner Plate Length (mm)	255	$l_{fp} = [2 * (l_w + 2 * s) + g]$ $= [2 * (2652 * 16) + 10.0]$ $= 605$	Pass

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3 3D View

Figure 1: 3D View