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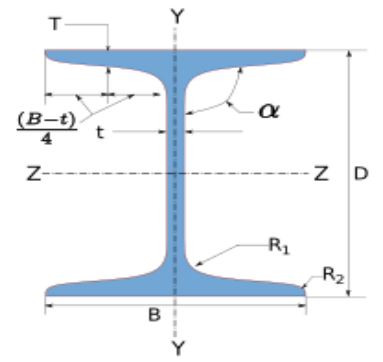
Designer	LoremIpsum	Job Number	123
Date	18 /05 /2020	Client	LoremIpsum

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 610 x 229 x 140	
Material *		E 250 (Fe 410 W)A	
Ultimate strength, fu (MPa)		410	
Yield Strength , fy (MPa)		250	
Mass	139.9	Iz(mm4)	1117770000.0
Area(mm2) - A	17820.0	Iy(mm4)	45050000.0
D(mm)	617.0	rz(mm)	250.0
B(mm)	230.2	ry(mm)	50.0
t(mm)	13.1	Zz(mm3)	3622000.0
T(mm)	22.1	Zy(mm3)	391000.0
FlangeSlope	90	Zpz(mm3)	4142000.0
R1(mm)	12.7	Zpy(mm3)	391000.0
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)		$Ac = \frac{A * f_y}{\gamma_{m0} * 1000}$ $= \frac{17820.0 * 250}{1.1 * 1000}$ $= 4050.0$	
Shear Capacity Sc (kN)		$S_c = \frac{A_v * f_y}{\sqrt{3} * \gamma_{mo} * 1000}$ $= \frac{572.8 * 13.1 * 250}{\sqrt{3} * 1.1 * 1000}$ $= 984.60265$	
Plastic Moment Capacity Pmc (kNm)		$Pmc = \frac{\beta_b * Z_p * fy}{\gamma_{mo} * 1000000}$ $= \frac{1 * 1074527 * 250}{1.1 * 1000000}$ $= 244.21$	
Moment Deformation Criteria Mdc (kNm)		$Mdc = \frac{1.5 * Z_e * fy}{1.1}$ $= \frac{1.5 * 3622000.0 * 250}{1.1}$ $= 1234.77$	
Moment Capacity Mc (kNm)		$M_c = min(Pmc, Mdc)$ $= min(244.21, 1234.77)$ $= 244.21$	

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2.2 Load Consideration

Check	Required	Provided	Remarks
Axial Load Au (kN)	$Ac_{min} = 0.3 * A_c$ $= 0.3 * 4050.0$ $= 1215.0$	$Au = max(A, Ac_{min})$ $= max(10.0, 1215.0)$ $= 1215.0$	Pass
Shear Load Vu (kN)	$Sc_{min} = 0.6 * A_c$ $= 0.6 * 984.6$ $= 590.76$	$Vu = max(V, Vc_{min})$ $= max(10.0, 590.76)$ $= 590.76$	Pass
Moment Load Mu (kNm)	$Mc_{min} = 0.5 * M_c$ $= 0.5 * 244.21$ $= 122.11$	$Mu = max(M, Mc_{min})$ $= max(10.0, 122.11)$ $= 122.11$	Pass
Forces Carried by Web		$A_w = Axial\ force\ in\ web$ $= \frac{(D - 2 * T) * t * Au}{A}$ $= \frac{(617.0 - 2 * 22.1) * 13.1 * 1215.0}{17820.0}$ $= 511.61$ $M_w = Moment\ in\ web$ $= \frac{Z_w * Mu}{Z}$ $= \frac{1074527 * 122.11}{4142000.0}$ $= 31.68$	
Forces Carried by Flange		$A_f = Axial\ force\ in\ flange$ $= \frac{Au * B * T}{A}$ $= \frac{1215.0 * 230.2 * 22.1}{17820.0}$ $= 346.87$ $M_f = Moment\ in\ flange$ $= Mu - M_w$ $= 122.11 - 31.68$ $= 90.43$ $F_f = flange\ force$ $= \frac{M_f * 1000}{D - T} + A_f$ $= \frac{90.43}{617.0 - 22.1} + 346.87$ $= 498.88$	

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2.3 Weld Design Checks

Check	Required	Provided	Remarks
Min Weld Size (mm)	$Thickness\ of\ Thicker\ part$ $= max(22.1, 18.0)$ $= 22.1$ $IS800:2007\ cl.10.5.2.3\ Table21,$ $t_{w_{min}} = 6$	16	Pass
Max Weld Size (mm)	$Thickness\ of\ Thinner\ part$ $= Min(22.1, 18.0) = 18.0$ $t_{w_{max}} = 18.0$	16	Pass
Flange Weld Strength (N/mm)	$Stress = \frac{F_f * 1000}{F_{rl}}$ $= \frac{498.88 * 1000}{575}$ $= 867.6100185794166$	2120.95	Pass

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2.4 Flange Plate Check-Outside/Inside

Check	Required	Provided	Remarks
Min. Plate Height (mm)	50	$b_{fp} = B - 2 * sp$ $= 230.2 - 2 * 21$ $= 185$	Pass
Min. Plate Length (mm)	185	$l_{fp} = [2 * (l_w + 2 * s) + g]$ $= [2 * (2152 * 16) + 10.0]$ $= 500$	Pass
Min. Inner Plate Height (mm)	50	$b_{ifp} = \frac{B - 4 * sp - t_w - 2 * r_1}{2}$ $= \frac{230.2 - 4 * 21 - 13.1 - 2 * 12.7}{2}$ $= 50$	Pass
Max. Inner Plate Height (mm)	$b_{ifp} = \frac{B - 4 * sp - t_w - 2 * r_1}{2}$ $= \frac{230.2 - 4 * 21 - 13.1 - 2 * 12.7}{2}$ $= 50$	50	Pass
Min. Inner Plate Length (mm)	185	$l_{fp} = [2 * (l_w + 2 * s) + g]$ $= [2 * (2152 * 16) + 10.0]$ $= 500$	Pass

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3 3D View

Figure 1: 3D View