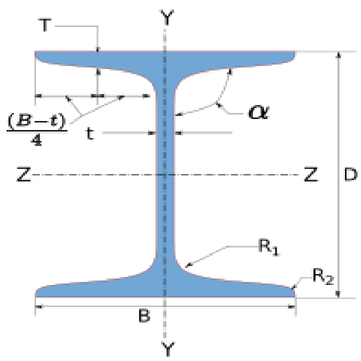
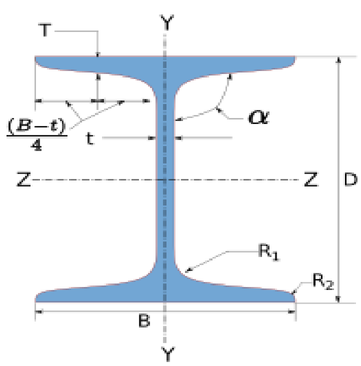
Company Name	LoremIpsum	Project Title	Fossee
Group/Team Name	LoremIpsum	Subtitle	
Designer	LoremIpsum	Job Number	123
Date	29 /04 /2020	Client	LoremIpsum

1 Input Parameters

<table>
<tr><td colspan="3">Module</td><td colspan="2">Fin Plate</td></tr>
<tr><td colspan="3">MainModule</td><td colspan="2">Shear Connection</td></tr>
<tr><td colspan="3">Connectivity</td><td colspan="2">Column flange-Beam web</td></tr>
<tr><td colspan="3">Shear(kN)*</td><td colspan="2">1.0</td></tr>
<tr><td colspan="5">Supporting Section</td></tr>
<tr><td rowspan="14">
</td><td colspan="2">Supporting Section</td><td colspan="2">HB 200</td></tr>
<tr><td colspan="2">Material *</td><td colspan="2">E 250 (Fe 410 W)A</td></tr>
<tr><td colspan="2">Ultimate strength, fu (MPa)</td><td colspan="2">410</td></tr>
<tr><td colspan="2">Yield Strength , fy (MPa)</td><td colspan="2">230</td></tr>
<tr><td>Mass</td><td>37.3</td><td>Iz(cm4)</td><td>36000000.0</td></tr>
<tr><td>Area(cm2) - A</td><td>4750.0</td><td>Iy(cm4)</td><td>9670000.0</td></tr>
<tr><td>D(mm)</td><td>200.0</td><td>rz(cm)</td><td>87.10000000000001</td></tr>
<tr><td>B(mm)</td><td>200.0</td><td>ry(cm)</td><td>45.099999999999994</td></tr>
<tr><td>t(mm)</td><td>6.1</td><td>Zz(cm3)</td><td>361000.0</td></tr>
<tr><td>T(mm)</td><td>9</td><td>Zy(cm3)</td><td>96700.0</td></tr>
<tr><td>FlangeSlope</td><td>94</td><td>Zpz(cm3)</td><td>361000.0</td></tr>
<tr><td>R1(mm)</td><td>9.0</td><td>Zpy(cm3)</td><td>96700.0</td></tr>
<tr><td>R2(mm)</td><td>4.5</td><td></td><td></td></tr>
<tr><td colspan="5">Supported Section</td></tr>
<tr><td rowspan="13">
</td><td colspan="2">Supported Section</td><td colspan="2">JB 225</td></tr>
<tr><td colspan="2">Material *</td><td colspan="2">E 250 (Fe 410 W)A</td></tr>
<tr><td colspan="2">Ultimate strength, fu (MPa)</td><td colspan="2">410</td></tr>
<tr><td colspan="2">Yield Strength , fy (MPa)</td><td colspan="2">230</td></tr>
<tr><td>Mass</td><td>12.8</td><td>Iz(cm4)</td><td>13100000.0</td></tr>
<tr><td>Area(cm2) - A</td><td>1630.0</td><td>Iy(cm4)</td><td>405000.0</td></tr>
<tr><td>D(mm)</td><td>225.0</td><td>rz(cm)</td><td>89.7</td></tr>
<tr><td>B(mm)</td><td>80.0</td><td>ry(cm)</td><td>15.8</td></tr>
<tr><td>t(mm)</td><td>3.7</td><td>Zz(cm3)</td><td>116000.0</td></tr>
<tr><td>T(mm)</td><td>5.0</td><td>Zy(cm3)</td><td>10100.0</td></tr>
<tr><td>FlangeSlope</td><td>91.5</td><td>Zpz(cm3)</td><td>116000.0</td></tr>
<tr><td>R1(mm)</td><td>6.5</td><td>Zpy(cm3)</td><td>10100.0</td></tr>
<tr><td>R2(mm)</td><td>1.5</td><td></td><td></td></tr>
<tr><td colspan="5">Bolt Details</td></tr>
<tr><td colspan="3">Diameter(mm)*</td><td colspan="2">[12.0, 16.0, 20.0, 24.0, 30.0, 36.0]</td></tr>
<tr><td colspan="3">Grade *</td><td colspan="2">[3.6, 4.6, 4.8, 5.6, 5.8, 6.8, 8.8, 9.8, 10.9, 12.9]</td></tr>
<tr><td colspan="3">Type *</td><td colspan="2">Bearing Bolt</td></tr>
<tr><td colspan="3">Bolt hole type</td><td colspan="2">Standard</td></tr>
<tr><td colspan="3">Slip factor (μ_f)</td><td colspan="2">0.3</td></tr>
<tr><td colspan="3">Type of edges</td><td colspan="2">a - Sheared or hand flame cut</td></tr>
</table>

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Gap between beam and support (mm)	10.0
Are the members exposed to corrosive influences	False
Weld Details	
Weld Type	Fillet
Type of weld fabrication	Shop Weld
Material grade overwrite (MPa) Fu	410.0

2 Design Checks

2.1 Bolt Design Checks

Check	Required	Provided	Remarks
Shear Capacity (kN)		$V_{dsb} = \frac{f_u b\ n_n\ A_{nb}}{\sqrt{3}\ \gamma_{mb}}$ $= \frac{410 * 1 * 84.3}{\sqrt{3}\ *\ 1.25}$ $= 11.68$	
Bearing Capacity (kN)		$V_{dpb} = \frac{2.5\ k_b\ d\ t\ f_u}{\gamma_{mb}}$ $= \frac{2.5\ * 0.52 * 12.0 * 3.7 * 410}{1.25}$ $= 11.68$	
Capacity (KN)		$V_{db} = min\ (V_{dsb}, V_{dpb})$ $= min\ (11.68, 11.68)$ $= 11.68$	
No of Bolts	$R_u = \sqrt{V_u^2 + A_u^2}$ $n_{trial} = R_u/V_{bolt}$ $R_u = \frac{\sqrt{1.0^2 + 1.0^2}}{11.68}$ $= 1$	2	
No of Columns		1	
No of Rows		2	
Min. Pitch (mm)	$p/g_{min} = 2.5\ d$ $=2.5 * 12.0 \quad = 30.0$	0.0	N/A
Max. Pitch (mm)	$p/g_{max} = \min(32\ t,\ 300\ mm)$ $= \min(32 *\ 3.7,\ 300\ mm)$ $= 300$	0.0	N/A
Min. Gauge (mm)	$p/g_{min} = 2.5\ d$ $=2.5 * 12.0 \quad = 30.0$	85	Pass
Max. Gauge (mm)	$p/g_{max} = \min(32\ t,\ 300\ mm)$ $= \min(32 *\ 3.7,\ 300\ mm)$ $= 300$	85	Pass
Min. End Distance (mm)	$e/e'_{min} = [1.5\ or\ 1.7] * d_0$ $= 1.7 * 13.0 = 22.1$	25	Pass

Check	Required	Provided	Remarks
Max. End Distance (mm)	$e/e`_{max} = 12\ t\ \varepsilon$   $\varepsilon = \sqrt{\frac{250}{f_y}}$   $e/e`_{max} = 12\ * 4.0 * \sqrt{\frac{250}{230}}$ $= 49.92$	25	Pass
Min. Edge Distance (mm)	$e/e`_{min} = [1.5\ or\ 1.7] * d_0$ $= 1.7 * 13.0 = 22.1$	25	Pass
Max. Edge Distance (mm)	$e/e`_{max} = 12\ t\ \varepsilon$   $\varepsilon = \sqrt{\frac{250}{f_y}}$   $e/e`_{max} = 12\ * 4.0 * \sqrt{\frac{250}{230}}$ $= 49.92$	25	Pass
Capacity (KN)	1039.86	11680.95	Pass

2.2 Plate Design Checks

Check	Required	Provided	Remarks
Min. Plate Height (mm)	$0.6 * d_b = 0.6 * 225.0 = 135.0$	135	Pass
Max. Plate Height (mm)	$d_b - 2(t_{bf} + r_{b1} + gap)$ $= 225.0 - 2 * (5.0 + 6.5 + 10)$ $= 202.0$	135	Pass
Min. Plate Length (mm)	$2 * e_{min} + (n\ c - 1) * p_{min})$ $= 2 * 22.1 + (1 - 1) * 30.0$ $= 54.2$	60.0	Pass
Min.Plate Thickness (mm)	$t_w = 3.7$	4.0	Pass
Shear yielding Capacity (V_dy) (kN)		$V_{dg} = \frac{A_v * f_y}{\sqrt{3} * \gamma_{mo}}$ $= \frac{135 * 4.0 * 230}{\sqrt{3} * 1.1}$ $= 39.11$	
Shear Rupture Capacity (V_dn) (kN)		$V_{dn} = \frac{0.75 * A_{vn} * f_u}{\sqrt{3} * \gamma_{mo}}$ $= 1 * (135 - (2 * 13.0)) * 4.0 * 410$ $= 134.07$	
Block Shear Capacity in Shear (V_db) (kN)		79.79	
Shear Capacity (V_d) (kN)	1.0	$V_d = Min(V_{dy}, V_{dn}, V_{db})$ $= Min(39.11, 134.07, 79.79)$ $= 39.11$	Pass

Check	Required	Provided	Remarks
Tension Yielding Capacity (kN)		$T_{dg} = \frac{l * t * f_y}{\gamma_{mo}}$ $= \frac{60.0 * 4.0 * 230}{\sqrt{3} * 1.1}$ $= 50.18$	
Tension Rupture Capacity(kN)		$T_{dn} = \frac{0.9 * A_n * f_u}{\gamma_{m1}}$ $= \frac{0.9 * (60.0 - 2 * 13.0) * 4.0 * 410}{1.25}$ $= 55.5$	
Block Shear Capacity in Tension (T_db) (kN)		79.79	
Tension Capacity (kN)	1.0	$T_d = Min(T_{dg}, T_{dn}, T_{db})$ $= Min(50.18, 55.5, 79.79)$ $= 50.18$	Pass
Moment Capacity (kNm)	0.04	3.05	Pass
Interaction Ratio	≤ 1	$\frac{0.04}{3.05} + \frac{1.0}{50.18} = 0.03$	Pass

2.3 Weld Checks

Check	Required	Provided	Remarks
Min Weld Size (mm)	$Thickness\ of\ Thicker\ part$ $= Max(9, 9) = 9$ $IS800 : 2007\ cl.10.5.2.3\ Table21,$ $t_{w_{min}} = 3$	3	Pass
Max Weld Size (mm)	$Thickness\ of\ Thinner\ part$ $= Min(9, 9) = 4.0$ $t_{w_{max}} = 4.0$	3	Pass
Weld Strength (kN/mm)	$R_w = \sqrt{(T_{wh} + A_{wh})^2 + (T_{wv} + V_{wv})^2}$ $T_{wh} = \frac{M * y_{max}}{Ipw} = \frac{35000.0 * 64.5}{357781.5}$ $T_{wv} = \frac{M * x_{max}}{Ipw} = \frac{35000.0 * 0.0}{357781.5}$ $V_{wv} = \frac{V}{l_w} = \frac{1000.0}{258}$ $A_{wh} = \frac{A}{l_w} = \frac{1000.0}{258}$ $R_w = \sqrt{(6.31 + 3.88)^2 + (0.0 + 3.88)^2}$ $= 10.9$	$f_w = \frac{t_t * f_u}{\sqrt{3} * \gamma_{mw}}$ $= \frac{3 * 410}{\sqrt{3}} * 1.25$ $= 568.11$	Pass

3 3D View

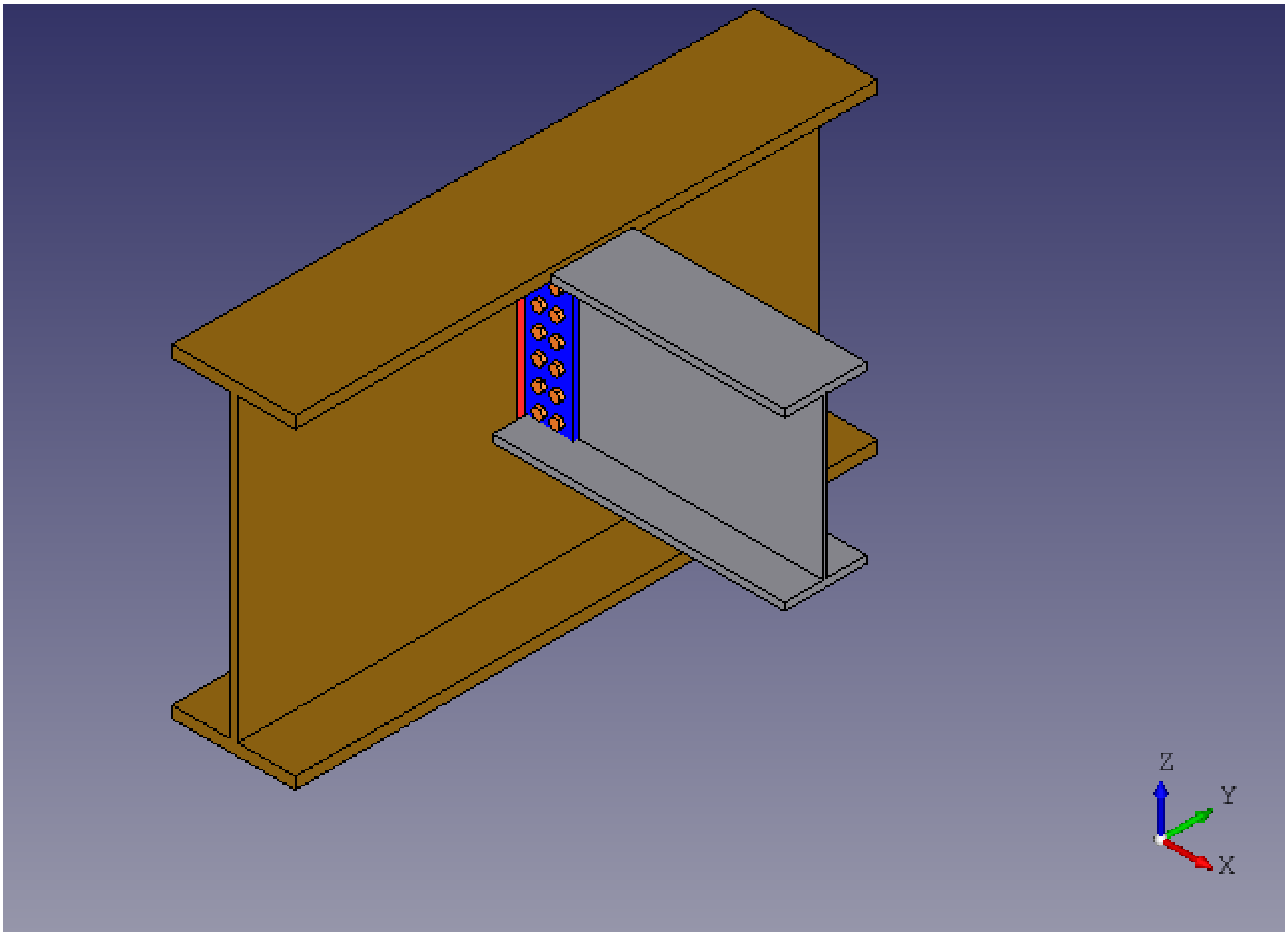

Figure 1: 3D View