

Design Calculation Sheet for ElementId

Designer:

Location:

City:

Country:

Date: 2020-06-22 08:03:21

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- Design For Flexural and shear
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Secondary Beams

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
45	(23.7,10,3)	(23.7,15,3)	5	0.78	0.63
44	(23.7,5,3)	(23.7,10,3)	5	0.78	0.63
43	(23.7,0,3)	(23.7,5,3)	5	0.78	0.63
2	(0,5,3)	(0,10,3)	5	0.89	0.71
3	(0,10,3)	(0,15,3)	5	0.89	0.71
1	(0,0,3)	(0,5,3)	5	0.89	0.71

Design Limit state:

Combo: 1*Dead + 1*Live

Md: 0.89 t.m

Vd: 0.71 ton

Service Limit State

Combo: LIVE

Span: 5 m

Load: -0.13 t/m'

Design Checks

1-Check Local Buckling

$dw/tw = 23.92 < 81.98 \Rightarrow$ Compact Web

$c/tf = 3.95 < 10.91 \Rightarrow$ Compact Flange

2-Check Lateral Torsional Buckling

$Lu_{act} = 0 \text{ m} < Lu_{max} = 94.24 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE270

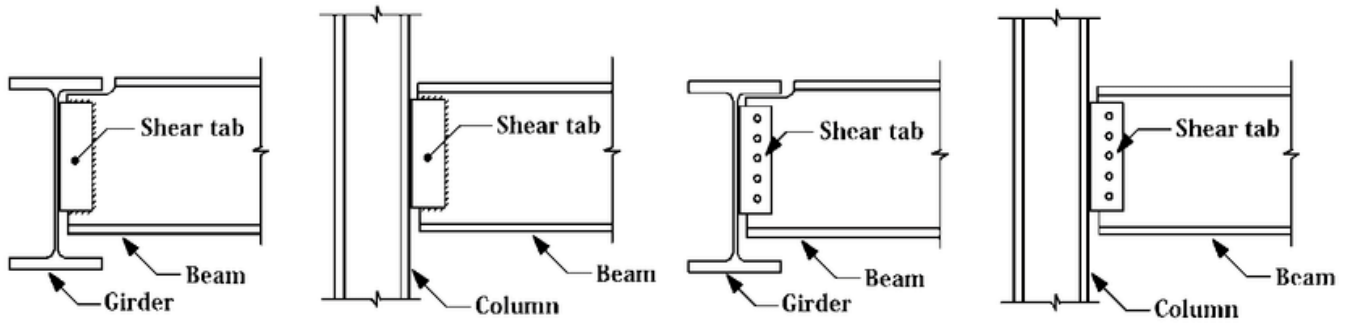
$f_{act} = 1.15 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$q_{act} = 0.11 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$

5-Check Deflection

$d_{act} = 0.93 \text{ cm} < d_{all} = 1.67 \text{ cm}$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

$V_d = 0.71$ ton

$R_{least} = 2.85$ ton

$N = 3$ with Pitch = 63 mm & Full Layout: (31;63 63 31.5)

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$f = 0.05$ t/cm² & $q = 0.03$ t/cm² $\Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.07$ t/cm² $< 1.1 * 0.2F_u = 0.79$ t/cm² \Rightarrow OK

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$q = 0.03$ t/cm² & $q_{mt} = 0.05$ t/cm² $\Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.06$ t/cm² $< 0.2F_u = 0.72$ t/cm² \Rightarrow OK

4-Check Thickness of Plate

$f = (6 * V_d * e) / (t_p * L^2) = 0.06$ t/cm² $< 0.72 * F_y = 1.73$ t/cm² \Rightarrow OK

Plate Layout $\Rightarrow L = 189$ mm & $t_p = 10$ mm & $S_w = 6$ mm

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
39	(21.1,10,3)	(21.1,15,3)	5	1.49	1.19
37	(21.1,0,3)	(21.1,5,3)	5	1.49	1.19
36	(19.8,10,3)	(19.8,15,3)	5	1.49	1.19
35	(19.8,5,3)	(19.8,10,3)	5	1.49	1.19
34	(19.8,0,3)	(19.8,5,3)	5	1.49	1.19
38	(21.1,5,3)	(21.1,10,3)	5	1.49	1.19
40	(22.4,0,3)	(22.4,5,3)	5	1.49	1.19
42	(22.4,10,3)	(22.4,15,3)	5	1.49	1.19
41	(22.4,5,3)	(22.4,10,3)	5	1.49	1.19

6	(1.5,10,3)	(1.5,15,3)	5	1.71	1.37
9	(3,10,3)	(3,15,3)	5	1.71	1.37
8	(3,5,3)	(3,10,3)	5	1.71	1.37
7	(3,0,3)	(3,5,3)	5	1.71	1.37
5	(1.5,5,3)	(1.5,10,3)	5	1.71	1.37
4	(1.5,0,3)	(1.5,5,3)	5	1.71	1.37
31	(18.5,0,3)	(18.5,5,3)	5	1.87	1.5
32	(18.5,5,3)	(18.5,10,3)	5	1.87	1.5
33	(18.5,10,3)	(18.5,15,3)	5	1.87	1.5
10	(4.5,0,3)	(4.5,5,3)	5	1.99	1.59
11	(4.5,5,3)	(4.5,10,3)	5	1.99	1.59
12	(4.5,10,3)	(4.5,15,3)	5	1.99	1.59

Design Limit state:

Combo: 1*Dead + 1*Live

Md: 1.99 t.m

Vd: 1.59 ton

Service Limit State

Combo: LIVE

Span: 5 m

Load: -0.26 t/m'

Design Checks

1-Check Local Buckling

$dw/tw = 27.93 < 81.98 \Rightarrow$ Compact Web

$c/tf = 4.36 < 10.91 \Rightarrow$ Compact Flange

2-Check Lateral Torsional Buckling

$Lu_{act} = 0 \text{ m} < Lu_{max} = 117.48 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE270

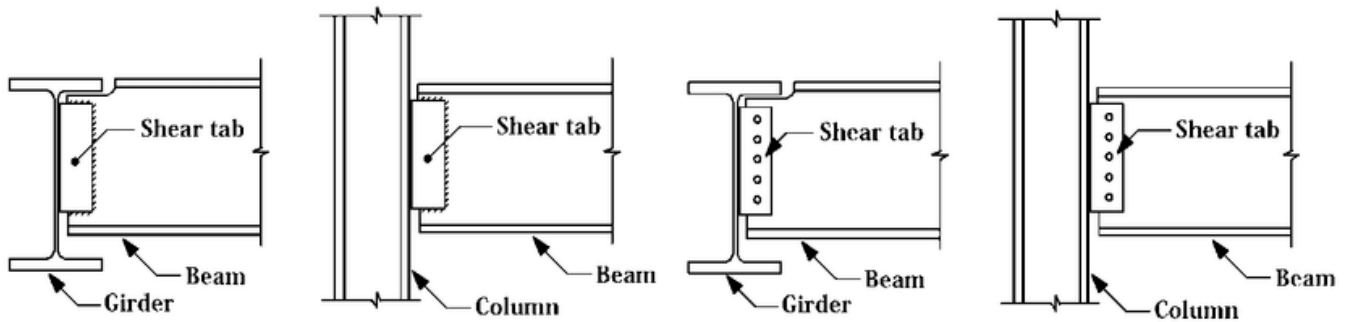
$f_{act} = 1.36 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$$q_{act} = 0.17 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$$

5-Check Deflection

$$\delta_{act} = 0.76 \text{ cm} < \delta_{all} = 1.67 \text{ cm}$$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

$$V_d = 1.59 \text{ ton}$$

$$R_{least} = 2.85 \text{ ton}$$

$$N = 3 \text{ with Pitch} = 63 \text{ mm \& Full Layout: (31;63 63 31.5)}$$

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$$f = 0.11 \text{ t/cm}^2 \text{ \& } q = 0.07 \text{ t/cm}^2 \Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.17 \text{ t/cm}^2 < 1.1 * 0.2F_u = 0.79 \text{ t/cm}^2 \Rightarrow \text{OK}$$

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$$q = 0.07 \text{ t/cm}^2 \text{ \& } q_{mt} = 0.11 \text{ t/cm}^2 \Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.13 \text{ t/cm}^2 < 0.2F_u = 0.72 \text{ t/cm}^2 \Rightarrow \text{OK}$$

4-Check Thickness of Plate

$$f = (6 * V_d * e) / (t_p * L^2) = 0.13 \text{ t/cm}^2 < 0.72 * F_y = 1.73 \text{ t/cm}^2 \Rightarrow \text{OK}$$

$$\text{Plate Layout} \Rightarrow L = 189 \text{ mm \& } t_p = 10 \text{ mm \& } S_w = 6 \text{ mm}$$

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
15	(6.5,10,3)	(6.5,15,3)	5	2.26	1.81
13	(6.5,0,3)	(6.5,5,3)	5	2.26	1.81
14	(6.5,5,3)	(6.5,10,3)	5	2.26	1.81
20	(10.5,5,3)	(10.5,10,3)	5	2.26	1.81
16	(8.5,0,3)	(8.5,5,3)	5	2.26	1.81
17	(8.5,5,3)	(8.5,10,3)	5	2.26	1.81

18	(8.5,10,3)	(8.5,15,3)	5	2.26	1.81
19	(10.5,0,3)	(10.5,5,3)	5	2.26	1.81
21	(10.5,10,3)	(10.5,15,3)	5	2.26	1.81
22	(12.5,0,3)	(12.5,5,3)	5	2.26	1.81
24	(12.5,10,3)	(12.5,15,3)	5	2.26	1.81
25	(14.5,0,3)	(14.5,5,3)	5	2.26	1.81
26	(14.5,5,3)	(14.5,10,3)	5	2.26	1.81
27	(14.5,10,3)	(14.5,15,3)	5	2.26	1.81
28	(16.5,0,3)	(16.5,5,3)	5	2.26	1.81
29	(16.5,5,3)	(16.5,10,3)	5	2.26	1.81
30	(16.5,10,3)	(16.5,15,3)	5	2.26	1.81
23	(12.5,5,3)	(12.5,10,3)	5	2.26	1.81

Design Limit state:

Combo: 1*Dead + 1*Live

Md: 2.26 t.m

Vd: 1.81 ton

Service Limit State

Combo: LIVE

Span: 5 m

Load: -0.4 t/m'

Design Checks

1-Check Local Buckling

$dw/tw = 29.65 < 81.98 \Rightarrow$ Compact Web

$c/tf = 4.56 < 10.91 \Rightarrow$ Compact Flange

2-Check Lateral Torsional Buckling

$Lu_{act} = 0 \text{ m} < Lu_{max} = 129.1 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE270

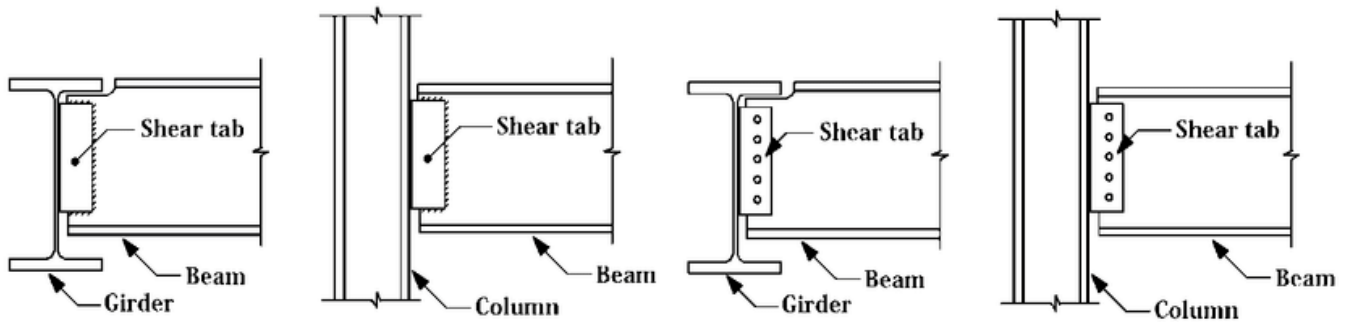
$f_{act} = 1.16 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$$q_{act} = 0.16 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$$

5-Check Deflection

$$\delta_{act} = 0.8 \text{ cm} < \delta_{all} = 1.67 \text{ cm}$$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

$$V_d = 1.81 \text{ ton}$$

$$R_{least} = 2.85 \text{ ton}$$

$$N = 3 \text{ with Pitch} = 63 \text{ mm} \text{ \& Full Layout: (31;63 63 31.5)}$$

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$$f = 0.13 \text{ t/cm}^2 \text{ \& } q = 0.08 \text{ t/cm}^2 \Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.19 \text{ t/cm}^2 < 1.1 * 0.2F_u = 0.79 \text{ t/cm}^2 \Rightarrow \text{OK}$$

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$$q = 0.08 \text{ t/cm}^2 \text{ \& } q_{mt} = 0.13 \text{ t/cm}^2 \Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.15 \text{ t/cm}^2 < 0.2F_u = 0.72 \text{ t/cm}^2 \Rightarrow \text{OK}$$

4-Check Thickness of Plate

$$f = (6 * V_d * e) / (t_p * L^2) = 0.15 \text{ t/cm}^2 < 0.72 * F_y = 1.73 \text{ t/cm}^2 \Rightarrow \text{OK}$$

$$\text{Plate Layout} \Rightarrow L = 189 \text{ mm} \text{ \& } t_p = 10 \text{ mm} \text{ \& } S_w = 6 \text{ mm}$$

Main Beams

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
58	(0,15,3)	(4.5,15,3)	4.5	2.14	1.45
46	(0,0,3)	(4.5,0,3)	4.5	2.14	1.45

Design Limit state:

$$\text{Combo: } 1 * \text{Dead} + 1 * \text{Live}$$

Md: 2.14 t.m

Vd: 1.45 ton

Service Limit State

Combo: LIVE

Span: 4.5 m

Load: -0.33 t/m'

Design Checks

1-Check Local Buckling

$d_w/t_w = 29.65 < 81.98 \Rightarrow$ Compact Web

$c/t_f = 4.56 < 10.91 \Rightarrow$ Compact Flange

2-Check Lateral Torsional Buckling

$L_{uact} = 0 \text{ m} < L_{umax} = 129.1 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE270

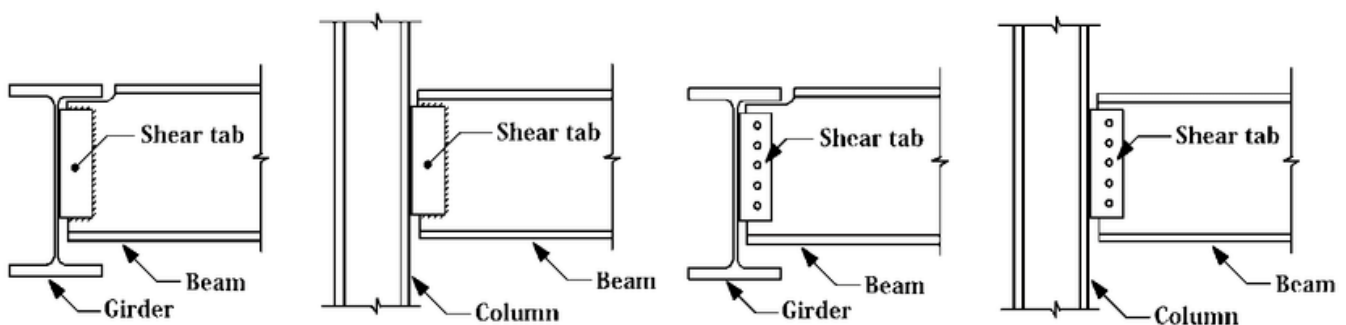
$f_{act} = 1.11 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$q_{act} = 0.13 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$

5-Check Deflection

$d_{act} = 0.44 \text{ cm} < d_{all} = 1.5 \text{ cm}$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

Vd= 1.45 ton

Rleast= 2.85 ton

N= 3 with Pitch= 63 mm & Full Layout: (31;63 63 31.5)

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$f = 0.1 \text{ t/cm}^2$ & $q = 0.07 \text{ t/cm}^2 \Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.15 \text{ t/cm}^2 < 1.1 * 0.2F_u = 0.79 \text{ t/cm}^2 \Rightarrow \text{OK}$

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$q = 0.07 \text{ t/cm}^2$ & $q_{mt} = 0.1 \text{ t/cm}^2 \Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.12 \text{ t/cm}^2 < 0.2F_u = 0.72 \text{ t/cm}^2 \Rightarrow \text{OK}$

4-Check Thickness of Plate

$f = (6 * V_d * e) / (t_p * L^2) = 0.12 \text{ t/cm}^2 < 0.72 * F_y = 1.73 \text{ t/cm}^2 \Rightarrow \text{OK}$

Plate Layout $\Rightarrow L = 189 \text{ mm}$ & $t_p = 10 \text{ mm}$ & $S_w = 6 \text{ mm}$

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
61	(18.5,15,3)	(23.7,15,3)	5.2	3.23	1.88
49	(18.5,0,3)	(23.7,0,3)	5.2	3.23	1.88
59	(4.5,15,3)	(10.5,15,3)	6	3.77	1.91
47	(4.5,0,3)	(10.5,0,3)	6	3.77	1.91
54	(0,10,3)	(4.5,10,3)	4.5	4.2	2.82
50	(0,5,3)	(4.5,5,3)	4.5	4.2	2.82

Design Limit state:

Combo: 1*Dead + 1*Live

Md: 4.2 t.m

Vd: 2.82 ton

Service Limit State

Combo: LIVE

Span: 6 m

Load: -0.33 t/m'

Design Checks

1-Check Local Buckling

$d_w/t_w = 32.39 < 81.98 \Rightarrow \text{Compact Web}$

$c/t_f = 4.81 < 10.91 \Rightarrow \text{Compact Flange}$

2-Check Lateral Torsional Buckling

$L_{uact} = 0 \text{ m} < L_{umax} = 154.92 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE270

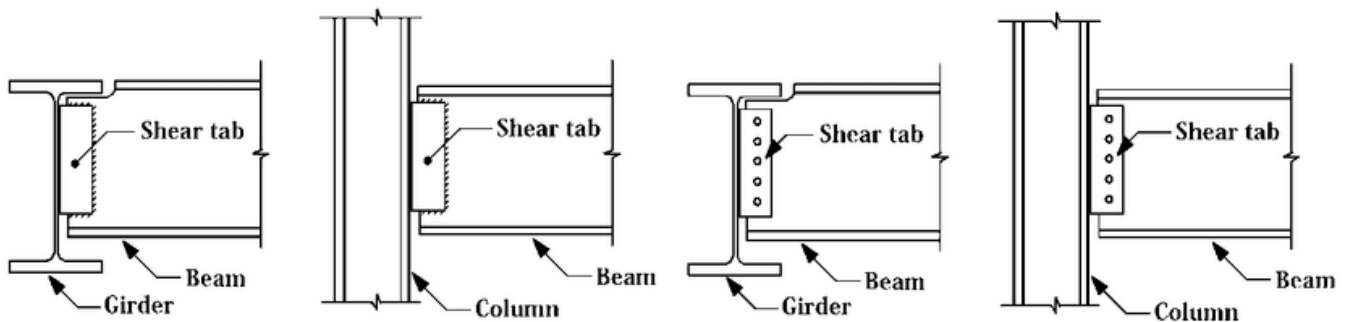
$f_{act} = 1.3 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$q_{act} = 0.19 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$

5-Check Deflection

$d_{act} = 0.69 \text{ cm} < d_{all} = 2 \text{ cm}$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

$V_d = 2.82 \text{ ton}$

$R_{least} = 2.85 \text{ ton}$

$N = 3$ with Pitch = 63 mm & Full Layout: (31;63 63 31.5)

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$f = 0.2 \text{ t/cm}^2$ & $q = 0.13 \text{ t/cm}^2 \Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.3 \text{ t/cm}^2 < 1.1 * 0.2F_u = 0.79 \text{ t/cm}^2 \Rightarrow \text{OK}$

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$q = 0.13 \text{ t/cm}^2$ & $q_{mt} = 0.2 \text{ t/cm}^2 \Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.24 \text{ t/cm}^2 < 0.2F_u = 0.72 \text{ t/cm}^2 \Rightarrow \text{OK}$

4-Check Thickness of Plate

$f = (6 * V_d * e) / (t_p * L^2) = 0.24 \text{ t/cm}^2 < 0.72 * F_y = 1.73 \text{ t/cm}^2 \Rightarrow \text{OK}$

Plate Layout $\Rightarrow L = 189 \text{ mm}$ & $t_p = 10 \text{ mm}$ & $S_w = 6 \text{ mm}$

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
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57	(18.5,10,3)	(23.7,10,3)	5.2	6.33	3.67
53	(18.5,5,3)	(23.7,5,3)	5.2	6.33	3.67
55	(4.5,10,3)	(10.5,10,3)	6	7.39	3.72
51	(4.5,5,3)	(10.5,5,3)	6	7.39	3.72
60	(10.5,15,3)	(18.5,15,3)	8	7.51	2.85
48	(10.5,0,3)	(18.5,0,3)	8	7.51	2.85

Design Limit state:

Combo: 1*Dead + 1*Live

Md: 7.51 t.m

Vd: 2.85 ton

Service Limit State

Combo: LIVE

Span: 8 m

Load: -0.38 t/m'

Design Checks

1-Check Local Buckling

$dw/tw = 36.23 < 81.98 \Rightarrow$ Compact Web

$c/tf = 5.68 < 10.91 \Rightarrow$ Compact Flange

2-Check Lateral Torsional Buckling

$Lu_{act} = 0 \text{ m} < Lu_{max} = 193.65 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE300

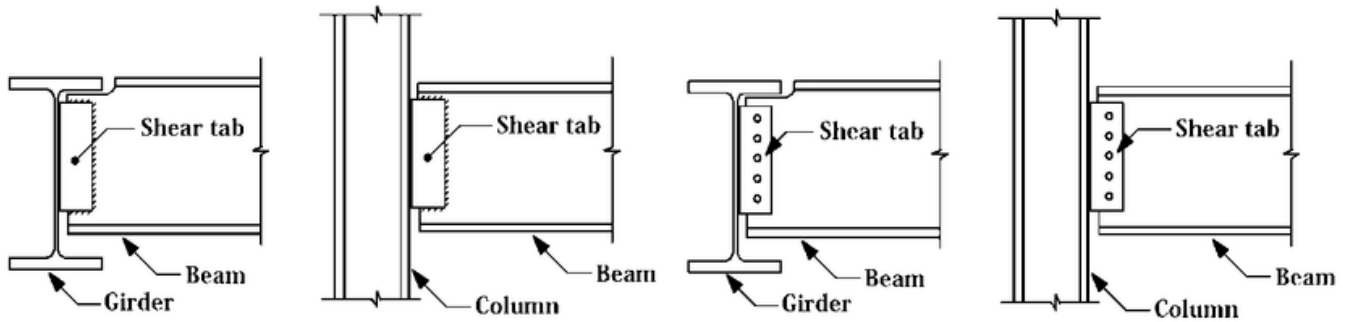
$f_{act} = 1.35 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$q_{act} = 0.13 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$

5-Check Deflection

$d_{act} = 1.14 \text{ cm} < d_{all} = 2.67 \text{ cm}$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

$V_d = 2.85$ ton

$R_{least} = 3.07$ ton

$N = 3$ with Pitch = 70 mm & Full Layout: (35;70 70 35)

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$f = 0.16$ t/cm² & $q = 0.11$ t/cm² $\Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.26$ t/cm² < $1.1 * 0.2F_u = 0.79$ t/cm² \Rightarrow OK

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$q = 0.11$ t/cm² & $q_{mt} = 0.16$ t/cm² $\Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.2$ t/cm² < $0.2F_u = 0.72$ t/cm² \Rightarrow OK

4-Check Thickness of Plate

$f = (6 * V_d * e) / (t_p * L^2) = 0.19$ t/cm² < $0.72 * F_y = 1.73$ t/cm² \Rightarrow OK

Plate Layout $\Rightarrow L = 210$ mm & $t_p = 10$ mm & $S_w = 6$ mm

Beam ID	Start Point	End Point	Span (m)	Mmax (t.m)	Vmax (ton)
56	(10.5,10,3)	(18.5,10,3)	8	14.74	5.56
52	(10.5,5,3)	(18.5,5,3)	8	14.74	5.56

Design Limit state:

Combo: 1*Dead + 1*Live

$M_d = 14.74$ t.m

$V_d = 5.56$ ton

Service Limit State

Combo: LIVE

Span: 8 m

Load: -0.75 t/m'

Design Checks

1-Check Local Buckling

$d_w/t_w = 40.24 < 81.98 \Rightarrow$ Compact Web

$c/t_f = 5.35 < 10.91 \Rightarrow$ Compact Flange

2-Check Lateral Torsional Buckling

$L_{uact} = 0 \text{ m} < L_{umax} = 232.38 \text{ m} \Rightarrow$ Supported (No LTB)

3-Check Bending Stress

Section: IPE400

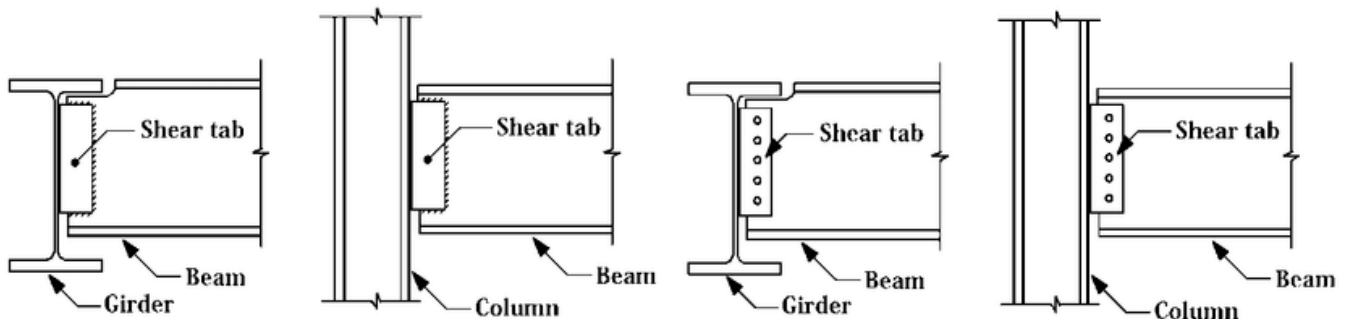
$f_{act} = 1.27 \text{ t/cm}^2 < F_b = 1.54 \text{ t/cm}^2$

4-Check Shear Stress

$q_{act} = 0.16 \text{ t/cm}^2 < q_{all} = 0.84 \text{ t/cm}^2$

5-Check Deflection

$\delta_{act} = 0.82 \text{ cm} < \delta_{all} = 2.67 \text{ cm}$



Group Connection Design (Simple Shear Plate Connection)

1-Bolts Design

Bolts: M20 of Grade 8.8

$V_d = 5.56 \text{ ton}$

$R_{least} = 3.72 \text{ ton}$

$N = 3$ with Pitch = 93 mm & Full Layout: (46;93 93 47.5)

2-Stresses Induced in Fillet Weld Lines at Plane(1-1)

$f = 0.18 \text{ t/cm}^2$ & $q = 0.17 \text{ t/cm}^2 \Rightarrow f_{eq} = (f^2 + 3q^2)^{0.5} = 0.34 \text{ t/cm}^2 < 1.1 * 0.2F_u = 0.79 \text{ t/cm}^2 \Rightarrow \text{OK}$

3-Stresses Induced in Fillet Weld Lines at Plane(2-2)

$q = 0.17 \text{ t/cm}^2$ & $q_{mt} = 0.18 \text{ t/cm}^2 \Rightarrow q_{res} = (q^2 + q_{mt}^2)^{0.5} = 0.24 \text{ t/cm}^2 < 0.2F_u = 0.72 \text{ t/cm}^2 \Rightarrow \text{OK}$

4-Check Thickness of Plate

$f = (6 \cdot V_d \cdot e) / (t_p \cdot L^2) = 0.21 \text{ t/cm}^2 < 0.72 \cdot F_y = 1.73 \text{ t/cm}^2 \Rightarrow \text{OK}$

Plate Layout $\Rightarrow L = 280 \text{ mm}$ & $t_p = 10 \text{ mm}$ & $S_w = 6 \text{ mm}$

Columns

Column ID	Start Point	End Point	Height (m)	Nmax (ton)
69	(10.5,5,0)	(10.5,5,3)	3	-13.02
74	(10.5,10,0)	(10.5,10,3)	3	-13.02
70	(18.5,5,0)	(18.5,5,3)	3	-12.36
75	(18.5,10,0)	(18.5,10,3)	3	-12.36
68	(4.5,5,0)	(4.5,5,3)	3	-9.84
73	(4.5,10,0)	(4.5,10,3)	3	-9.84
64	(10.5,0,0)	(10.5,0,3)	3	-6.7
79	(10.5,15,0)	(10.5,15,3)	3	-6.7
65	(18.5,0,0)	(18.5,0,3)	3	-6.36
80	(18.5,15,0)	(18.5,15,3)	3	-6.36
63	(4.5,0,0)	(4.5,0,3)	3	-5.08
78	(4.5,15,0)	(4.5,15,3)	3	-5.08
71	(23.7,5,0)	(23.7,5,3)	3	-5.05
76	(23.7,10,0)	(23.7,10,3)	3	-5.05
67	(0,5,0)	(0,5,3)	3	-4.37
72	(0,10,0)	(0,10,3)	3	-4.37
81	(23.7,15,0)	(23.7,15,3)	3	-2.64
66	(23.7,0,0)	(23.7,0,3)	3	-2.64
77	(0,15,0)	(0,15,3)	3	-2.29
62	(0,0,0)	(0,0,3)	3	-2.29

Design Limit state:

Combo: 1*Dead + 1*Live

Nd: -13.02 ton

1-Check Local Buckling

$dw/tw = 36.23 < 37.44 \Rightarrow$ Compact Web

$c/tf = 5.68 < 10.91 \Rightarrow$ Compact Flange

2-Check Normal Stress

Section: IPE300

$\lambda = 89.55 < 100$

$f_c = 0.24 \text{ t/cm}^2 < F_c = 0.88 \text{ t/cm}^2$
