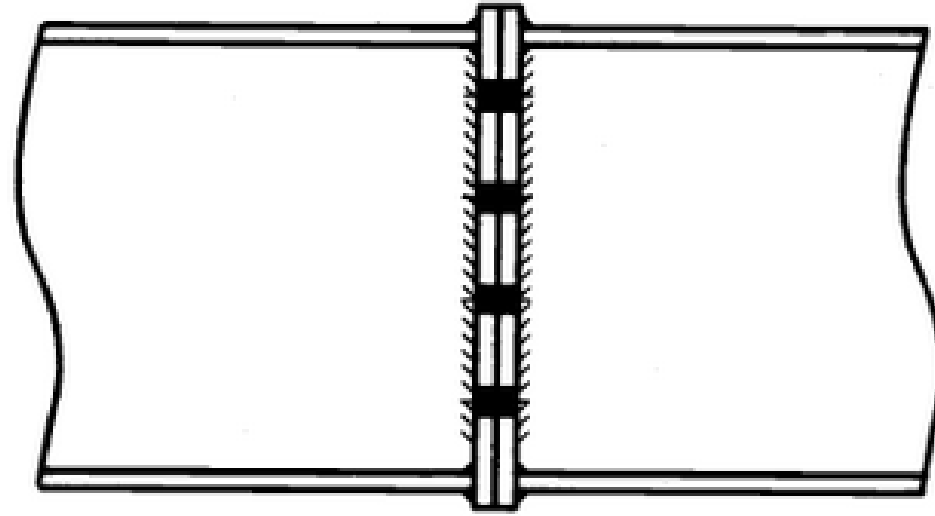


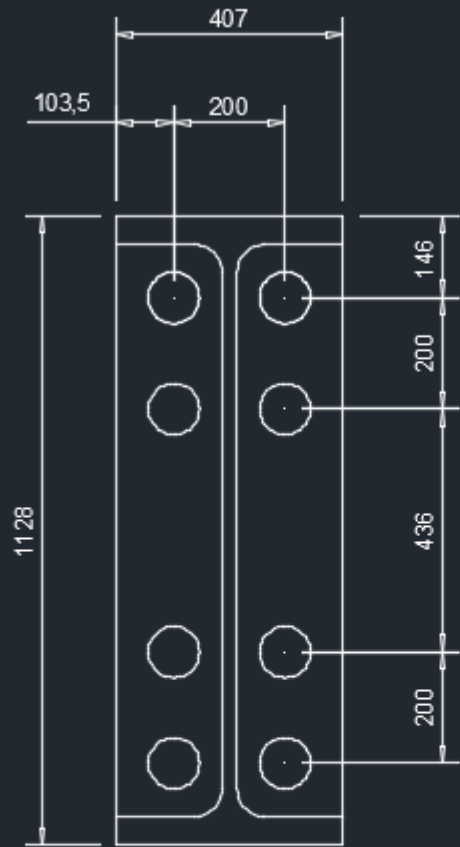
Neutrino splices



Flush - beam

Beam : HL 1100*548
end plate as thick as flange
(50mm)

Calculations with two bolt sizes (M48 and M36) are provided



HL 1100*548

M48

tp=50 mm (as tf)

• Connection capacity

Moment resistance

$$M_{j.Rd} = (4.116 \cdot 10^3) \text{ kN} \cdot \text{m}$$

Shear resistance

$$V_{j.Rd} = (1.347 \cdot 10^3) \text{ kN}$$

Initial rotation stiffness

$$S_{j.ini} = 4739843.367 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Idealized rotation stiffness (for design)

$$S_j = 2369921.683 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Minimum rigidity for rigid joint

$$S_{j.rigid} = 2023938.746 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

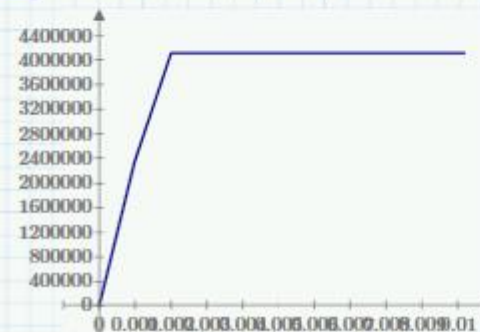
maximum rigidity for pinned joint

$$S_{j.pinned} = 126496.172 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Joint classification

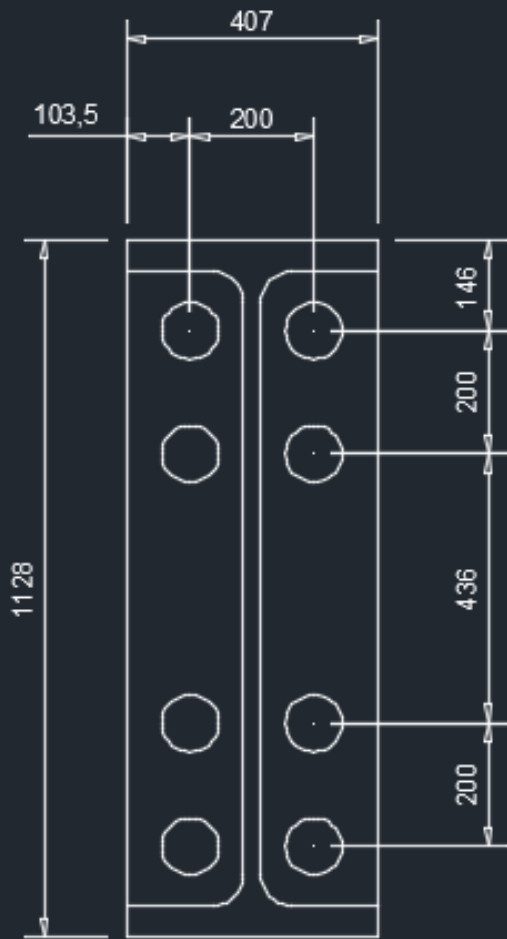
$$Joint_{classification} := \begin{cases} \text{if } S_j \leq S_{j.pinned} & \text{= "Rigid"} \\ \text{"Pinned"} \\ \text{else if } S_j \geq S_{j.rigid} & \text{"Rigid"} \\ \text{else} & \text{"Semi-rigid"} \end{cases}$$

$M(\phi)$ (J)



ϕ (rad)

Note: When $2/3 \cdot M_{j.Rd} > M_{j.Ed}$, $S_{j.ini}$ can be used in the assessment



HL 1100*548

M36

tp=50 mm (as tf)

• Connection capacity

Moment resistance

$$M_{j.Rd} = (2.282 \cdot 10^3) \text{ kN} \cdot \text{m}$$

Shear resistance

$$V_{j.Rd} = 746.725 \text{ kN}$$

Initial rotation stiffness

$$S_{j.ini} = 3027918.438 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Idealized rotation stiffness (for design)

$$S_j = 1513959.219 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Minimum rigidity for rigid joint

$$S_{j.rigid} = 2023938.746 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

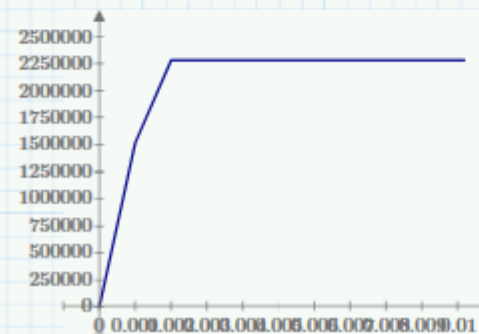
maximum rigidity for pinned joint

$$S_{j.pinned} = 126496.172 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Joint classification

$$Joint_{classification} := \begin{cases} \text{if } S_{j.ini} \leq S_{j.pinned} & = \text{“Rigid”} \\ \text{“Pinned”} \\ \text{else if } S_{j.ini} \geq S_{j.rigid} & \\ \text{“Rigid”} \\ \text{else} & \\ \text{“Semi-rigid”} \end{cases}$$

M(φ) (J)

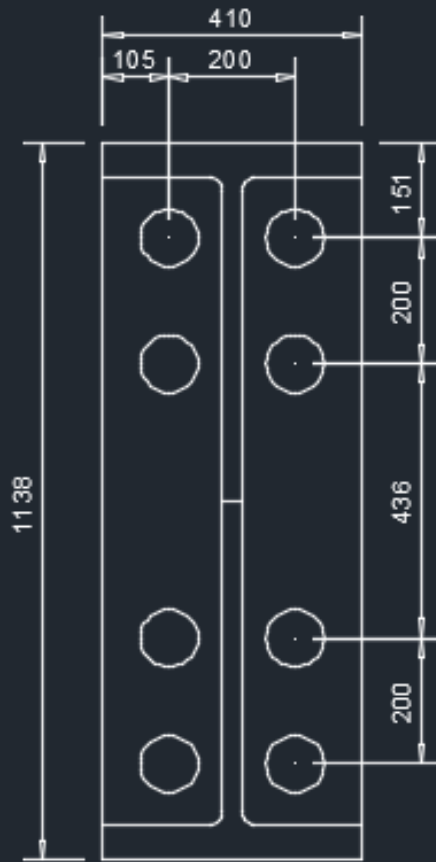


φ (rad)

Note: When $2/3 \cdot M_{j.Rd} > M_{j.Ed}$, $S_{j.ini}$ can be used in the assessment

Beam : HL 1100*607
end plate (50mm)

Calculations with two bolt sizes (M48 and M36) are provided



HL 1100*607

M48

tp=50 mm

- Connection capacity

Moment resistance

$$M_{j.Rd} = (4.135 \cdot 10^3) \text{ kN} \cdot \text{m}$$

Shear resistance

$$V_{j.Rd} = (1.347 \cdot 10^3) \text{ kN}$$

Initial rotation stiffness

$$S_{j.ini} = 4859011.903 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Idealized rotation stiffness (for design)

$$S_j = 2429505.952 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Minimum rigidity for rigid joint

$$S_{j.rigid} = 2258383.033 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

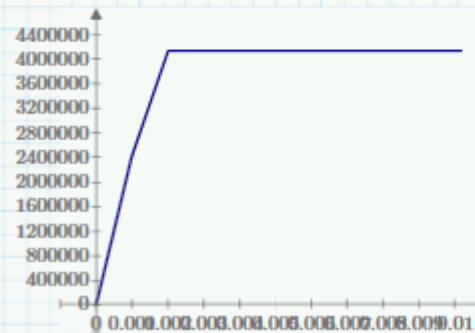
maximum rigidity for pinned joint

$$S_{j.pinned} = 141148.94 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Joint classification

$$Joint_{classification} := \begin{cases} \text{if } S_{j.ini} \leq S_{j.pinned} & = \text{"Rigid"} \\ \text{"Pinned"} \\ \text{else if } S_{j.ini} \geq S_{j.rigid} & \\ \text{"Rigid"} \\ \text{else} & \\ \text{"Semi-rigid"} \end{cases}$$

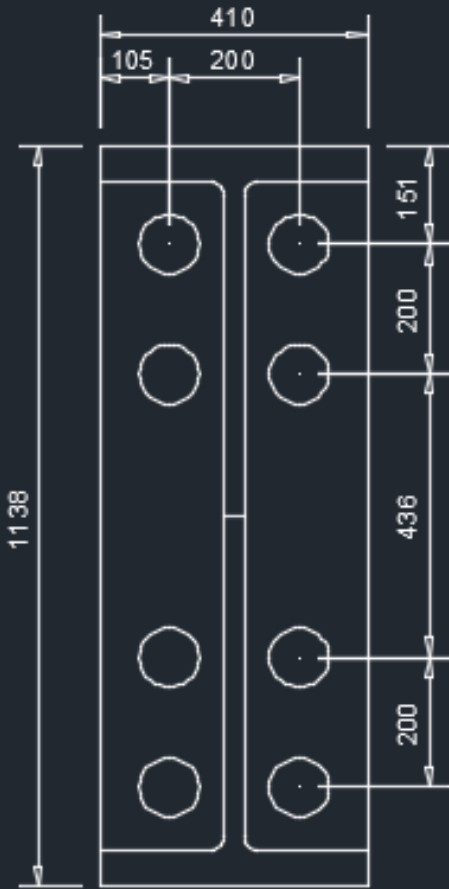
$M(\phi)$ (J)



ϕ (rad)

Note: When $2/3 \cdot M_{j.Rd} > M_{j.Ed}$, $S_{j.ini}$ can be used in the assessment





HL 1100*607
M36
tp=50 mm

- Connection capacity

Moment resistance

$$M_{j.Rd} = (2.293 \cdot 10^3) \text{ kN} \cdot \text{m}$$

Shear resistance

$$V_{j.Rd} = 746.725 \text{ kN}$$

Initial rotation stiffness

$$S_{j.ini} = 3083688.906 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Idealized rotation stiffness (for design)

$$S_j = 1541844.453 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Minimum rigidity for rigid joint

$$S_{j.rigid} = 2258383.033 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

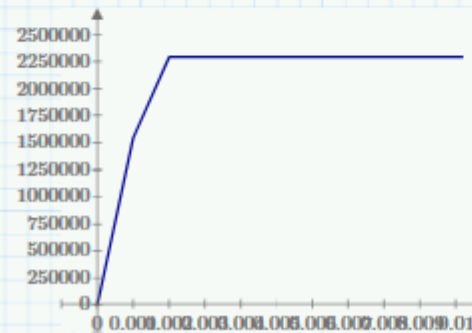
maximum rigidity for pinned joint

$$S_{j.pinned} = 141148.94 \text{ kN} \cdot \frac{\text{m}}{\text{rad}}$$

Joint classification

$$Joint_{classification} := \begin{cases} \text{if } S_{j.ini} \leq S_{j.pinned} & \text{= "Rigid"} \\ \text{"Pinned"} \\ \text{else if } S_{j.ini} \geq S_{j.rigid} & \text{"Rigid"} \\ \text{else} \\ \text{"Semi-rigid"} \end{cases}$$

$M(\phi)$ (J)



ϕ (rad)

Note: When $2/3 \cdot M_{j.Rd} > M_{j.Ed}$, $S_{j.ini}$ can be used in the assessment