

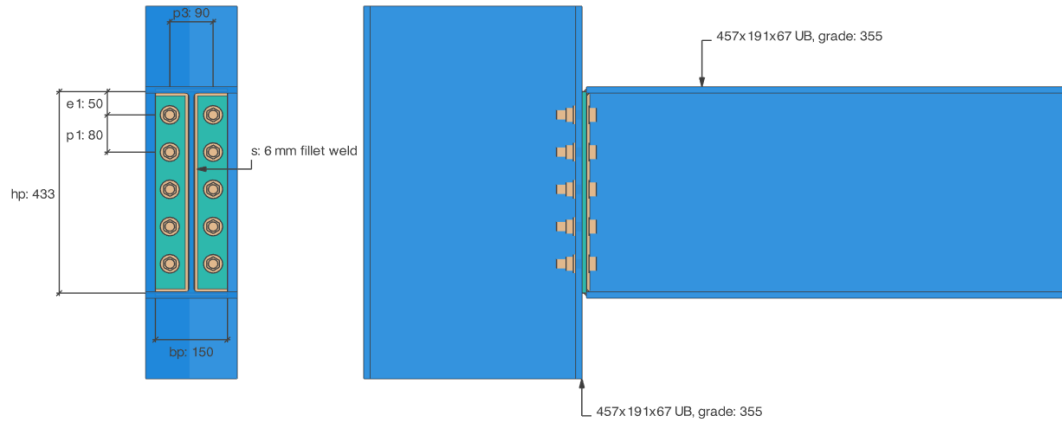


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Computer and Design Services Ltd, Arrowsmith Court, 10 Station Approach, Broadstone, Dorset, BH18 8AX, Tel: +44 (0)1202 603031, Email: support@cad.s.co.uk

Beam-to-column end plate simple connection check

In accordance with EN 1993-1-8:2005 and SCI P358: Joints in simple construction.



Connection

Description	Value
Column connection location	Flange
Design shear force, V_{Ed}	100.00 kN

Supporting column

Description	Value
Section	457x191x67 UB
Overall depth, h_{b2}	453.4 mm
Width of flange, b_{b2}	189.9 mm
Thickness of flange, $t_{f,b2}$	12.7 mm
Thickness of web, $t_{w,b2}$	8.5 mm
Root radius, r_{b2}	10.2 mm
Grade of steel	S 355
Yield strength, f_{yb2}	355.0 N/mm ²
Ultimate strength, f_{ub2}	470.0 N/mm ²

Supported beam

Description	Value
Section	457x191x67 UB
Overall depth, h_{b1}	453.4 mm
Width of flange, b_{b1}	189.9 mm
Thickness of flange, $t_{f,b1}$	12.7 mm
Thickness of web, $t_{w,b1}$	8.5 mm
Root radius, r_{b1}	10.2 mm
Grade of steel	S 355
Yield strength, f_{yb1}	355.0 N/mm ²
Ultimate strength, f_{ub1}	470.0 N/mm ²



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End plate details

Description	Value
Plate type	Full depth end plate
Plate height, h_p	433.4 mm
Plate width, b_p	150.0 mm
Plate thickness, t_p	10.0 mm
End plate top projection, w_t	-10.0 mm
End plate bottom projection, w_b	-10.0 mm
Grade of steel	S 275
Yield strength, f_{yp}	275.0 N/mm ²
Ultimate strength, f_{up}	410.0 N/mm ²
Weld leg length, s	6.0 mm

Bolt details

Description	Value
Diameter of bolt, d	20.0 mm
Diameter of bolt hole, d_0	22.0 mm
Number of bolt rows, n_1	5
Vertical spacing of bolts, p_1	80.0 mm
Horizontal spacing of bolts, p_3	90.0 mm
Grade of bolt, Gr_{bo}	8.8
Ultimate strength, f_{ub}	800.0 N/mm ²
Distance from top of end plate to first bolt row, e_{1t}	50.0 mm

Detailing dimensions

Description	Value
Distance from bottom of end plate to last bolt row, e_{1b}	63.4 mm
Distance from edge of the end plate to the bolt row, e_2	30.0 mm
Distance from top beam flange to first bolt row, e_{3t}	41.3 mm
Distance from bottom beam flange to last bolt row, e_{3b}	60.7 mm
Distance from beam web to bolt column, e_4	40.8 mm
Horizontal distance from bolt to the edge of column flange, e_{6l}	50.0 mm
Horizontal distance from bolt to the edge of column flange, e_{6r}	50.0 mm
Spanner/wrench clearance, c	32.0 mm

Partial safety factors

Description	Value
PSF for resistance of cross-section, γ_{M0}	1.00
PSF for resistance of weld, $\gamma_{M2,w}$	1.25
PSF for resistance of bolts, $\gamma_{M2,b}$	1.25
PSF for resistance of cross section to fracture, $\gamma_{M2,f}$	1.10

Detailing and geometry requirements

(Check 1 of section 4.7: SCI P358 and EC3: warnings and errors)

i The connection passes all SCI detailing recommendations given in SCI P358.



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i [The connection passes fixing dimension requirements based on spanner clearance c.](#)

Result summary

Check	Value	Limit	Utilisation	Result
Weld shear resistance check	100.000 kN	808.982 kN	0.124	✓ Pass
Supported beam shear resistance check	100.000 kN	839.015 kN	0.119	✓ Pass
Resistance of bolt group check	100.000 kN	752.640 kN	0.133	✓ Pass
Shear resistance check	100.000 kN	2224.368 kN	0.045	✓ Pass
Critical component resistance check	100.000 kN	752.640 kN	0.133	✓ Pass



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Appendix 1: Explanation of geometry variables used in calculations

