

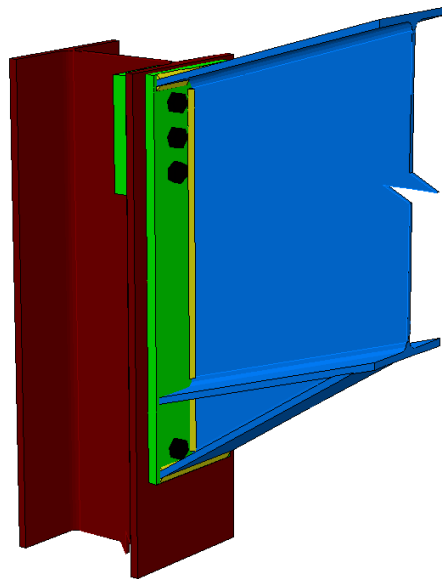


BEAM COLUMN

STEEL BEAM TO COLUMN MOMENT CONNECTIONS
DESIGN | DETAILING | S12

Summary

Beam Column is used to design the moment connection between a steel column and beam. The module considers vertical shear, axial compression or tension, and in-plane moment. It facilitates the design of bolted or welded connections and can include a beam haunch.



What makes this module special?

- Optimise beam-column connections
- Detailed calculations
- View the connections in 3D or 2D and save the pictures as CAD drawings

Detailed Description

Beam Column supports all I and H-sections (universal columns and beams) available in the **Section Database**. The module includes an optimisation function which assists you in determining a suitable layout, e.g., end plate and stiffener size and thickness, bolt/weld sizes and spacing. The design table lists all the variable dimensions and parameters of the connection. A value for any property in the table can be calculated using the optimise function. Values for any individual property can also be fixed selectively to suit the user's preferences.



BEAM COLUMN

STEEL BEAM TO COLUMN MOMENT CONNECTIONS
DESIGN | DETAILING | S12

Detailed Equations are included within a Calcsheet, where all relevant design checks can be reviewed.

End Plate	Width	(mm)	Optimise
	Extent Above Beam Flange	(mm)	N/A
	Extent Below Haunch	(mm)	N/A
	Thickness	(mm)	Optimise
Column Stiffeners	Stiffeners		N/A
	Width	(mm)	Optimise
	Top Stiffener Thickness	(mm)	Optimise
	Bottom Stiffener Thickness	(mm)	Optimise
	Shear Stiffener Thickness	(mm)	Optimise
Web Plates	Shear Stiffener Orientation		Optimise
	Layout		Optimise
Top Backing Plate	Thickness	(mm)	Optimise
Bottom Backing Plate	Thickness	(mm)	Optimise
Bolts	Diameter	(mm)	Optimise
	Above Top Flange		N/A
	Below Top Flange		Optimise
	Above Haunch		Optimise
Rows of Bolts	Below Haunch		N/A
	Row Spacing	(mm)	Optimise
	Web	(mm)	Optimise
Bolt Offsets	Flange	(mm)	Optimise
	Above Haunch	(mm)	Optimise
	Beam & Haunch Flanges		Optimise
Welds	Beam Web	(mm)	Optimise
	Top Stiffener	(mm)	Optimise
	Bottom Stiffener	(mm)	Optimise
	Shear Stiffener	(mm)	Optimise

Check 1 : Capacity of the Beam Flange Welds

The worst load is encountered for Load Case : D+L
when $F_{max} = 223.119 \text{ kN}$

The Capacity of the weld is the lesser of :

$$V_r = \frac{0.67 \cdot \phi_w \cdot A_w \cdot f_{uw}}{1000}$$

$$= \frac{0.67 \times 0.67 \times 1\,014.399 \times 480}{1000}$$

$$= 218.575 \text{ kN}$$

$$V_r = \frac{0.67 \cdot \phi \cdot A_m \cdot f_y}{1000}$$

$$= \frac{0.67 \times 0.9 \times 1\,541.4 \times 300}{1000}$$

$$= 278.839 \text{ kN}$$

Beam Flange Weld failure

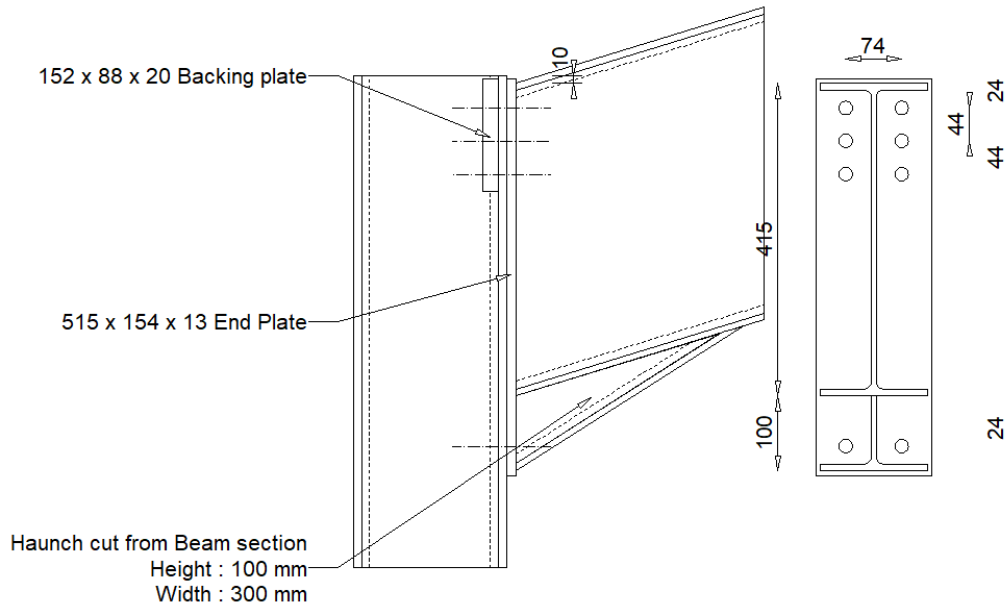
Workflow

Beam Column can be used as stand-alone module, but the strength lies with the ability to use the design links in **Sumo** and import the necessary information. A drawing of the final design can be saved in either a **Padds** or a DXF format for final fabrication drawings.



BEAM COLUMN

STEEL BEAM TO COLUMN MOMENT CONNECTIONS
DESIGN | DETAILING | S12



All welds are Both Sides unless otherwise indicated
All bolts are of Grade 8.8
All bolt diameters are 16 mm

Supported Design Codes

Design Codes

- AISC - 1999 LRFD
- AISC 360 - 16 LRFD
- BS 5950 - 1990
- BS 5950 - 2000
- CAN/CSA-S16.1-94
- Eurocode 3 - 2005
- SABS 0162 - 1984
- SABS 0162 - 1993
- SANS 10162 - 2005
- SANS 10162-1:2011