Project	Project number
76a Earlsfield Road London SW18 3DN	002058

Calcs for	Date
Rear Elevation, Folding Patio Doors	11 Sep 2020

Steel Beam Calculation

www.PlanningApplications.com

Beam details

203 x 203 x 46 UC S275

Beam effective span length: **2.85 metres**
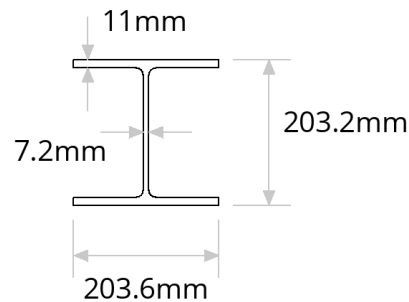
Width: **203.6 mm**
Depth: **203.2 mm**
Web: **7.2 mm**
Flange: **11 mm**
Radius: **10.2 mm**
Mass per metre: **46.1 kg/m**

Safety factors, restraints & deflection limits

Permanent load safety factor: **1.35**
Variable load safety factor: **1.5**

Beam is fully restrained along its length: **No**
Length between lateral restraints: **2.85 metres**

Variable load deflection limit: **Span/360 = 7.92 mm**
Total load deflection limit: **Span/200 = 14.25 mm**

Load details

UDL 1: 225mm Brickwork + Plaster or render on BOTH sides
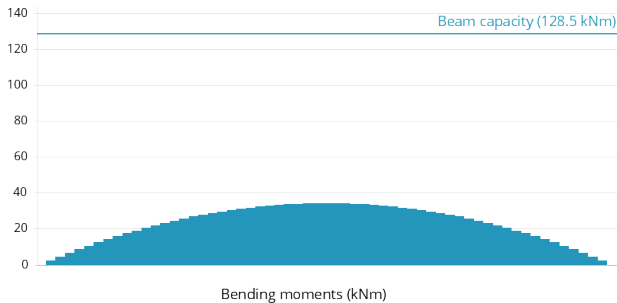
Permanent (dead) load per square metre: **4.9 kN/m²**

Variable (live) load per square metre: **0 kN/m²**

Width of load perpendicular to beam, or height of load supported by beam: **5 metres**
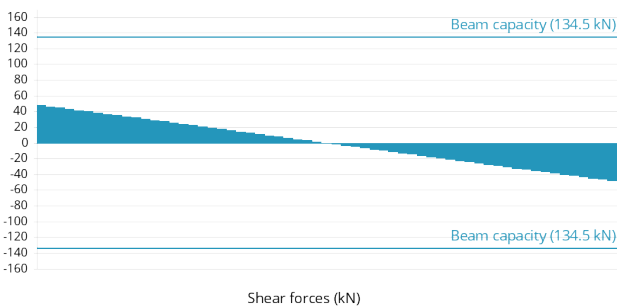
Calculations

Bending moments (kNm)

Bending moments

Mc,y = 137kNm > 34.2kNm, <mark>Therefore OK</mark>

Mc,y value from Tata Steel 'blue book' to BS EN 1993-1-1

Mb = 128.5kNm > 34.2kNm, <mark>Therefore OK</mark>

Mb value INTERPOLATED from Tata Steel 'Blue Book' to BS EN 1993-1-1
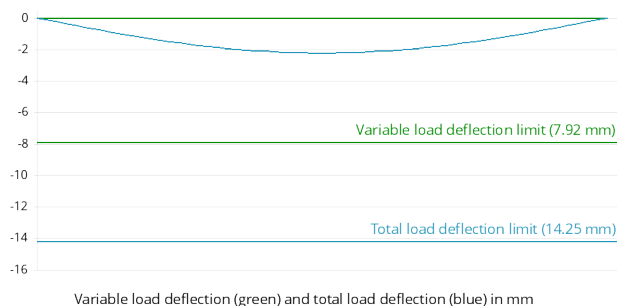
C1 value conservatively taken as 1.0

Shear forces (kN)

Shear forces

Shear capacity Vc = 269kN x 0.5 = 134.5kN > 48kN, <mark>Therefore OK</mark>

Shear Capacity, Vc from Tata Steel 'Blue Book' to BS EN 1993 -1-1

Reduction of moment resistance by high coincident shear force has been avoided by checking that the shear force is no more than 50% of the shear resistance

Variable load deflection (green) and total load deflection (blue) in mm

Deflection

Variable load deflection = 0mm < 7.92mm, <mark>Therefore OK</mark>

Total load deflection = 2.23mm < 14.25mm, <mark>Therefore OK</mark>

Notes

Mc,y value from Tata Steel 'Blue Book' to BS EN 1993-1-1

Mb value interpolated from Tata Steel 'Blue Book' to BS EN 1993-1-1

C1 value conservatively taken as 1.0

Shear Capacity, Vc from Tata Steel 'Blue Book' to BS EN 1993-1-1

Reduction of moment resistance by high coincident shear force has been avoided by checking that the shear force is not more than 50% of the shear resistance

Ends of beam are to be laterally restrained. Ends of beams can be laterally restrained using one of the following methods;

1) End of beam built into masonry wall.
2) End of beam fixed to a masonry wall.
3) End of beam fixed to a column or a beam.

The designer is to ensure that the proposed detail adequately ensures that the end of the beam is laterally restrained.

No allowance has been made for destabilising loads which are outside the scope of these calculations (Destabilising loads would not normally occur in a traditional masonry structure)

<mark>Span 2700mm, 150mm support each end, total length 3000mm subject to builder measuring on site.</mark>