

Project No	Example	Sht. No.	7 of 16
Site Address	Example		
Subject	Extension and alteration works – Supporting Calculations		
Engineer	Peter V	Date:	

Maximum reaction at support A;

$$R_{A_max} = 15 \text{ kN};$$

$$R_{A_min} = 15 \text{ kN}$$

Unfactored dead load reaction at support A;

$$R_{A_Dead} = 8.6 \text{ kN}$$

Unfactored imposed load reaction at support A;

$$R_{A_Imposed} = 1.8 \text{ kN}$$

Maximum reaction at support B;

$$R_{B_max} = 15 \text{ kN};$$

$$R_{B_min} = 15 \text{ kN}$$

Unfactored dead load reaction at support B;

$$R_{B_Dead} = 8.6 \text{ kN}$$

Unfactored imposed load reaction at support B;

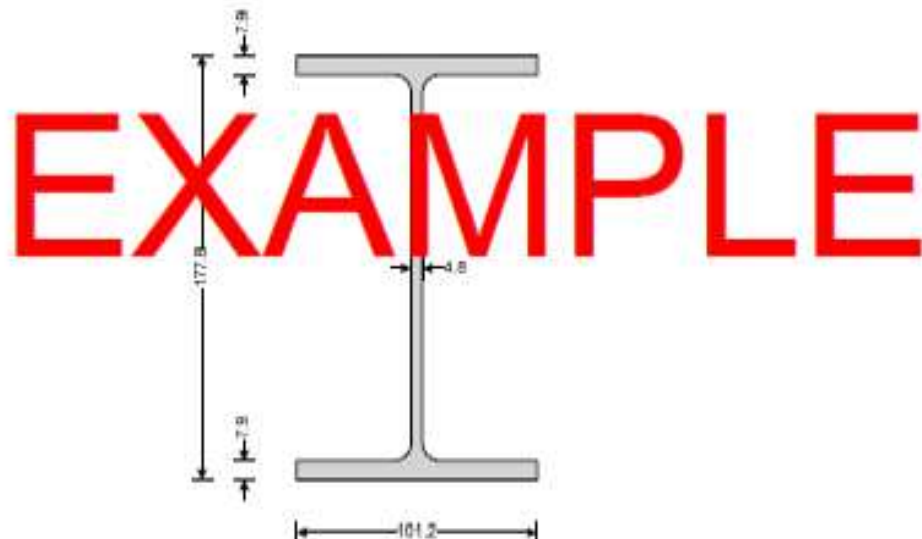
$$R_{B_Imposed} = 1.8 \text{ kN}$$

Section details

Section type;

UKB 178x102x19 (Corus Advance);

Steel grade: S275



Classification of cross sections - Section 3.5

Tensile strain coefficient; $\epsilon = 1.00$;

Section classification;

Plastic

Shear capacity - Section 4.2.3

Design shear force; $F_v = 15 \text{ kN}$;

Design shear resistance;

$$P_v = 140.8 \text{ kN}$$

PASS - Design shear resistance exceeds design shear force

Moment capacity - Section 4.2.5

Design bending moment; $M = 9 \text{ kNm}$;

Moment capacity low shear;

$$M_c = 47.1 \text{ kNm}$$

Buckling resistance moment - Section 4.3.6.4

Buckling resistance moment; $M_b = 23.5 \text{ kNm}$;

$$M_b / m_{LT} = 25.4 \text{ kNm}$$

PASS - Buckling resistance moment exceeds design bending moment

Check vertical deflection - Section 2.5.2

Consider deflection due to dead and imposed loads

Limiting deflection $\delta_{lim} = 4.8 \text{ mm}$;

Maximum deflection;

$$\delta = 1.353 \text{ mm}$$

PASS - Maximum deflection does not exceed deflection limit

NOTE: For Building Regulations Submission only, not for ordering materials. Principal Contractor is responsible for taking measurements on site, preparing construction drawings and safely erecting the proposed structural works. Team Design is not responsible for site supervision.