

Moment at the face of the column (ANSI/AISC 358-10, 6.10)

Step 1. Determine the moment at the face of the column, M_f .

$$M_f : \underline{643.49} \text{ kN}\cdot\text{m}$$

where:

M_{pr} : Probable maximum moment at plastic hinge.

$$M_{pr} : \underline{588.22} \text{ kN}\cdot\text{m}$$

where:

C_{pr} : Factor to account for the peak connection strength, including strain hardening, local restraint, additional reinforcement, and other connection conditions.

$$C_{pr} : \underline{1.20}$$

F_y : Specified minimum yield stress.

$$F_y : \underline{250.00} \text{ MPa}$$

F_u : Specified minimum tensile strength.

$$F_u : \underline{400.00} \text{ MPa}$$

R_y : Ratio of the expected yield stress to the specified minimum yield stress.

$$R_y : \underline{1.50}$$

Z_e : Effective plastic section modulus of the section (or connection) at the location of the plastic hinge.

$$Z_e : \underline{1307148} \text{ mm}^3$$

V_u : Shear force at end of beam.

$$V_u : \underline{276.36} \text{ kN}$$

where:

L_h : Distance between plastic hinge locations.

$$L_h : \underline{4600} \text{ mm}$$

$V_{gravity}$: Factored beam shear force due to gravity loads.

$$V_{gravity} : \underline{20.62} \text{ kN}$$

S_h : Distance from face of column to plastic hinge.

$$S_h : \underline{200} \text{ mm}$$

= the lesser of $d/2$ or $3b_{bf}$ for an unstiffened connection (4E)

b_{bf} : Width of beam flange.

$$b_{bf} : \underline{180} \text{ mm}$$

d : Depth of connecting beam.

$$d : \underline{400} \text{ mm}$$

