

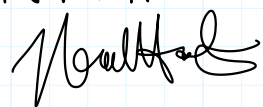
CIVE 3205

Structural Steel Components

Example BC20

Eccentrically-Loaded Column (2)

March 27, 2020

N.M. Holtz

Mar 27, 2020

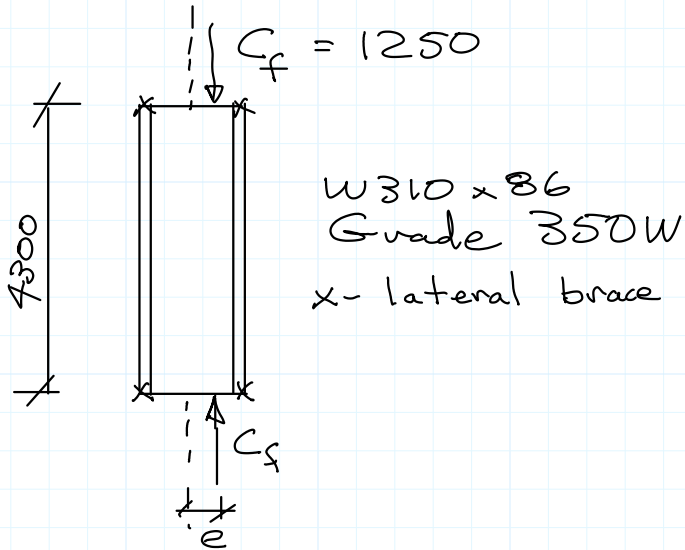
Revisions:

- Mar 27/20 - initial posting.

Beam Column Example BC20

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2/2



$$C_f = 1250 \text{ kN}$$

$$M_{f_x} = 1250 e$$

As per Example BC10, except:

Find max. value of e

- braced frame
- compr. flange laterally supported only at ends.
- pinned both ends, both directions
- sway effects included in analysis.

From example BC10:

a) x-sect strength: $0.689 \leq 1.0$

b) overall strength: $0.716 \leq 1.0$

c) L.T.B. strength: $0.886 \leq 1.0$

c) has the least "spare" capacity
and U_{ix} is the same for all 3 cases:

$$\frac{1250}{2278} + \frac{0.85 \times 1.06 \times 1250 e}{434.7} \leq 1.0$$

$$0.549 + 2.591 e \leq 1.0$$

$$e \leq 0.174$$

$$\underline{\underline{e_{max} = 174 \text{ mm}}}$$