Revisions and Errata List
AISC Steel Design Guide 31, 1st Printing (Printed and Digital Editions)
February 16, 2023

The following list represents corrections to the first printing of AISC Design Guide 31, *Castellated and Cellular Beam Design.*

Page(s)	Item
8	In Section 2.3, first sentence, revise Section 3.3 to Section 3.4.
18	Revise Equation 3-12 to: $$T_o = M_r \left[\frac{1 - \frac{(q)(X_i)}{T_1}}{d_{effec\text{-}noncomp}} \right]$$
19	In Section 3.4, second paragraph, third sentence, revise the end of the sentence as follows: "…a function of $2h/e$; the value of $2h/e$ need not be taken as less than 2."
20	Revise Equation 3-19 to: $$V_{rh} = \left| \frac{M_{r(i+1)} - M_{r(i)}}{d_{effect\text{-}noncomp}} \right| = \left| T_{r(i)} - T_{r(i+1)} \right|$$
27	The value of y_o in Table 4-1 should be $y_o = 0.568$ in.
32-33	The flexural torsional buckling check is revised as follows:

$$\bar{r}_o^2 = x_o^2 + y_o^2 + \frac{I_x + I_y}{A_g} \qquad \text{(Spec. Eq. E4-9)}$$

$$= y_o^2 + \frac{I_x + I_y}{A_{tee}}$$

$$= (0.568 \text{ in.})^2 + \frac{1.13 \text{ in.}^4 + 1.18 \text{ in.}^4}{1.45 \text{ in.}^2}$$

$$= 1.92 \text{ in.}^2$$

$$F_{ez} = \left[\frac{\pi^2 (29{,}000 \text{ ksi})}{(3.00 \text{ in.})^2} + (11{,}200 \text{ ksi})(0.022 \text{ in.}^4) \right] \frac{1}{(1.45 \text{ in.}^2)(1.92 \text{ in.}^2)}$$

$$= 11{,}500 \text{ ksi}$$

$$H = 1 - \frac{x_o^2 + y_o^2}{\bar{r}_o^2} \qquad \text{(Spec. Eq. E4-8)}$$

$$= 1 - \frac{(0.568 \text{ in.})^2}{1.92 \text{ in.}^2}$$
$$= 0.832$$

$$F_e = \left[\frac{25{,}800 \text{ ksi} + 11{,}500 \text{ ksi}}{2(0.832)}\right]\left[1 - \sqrt{1 - \frac{4(25{,}800 \text{ ksi})(11{,}500 \text{ ksi})(0.832)}{(25{,}800 \text{ ksi} + 11{,}500 \text{ ksi})^2}}\right]$$
$$= 10{,}300 \text{ ksi}$$

$$F_{cr} = \left(0.658^{\frac{F_y}{F_e}}\right) F_y$$
$$= \left(0.658^{\frac{50 \text{ ksi}}{10{,}300 \text{ ksi}}}\right)(50 \text{ ksi}) \qquad \text{(}\textit{Spec}\text{. Eq. E3-2)}$$
$$= 49.9 \text{ ksi}$$

$$P_n = F_{cr} A_{tee}$$
$$= (49.9 \text{ ksi})(1.45 \text{ in.}^2)$$
$$= 72.4 \text{ kips}$$

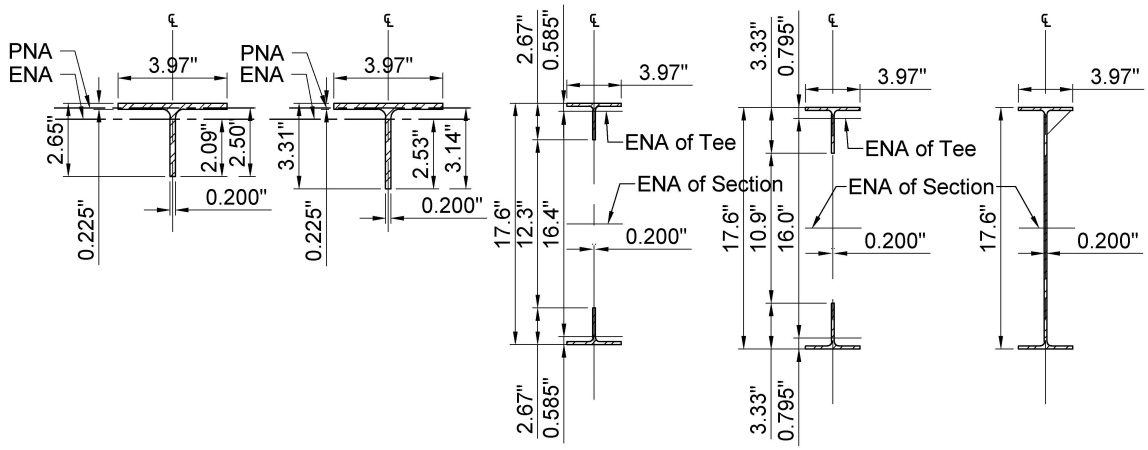
The available compressive strength of the tee is:

LRFD	ASD
From Table 4-3, $P_r = 47.8$ kips $P_u = \phi_c P_n$ $= 0.90(72.4 \text{ kips})$ $= 65.2 \text{ kips} > 47.8 \text{ kips}$ **o.k.**	From Table 4-3, $P_r = 34.9$ kips $P_a = \frac{P_n}{\Omega_c}$ $= \frac{72.4 \text{ kips}}{1.67}$ $= 43.4 \text{ kips} > 34.9 \text{ kips}$ **o.k.**

42 The value of y_o in Table 4-7 should be $y_o = 0.448$ in.

The value of y_o in Table 4-8 should be $y_o = 0.668$ in.

Revise the dimensions in Figure 4-4 to:



Net Tee Section *Critical Net Section* *Net Section* *Critical Net Section* *Gross Section*

48-49 The flexural torsional buckling check is revised as follows:

$$\bar{r}_o^2 = x_o^2 + y_o^2 + \frac{I_x + I_y}{A_g} \qquad \text{(}Spec\text{. Eq. E4-9)}$$

$$= y_o^2 + \frac{I_{x\text{-}tee\text{-}crit} + I_y}{A_{tee\text{-}crit}}$$

$$= (0.668 \text{ in.})^2 + \frac{1.52 \text{ in.}^4 + 1.18 \text{ in.}^4}{1.51 \text{ in.}^2}$$

$$= 2.23 \text{ in.}^2$$

$$F_{ez} = \left[\frac{\pi^2 (29{,}000 \text{ ksi})}{(6.15 \text{ in.})^2} + (11{,}200 \text{ ksi})(0.023 \text{ in.}^4)\right] \frac{1}{(1.51 \text{ in.}^2)(2.23 \text{ in.}^2)}$$

$$= 2{,}320 \text{ ksi}$$

$$H = 1 - \frac{x_o^2 + y_o^2}{\bar{r}_o^2} \qquad \text{(}Spec\text{. Eq. E4-8)}$$

$$= 1 - \frac{(0.668 \text{ in.})^2}{2.23 \text{ in.}^2}$$

$$= 0.800$$

$$F_e = \left(\frac{5{,}870 \text{ ksi} + 2{,}320 \text{ ksi}}{2(0.800)}\right)\left[1 - \sqrt{1 - \frac{4(5{,}870 \text{ ksi})(2{,}320 \text{ ksi})(0.800)}{(5{,}870 \text{ ksi} + 2{,}320 \text{ ksi})^2}}\right]$$

$$= 2{,}090 \text{ ksi}$$

$$F_{cr} = \left(0.658^{\frac{F_y}{F_e}} \right) F_y$$
$$= \left(0.658^{\frac{50 \text{ ksi}}{2{,}090 \text{ ksi}}} \right) (50 \text{ ksi})$$
$$= 49.5 \text{ ksi}$$

$$P_n = F_{cr} A_{tee\text{-}crit}$$
$$= (49.5 \text{ ksi})(1.51 \text{ in.}^2)$$
$$= 74.7 \text{ kips}$$

The available compressive strength of the tee is:

LRFD	ASD
From Table 4-10, $P_r = 49.0$ kips $P_u = \phi_c P_n$ $= 0.90(74.7 \text{ kips})$ $= 67.2 \text{ kips} > 49.0 \text{ kips}$ **o.k.**	From Table 4-10, $P_r = 35.8$ kips $P_a = \frac{P_n}{\Omega_c}$ $= \frac{74.7 \text{ kips}}{1.67}$ $= 44.7 \text{ kips} > 35.8 \text{ kips}$ **o.k.**

60 In the calculation of $I_{x\text{-}comp}$ using Equation 4-38, the value of t_c should be 3.00 in.

64 Revise Equation 3-12 to:

$$T_o = M_r \left[\frac{1 - \frac{(q)(X_i)}{T_1}}{d_{effec\text{-}noncomp}} \right]$$

88 Revise Equation 3-12 to:

$$T_o = M_r \left[\frac{1 - \frac{(q)(X_i)}{T_1}}{d_{effec\text{-}noncomp}} \right]$$

102 Add $d_{effect\text{-}noncomp}$ to the Symbols List after $d_{effect\text{-}comp}$:

$d_{effect\text{-}noncomp}$ Effective depth of noncomposite section, in. (mm)