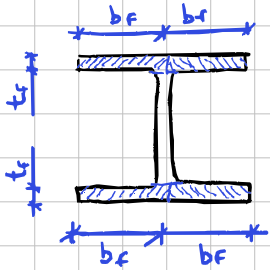
08 - I-Beam weak axis shear resistance

CSA S16-24 13.4.3 requires rational analysis, let's have a look at AISC 360 22-G6

$$V_R = \phi \cdot 0.6 \cdot F_y \sum (b_f \cdot t_f) \cdot C_{v2}$$



where $K_v = 1.2$ (Free Edge)

if $\left(b_f/t_f \leq 1.10\sqrt{1.2E/F_y} \right)$:

$C_{v2} = 1.0$

if $\left(1.10\sqrt{1.2E/F_y} < b_f/t_f \leq 1.37\sqrt{1.2E/F_y} \right)$:

$C_{v2} = 1.10\sqrt{1.2E/F_y} \,/\, (b_f/t_f)$

if $\left(b_f/t_f > 1.37\sqrt{1.2E/F_y} \right)$:

$$C_{v2} = \frac{1.51 \cdot 1.2 \cdot E}{(b_f/t_f)^2 F_y}$$

Comparing to CSA and neglecting all post-buckling strenght (as per AISC commentary):

$V_R = \phi A_w F_s \longrightarrow \phi = 1.00$, so : $F_{seq} = \overbrace{0.6 F_y C_{v2}}^{\text{AISC}}$

LIMITS

	CSA	AISC	
#1	$439\sqrt{K_v/F_y} = 0.98\sqrt{K_v E/F_y}$	$\simeq 1.10\sqrt{K_v E/F_y}$	O.K.
#2	$C_{a1}\sqrt{K_v/F_y} = 1.39\sqrt{K_v E/F_y}$	$\simeq 1.37\sqrt{K_v E/F_y}$	O.K.

EQUATIONS

	CSA		AISC		
#1	$F_s = 0.66 F_y$	$\simeq$	$C_{v2} \cdot 0.6 \cdot F_y = 0.6 \cdot F_y$		O.K.
#2	$F_s = 290\dfrac{\sqrt{F_y K_v}}{(b_f/t_f)}$	$\simeq$	$C_{v2} \cdot 0.6 \cdot F_y = 295\dfrac{\sqrt{F_y K_v}}{(b_f/t_f)}$		O.K.
#3	$F_s = \dfrac{190000\,K_v}{(b_f/t_f)^2}$	$\simeq$	$C_{v2} \cdot 0.6 \cdot F_y = \dfrac{181200\,K_v}{(b_f/t_f)^2}$		O.K.