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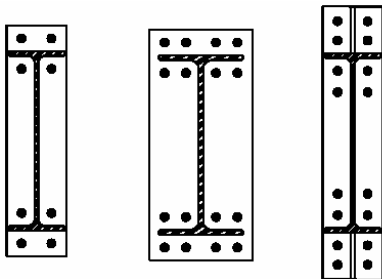
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(IPE 600) W24x68

(IPBL 360) W14x120

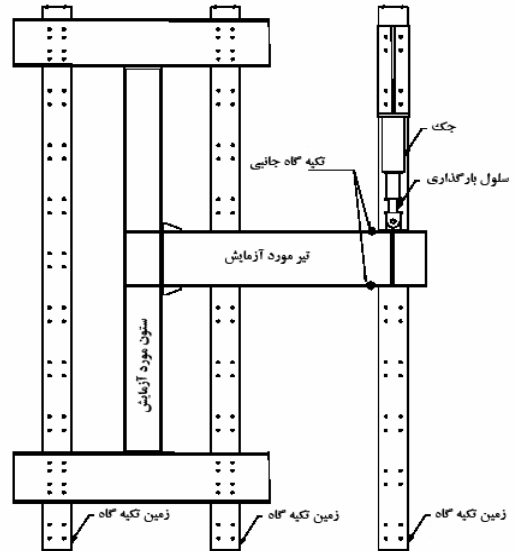
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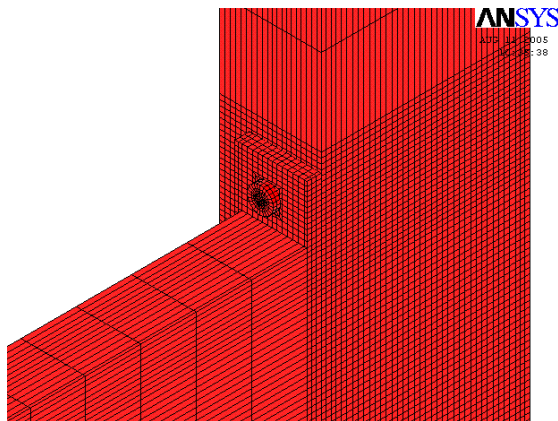
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Contact174
 Solid45



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Solid45

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Target170 Contact174
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/ (Mpa) Ksi

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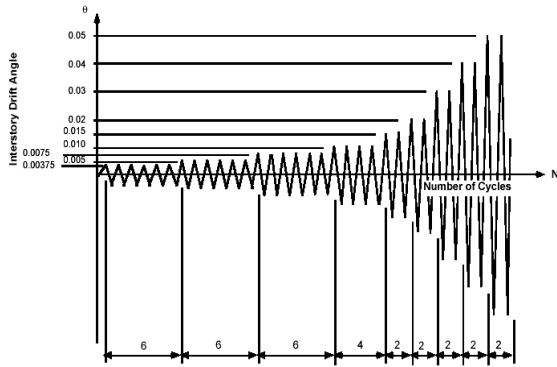
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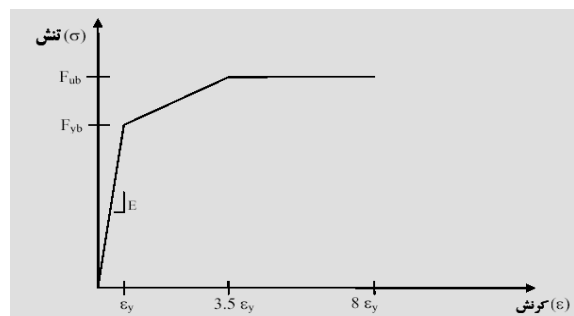
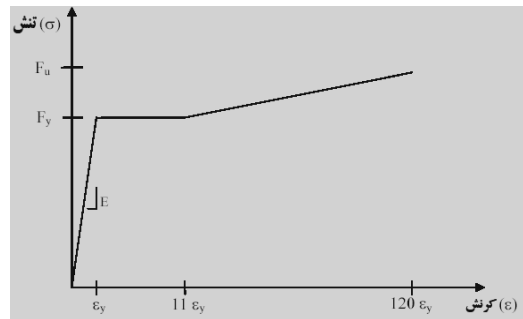
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Ksi (Mpa)	Ksi (Mpa)		
/ ()	()	A572	
()	()	A36	
()	()	A490	



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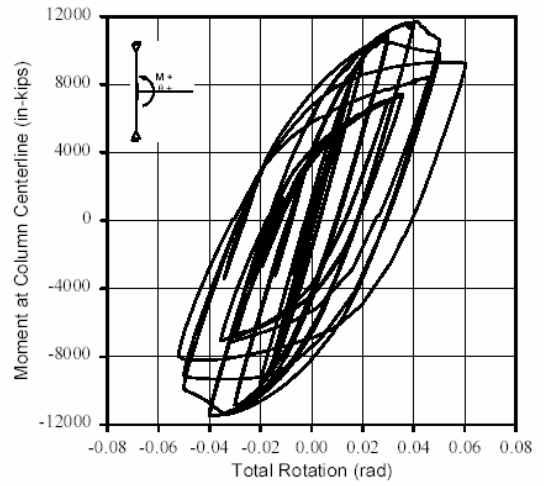


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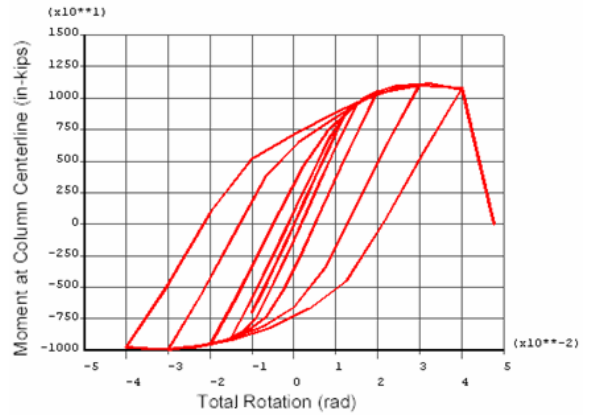
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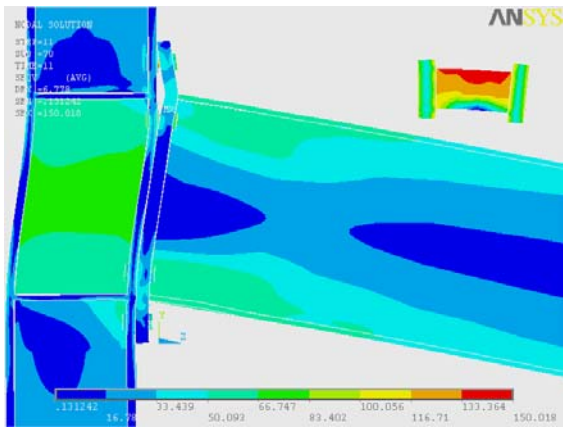
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$$M_{\max} \quad \theta_u \quad M_y \quad \theta_y \quad ()$$



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M_{\max} (k.in)	θ_u (rad.)	M_y (k.in)	θ_y (rad.)	
	/		/	
	/		/	

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$$V_p < V_y$$

$$V_p$$

$$V_y$$

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$$V_y = 0.6F_{yc}d_c t_{wc} \left\{ 1 + \frac{3b_c t_{cf}^2}{d_b d_c t_{wc}} \right\}$$

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$$V_p = 0.8 \frac{M_p}{d_b}$$

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d_b

M_p

$t_{cf}, b_c, t_{wc}, d_c, F_{yc}$

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M_p

$$M_p = f_y \cdot Z$$

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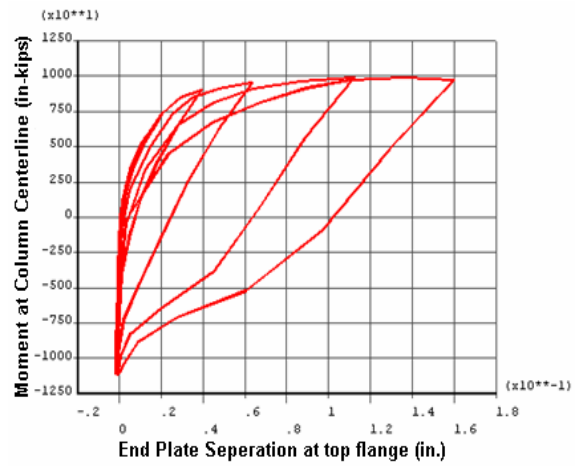
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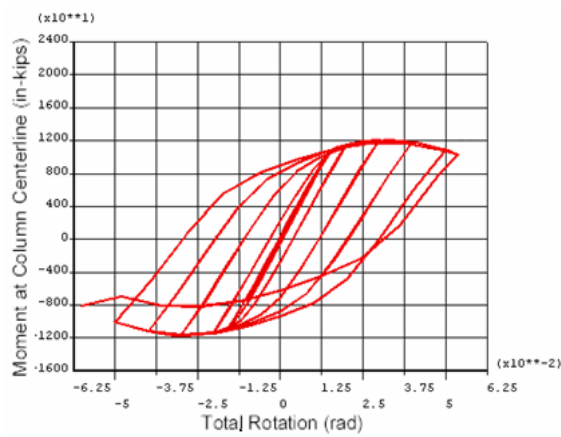
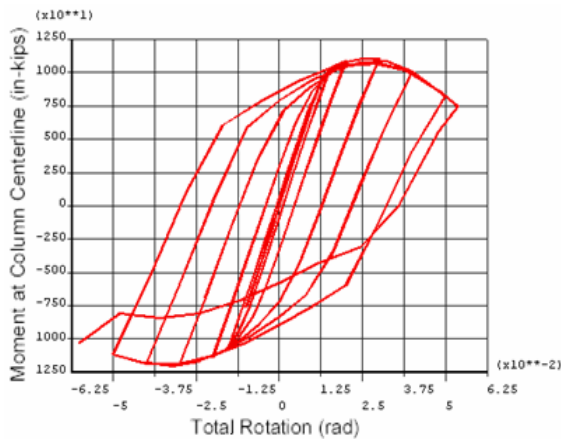
f_y

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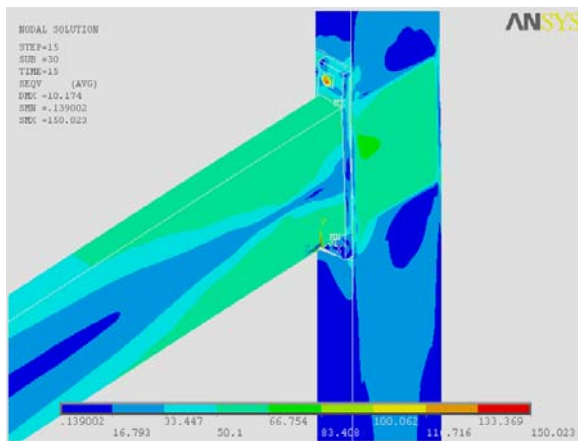
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M_{max} (k.in)	θ_p (rad.)	M_y (k.in)	θ_y (rad.)	
	/		/	"
	/		/	"



[] FEMA-350

$$M_p = 1.1 \left[\frac{f_y + f_u}{2} \right] Z \quad (1)$$

$$\dots \quad (2)$$

:(Kip = / kN)

$$V_y = 0.6 \times 53 \times 14.5 \times 0.6 \times \left\{ 1 + \frac{3 \times 14.75 \times 0.95^2}{24 \times 14.5 \times 0.6} \right\} = 30211 K \quad (3)$$

$$\dots \quad (4)$$

$$V_{P1} = 0.8 \frac{53 \times 178}{24} = 314.7 \text{ Kips} \quad (5)$$

$$\dots \quad (6)$$

$$V_{P2} = 0.8 \frac{1.1 \left(\frac{53 + 70.7}{2} \right) \times 178}{24} = 403.7 \text{ Kips} \quad (7)$$

$$\dots \quad (8)$$

$$V_{P1} = 314.7 K \Rightarrow d_{c1} = 15.3'' \Rightarrow d_c = 16'' \quad (9)$$

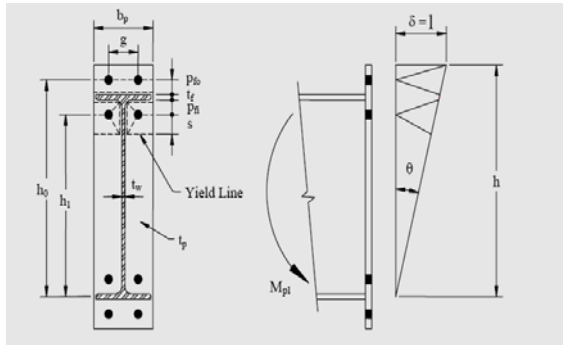
$$V_{P2} = 403.7 K \Rightarrow d_{c2} = 20.3'' \Rightarrow d_c = 21'' \quad (10)$$

$$\dots \quad (11)$$

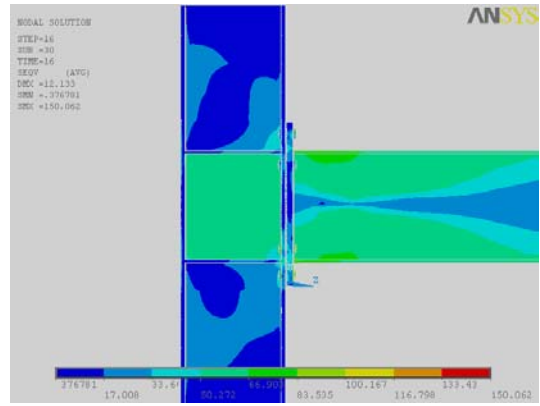
$$\dots \quad (12)$$

$$S = \frac{1}{2} \sqrt{b_p g}$$

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$$s = \frac{1}{2} \sqrt{10 \times 6} = 3.87''$$

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$$M_{nL} = 38 \times 1.5^2 \left[\frac{10}{2} \left[215 \left(\frac{1}{19} + \frac{1}{387} \right) + 259 \left(\frac{1}{19} \right) - \frac{1}{2} \right] + \frac{2t_w}{6} [215(19+387)] \right]$$

$$= 16362 \text{ (K}\cdot\text{in)}$$

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k.in $\phi_b = 0.9$

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M_{nL}

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$$53 \times 178 = 0.9 \times 38 \times t_p^2 \times 191.368 \Rightarrow t_{p1} = 1.43''$$

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$$1.1 \left(\frac{53 + 70.7}{2} \right) 178 = 0.9 \times 38 \times t_p^2 \times 191.368$$

$$\Rightarrow t_{p2} = 1.21''$$

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$$M_l = F_{yL} t_p^2 \left\{ \frac{b_p}{2} \left[h_1 \left(\frac{1}{p_{fi}} + \frac{1}{s} \right) + h_0 \left(\frac{1}{p_{fo}} \right) - \frac{1}{2} \right] + \frac{2}{g} [h_1(p_{fi} + s)] \right\}$$

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$$g \quad s \quad b_p \quad p_{fo} \quad p_{fi} \quad h_0 \quad h_1$$

$$t_p \quad \cdot \quad ()$$

F_{yL}

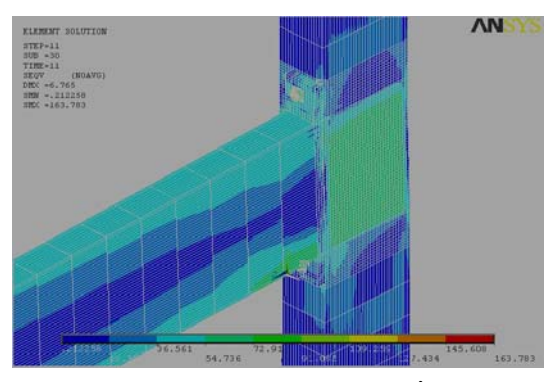
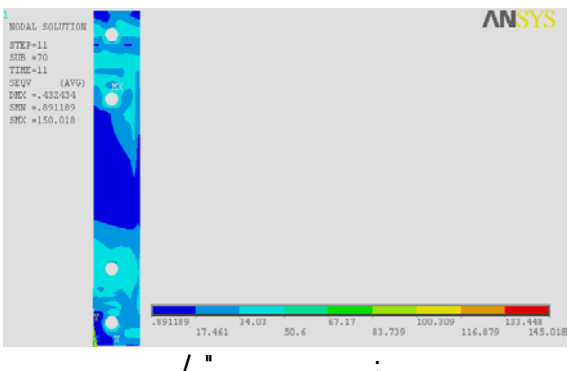
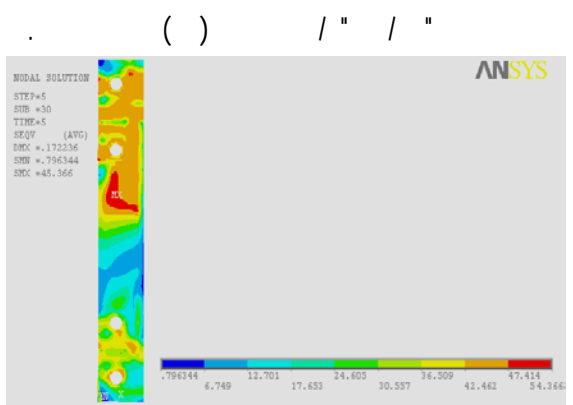
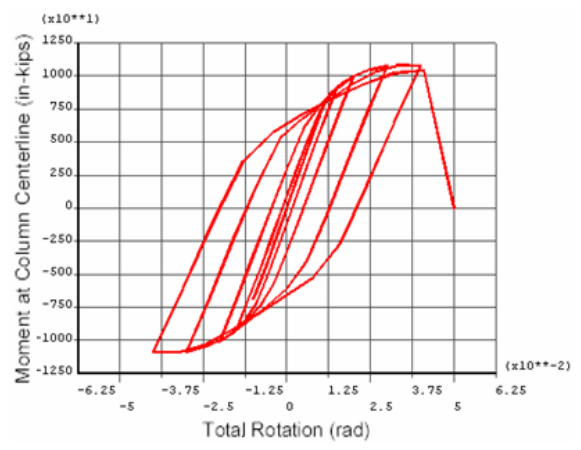
s

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$$M_{nL} = 1.25^2 \times 38 \times 191.3 = 11358.3 \text{ K.in} \quad ()$$

$$/ " \quad () \quad () \quad ()$$



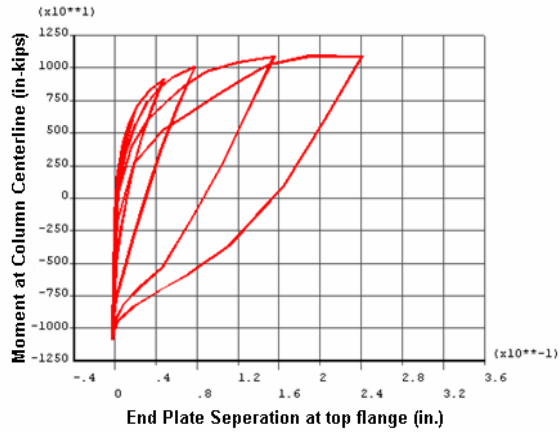
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K.in

ksi

(Mpa)



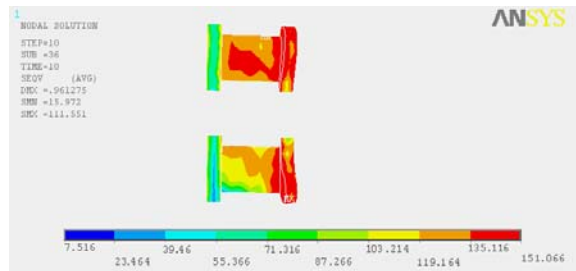
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(Mpa) ksi

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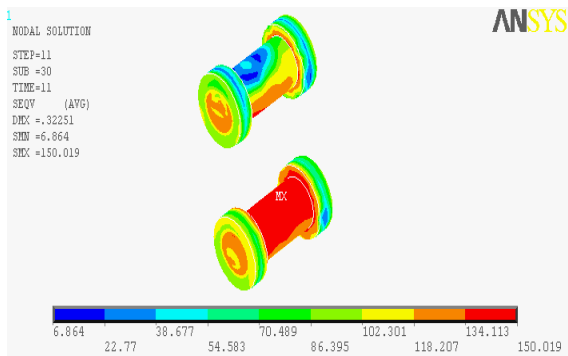
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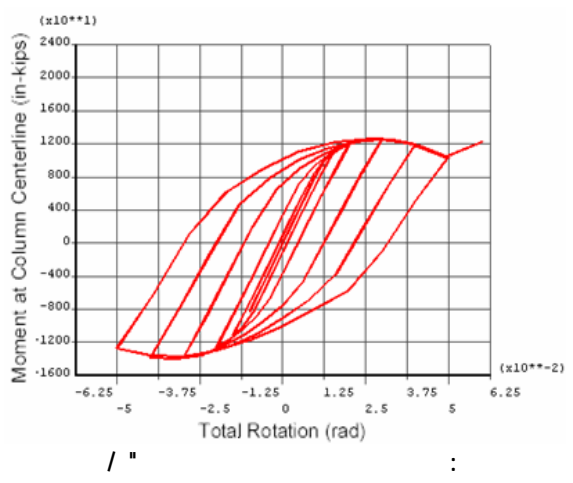


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 (L_{st})
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$$\frac{d}{4}$$

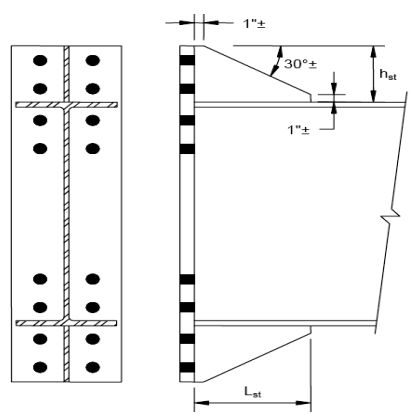
FEMA

$$L_{st} = \frac{h_{st}}{\tan 30^\circ} = \frac{4.5}{\tan(30)} = 8"$$

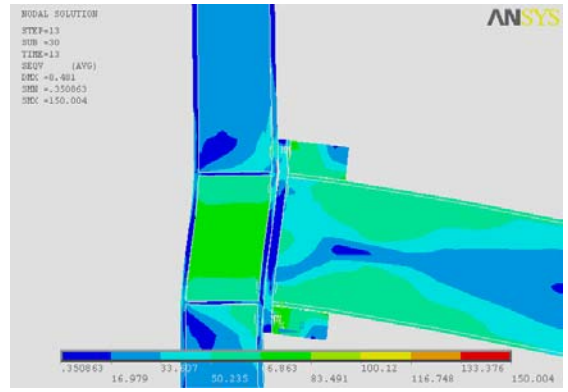
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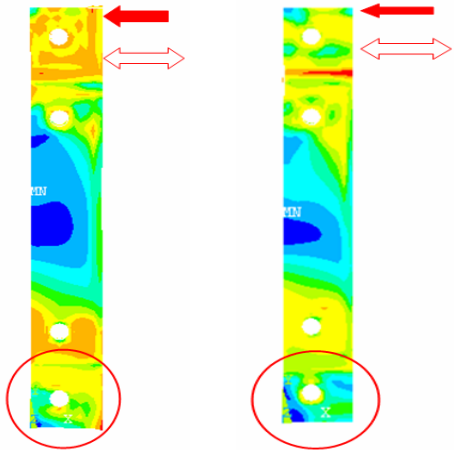
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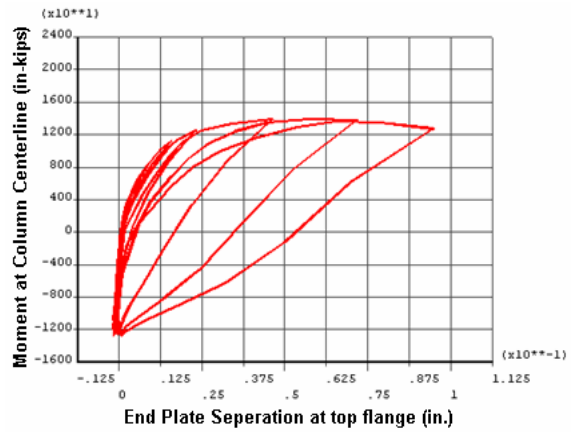
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- i- Extended end-plate moment connection
 - 2 - Cyclic loading
 - 3 - Actuator
 - 4 - Pre-tension
 - 5 - Panel zone
 - 6 - Prying action
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