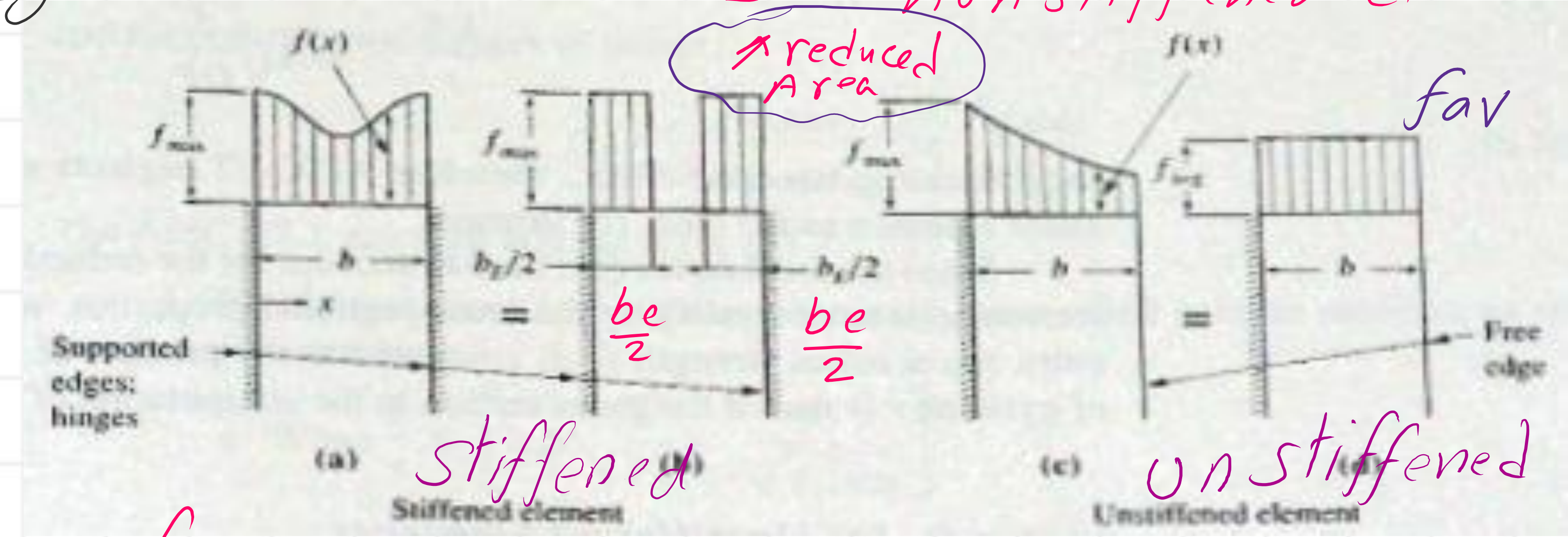
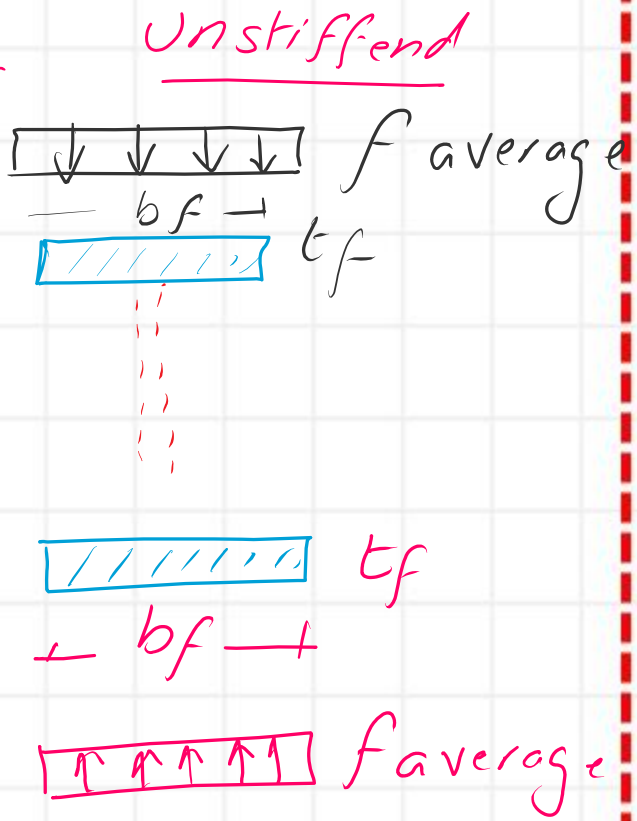
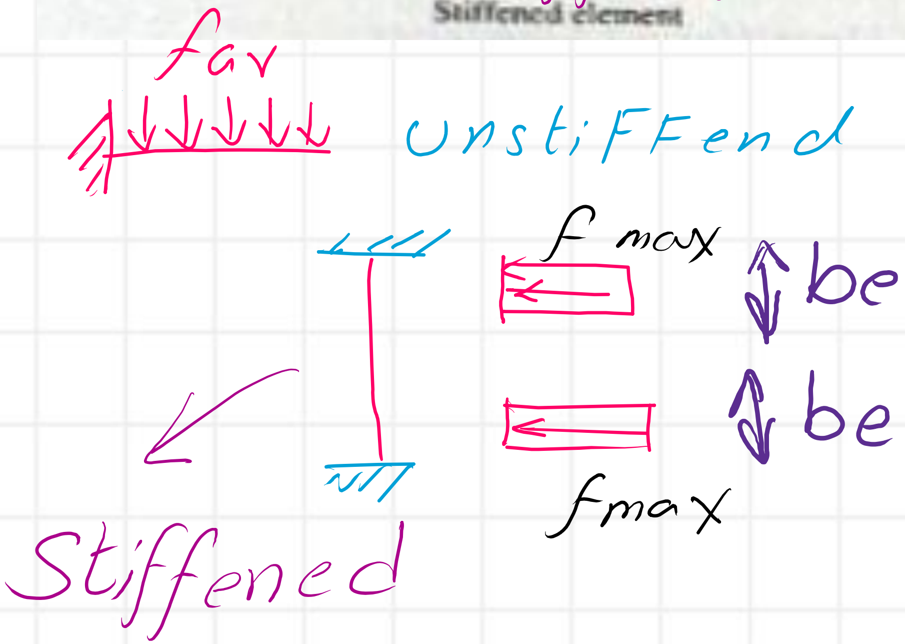
Pg-317 SAlmon → stiffened elements, non stiffened elements







$$P_n = (bt)\, f_{av}$$
$$(bt = A_g)$$

$$P_n = (b_e t)\, f_{max}$$

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Page 318 - Chapter 6 Salmon Q_A & Q_s terms

Compression members composed of both stiffened and unstiffened shall be treated as unstiffened for establishing f_{av}: then the effective width for the stiffened is determined using $f_{av} = f_{max}$

Unstiffened

$$P_n = A_g \cdot f_{av}$$

$$P_n = A_g f_{av} \left(\frac{f_{max}}{f_{max}}\right)$$

$$= f_{max} (Q_s) A_{gross}$$

$$Q_s = f_{av} / f_{max}$$

Stiffened

$$P_n = A_{eff} \cdot f_{max} \left(\frac{A_{gross}}{A_{gross}}\right)$$

$$= \left(\frac{A_{eff}}{A_g}\right) \cdot (f_{max} \cdot A_{gross})$$

$$P_n = Q_A (f_{max})(A_{gross})$$

$$Q_A = \frac{A_{eff}}{A_{gross}}$$

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$P_n = f_{av} \cdot A_{eff}$ Whole Section

$P_n = f_{av} \cdot A_{eff} \left(\frac{f_{max}}{f_{max}}\right)\left(\frac{A_g}{A_g}\right)$

Ag: gross area

fmax: maximum stress

$Q_A = \frac{A_{eff}}{A_g}$

$Q_s = \frac{f_{av}}{f_{max}}$

$P_n = Q_s \cdot Q_A \cdot f_{max} \cdot A_{gross}$

↓ Gross area

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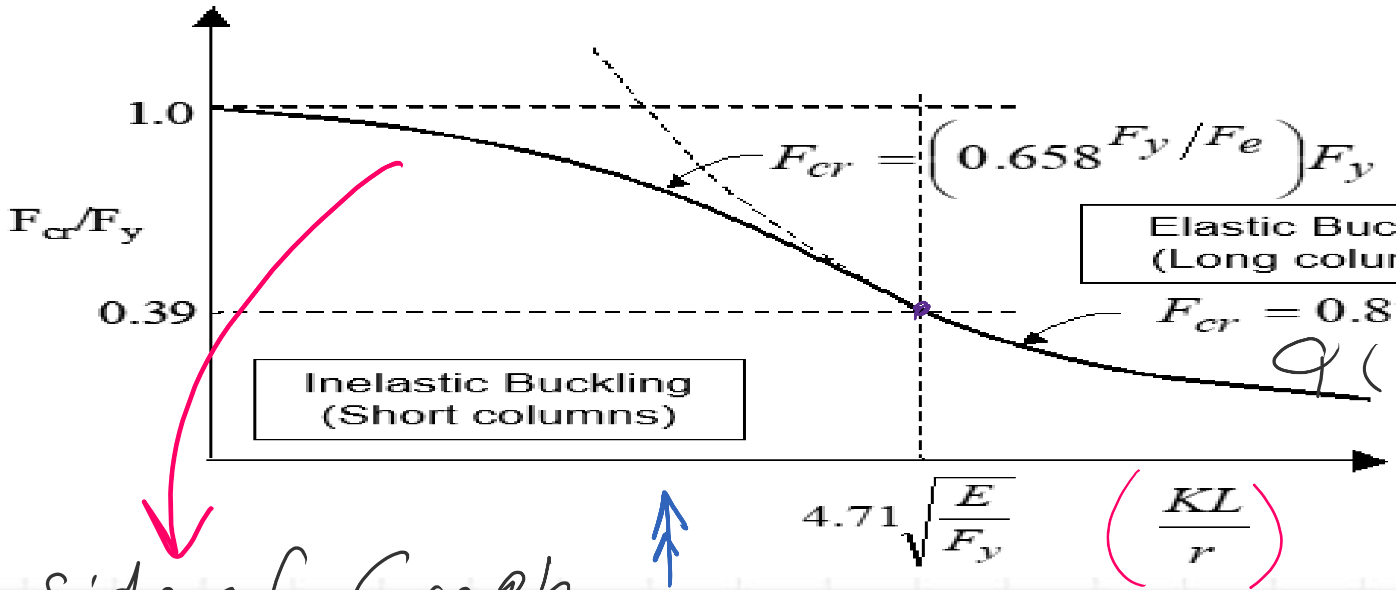
CM # 14

Spec. 2010



$Q(0.877)fe$

right side by Q

Left side of Graph

$$F_{cr} = Q_s Q_a \left(0.658^{\frac{Qf_y}{fe}}\right) f_y$$

$$F_{cr} = Q_s Q_a \left(0.658^{\frac{QFy}{Fe}}\right)(Fy)$$

$$Q_s \cdot Q_a = Q$$

For parameters of stiffened and unstiffened

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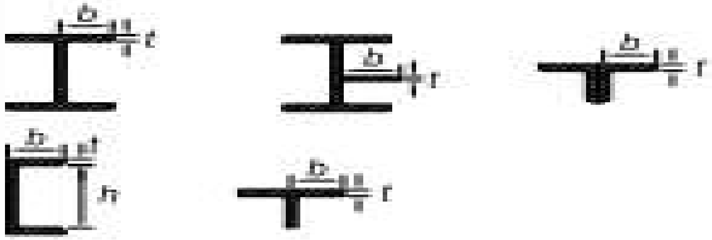
16.1-16 AISC-360-10

λ_r Limiting

un-stiffened

TABLE B4.1a
Width-to-Thickness Ratios: Compression Elements Members Subject to Axial Compression

	Case	Description of Element	Width-to-Thickness Ratio	Limiting Width-to-Thickness Ratio λ_r (nonslender/slender)	Examples
Unstiffened Elements	1	Flanges of rolled I-shaped sections, plates projecting from rolled I-shaped sections; outstanding legs of pairs of angles connected with continuous contact, flanges of channels, and flanges of tees	b/t b/t	$0.56\sqrt{\frac{E}{F_y}}$	
	2	Flanges of built-up I-shaped sections and plates or angle legs projecting from built-up I-shaped sections	b/t b/t b/t	$0.64\sqrt{\frac{k_cE}{F_y}}$ [a]	
	3	Legs of single angles, legs of double angles with separators, and all other unstiffened elements	b/t b/t	$0.45\sqrt{\frac{E}{F_y}}$	
	4	Stems of tees	d/t	$0.75\sqrt{\frac{E}{F_y}}$	

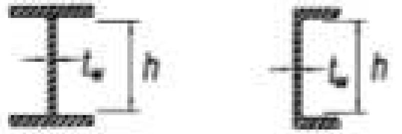
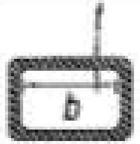
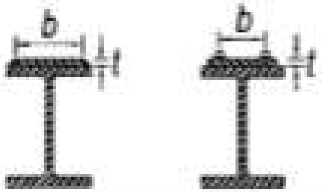
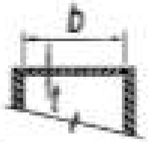
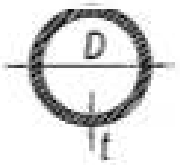
Stiffened Elements From 5 → 9

stiffened part

Cases from Table B 4.1b part -2

CM # 14

Spec. 2010

Stiffened Elements	5	Webs of doubly-symmetric I-shaped sections and channels	h/t_w	$1.49\sqrt{\frac{E}{F_y}}$	
	6	Walls of rectangular HSS and boxes of uniform thickness	b/t	$1.40\sqrt{\frac{E}{F_y}}$	
	7	Flange cover plates and diaphragm plates between lines of fasteners or welds	b/t	$1.40\sqrt{\frac{E}{F_y}}$	
	8	All other stiffened elements	b/t	$1.49\sqrt{\frac{E}{F_y}}$	
	9	Round HSS	D/t	$0.11\frac{E}{F_y}$	

↓ Flexure

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