SPREADER BAR

I.D. Nº 10 COLOR OF BAR : Red Primer

LOAD CAPACITY PAINTED ON BAR 22 TONS.

DATE CAP. & I.D. Nº PAINTED ON BAR Aug. 1988

BAR WT ~1550 ±

DATE OF LAST LOAD TEST. August 9, 1988

TEST LOAD WEIGHT 26.5 TONS

TESTED WITH (2) STEEL BLOCKS 3'x3'x6'h.

TEST LOAD % 120.3%

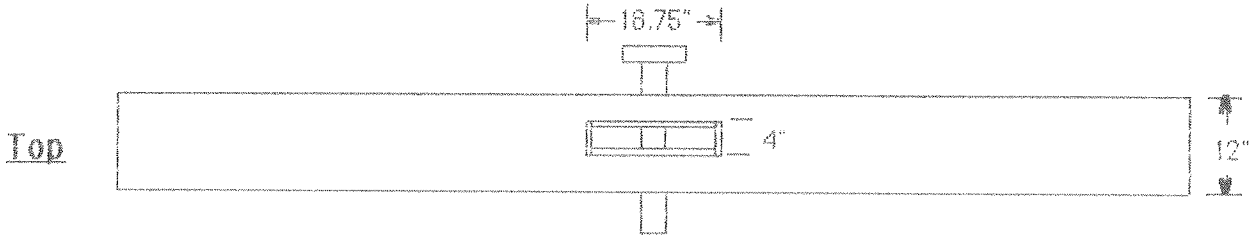
STRESS CALCULATIONS:

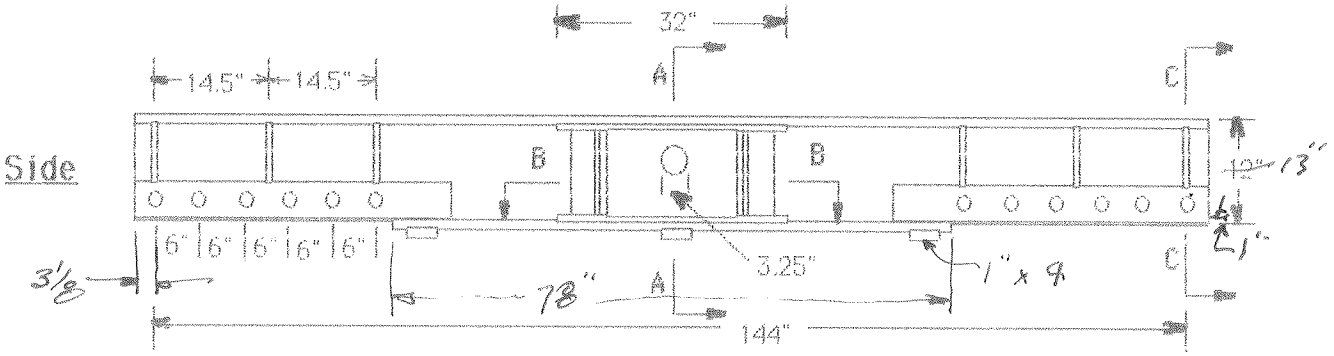
DONE BY Bosek & Miranda

DATE July 1988

REMARKS : TESTED OK

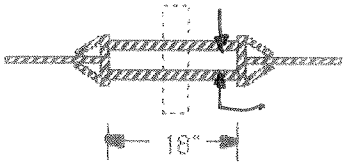
Primer #10





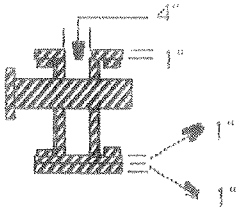
B-B

Section AA

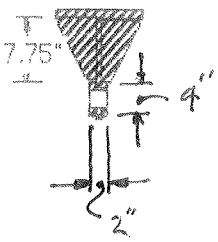


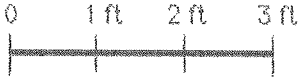
A-A

Section BB

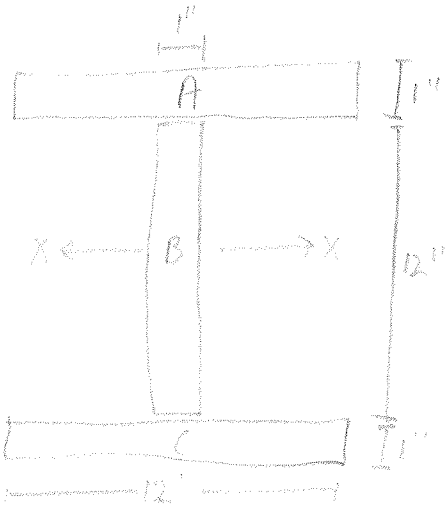


Section CC





scale: 1/2" = 1'



$I_A = \frac{bh^3}{12} = \frac{12}{12} = 1\ in^4$

$I_B = \frac{(12)^3}{12} = 144\ in^4$

$I_C = 1\ in^4$

$A_A = 12\ in^2$ $A_B = 12\ in^2$ $A_C = 12\ in^2$

$Y_A = 6.5\ in$ $Y_B = 0$ $Y_C = 6.5\ in$

$C = 7\ in$

$I_{xx} = I_A + A_A Y_A^2 + I_B + I_C + A_C Y_C^2$

$= 1 + (12)(6.5)^2 + 144 + 1 + (12)(6.5)^2$

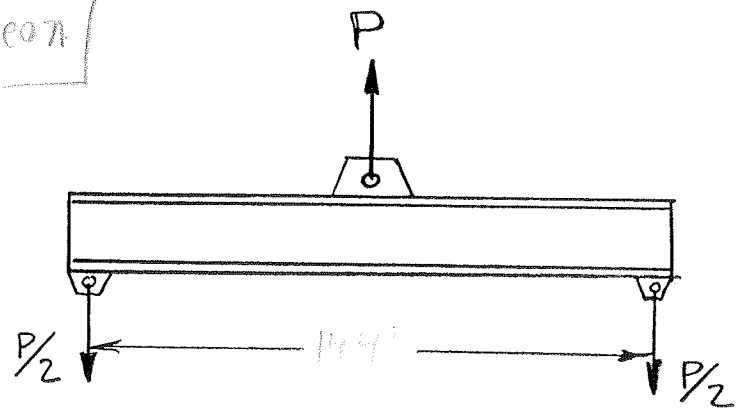
$= 1160\ in^4$

$S = \frac{I}{C} = \frac{1160}{7} = 165.7\ in^3$

$\frac{d}{A_F} = \frac{14}{12} = 1.167\ in$

SPREADER BAR Nº 10 PAINT COLOR Primer

Leon



BEAM SIZE Special

d = 14 in

L = 14 ft

d/A_f = 1.65

S_x = 103 in³

t_w = 1 in

$A_w = d \cdot t_w$ = 14 in²

$M = \frac{PL}{4}$ = 36P

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW}$ = 12,000 psi ✓

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{(144)(1.65)}$ = 50,505 psi } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{36P}{103} = 12{,}000$ $\therefore P = 33{,}233$ lbs = 33.2 kips

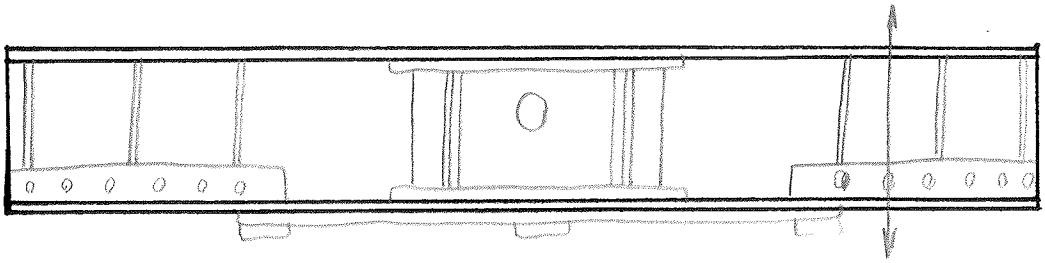
SHEAR STRESS:

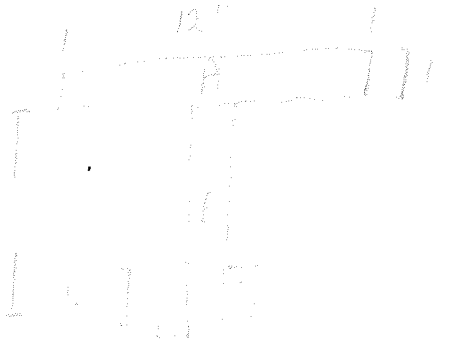
$F_{V\ ALLOW} = \frac{.4\ F_y}{3}$ = 4800 psi

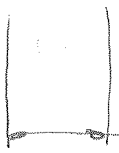
$\therefore f_{V\ MAX} = \frac{V}{A_w} = \frac{P}{2(14)} = 4800$ $\therefore P = 134{,}400$ lbs = 67.2 tons

SUMMARY: $\therefore P =$ 27.6 TONS

SPREADER BAR Nº 10	Logo	PAINT Color Primer





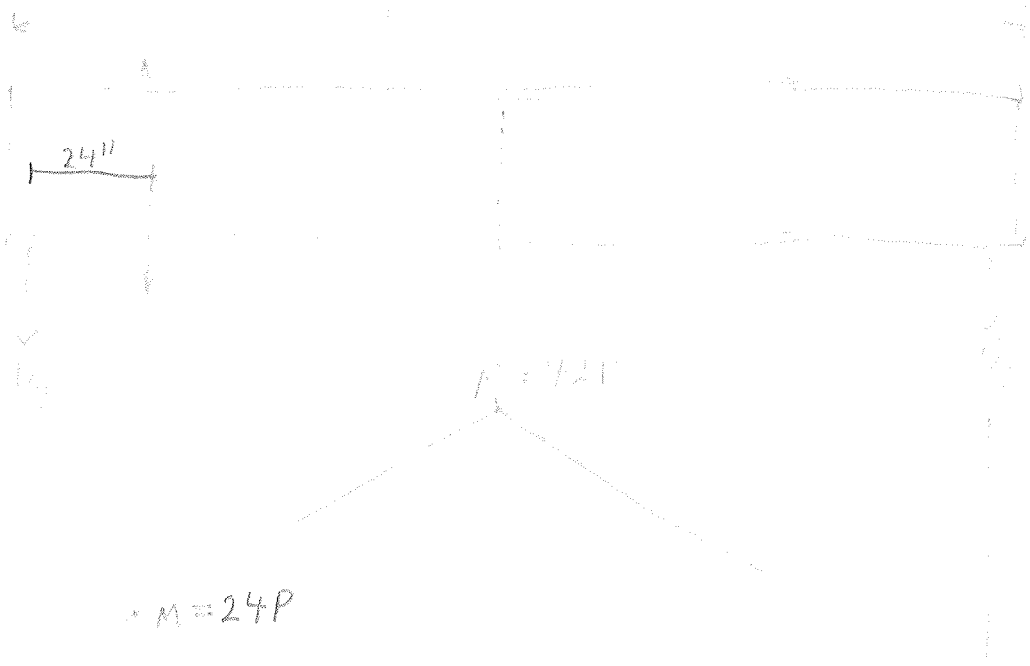


Section	Base (in)	Height (in)	I (in⁴)	Area (in²)	r (in)	r' (in)	Ar'² (in²)

$c =$

$I_{xx} =$

$S_{xx} =$



$M = 24P$

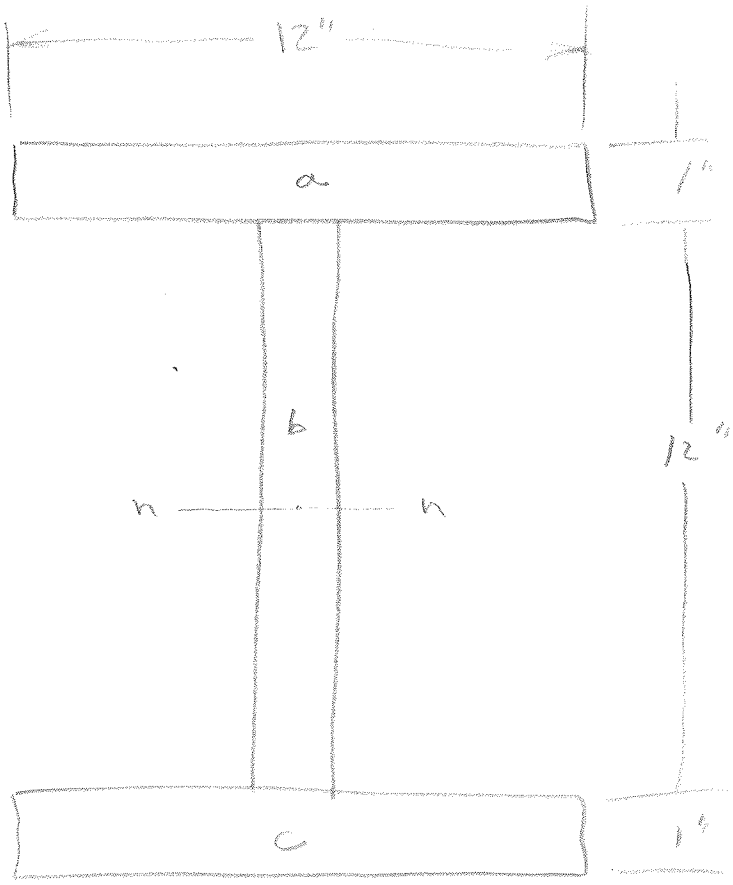
$24P$

0.333

X → tonnage adjusted from 27.6 tons to 22.24 tons.

SPREADER BAR #10

N. BOSEK
6-28-84



$$I_a = \frac{bh^3}{12} = \frac{12 \times 1^3}{12} = 1$$

$$I_c = 1$$

$$I_b = \frac{1 \times 12^3}{12} = 144$$

$$A_a = A_c = 12$$

$$r_a = r_c = 6.5"$$

$$I_{nn} = I_a + A_a r_a^2 + I_b + I_c + A_c r_c^2$$

$$= 1 + 12(42.25) + 144 + 1 + 12(42.25)$$

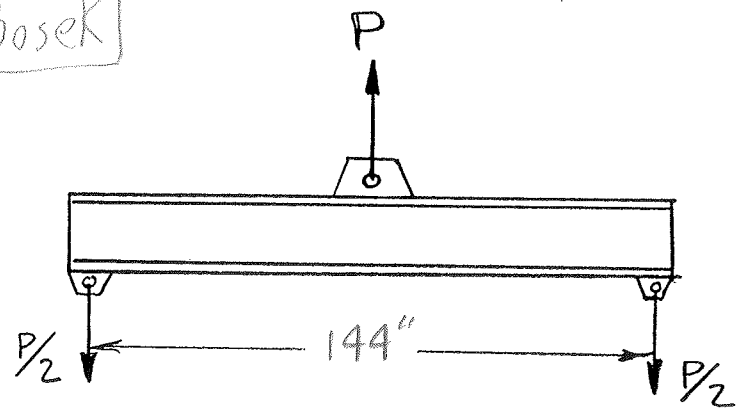
$$I_{nn} = 1160 \text{ in}^4$$

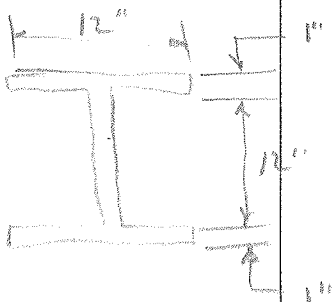
$$S = \frac{I}{c} = \frac{1160}{7} = 165.714 \text{ in}^3$$

$$\frac{d}{A_s} = \frac{14}{12} = 1.166$$

SPREADER BAR Nº 10 PAINT COLOR RED

BOSEK





BEAM SIZE SPECIAL

$d = 14"$

$L = 144$

$d/A_f = 1.167$

$S_x = 165.714 \text{ in}^3$

$t_w = 1$

$A_w = d \cdot t_w = 14$

$M = \frac{PL}{4} = 36P$

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW} = 12{,}000 \text{ psi}$

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{144 \times 1.167} = 71908 \text{ psi}$ } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{36P}{165.714} = 12{,}000$ $P = 55238 \text{ lb}$ $= 27.6 \text{ TONS}$

SHEAR STRESS:

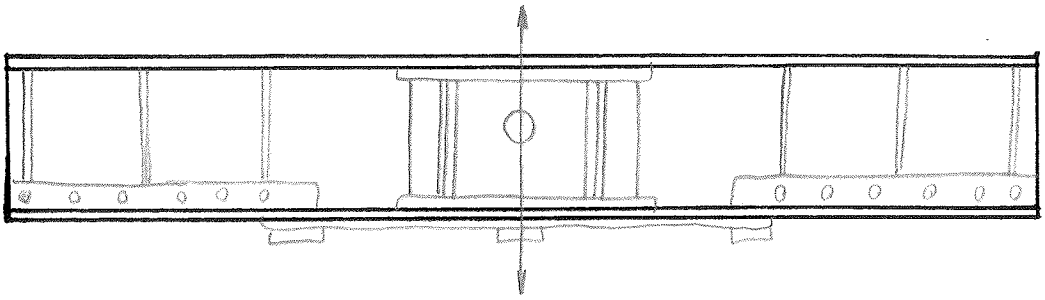
$F_{V\ ALLOW} = \frac{.4 F_y}{3} = 4800 \text{ psi}$

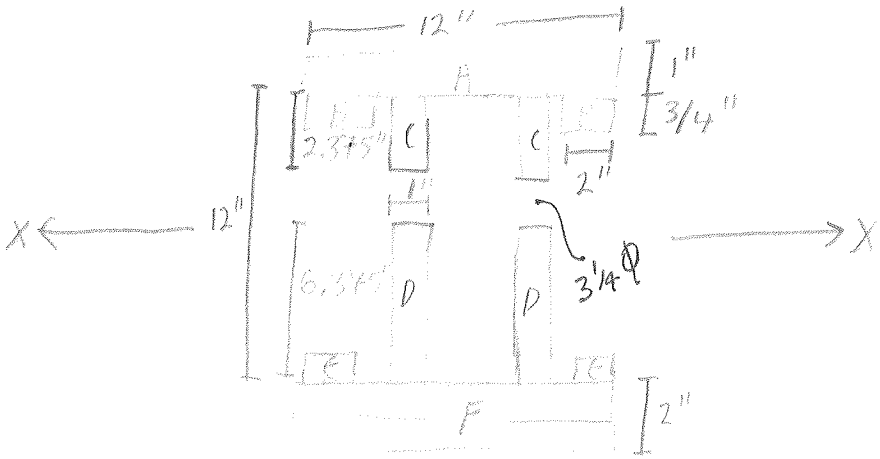
$P = 134400 \text{ LB.}$

$\therefore f_{V\ MAX} = \frac{V}{A_w} = \frac{P}{2 \times 14} = 4800$

SUMMARY: $\therefore P =$ 27.6 TONS

SPREADER BAR Nº 10 | | PAINT COLOR Primer





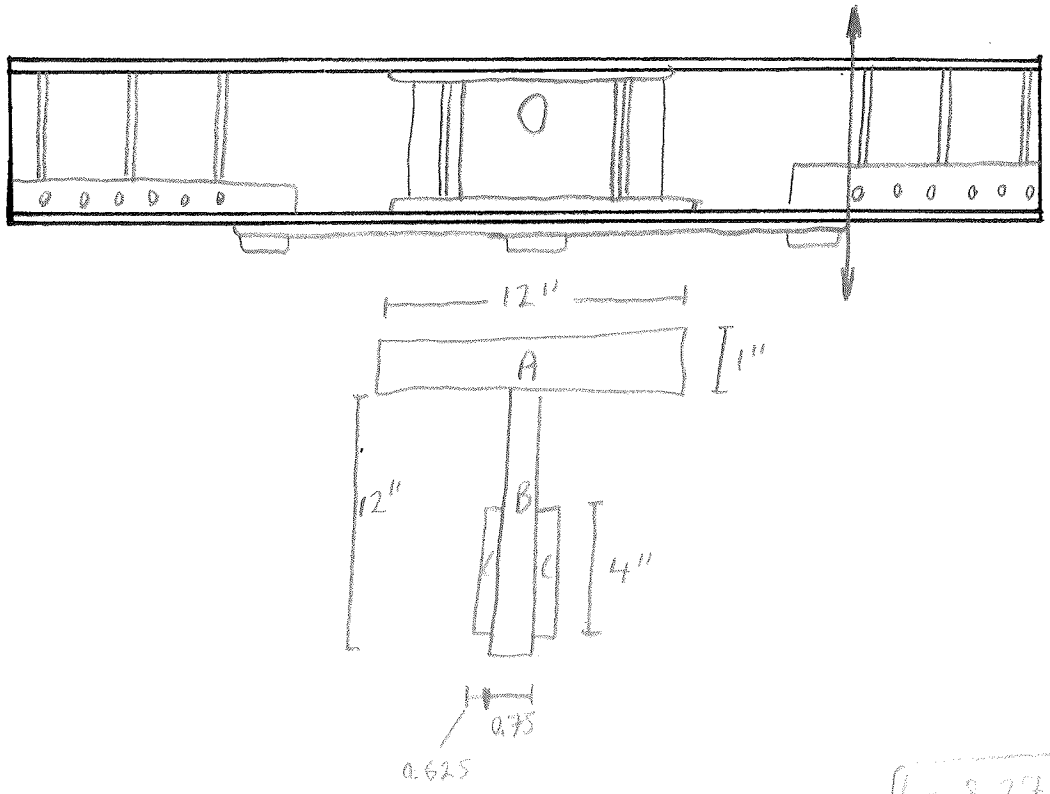
h = 6.259 in

Section	Base (in)	Height (in)	I (in⁴)	Area (in²)	r (in)	r' (in)	Ar'² (in²)
A	12	1	1	12	14.5	8.241	812.992
B	4	0.75	0.141	3	13.625	7.866	185.552
C	2	2.375	2.233	4.75	12.063	6.304	203.444
D	2	6.375	43.101	12.75	5.158	1.081	14.899
E	4	0.75	0.141	3	2.375	3.897	45.49
F	12	2	8	24	1	5.261	496.297

c = 8.731 in

I_{xx} = 1960.12 in⁴ S_{xx} = 244.501 in³ > 165.714 in³

SPREADER BAR Nº 10 | | PAINT Color Primer



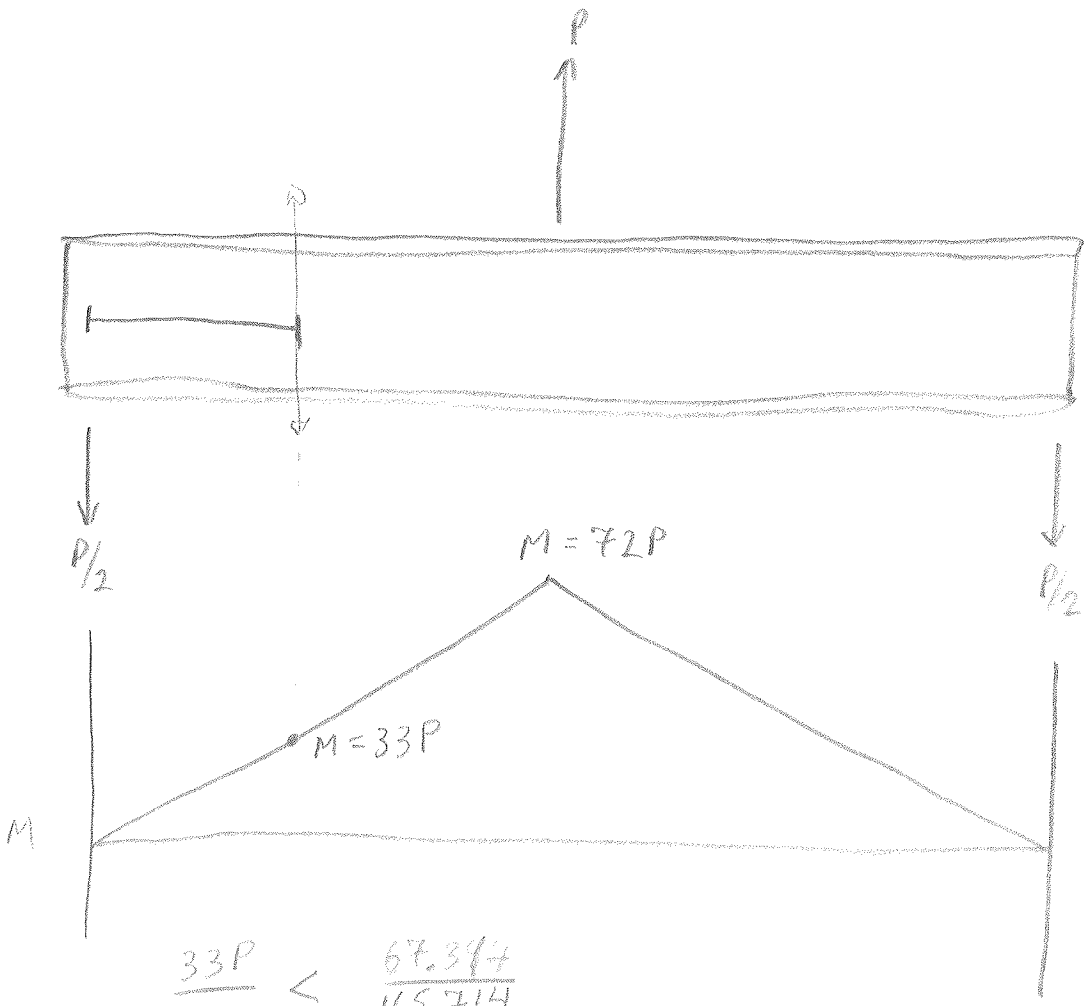
h = 8.279 in

Section	Base (in)	Height (in)	I (in⁴)	Area (in²)	r (in)	r' (in)	Ar'² (in²)
A	12	1	1	12	12.5	4.221	213.892
B	0.75	12	108	9	6	2.279	46.745
C	1.25	4	6.667	5	2.25	6.029	181.744

c = 8.279 in

I_{xx} = 557.958 in⁴

S_{xx} = 67.394< 165.714 in³ ⇒ see back



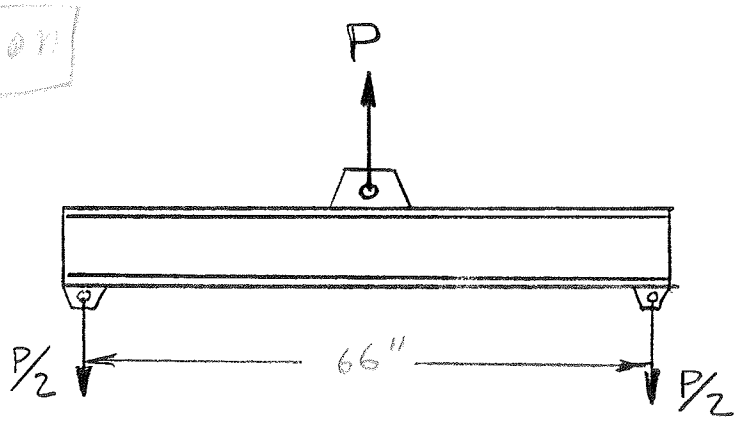
$$\frac{33P}{72P} < \frac{67.314}{165.714}$$

$$.463 < .4067 \quad \text{X}$$

Tonnage adjusted from 24.6 Tons to 24.5 Tons.

SPREADER BAR Nº 10 PAINT COLOR Primer

Leon



BEAM SIZE SPECIAL

$d = 14$

$L = 66$ in

$d/A_f = 1.167$

$S_x = 69.394$ in³

$t_w = 1$

$A_w = d \cdot t_w = 14$

$M = \frac{PL}{4} = 16.5P$

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW} = 12{,}000$ psi ✓

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{(66)(1.167)} = 155{,}949.6$ } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{16.5P}{69.394} = 12{,}000$ $\therefore P = 49{,}014$ lbs $= 24.507$ tons

SHEAR STRESS:

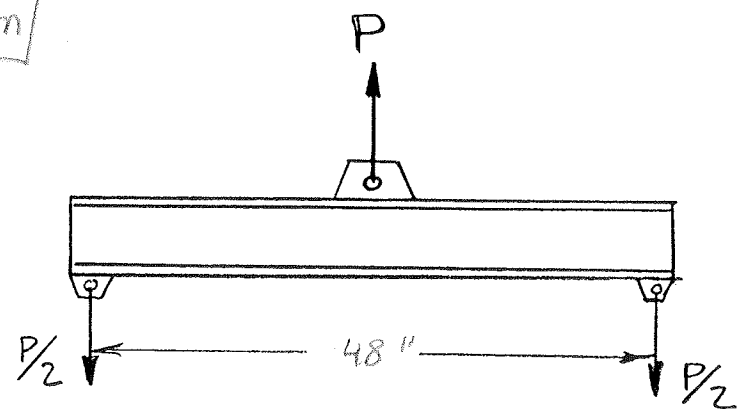
$F_{V\ ALLOW} = \frac{.4\ F_y}{3} = 4800$ psi

$\therefore f_{V\ MAX} = \frac{V}{A_w} = \frac{P}{2 \cdot 14} = 4800 = 134{,}400$ lbs

SUMMARY: $\therefore P =$ 24.5 TONS

SPREADER BAR Nº 10 PAINT COLOR Red

Leon



Adjusted

BEAM SIZE SPECIAL

$d = 14''$

$L = 48''$

$d/A_f = 1.167$

$S_x = 44.48\ in^3$

$t_w = 1$

$A_w = d \cdot t_w = 14$

$M = \frac{PL}{4} = 12P$

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW} = 12{,}000\ psi$ ✓

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{(48)(1.167)} = 214{,}224.5$ } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{12P}{44.48} = 12{,}000$ $\therefore P = 44{,}480\ lbs$

$= 22.24\ Tons$

SHEAR STRESS:

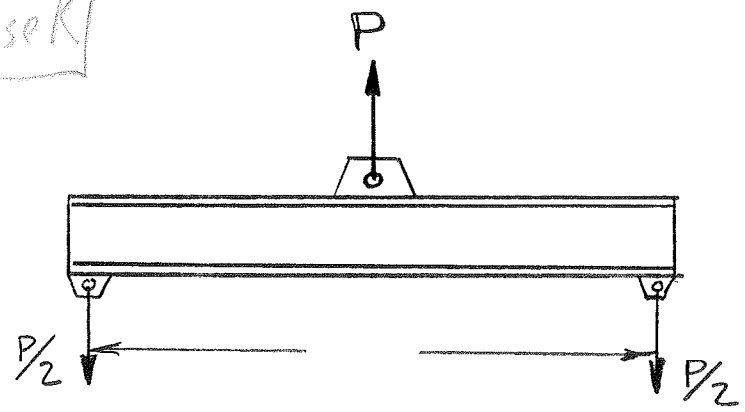
$F_{V\ ALLOW} = \frac{.4\ F_y}{3} = 4800\ psi$

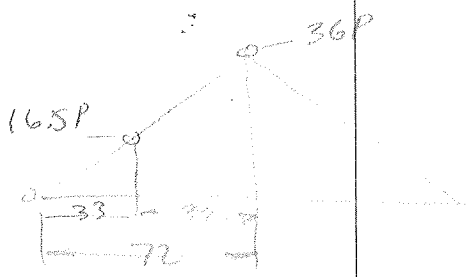
$\therefore f_{V\ MAX} = \frac{V}{A_w} = \frac{P}{2 \times 14} = 4800$ $\therefore P = 134{,}400\ lbs$

SUMMARY: $\therefore P =$ 22.24 TONS

SPREADER BAR Nº 10 PAINT COLOR PALMER

Bose K





BEAM SIZE _____

d = _____

L = _____

d/A_f = _____

S_x = 67.395

t_w = _____

$A_w = d \cdot t_w$ = _____

$M = \frac{PL}{4}$ = 16.5P

$V = \frac{P}{2}$

BENDING STRESS:

$F_{b\ ALLOW}$ = 12,000 psi

OR $F_{b\ ALLOW} = \frac{12 \times 10^6}{L \cdot d/A_f} = \frac{12 \times 10^6}{\quad} =$ _____ } USE THE LEAST

$\therefore f_{b\ MAX} = \frac{M}{S_x} = \frac{16.5P}{67.395} = 12{,}000$ $P = 49019.5$ lb

$P = 24.5$ TON.

SHEAR STRESS:

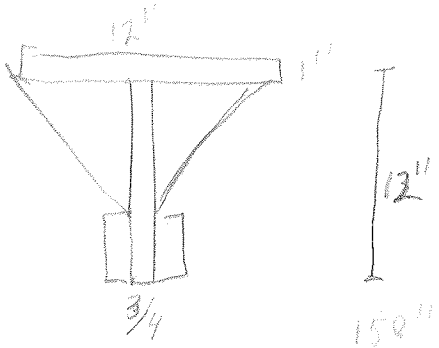
$F_{V\ ALLOW} = .4 F_y = \frac{}{3} = 4800$ psi

$\therefore f_{V\ MAX} = \frac{V}{A_w} =$

SUMMARY: $\therefore P =$ _____ TONS

#10

see BILL STRICKLAN



150"