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(212) 687-2233
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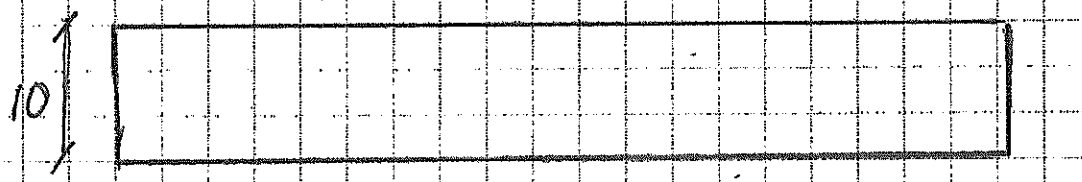
JOB SUNY Buffalo Bridge
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Live load 100 psf



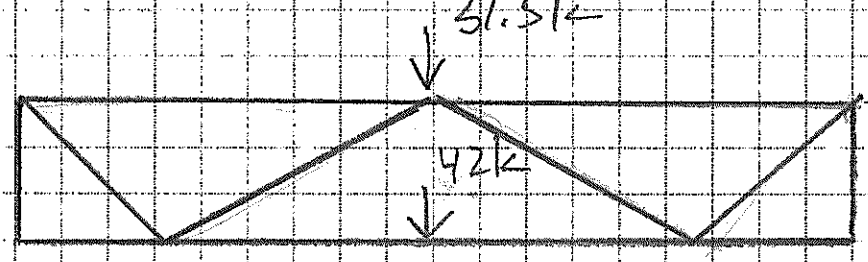
$10(84) = 840\,ft^2\,(100psf) = 84k$

Snow load

$P_f = .7C_eC_tIP_g = .7($

assume 50 psf snow load

$15(84) = 1260(50) = 63k$



Live + Dead load on one side

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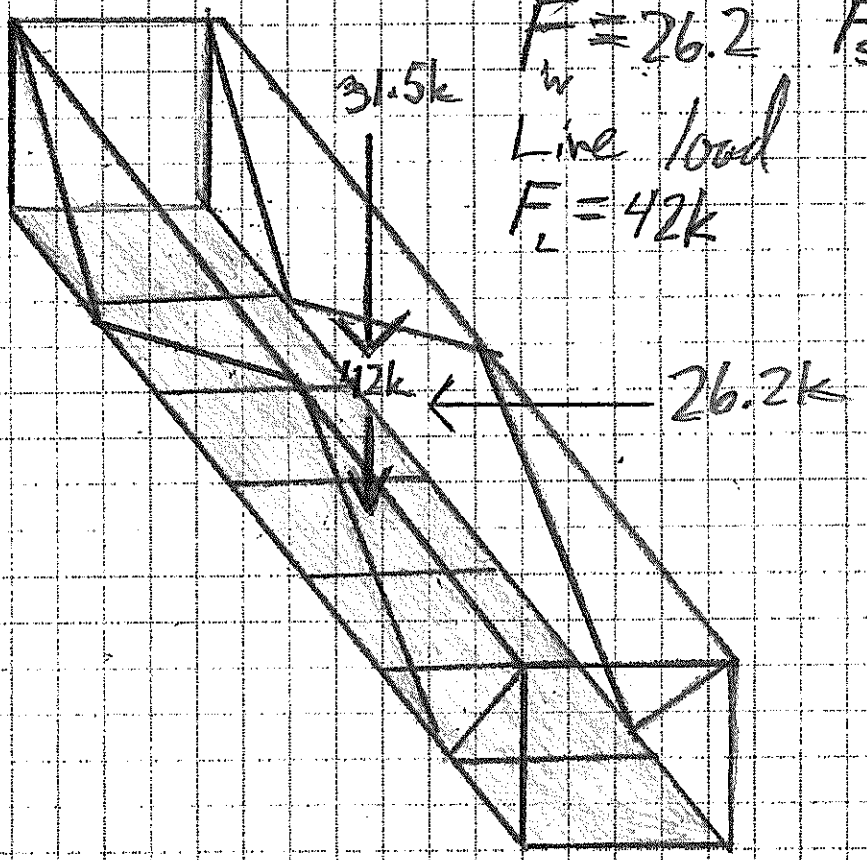
Wind load $F_w = 26.2$

Snow load $F_s = 31.5k$

Live load $F_L = 42k$



Wind Load

$$F = q_z G C_f A_f \qquad q_z =$$

$G = .85$ (rigid) $\quad C_f = 1.33 \quad A_f = 1176 ft^2$

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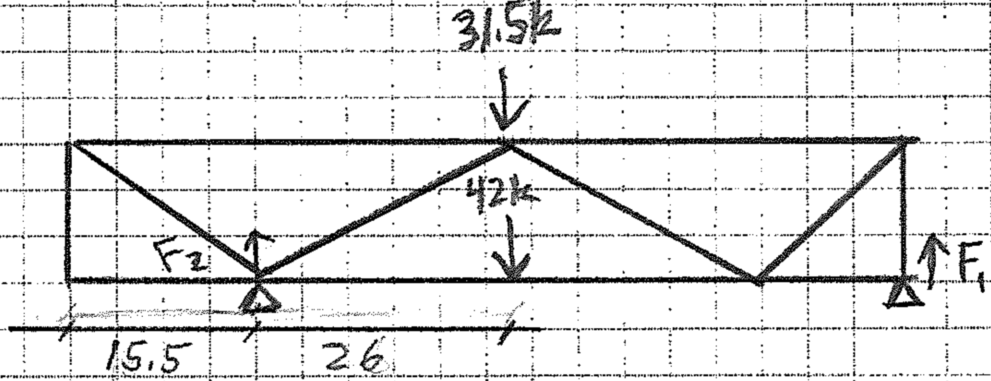


$\Sigma F_y = 0$

$F_1 + F_2 = 73.5$

$\Sigma M = 0$

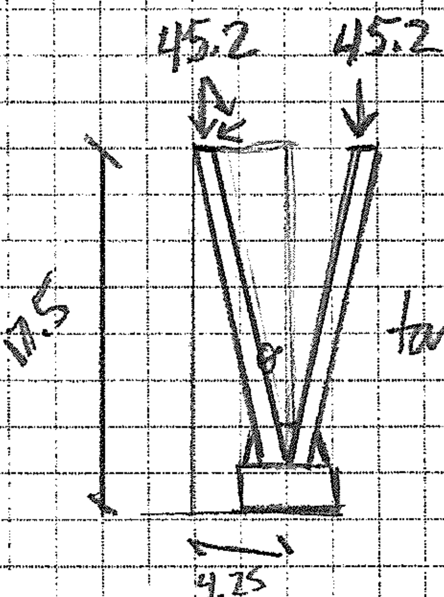
$(41.5)(73.5) = (67.5)(F_2)$

$3050 = 67.5 F_2$

$F_2 = 45.2$

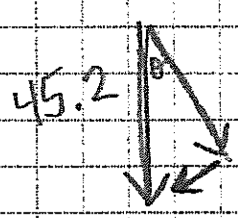
$F_1 = 28.31$

$F_2 = 90k$ at column



$\tan\theta = \frac{4.25}{17.5}$

$\theta = 13.65°$



$\sin 13.65 = \frac{x}{45.2}$ $x = 10.67$

$\cos 13.65 = \frac{y}{45.2}$ $y = 43.92$

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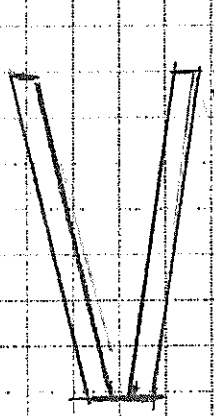
Moment on Column from Wind

$\Sigma F_w = 26.2k \quad \approx 19k$ at column support



$19/2 = 9.5k$ each column

$\theta = 13.65$

$\sin 13.65 = \frac{y}{9.5} \quad y = 2.24$

$\cos 13.65 = \frac{x}{9.5} \quad x = 9.23$

total forces on each column

$X = 9.23 + 10.67 = 19.9 \quad y = 2.24 + 43.92 = 46.16$

axial = 46.16k

moment = 19.9 (18) = 358.4 k ft

Try W14 x 159

$\frac{P_r}{P_c} + \frac{M_r}{M_c} \leq 1.0 \qquad \frac{46.16}{318} + \frac{358}{716} =$

$.15 + .5 = .65$

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$$q_z = .00256 K_z K_{zt} K_d V^2 I$$

$K_{zt} = 1$ $K_z = .68$ $K_d = .85$ $I = 1.1$

$V = 110$

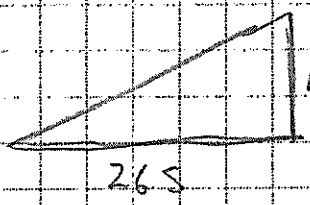
$$q_z = .00256(.68)(1)(.85)(110)^2(1.1)$$

$$q_z = 19.69$$

$$F = (19.69)(.85)(1.33)(11.76) = 26.2k$$

Deflection Check

brace HSS 6x6x5/8

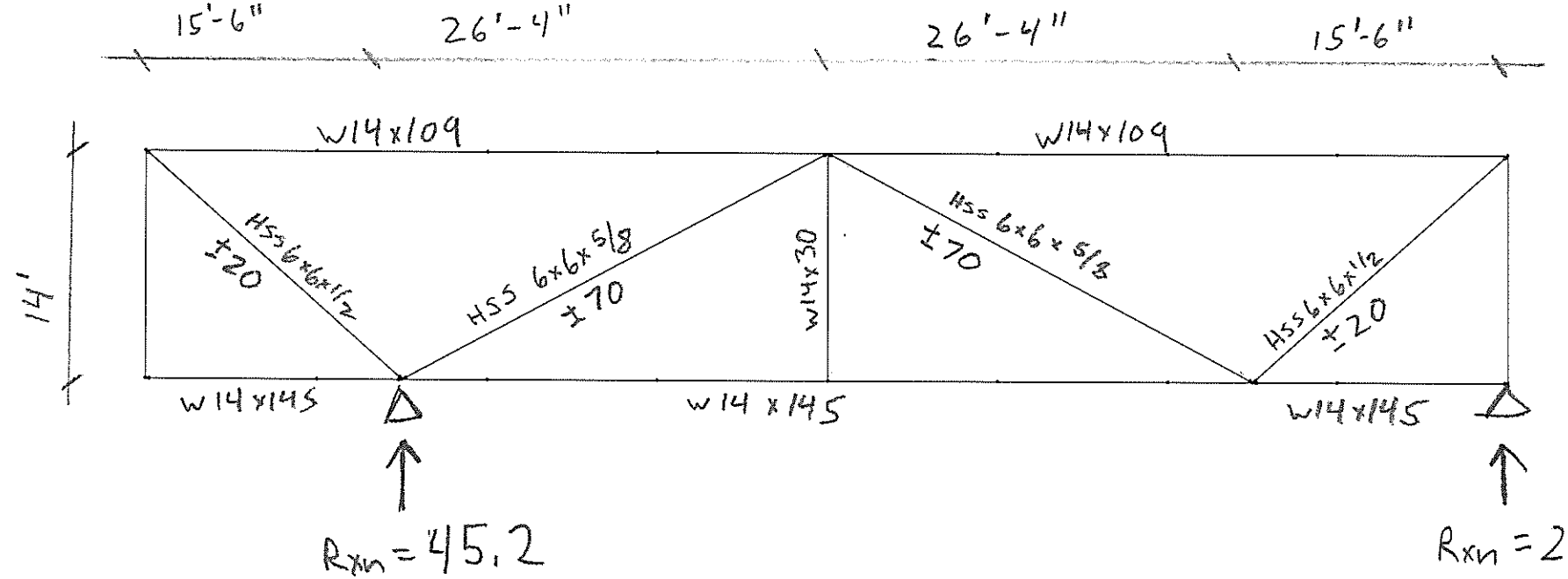


$\sqrt{26.5^2 + 15^2} = L = 30.5$

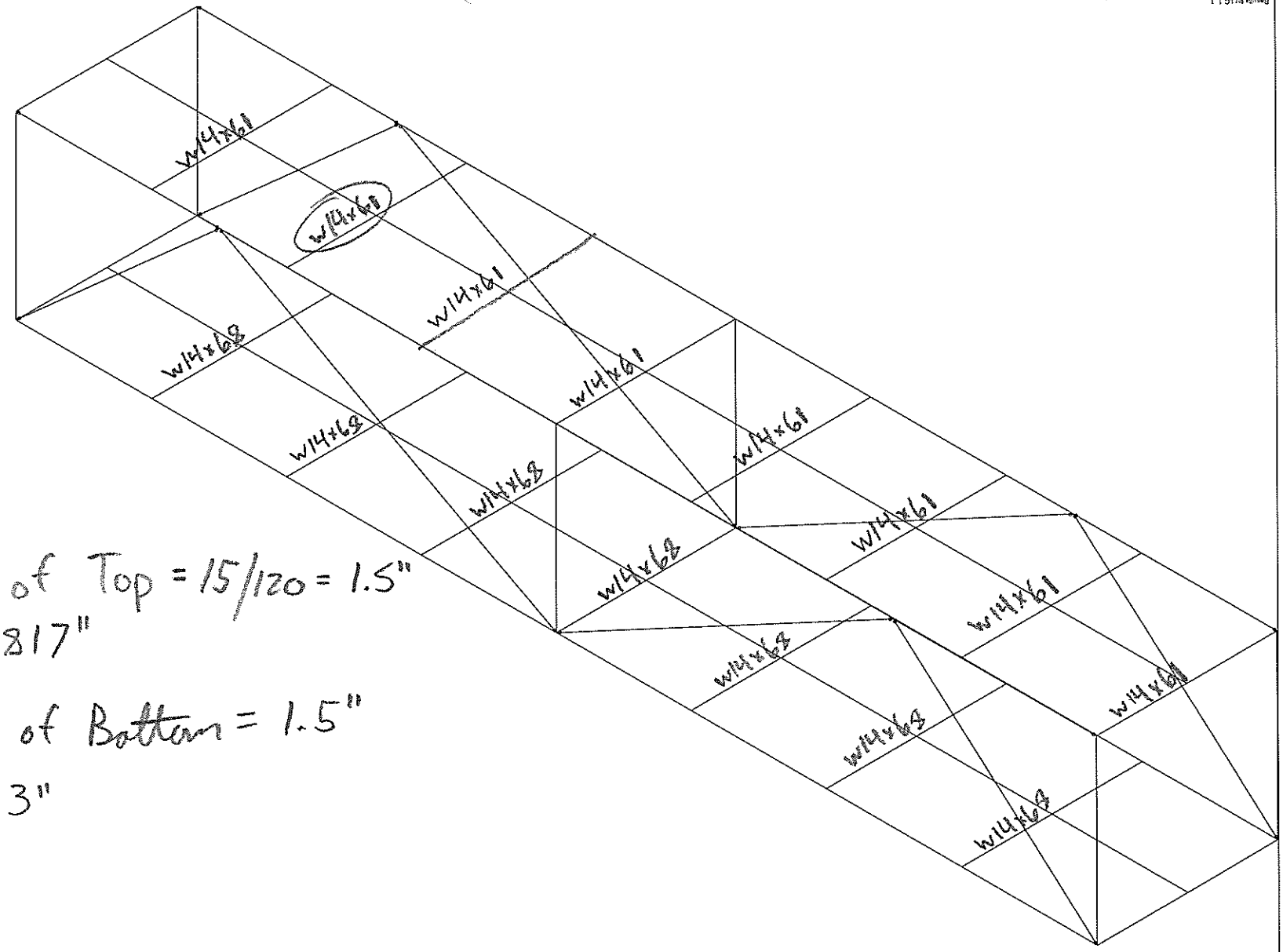
$L/120 = 30.5/120 = 3.04"$

6k

Loads = Live = 100 psf
Dead = 70 psf
Snow = 50 psf
Wind = 25 psf



Deflection of bottom chord = .5" L/120 = 50/120 = 5"
Deflection of top chord = .8" L/120 = 42/120 = 4.2"
Deflection of brace = .8" L/120 = 30/120 = 3"



Deflection of Top = 15/120 = 1.5"

= .817"

Deflection of Bottom = 1.5"

= .3"