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Design Engineer : Ben Hamed

Project: Kaweah Hvac Roof support

Structural Hand Calculation Sheet

* units seismic and overturning

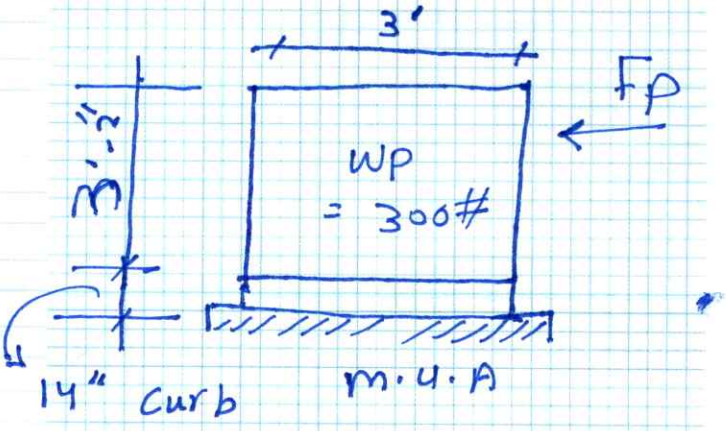
$$F_{p\,m.A} = 0.4 \times a_p \times SDS \times W_p \times \left(1 + 2\left(\frac{z}{h}\right)\right) \div \frac{R_p}{I_p}$$

$$F_p = 0.4 \times \frac{1}{2.5} \times 1.13 \times 300 \times \left(1 + 2\left(\frac{16.74}{14}\right)\right) \div \frac{2.5}{1}$$

$$= 339 \times 3.39$$

$$\simeq 1149.7 = \frac{135.6 \times 3.39}{2.5}$$

$$F_{p\,m.A} \simeq 184\ \#$$



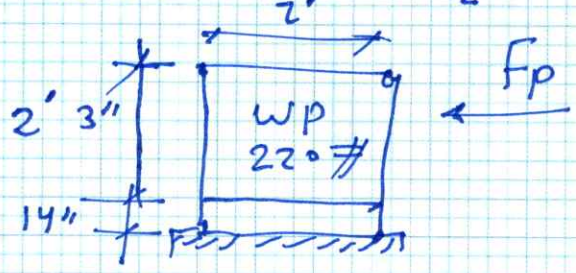
Total height above Base = 3' 2" + 14"
= 4.3'

$$Z = 14" + 14" + \frac{3'\,2"}{2}$$
$$= 16.74$$

$$F_{p\,E.f} = 0.4 \times a_p \times SDS \times W_p \times \left(1 + 2\left(\frac{z}{h}\right)\right) \div \frac{R_p}{I_p}$$

$$= 0.4 \times 1 \times 1.13 \times 220 \times 3.32 \div 2.5$$

$$F_{p\,E.f} \simeq 132\ \#$$



Total h = 14" + 2' 3"
= 3'.4

E.F

$$Z = 14' + 14" + \frac{2'\,3"}{2}$$
$$= 16.3$$

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Design Engineer : Ben Hamed

Project: Elevanty Hvac Roof support

Structural Hand Calculation Sheet

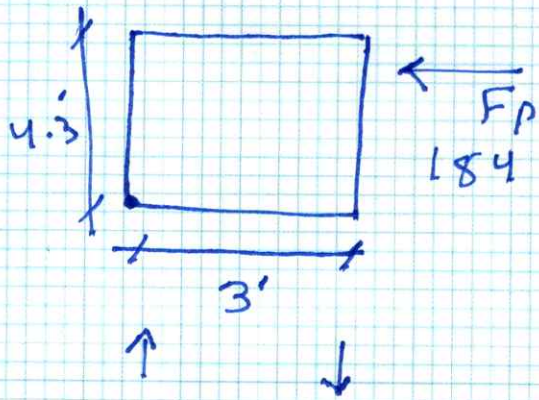
* Anchorage design

M.A.U over turning and siesmic

$M = 184 \times 4.3 = \frac{791.2\#'}{3'}$

= 263.7 #at each side

+ assuming comp and Tension carton acting uplift and gravity

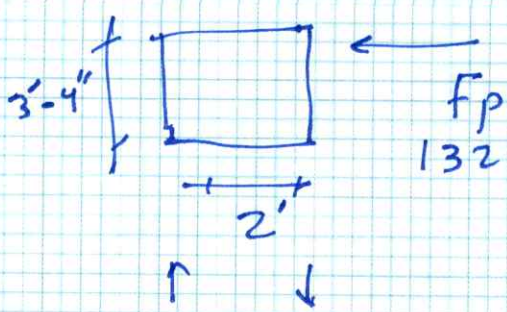


M.A.U

Exhaust Fan

$M = \frac{132 \times 3.4}{2}$

= 224.4 lbs at each side.



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Design Engineer : Ben Hamed

Project: devanty

Structural Hand Calculation Sheet

* Connection Design - NDS

try (2) 1/4" lag screw at each corner

withdrawl value - Assume Douglas Fir Larch

W = 218 lb/in G = .49

$W' = W \times C_M \times C_t \times C_{EG} \times C_{TN} \times k_F \times \phi_2 \lambda$ table 11.2A

- $C_M = 1$ table 10.3.3
- $C_t = 1$ " 10.3.4
- $C_{EG} = .98$ " 10.3.6
- $C_{TN} = 1$ " 11.5.4
- $k_F = 216/D$ Table N_1
- $\phi = .65$ $\lambda = .6$

$W' = 218 \times 1 \times 1 \times 2.16/6 \times .65 \times .6$

$= 180$ lb/in

$180 \times 2 > 224.4$ ✓ O.K

two screws each corner