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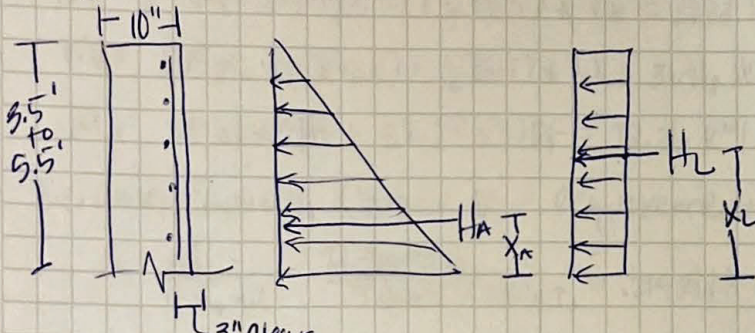


Subject: Reinforcement Schedule WBR 75028

These calculations must be on site and made available by the Permittee for all inspections.

PRPO20251253

Project Parameters:



Assume: 2' Surcharge  
 $H = 1.6$  (lateral earth pressure per ASCE 7-16)  
 $f'_c = 4500$  psi  
 $f_y = 60,000$  psi (Grade 60)

$d = 10" - 3" = 7"$  (3" clear cover)

assume  $\phi = .9$  assume  $jd = 0.875d$

3.5' wall or a span wall

$$M_n = \frac{1}{2}(65 \times 3.5)(3.5) \times 1.3(3.5) \times 1.6 = 743.16 \text{ lbs} = 8.92 \text{ k'ft}$$

$$M_q = (65 \times 2) \times 3.5 + \frac{1}{2}(3.5) \times 1.6 = 1274 \text{ lbs} = 15.29 \text{ k'ft}$$

$$M_u = 8.92 + 15.29 = 24.21 \text{ k'ft}$$

Bending Capacity (vertical Bar requirement)

$$A_s = \frac{M_u}{\phi f_y jd} = \frac{24.21 \text{ k'ft}}{.9(60 \text{ ksi})(0.875)(7)} = .073 \text{ in}^2/\text{ft of wall section}$$

$$a = \frac{A_s f_y}{.085 f'_c b w} = \frac{(.073 \text{ in}^2)(60 \text{ ksi})}{.085(4.5 \text{ ksi})(12")} = .954" \quad \checkmark j = 7" - \left(\frac{.954}{2}\right) = .931$$

$$A_s = \frac{24.21 \text{ k'ft}}{.9(60 \text{ ksi})(.931)(7)} = .069 \text{ in}^2/\text{ft} \Rightarrow \boxed{.07 \text{ in}^2/\text{ft of wall section}}$$

$$a = \frac{(.069 \text{ in}^2)(60 \text{ ksi})}{.085(4.5 \text{ ksi})(12")} = \boxed{.902} \quad \checkmark j = 7" - \left(\frac{.902}{2}\right) = .936$$

#4 @ 1'-6"  $\Rightarrow .2 (12/18) = \boxed{.13 > .07 \text{ okay}}$   $\therefore jd = (.936)d \checkmark \text{ok}$

$A_s \text{ Min} = .00012 \checkmark \text{ok}$

Confirm  $\phi$  in tension  $\Rightarrow \phi = .9 \quad \beta = 0.85 - \frac{0.05(f'_c - 4000)}{1000} = \frac{0.85(4500 - 4000)}{1000} = .825$

$c = \frac{a}{\beta} = \frac{.9}{.825} = 1.09" \quad \epsilon_t = 0.003 \left( \frac{d - c}{c} \right) = 0.003 \left( \frac{7" - 1.09"}{1.09"} \right) =$

$.016 > .005 \therefore \phi = .9$

City of Puyallup  
Building  
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COMPLIANCE

BSnowden  
10/03/2025  
11:17:45 AM





Subject: Reinforcement Schedule (cont)

5.5' Wall

$$M_n = \frac{1}{2} (65 \text{ psi} \times 5.5)(5.5) + \frac{1}{3} (5.5) \times 1.4 = 2883.83 \text{ HS/ft} = 34.61 \text{ K'"/ft}$$

$$M_u = (65 \text{ psi} \times 2')(5.5) + \frac{1}{2} (5.5) \times 1.6 = 31.16 \text{ HS/ft} = 37.75 \text{ K'"/ft}$$

$$M_u = 34.61 \text{ K'"/ft} + 37.75 \text{ K'"/ft} = 72.36 \text{ K'"/ft}$$

Bending Capacity (Vertical Bar Requirement)

$$A_s = \frac{M_u}{\phi f_y d} = \frac{72.36 \text{ K'"/ft}}{.9 (60 \text{ ksi}) (.875)(7)} = .219 \text{ in}^2/\text{ft of wall}$$

$$a = \frac{A_s f_y}{0.85 f'_c b_w} = \frac{.219 \text{ in}^2/\text{ft} (60 \text{ ksi})}{0.85 (4.5 \text{ ksi}) (12'')} = 2.86'' \quad \checkmark j = \frac{7 - (2.86/2)}{7} = .796$$

$$A_s = \frac{M_u}{\phi f_y d} = \frac{72.36 \text{ K'"/ft}}{.9 (60 \text{ ksi}) (.796)(7)} = .240 \text{ in}^2/\text{ft}$$

$$a = \frac{A_s f_y}{0.85 f'_c b_w} = \frac{.240 \text{ in}^2/\text{ft} (60 \text{ ksi})}{0.85 (4.5 \text{ ksi}) (12'')} = 3.14'' \quad \checkmark j = \frac{7 - (3.14/2)}{7} = .776$$

$$A_s = \frac{M_u}{\phi f_y d} = \frac{72.63 \text{ K'"/ft}}{.9 (60 \text{ ksi}) (.776)(7)} = .247 \text{ in}^2/\text{ft of wall}$$

$$a = \frac{A_s f_y}{0.85 f'_c b_w} = \frac{(.247 \text{ in}^2/\text{ft} (60 \text{ ksi}))}{0.85 (4.5) (12')} = 3.23'' \quad \checkmark j = \frac{7 - (3.23/2)}{7} = .769$$

$$1/s = \frac{M_u}{\phi f_y d} = \frac{72.63 \text{ K'"/ft}}{.9 (60 \text{ ksi}) (.769)(7)} = .249 \text{ in}^2/\text{ft of wall} = .25 \text{ in}^2/\text{ft}$$

$$a = \frac{A_s f_y}{0.85 f'_c b_w} = \frac{.25 \text{ in}^2/\text{ft}}{0.85 (4.5 \text{ psi}) (12'')} = 3.25'' \quad \checkmark j = \frac{7 - (3.25/2)}{7} = .768 \checkmark$$

Vertical Bar Requirement  $\Rightarrow .25 \text{ in}^2/\text{ft}$

#4 @ max 8" = .2 (12/8) = .3 in<sup>2</sup>/ft OK