

**supplemental structural calculations for:**

# **talerman-simon residence**

**3879 west mercer way  
mercero island washington**

**client: floisand studio**

**Δ 25 march 2019**

**index:**

**gr- guard-rail analysis**



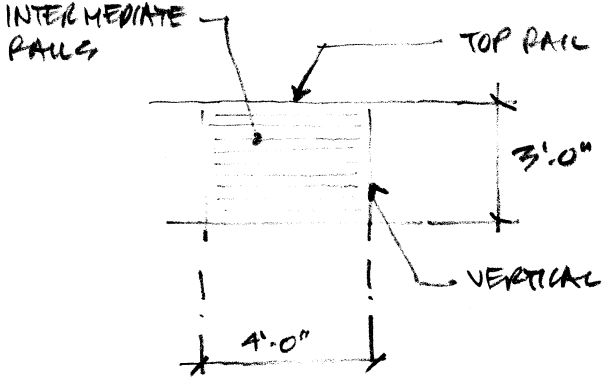
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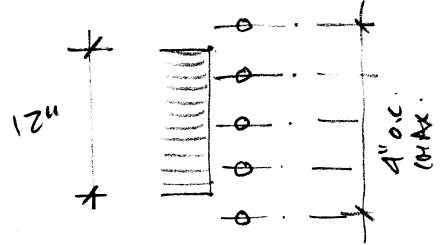
# GUARDRAIL DESIGN

## LOADS

200# EITHER DIRECTION ON TOP RAIL  
50# OVER 12" x 12" AREA BELOW.



## INTERMEDIATE RAILS



WORST CASE

50# / (3) RAILS 17# EACH

$$L = 3.83' \text{ MAX}$$

$$M_{MAX} = 16 \text{ FT.}\#$$

$$V_{MAX} = 17\#$$

### 1/2" $\phi$ BAR

$$A = 0.196 \text{ in}^2$$

$$S = .01227 \text{ in}^3$$

$$I = .00306 \text{ in}^4$$

$$F_u = 0.13 \text{ ksi} \checkmark$$

$$F_b = 15.6 \text{ ksi} \checkmark$$

$$A_{MAX} = .0002" \checkmark$$

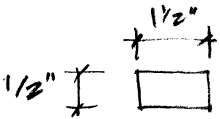
## TOP RAIL

$$L = 4.0'$$

$$P = 200\#$$

$$M_{MAX} = 200 \text{ FT.}\#$$

$$V_{MAX} = 200\#$$



$$A = .75 \text{ in}^2$$

$$S_{yy} = 0.1875 \text{ in}^3$$

$$I_{yy} = 0.140625 \text{ in}^4$$

$$f_D = 12.8 \text{ ksi} \checkmark$$

$$F_u = 0.4 \text{ ksi} \checkmark$$

$$\Delta_{MAX} = .1129" \checkmark$$

$$\Delta_{DL} = .032"$$

3/4" x 1 1/2" BAR

CONT  
→

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date: 03-25-19

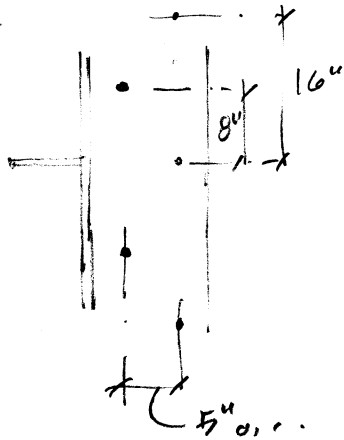
proj #: 2018.024

client: FLORESANO STUDIO

sheet: GR-1



PLATE 2 CONT



WELDS BETWEEN  
PLATE 1 & 2

$$T = C = \frac{.63 \times 12}{5} = 15.12k.$$

3/16" WELD 2.8k/INCH

2"-6" WELD OVER 3'-9" = 14.66"

∴ 41.07k / CAPACITY.

$$T = C = \frac{.63 \times 12}{5} = 15.12k.$$

3/8" φ THREADED STUD

SINGLE STUD OK → T MAX = 2.12k. ✓

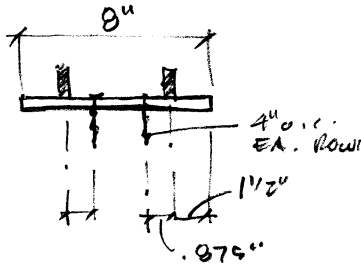


PLATE 3

THICKNESS  
TO MATCH PLATE 2.

THREE SCREWS =

$$0.63 \times 12 / 5.625" = 1.344k.$$

#12 SCREW IN DOUG FIR 154#/INCH

(4) SCREWS (MIN.) ENGAGED

#12 x 3" (2 1/2" EMBED) 385# / SCREW

T (4) SCREWS = 1.74k. ✓

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proj #: 2018-029

client: FLOISAND STUDIO

sheet: GR-3