

BY G. OHANIAN  
DATE 7-29-2025  
SUBJECT

RACK DESIGN & ENGINEERING CO.  
412 WEST BROADWAY, SUITE #204  
GLENDALE, CA. 91204  
E-MAIL: rackdesign1@gmail.com

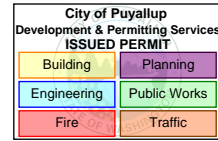
SHEET NO. 1  
JOB NO. RD-21741

PRCTI20251104

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

## STRUCTURAL CALCULATIONS OF STORAGE RACKS FOR:

CODEL ENTRY SYSTEMS CORPORATION  
1601 INDUSTRIAL PARKWAY, SUITE 102  
PUYALLUP, WA 98371



City of Puyallup  
Building  
REVIEWED  
FOR  
COMPLIANCE

BSnowden  
10/08/2025  
8:27:57 AM



PER IBC 2021, ASCE 7-16  
RMI/ANSI/MH16.3:2016



Digitally signed by  
Garnik Ohanian  
Date: 2025.07.30  
12:46:33 -07'00'

STORAGE RACKS CAPACITY:  
750 #/ ARM

EXPIRES 12-26-25

CALCS. 1 THRU 4

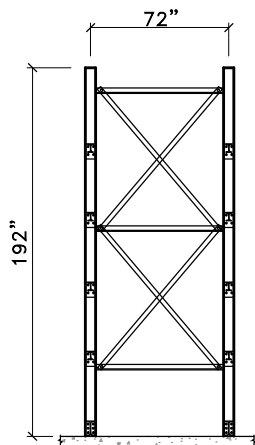
DRAWINGS: RD-21741

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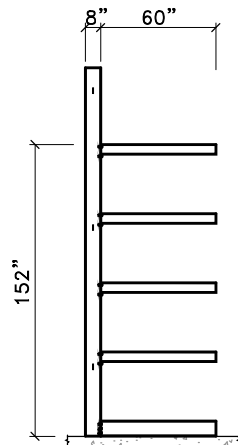
RACK DESIGN & ENGINEERING CO.  
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SHEET NO. 2  
 JOB NO. RD-21741

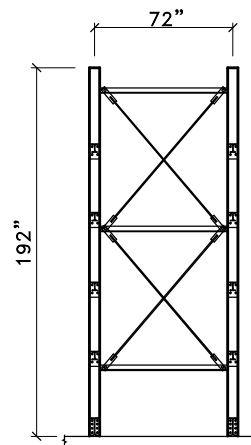
PRCTI20251104



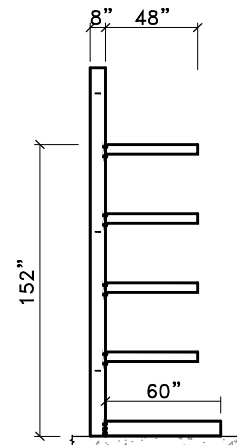
TYPE-1



SIDE VIEW

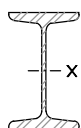


TYPE-2



SIDE VIEW

#### S3x5.7 ARM



$$I_x = 2.5$$

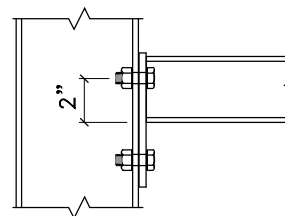
$$S_x = 1.67$$

$$F_Y = 50 \text{ KSI.}$$

750 #/ ARM

$$M = 0.5^K \times 30'' = 23''^K$$

$$S_R = \frac{23''^K}{30} = 0.8 < 1.67$$

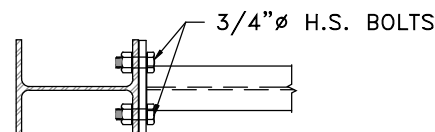


$$P_a = 19.4^K \quad 3/4'' \varnothing \text{ H.S. BOLTS}$$

$$19.4 \times 2 = 38.8^K \quad 2 \text{ BOLTS}$$

$$M_a = 38.8^K \times 2'' = 78 > 23''^K$$

CONN.



#### SEISMIC DESIGN

$$V = \frac{S_{D1} \times I}{T_x R_x \times 1.4} \times W \quad \text{IBC 2021}$$

ANSI MH16.3-2016

$$S_{D1} = .47$$

SITE CLASS D

$$I = 1$$

NO PUBLIC ACCESS

$$R = 2.5$$

CROSS AISLE

$$R = 3.25$$

DOWN AISLE

$$T = 0.5$$

SECONDS

$$W =$$

D.L. + (.67 x PRODUCT LOAD)

$$\text{LOAD PER COL.} = 4 \times .75^K = 3.0^K$$

$$W = .5_{DL} + (3.0_{PL}^K \times 0.67) = 2.5^K$$

$$V_{\text{CROSS}} = .67^K$$

$$V_{\text{DOWN}} = .52^K$$

$$M_e = 2.5^K \times (30'' + 4'') = 85''^K$$

$$M_s = .67^K \times 152'' \times .66 = \frac{68''^K}{153''^K}$$

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#### W8x18 COLUMN

$$\begin{aligned}
 F_y &= 50 \text{ KSI} & \frac{KI}{r_x} &= \frac{2 \times 152}{3.43} = 88 & F_e &= \frac{\pi^2 E}{\left(\frac{KI}{r}\right)^2} = 37 & P_n &= F_{cr} \cdot A_g = 150 \text{ K} \\
 A_g &= 5.26 & \Omega_b &= 1.67 & & & & \\
 Z_x &= 17 & \Omega_c &= 1.67 & M_n &= Z_x \cdot F_y = 850 \text{ "K} & F_e &> .44 F_y = 22 & P_c &= \frac{P_n}{\Omega_c} = \frac{150}{1.67} = 90 \\
 r_x &= 3.43 & & & M_c &= \frac{M_n}{\Omega_b} = 508 \text{ "K} & F_{cr} &= F_y (.658^{F_y/F_e}) = 28 \text{ KSI}
 \end{aligned}$$

#### COMBINED STRESS RATIO

$$\begin{aligned}
 \frac{P}{P_c} &= \frac{3.0}{90} = .03 < .2 \\
 \frac{P_r}{2P_c} + \frac{M}{M_c} &= \frac{3.0}{2 \times 90} + \frac{153}{508} = .32 < 1.0
 \end{aligned}$$

#### OVERTURNING

$$\begin{aligned}
 M_{OT} &= 68 \text{ "K} \\
 M_R &= 2.5 \text{ K} \times 34" = 85 \text{ "K} \quad \text{NO UPLIFT}
 \end{aligned}$$

(4)-5/8"Ø ANCHORS PER BASE 3 1/2" EMB.

HILTI KWIK BOLT-TZ2 ESR-4266

PERIODIC SPECIAL INSPECTION IS REQUIRED

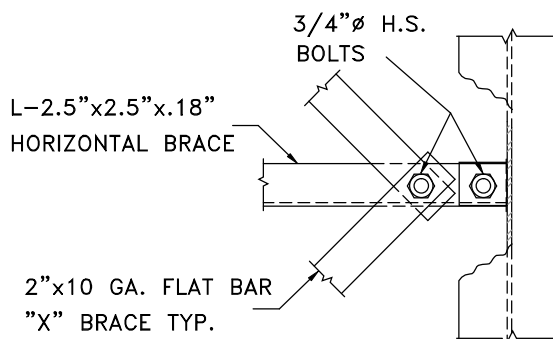
#### "X" BRACING TYPE-1

$$P = .52 \times 2 \times \frac{88"}{72"} \times \frac{\text{LENGTH OF BAR}}{\text{SPAN}} = 1.3 \text{ K}$$

2"x10 GA. FLAT BAR

$$P_a = 2" \times 13" \times 36 \times .6 = 5.6 \text{ K}$$

$$3/4" \text{Ø H.S. BOLT} \quad P_a = 9.3 > 1.3 \text{ K}$$



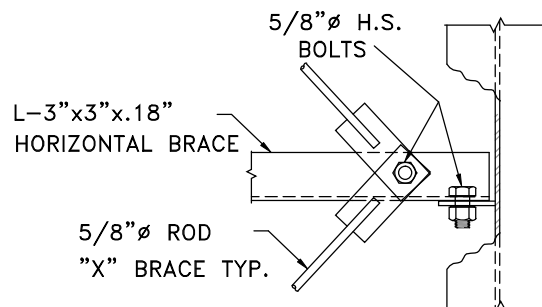
#### "X" BRACING TYPE-2

$$P = .52 \times 2 \times \frac{88"}{72"} \times \frac{\text{LENGTH OF BAR}}{\text{SPAN}} = 1.3 \text{ K}$$

$$5/8" \text{Ø ROD} \quad A = .31$$

$$T_a = .31 \times 36 \times .6 = 6.7 > 1.3 \text{ K}$$

$$5/8" \text{Ø H.S. BOLT} \quad P_a = 6.4 \text{ K}$$



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#### BASE CONNECTION

$$M_{\text{BASE}} = 153 \text{ "K}$$

$$M_{\text{a}} = 19.4 \text{ K} \times 4 \times 5 = 388 > 153 \text{ "K}$$

BASE 3/4" H.S. BOLT

