

BY G. OHANIAN
DATE 7-25-2025
SUBJECT

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

SHEET NO. 1
JOB NO. RD-21739

PRCTI20251104

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

STRUCTURAL CALCULATIONS OF STORAGE RACKS FOR:

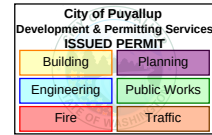
CODEL ENTRY SYSTEMS CORPORATION
1601 INDUSTRIAL PKWY, SUITE 102
PUYALLUP, WA 98371

PER IBC 2021, ASCE 7-16
RMI/ANSI/MH16.1:2021

STORAGE RACKS CAPACITY:
SEE ELEVATIONS

CALCS. 1 THRU 10

DRAWINGS: RD-21739



City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE

BSnowden
10/08/2025
8:27:42 AM



Digitally signed by
Garnik Ohanian
Date: 2025.07.28
15:04:43 -07'00'

EXPIRES 12-26-25

BY G. OHANIAN

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412 WEST BROADWAY, SUITE #204

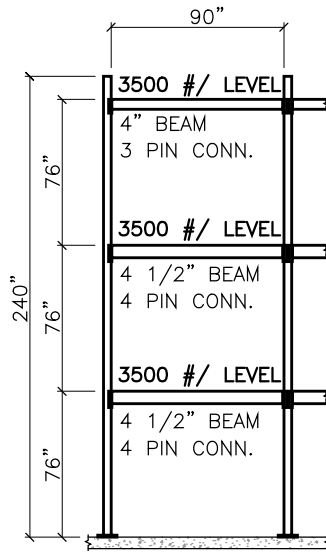
GLENDAL, CA. 91204

E-MAIL: rackdesign1@gmail.com

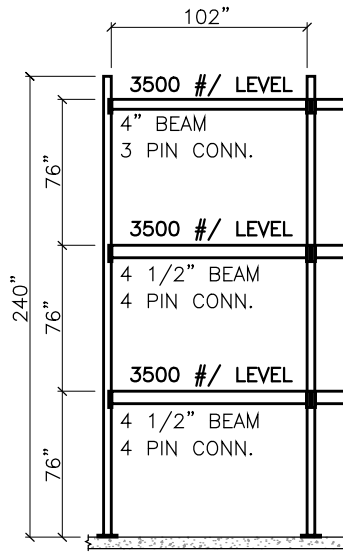
SHEET NO. 2

JOB NO. RD-21739

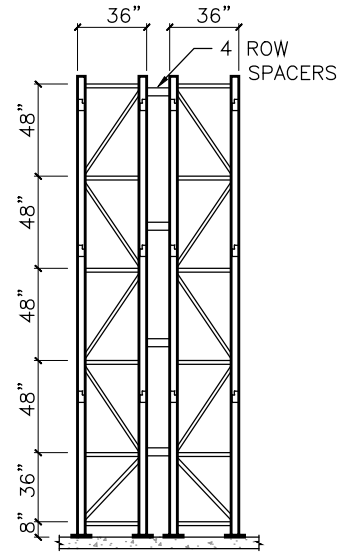
PRCTI20251104



TYPE-1

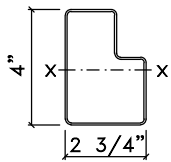


TYPE-2



SIDE VIEW

BEAM DESIGN



$$I_x = 1.63$$

$$S_x = .77$$

$$F_y = 55 \text{ KSI.}$$

$$t = .06" \text{ (16 GA.)}$$

LOAD PER BEAM + 25% IMPACT LOAD

$$(3.5 \text{ K} \times .88) + (1.8 \text{ K} \times .25) = \frac{3.5}{2} = 1.8 \text{ K}$$

$$M = \frac{wL^2}{8} = 22 \text{ "K}$$

$$S_R = .68 < .77$$

$$\Delta = \frac{5 \times wL^4}{384 \times I_x \times E} = .51" < \frac{L}{180} = .57"$$

SEISMIC DESIGN

$$V = \frac{S_{DS} \times I}{R \times 1.4} \times W$$

$$S_{DS} = 1.00$$

SITE CLASS D

$$I = 1$$

NO PUBLIC ACCESS

$$R = 6$$

MOM. CONN. RMI 2.6 AND 2.6.3

$$R = 4$$

BRACED CONN.

$$W =$$

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

$$\text{LOAD PER COL.} = \frac{3 \times 3.5 \text{ K}}{2 \text{ col.}} = 5.2 \text{ K}$$

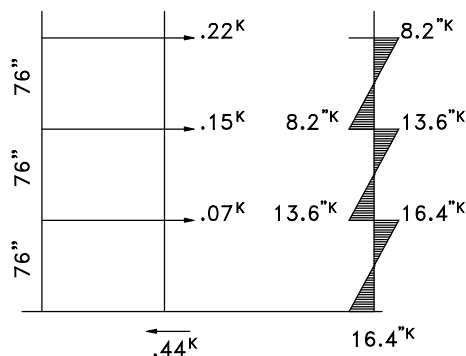
$$P = .2 \text{ DL} + (5.2 \text{ K} \times 0.75) = 4.1 \text{ K}$$

$$W = .2 \text{ DL} + (5.2 \text{ K} \times 0.67) = 3.7 \text{ K}$$

$$V_{\text{LONGIT.}} = .44 \text{ K}$$

$$V_{\text{TRANS.}} = .66 \text{ K}$$

LONGIT. SEISMIC



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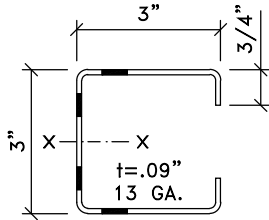
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SHEET NO. 3

JOB NO. RD-21739

PRCTI20251104

COLUMN DESIGN



$$F_y = 55 \text{ KSI}$$

$$A_e = .78$$

$$I_x = 1.19$$

$$S_e = .8$$

$$r_x = 1.2$$

$$r_y = 1.1$$

$$\frac{KL}{r_x} = \frac{76 \times 1.0}{1.2} = 62$$

$$\frac{KL}{r_y} = \frac{36}{1.1} = 33$$

$$M_n = S_e \cdot F_y = 44$$

$$F_e = \frac{\pi^2 E}{\left(\frac{KL}{r_x}\right)^2} = 76$$

$$F_n = F_y (.658 \lambda_c^2) = 41 \text{ KSI}$$

$$P_n = F_n \cdot A_e = 32.0 \text{ K}$$

$$\lambda_c = \sqrt{F_y / F_e} = 0.85$$

$$\lambda_c < 1.5$$

COMBINED STRESS RATIO

$$P_{ex} = \frac{\pi^2 E I_x}{(KL)^2} = 60.0$$

$$\Omega_c = 1.8$$

$$\frac{\Omega_c P}{P_n} + \frac{\Omega_b C_{mx} M}{M_n \alpha_x} = .84 < 1$$

$$\alpha_x = 1 - \frac{\Omega_c P}{P_{ex}} = .88$$

$$\Omega_b = 1.67$$

$$C_{mx} = .85$$

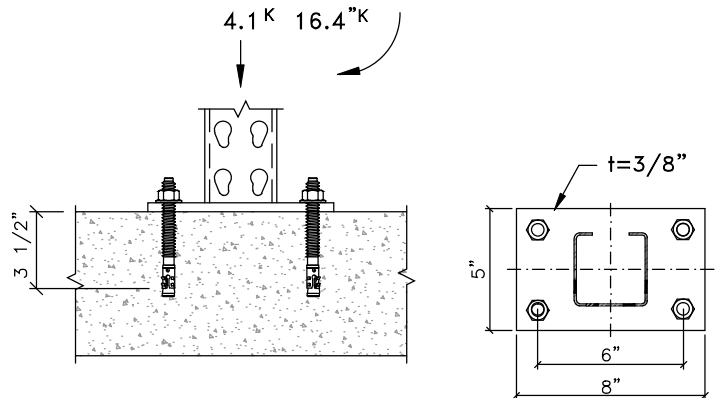
BASE PLATE

$$\text{ANCH. TENSION} = .66 \text{ K}$$

$$\text{ANCHOR SHEAR} = .22 \text{ K}$$

(4)-1/2"Ø ANCHORS PER BASE PL., 3 1/2" EMB.
HILTI KWIK BOLT-TZ2 ESR-4266

PERIODIC SPECIAL INSPECTION IS REQUIRED



MOMENT AT BEAM CONNECTION

$$.5 \times .09 \times 1 \times 65 = 2.9 \text{ K}$$

BEARING CAPACITY
OF COL. HOLE

7/16"Ø RIVET

$$A = .1 \quad F_y = 79 \text{ KSI}$$

$$P_a = .1 \times 79 \times .4 = 3 \text{ K}$$

$$M_a = (2.9 \text{ K} \times 6") + (2.0 \text{ K} \times 4") = 25.4 \text{ inch-K}$$

4 PIN CONN.
1st & 2nd LEVELS

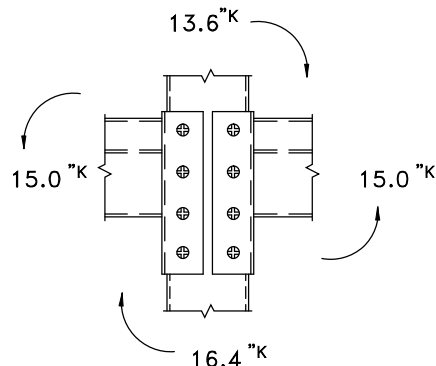
$$M_a = (2.9 \text{ K} \times 4") + (1.5 \text{ K} \times 2") = 14.6 \text{ inch-K}$$

3 PIN CONN.
3rd LEVEL

$$M_{END} = .01 \times w l^2 = 1.8 \text{ inch-K}$$

$$M = 15.0 \text{ inch-K} \quad M = 16.8 \text{ inch-K}$$

SEISMIC TOTAL



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SHEET NO. 4
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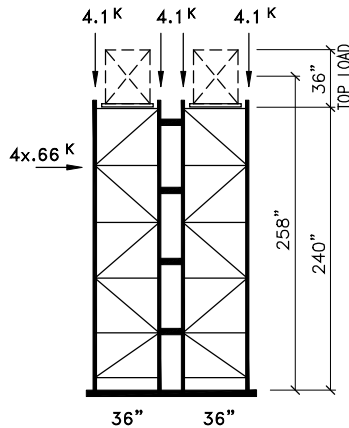
PRCTI20251104

OVERTURNING

$$M_{OT} = .66 K \times 4 \times \frac{246}{\text{COL.}} \times 0.66 = 428 \text{ "K}$$

$$M_R = 4.1 K \times 4 \times 42 = 688 \text{ "K}$$

NO UPLIFT



TOP LEVEL 100% LOADING

$$W = 0.2_{DL} + 1.8_{LL} = 2.0 K \text{ LOAD PER COL.}$$

$$V = .35 K$$

$$M_{OT} = .35 K \times 4 \times \frac{228}{\text{COL.}} = 319 \text{ "K}$$

$$M_R = 2.0 K \times 4 \times 42 = 336 \text{ "K}$$

NO UPLIFT

LOAD TO DIAGONAL

$$P = .66 K \times 2 \times \frac{46}{\text{COL.}} = 1.7 K$$

$$F_Y = 55 \text{ KSI}$$

$$A_e = .26$$

$$r_x = .48$$

$$L = 46 \text{ "}$$

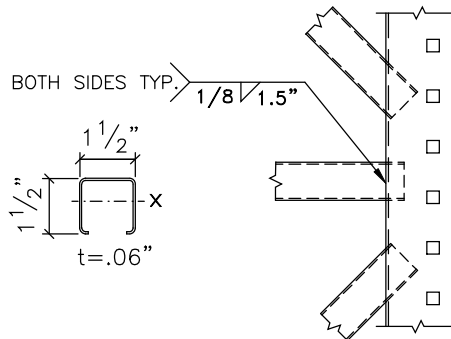
$$P_a = 4.1 K$$

CHECK WELDS

$$P_n = L \cdot t \cdot F_u = .06 \times 1.5 \text{ "} \times 65 = 5.9 K$$

$$\Omega = 2.35$$

$$\frac{P_n}{\Omega} = \frac{5.9 K}{2.35} = 2.5 \times 2 \text{ SIDES} = 5.0 K$$



CHECK SLAB

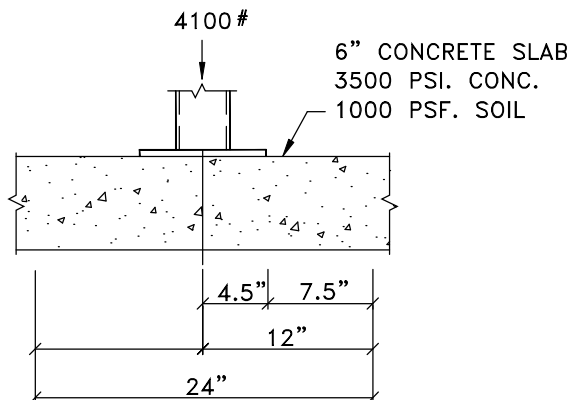
$$\frac{4100}{1000} = 4.1 \text{ '}, \quad 4.1 \times 144 = 590 \text{ "}$$

$$\sqrt{590} = 24 \text{ "}$$

$$M = \left(\frac{7.5}{12} \right)^2 \times 1000 \times \frac{1}{2} \times 12 = 2344 \text{ " #}$$

$$S = \frac{12 \times 6^2}{6} = 72$$

$$\frac{2344}{72} = 33 < 1.6 \sqrt{3500} = 90$$



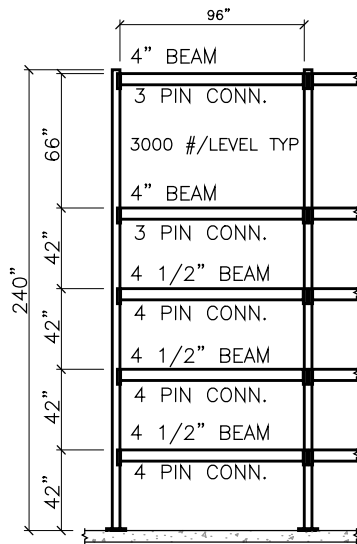
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SHEET NO. 5

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TYPE "3", "M" & "O"

$$\text{LOAD PER COL.} = \frac{5 \times 3.0 \text{ K}}{2 \text{ COL.}} = 7.5 \text{ K}$$

$$P = .2 \text{ DL} + (7.5 \text{ K} \times 0.75) = 5.8 \text{ K}$$

$$W = .2 \text{ DL} + (7.5 \text{ K} \times 0.67) = 5.2 \text{ K}$$

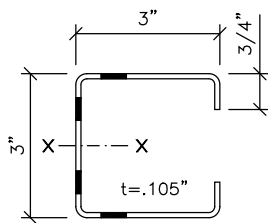
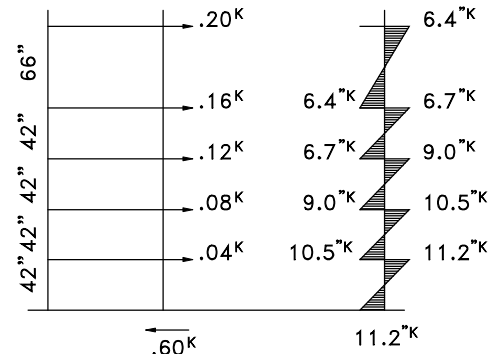
$$V_{\text{LONGIT.}} = .59 \text{ K}$$

$$V_{\text{TRANS.}} = .89 \text{ K}$$

OVERTURNING

$$M_{\text{OT}} = .89 \text{ K} \times 4 \times 218'' \times 0.66 = 510 \text{ K}$$

$$M_R = 23 \text{ K} \times 42'' = 966 \text{ K}$$



$$\begin{aligned} F_Y &= 55 \text{ KSI} \\ A_e &= .91 \\ I_x &= 1.36 \\ S_e &= .9 \\ r_x &= 1.2 \\ r_y &= 1.1 \end{aligned}$$

$$\frac{KL}{r_x} = \frac{40 \times 1.2}{1.2} = 40$$

$$\frac{KL}{r_y} = \frac{36}{1.1} = 33$$

$$M_n = S_e \cdot F_Y = 50$$

$$F_e = \frac{\pi^2 \times E}{\left(\frac{KL}{r_x}\right)^2} = 182$$

$$F_n = F_Y (.658 \lambda_c^2) = 48 \text{ KSI}$$

$$P_n = F_n \cdot A_e = 44.0 \text{ K}$$

$$\lambda_c = \sqrt{F_Y / F_e} = 0.55$$

$$\lambda_c < 1.5$$

COMBINED STRESS RATIO

$$P_{ex} = \frac{\pi^2 E I_x}{(KL)^2} = 172.0 \quad \Omega_c = 1.8$$

$$\alpha_x = 1 - \frac{\Omega_c P}{P_{ex}} = .94 \quad \Omega_b = 1.67$$

$$C_{mx} = .85$$

$$\frac{\Omega_c P}{P_n} + \frac{\Omega_b C_{mx} M}{M_n \alpha_x} = .58 < 1$$

BASE PLATE

$$\text{ANCH. TENSION} = 0$$

$$\text{ANCHOR SHEAR} = .15 \text{ K}$$

(4)-1/2" Ø ANCHORS PER BASE PL., 3 1/2" EMB.

SPECIAL INSPECTION IS REQUIRED

$$M_a = (3.0 \text{ K} \times 6'') + (2.0 \text{ K} \times 4'') = 26.0 \text{ K}$$

$$M_a = (3.0 \text{ K} \times 4'') + (1.5 \text{ K} \times 2'') = 15.0$$

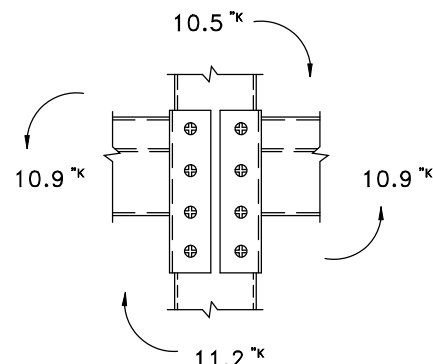
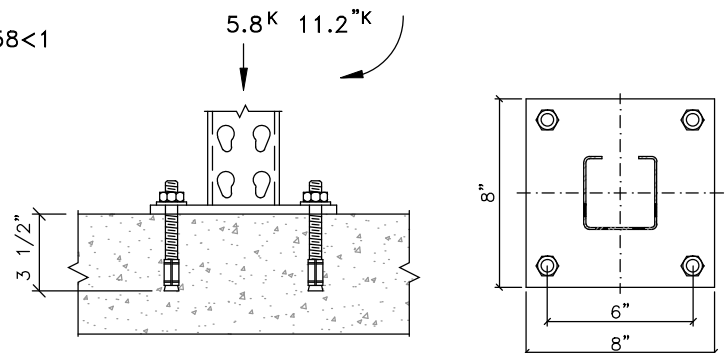
$$M_{\text{END}} = .01 \times w l^2 = 1.4 \text{ K}$$

$$M = 10.9 \text{ K} \quad M = 12.3 \text{ K}$$

SEISMIC

TOTAL

4 PIN CONN.
 1st, 2nd & 3rd LEVELS
 3 PIN CONN.
 UPPER LEVELS



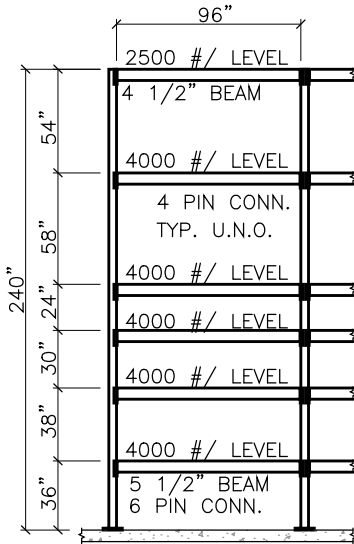
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SHEET NO. 6

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TYPE "B"

$$\text{LOAD PER COL.} = \frac{(5 \times 4.0 \text{ K}) + 2.5 \text{ K}}{2 \text{ COL.}} = 11.2 \text{ K}$$

$$P = .2 \text{ DL} + (11.2 \text{ K} \times 0.75) = 8.6 \text{ K}$$

$$W = .2 \text{ DL} + (11.2 \text{ K} \times 0.67) = 7.7 \text{ K}$$

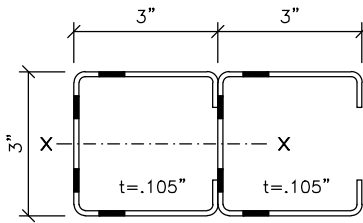
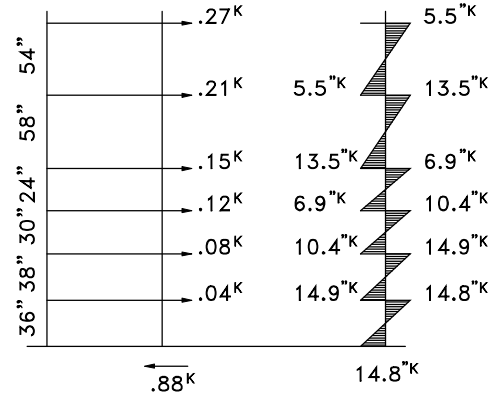
$$V_{\text{LONGIT.}} = .88 \text{ K}$$

$$V_{\text{TRANS.}} = 1.3 \text{ K}$$

OVERTURNING

$$M_{\text{OT}} = 1.3 \text{ K} \times 4 \text{ COL.} \times 258 \text{"} \times 0.66 = 900 \text{"} \text{ K}$$

$$M_R = 24 \text{ K} \times 47 \text{"} = 1128 \text{"} \text{ K}$$



$$F_Y = 55 \text{ KSI}$$

$$A_e = 1.82$$

$$I_x = 2.93$$

$$S_e = 2.0$$

$$r_x = 1.3$$

$$r_y = 1.8$$

$$\frac{KL}{r_x} = \frac{36 \times 1.2}{1.3} = 33$$

$$\frac{KL}{r_y} = \frac{36}{1.8} = 20$$

$$M_n = S_e \cdot F_Y = 107$$

$$F_e = \frac{\pi^2 \times E}{\left(\frac{KL}{r_x}\right)^2} = 264$$

$$F_n = F_Y \cdot (.658 \lambda_c^2) = 50 \text{ KSI}$$

$$P_n = F_n \cdot A_e = 92.0 \text{ K}$$

$$\lambda_c = \sqrt{F_Y / F_e} = 0.46$$

$$\lambda_c < 1.5$$

$$P_{ex} = \frac{\pi^2 E I_x}{(KL)^2} = 457$$

$$\Omega_c = 1.8$$

$$\alpha x = 1 - \frac{\Omega_c P}{P_{ex}} = .97$$

$$\Omega_b = 1.67$$

$$C_{mx} = .85$$

$$\frac{\Omega_c P}{P_n} + \frac{\Omega_b C_{mx} M}{M_n \alpha x} = .37 < 1$$

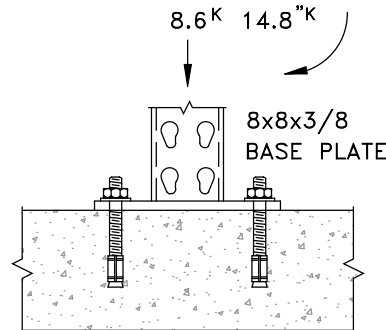
BASE PLATE

ANCH. TENSION = 0

ANCHOR SHEAR = .22 K

(4) - 1/2" Ø ANCHORS PER BASE PL, 3 1/2" EMB.

SPECIAL INSPECTION IS REQUIRED



BEAM CONN

$$M_a = (3.0 \text{ K} \times 10 \text{"} + (2.5 \text{ K} \times 8 \text{"} + (2.0 \text{ K} \times 6 \text{"})) = 62.0 \text{"} \text{ K} \quad \text{6 PIN CONN. 1st LEVEL}$$

$$M_a = (3.0 \text{ K} \times 6 \text{"} + (2.0 \text{ K} \times 4 \text{"})) = 26.0 \text{"} \text{ K} \quad \text{4 PIN CONN. UPPER LEVELS}$$

$$M_{\text{END}} = .01 \times w \times l^2 = 1.8 \text{"} \text{ K}$$

$$M = 14.8 \text{"} \text{ K} \quad \text{SEISMIC}$$

$$M = 16.6 \text{"} \text{ K} \quad \text{TOTAL}$$

LOAD TO DIAGONAL

$$P = 1.3 \text{ K} \times 2 \times \frac{50}{44} = 2.9 \text{ K}$$

$$F_Y = 55 \text{ KSI}$$

$$A_e = .26$$

$$r_x = .48$$

$$L = 50 \text{"} \text{ DOUBLED BRACE}$$

2 LOWER DIAGONALS

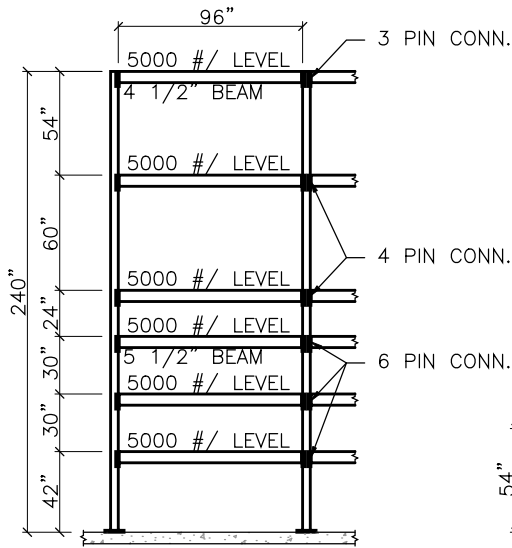
$$P_d = 3.4 \text{ K} \times 2 = 6.8 \text{ K}$$

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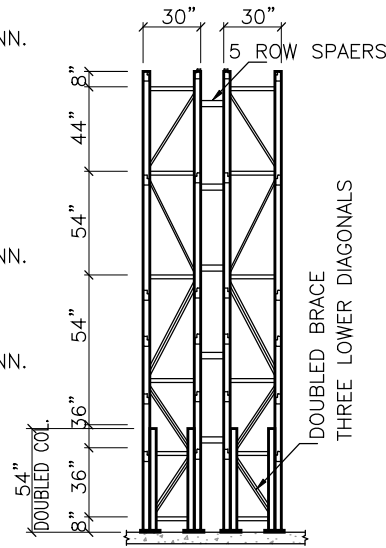
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SHEET NO. 7
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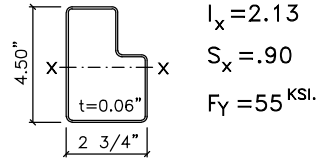


TYPE "C"



SIDE VIEW

BEAM DESIGN



$$I_x = 2.13$$

$$S_x = .90$$

$$F_y = 55 \text{ KSI.}$$

$$\text{LOAD PER BEAM} + 25\% \text{ IMPACT LOAD} \\ (5.0 \text{ K} \times .88) + (2.5 \text{ K} \times .25) = \frac{5.0}{2} = 2.5 \text{ K}$$

$$M = \frac{wL^2}{9} = 26 \text{ \"K}$$

$$S_R = .81 < .90$$

$$\Delta = \frac{5 \times wL^4}{384 \times I_x \times E} = .46\" < \frac{L}{180} = .53"$$

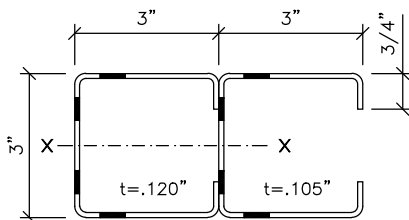
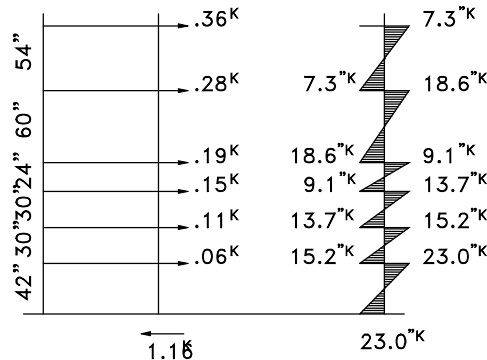
$$\text{LOAD PER COL.} = \frac{6 \times 5.0 \text{ K}}{2 \text{ COL.}} = 15.0 \text{ K}$$

$$P = .2 \text{ DL} + (15.0 \text{ K} \times 0.75) = 11.4 \text{ K}$$

$$W = .2 \text{ DL} + (15.0 \text{ K} \times 0.67) = 10.2 \text{ K}$$

$$V_{\text{LONGIT.}} = 1.16 \text{ K}$$

$$V_{\text{TRANS.}} = 1.74 \text{ K}$$



$$F_y = 55 \text{ KSI}$$

$$A_e = 1.94$$

$$I_x = 3.09$$

$$S_e = 2.1$$

$$r_x = 1.3$$

$$r_y = 1.8$$

$$\frac{KL}{r_x} = \frac{42 \times 1.2}{1.3} = 39$$

$$\frac{KL}{r_y} = \frac{36}{1.8} = 20$$

$$M_n = S_e \cdot F_y = 113$$

$$P_n = F_n \cdot A_e = 95.0 \text{ K}$$

$$\frac{\Omega_c \cdot P}{P_n} + \frac{\Omega_b \cdot C_{mx} \cdot M}{M_n \cdot \alpha_x} = .53 < 1$$

OVERTURNING

$$M_{OT} = 1.74 \text{ K} \times 4 \times 258\" \times 0.66 = 1185 \text{ \"K}$$

$$M_R = 11.4 \text{ K} \times 4 \times 36\" = 1642 \text{ \"K}$$

$$M_a = (3.0 \text{ K} \times 10\") + (2.5 \text{ K} \times 8\") + (2.0 \text{ K} \times 6\") = 62.0 \text{ \"K}$$

$$M_{END} = .01 \times wL^2 = 2.4 \text{ \"K}$$

$$M = 19.1 \text{ \"K} \quad M = 21.5 \text{ \"K}$$

SEISMIC TOTAL

8\"x8\"x3/8\" BASE PLATE

(4)-1/2\"Ø ANCHORS PER BASE PL.

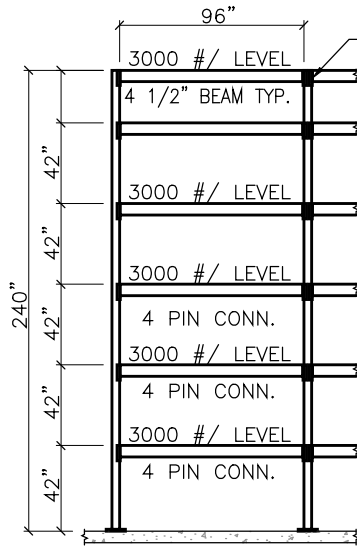
6 PIN CONN.
 1st, 2nd & 3rd LEVELS
 4 PIN CONN.
 4th & 5th LEVELS
 3 PIN CONN.
 6th LEVEL

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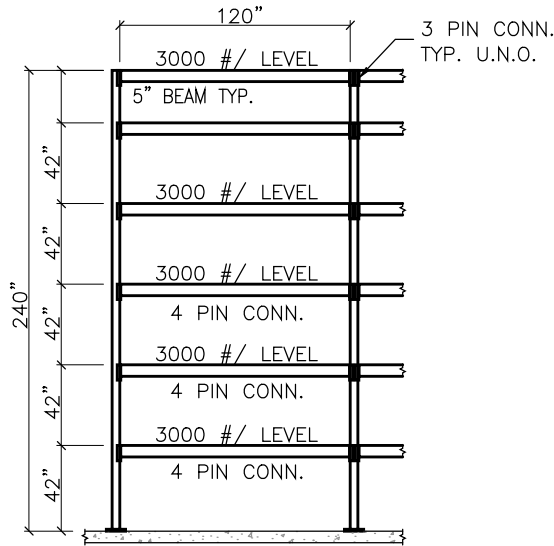
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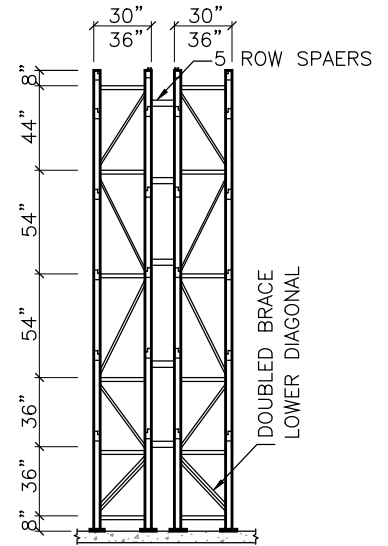
PRCTI20251104



TYPE "D" & "N"



TYPE "E, T"



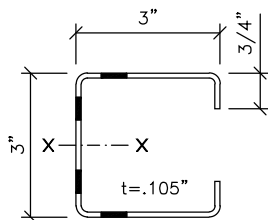
SIDE VIEW

$$\text{LOAD PER COL.} = \frac{6 \times 3.0 \text{ K}}{2 \text{ col.}} = 9.0 \text{ K}$$

$$P = .2_{DL} + (9.0 \text{ K} \times 0.75) = 7.0 \text{ K}$$

$$W = .2_{DL} + (9.0 \text{ K} \times 0.67) = 6.2 \text{ K}$$

$$V_{\text{LONGIT.}} = .70 \text{ K} \quad V_{\text{TRANS.}} = 1.1 \text{ K}$$



$$\begin{aligned} F_Y &= 55 \text{ KSI} \\ A_e &= .91 \\ I_x &= 1.36 \\ S_e &= .9 \\ r_x &= 1.2 \\ r_y &= 1.1 \end{aligned}$$

$$\frac{\Omega_c P}{P_n} + \frac{\Omega_b C_{mx} M}{M_n \alpha_x} = .87 < 1$$

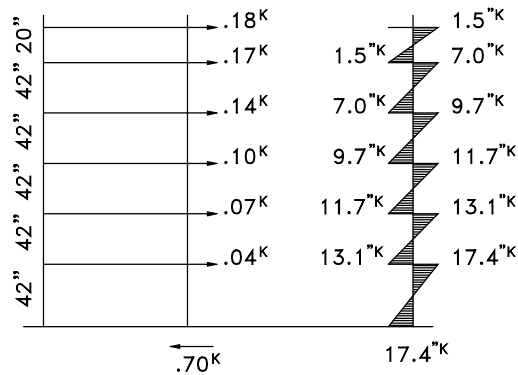
8"x8"x3/8" BASE PLATE

(4)-1/2"Ø ANCHORS PER BASE PL

BEAM CONN

4 PIN CONN.
 1st, 2nd & 3rd LEVELS

3 PIN CONN.
 UPPER LEVELS



OVERTURNING

$$M_{OT} = 1.1 \text{ K} \times 4 \times 258 \text{ inch} \times 0.66 = 749 \text{ inch-K}$$

$$M_R = 7.0 \text{ K} \times 4 \times 36 \text{ inch} = 1008 \text{ inch-K}$$

NO UPLIFT

BY G. OHANIAN

DATE 7-25-2025

SUBJECT

RACK DESIGN & ENGINEERING CO.

412 WEST BROADWAY, SUITE #204

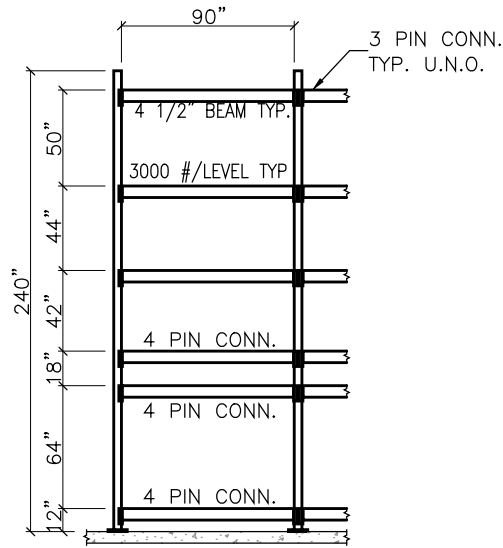
GLENDALE, CA. 91204

E-MAIL: rackdesign1@gmail.com

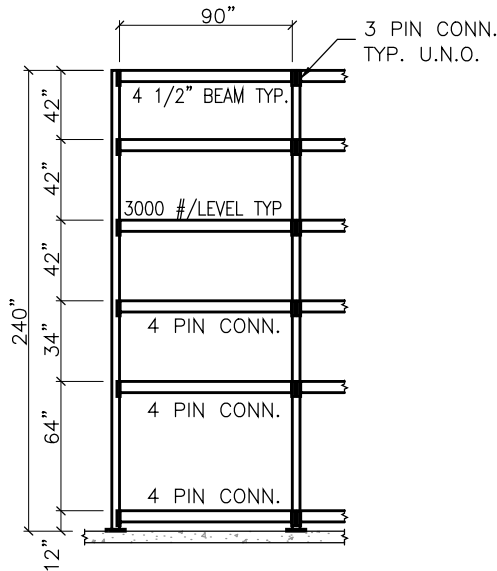
SHEET NO. 9

JOB NO. RD-21739

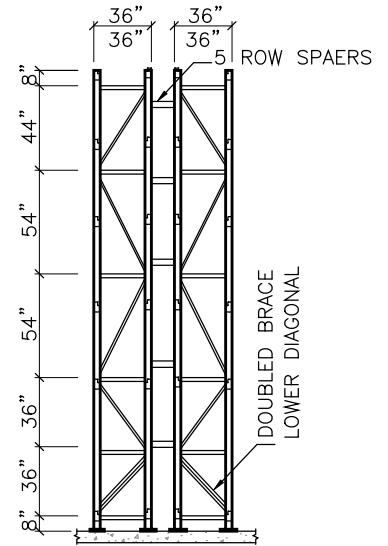
PRCTI20251104



TYPE "R"



TYPE "S"



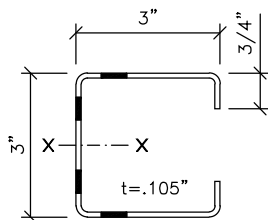
SIDE VIEW

$$\text{LOAD PER COL.} = \frac{6 \times 3.0 \text{ K}}{2 \text{ COL.}} = 9.0 \text{ K}$$

$$P = .2_{DL} + (9.0 \text{ K} \times 0.75) = 7.0 \text{ K}$$

$$W = .2_{DL} + (9.0 \text{ K} \times 0.67) = 6.2 \text{ K}$$

$$V_{\text{LONGIT.}} = .70 \text{ K} \quad V_{\text{TRANS.}} = 1.1 \text{ K}$$



$$F_Y = 55 \text{ KSI}$$

$$A_e = .91$$

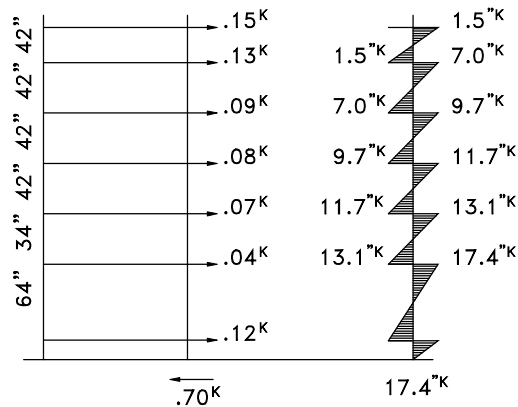
$$I_x = 1.36$$

$$S_e = .9$$

$$r_x = 1.2$$

$$r_y = 1.1$$

$$\frac{\Omega_c P}{P_n} + \frac{\Omega_b C_{mx} M}{M_n \alpha_x} = .87 < 1$$



OVERTURNING

$$M_{OT} = 1.1 \text{ K} \times 4 \times 258 \text{ inches} \times 0.66 = 749 \text{ inch-K}$$

$$M_R = 7.0 \text{ K} \times 4 \times 36 \text{ inches} = 1008 \text{ inch-K}$$

NO UPLIFT

8"x8"x3/8" BASE PLATE

(4)-1/2"Ø ANCHORS PER BASE PL

BEAM CONN

4 PIN CONN.

1st, 2nd & 3rd LEVELS

3 PIN CONN.

UPPER LEVELS

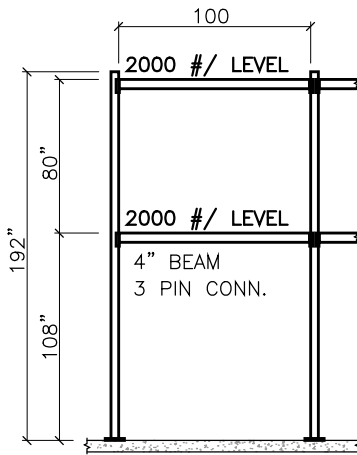
BY G. OHANIAN
 DATE 7-25-2025
 SUBJECT

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

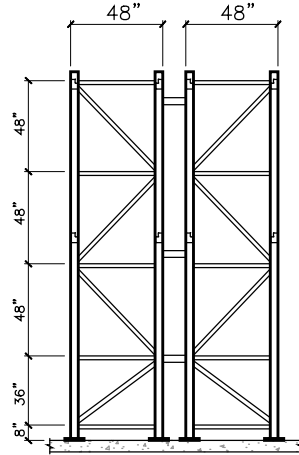
SHEET NO. 10

JOB NO. RD-21739

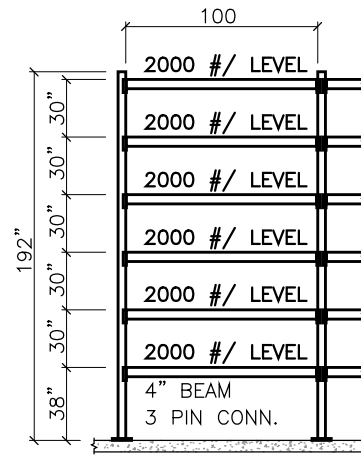
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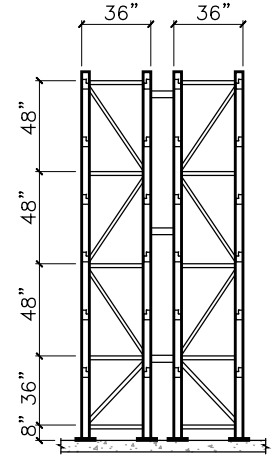
TYPE-Z



SIDE VIEW



TYPE-V



SIDE VIEW

$$\text{LOAD PER COL.} = \frac{2 \times 2.0 \text{ K}}{2 \text{ COL.}} = 2.0 \text{ K}$$

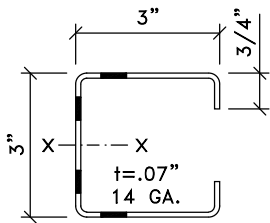
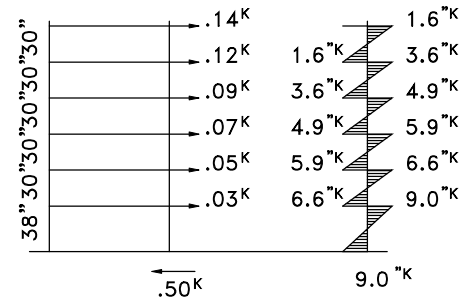
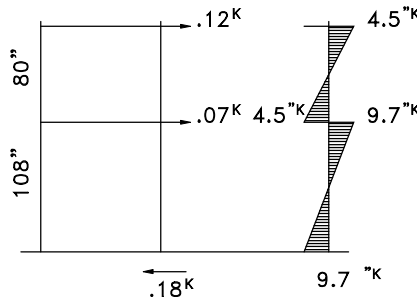
$$W = .2_{DL} + (2.0_{PL} \times 0.67) = 1.5 \text{ K}$$

$$V_{\text{LONGIT.}} = .18 \text{ K} \quad V_{\text{TRANS.}} = .28 \text{ K}$$

TYPE V

$$W = .2_{DL} + (6.0_{PL} \times 0.67) = 4.2 \text{ K}$$

$$V_{\text{LONGIT.}} = .50 \text{ K} \quad V_{\text{TRANS.}} = .75 \text{ K}$$



$$F_y = 55 \text{ KSI}$$

$$A_e = .62$$

$$I_x = .95$$

$$S_e = .6$$

$$r_x = 1.2$$

$$r_y = 1.1$$

$$\frac{KL}{r_x} = \frac{108 \times 1.0}{1.2} = 90$$

$$\frac{KL}{r_y} = \frac{30}{1.1} = 27$$

$$M_n = S_e \cdot F_y = 35$$

$$F_e = \frac{\pi^2 \times E}{\left(\frac{KL}{r_x}\right)^2} = 36$$

$$F_n = F_y \left(.658 \lambda_c^2 \right) = 29 \text{ KSI} \quad \lambda_c < 1.5$$

$$P_n = F_n \cdot A_e = 18.0 \text{ K}$$

$$\lambda_c = \sqrt{F_y / F_e} = 1.24$$

$$\frac{\Omega_c \cdot P}{P_n} + \frac{\Omega_b \cdot C_{mx} \cdot M}{M_n \cdot a_x} = .66 < 1 \text{ TYPE U \& V}$$

$$\frac{\Omega_c \cdot P}{P_n} + \frac{\Omega_b \cdot C_{mx} \cdot M}{M_n \cdot a_x} = .63 < 1 \text{ TPE Z}$$

5"x8"x3/8" BASE PLATE

$$\text{ANCH. TENSION} = .77 \text{ K}$$

$$\text{ANCHOR SHEAR} = .09 \text{ K} \quad (2) - 1/2" \varnothing \text{ ANCHORS PER BASE PL, 3 } 1/2" \text{ EMB.}$$

BEAM CONN

$$M_{\text{END}} = .01 \times w \times l^2 = 1.0 \text{ inch-K}$$

$$M = 7.1 \text{ inch-K} \quad M = 8.1 \text{ inch-K}$$

SEISMIC TOTAL

$$M_{\text{END}} = .01 \times w \times l^2 = 1.0 \text{ inch-K}$$

$$M = 7.8 \text{ inch-K} \quad M = 8.8 \text{ inch-K}$$

SEISMIC TOTAL

OVERTURNING Z

$$M_{\text{OT}} = .28 \text{ K} \times 4 \times 203 \text{ inch} \times 0.66 = 148 \text{ inch-K}$$

$$M_R = 6 \text{ K} \times 54 \text{ inch} = 324 \text{ inch-K}$$

OVERTURNING V

$$M_{\text{OT}} = .75 \text{ K} \times 4 \times 203 \text{ inch} \times 0.66 = 404 \text{ inch-K}$$

$$M_R = 16 \text{ K} \times 42 \text{ inch} = 672 \text{ inch-K}$$