

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



STRUCTURAL CALCULATIONS FOR

DANA POINT HARBOR REVITALIZATION – SUPPLEMENTAL CALCS

KPFF Job # 1900799



DATE 08/04/2022

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project

location

client

by

date

job no.

sheet no.

1 of 170

Building&Safety- OCPWArvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

Table of Contents

- Shear Wall Locations
- Seismic Loads
- Diaphragm Shear Check
- Rigid Diaphragm Analysis 15
- Building 8 Shearwall Design 27
- Building 9 Shearwall Design 65
- Drag Loads 135
- GRAVITY RAM MODEL CHECK 168tt

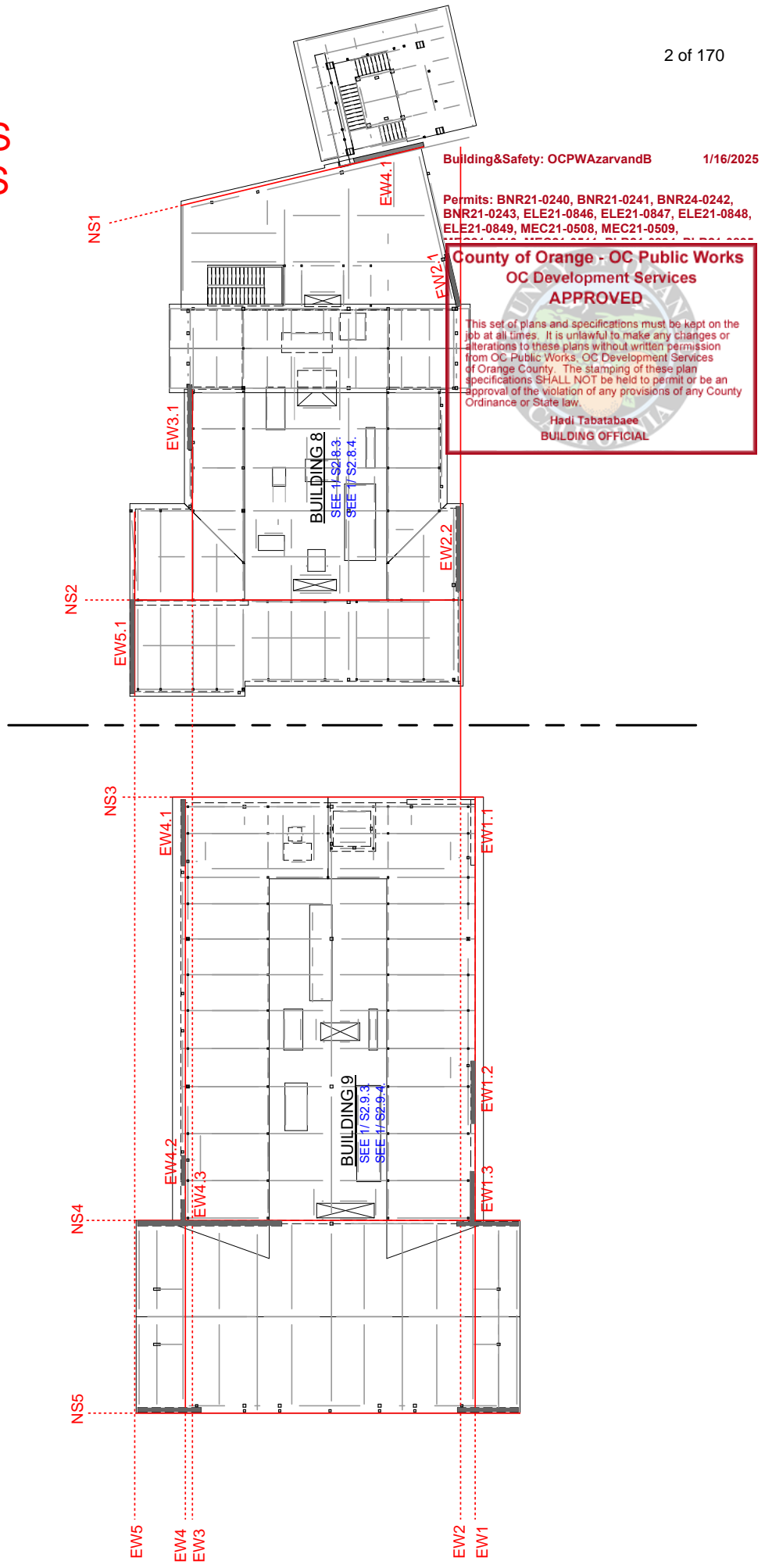
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7

BLDG 8 & 9 RESISTANCE LINES AND SHEAR WALLS





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project	DPH - Building 8	by	JS	sheet no. 3 of 170
location	Dana Point, CA	date	8/4/2022	
client	SMS Architects	job no.	1900799	Building&Safety: OCPWazarvandB 1/16/2025

Seismic Weight

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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High Roof	Area/Perimeter (sq ft/ft)	Height (ft)	DL (psf)	Total Load (k)
High Roof				
Roof	4745	1	67	317.9
Walls Below:				
Stud Wall	175	7.5	20	26.3

Total = **344 k**

Low Roof/Deck	Area/Perimeter (sq ft/ft)	Height (ft)	DL (psf)	Total Load (k)
Low Roof/Deck				
Roof	5270	1	131	690.37
Deck	1840	1	192	353.28
Wall Above:				
Stud Wall	175	7.5	20	26.3
Wall Below:				
12" Concrete	112	8	150	134.4
Storefront	200	8	17	27.2
Stud Wall	450	8	20	72.0

Total = **1304 k**

2nd Floor	Area/Perimeter (sq ft/ft)	Height (ft)	DL (psf)	Total Load (k)
2nd Floor				
Floor	7225	1	131	946.475
Deck	6400	1	171	1094.4
Wall Above:				
12" Concrete	112	8	150	134.4
Storefront	200	8	17	27.2
Stud Wall	450	8	20	72.0
Wall Below:				
12" Concrete	112	8.5	150	142.8
Storefront	200	8.5	17	28.9
Stud Wall	450	8.5	20	76.5

Total = **2523 k**



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location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
			Building&Safety: OCPWArvandB		1/16/2025

Seismic Response Coefficient Calculation

(ASCE/SEI 7-16 Equivalent Lateral Force Procedure - Section 12.8)

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Risk Category	III
Ground Hazard Motion Analysis?	No
Site Class	C
Seismic Design Category	D

Table 1.5-1
per soils report (D "Default" assumed, without soils report)
Table 11.6-1 & 11.6-2

System Type	Bearing Wall Systems
SFRS System	Special Reinforced Concrete Shear Walls
Flexible Diaphragm?	Yes

Table 12.2-1, Footnote B

R	5	Table 12.2-1
Ω_0	2	Table 12.2-1
C_d	5	Table 12.2-1
I_e	1.25	Table 1.5-2
S_s	1.266 g	2% in 50 years
S_1	0.455 g	2% in 50 years
h_n	48.0 ft	
C_t	0.02	Table 12.8-2
x	0.75	Table 12.8-2
T_L	8 s	
T_a	0.36 s	Eq. 12.8-7
$C_u T_a$	0.51 s	Sec. 12.8.2
$T_{modeled}$	No	
T_0	0.09 s	Sec. 11.4.6
T_s	0.45 s	Sec. 11.4.6
T	0.36 s	Sec. 12.8.2
k	1.00	Sec. 12.8.3
F_a	1.20	Table 11.4-1
F_v	1.50	Table 11.4-2
S_{MS}	1.519 g	Eq. 11.4-3
S_{M1}	0.683 g	Eq. 11.4-4
S_{D5}	1.013 g	Eq. 11.4-1
S_{D1}	0.455 g	Eq. 11.4-2
C_s	0.25	Eq. 12.8-2
$C_{s,min}$	0.06	Eq. 12.8-5
$C_{s,max}$	0.31	Eq. 12.8-3
$C_{s,design}$	0.25	
Seismic Weight, W	4,170 kips	
$V = C_s W$	1,056 kips	Eq. 12.8-1, Strength Level Base Shear

Table 12.2-1, Footnote B

$$T_a = C_t h_n^x \quad \text{Eq. 12.8-7}$$

$$S_{MS} = F_a S_s \quad \text{Eq. 11.4-3}$$

$$S_{M1} = F_v S_1 \quad \text{Eq. 11.4-4}$$

$$S_{D5} = 2/3 S_{MS} \quad \text{Eq. 11.4-1}$$

$$S_{D1} = 2/3 S_{M1} \quad \text{Eq. 11.4-2}$$

$$C_s = \frac{S_{D5}}{\left(\frac{R}{I_e}\right)} \quad \text{Eq. 12.8-2}$$

$$C_{s,min} = 0.044 S_{D5} I_e \geq 0.01 \quad \text{Eq. 12.8-5}$$

$$C_{s,min} = \frac{0.5 S_1}{(R/I_e)} \text{ where } S_1 \geq 0.6 \quad \text{Eq. 12.8-6}$$

$$C_{s,max} = \frac{S_{D1}}{T(R/I_e)} \text{ for } T \leq T_L \quad \text{Eq. 12.8-3}$$

$$C_{s,max} = \frac{S_{D1} T_L}{T^2 (R/I_e)} \text{ for } T > T_L \quad \text{Eq. 12.8-4}$$

$$F_x = C_{vx} V \quad \text{Eq. 12.8-11}$$

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^n w_i h_i^k} \quad \text{Eq. 12.8-12}$$

$$V_x = \sum_{i=x}^n F_i \quad \text{Eq. 12.8-13}$$

$$F_{px} = \frac{\sum_{i=x}^n F_i w_{px}}{\sum_{i=x}^n w_i} \quad \text{Eq. 12.10-1}$$

$$F_{px,min} = 0.2 S_{D5} I_e w_{px} \quad \text{Eq. 12.10-2}$$

$$F_{px,max} = 0.4 S_{D5} I_e w_{px} \quad \text{Eq. 12.10-3}$$

Levels Above Base	3
ρ	1.3
Design	Strength

Diaph. No.	Level Name	Fl to Fl Height	Height h_x	Weight w_x	$w_x h_x^k$	C_{vx}	Lateral Force @ Each Level			Diaphragm Force ($\rho = 1.0$)			F_{px}/F_x
							F_x	V_x	M_{OT}	$V_x = \sum F_i$	$\sum W_i$	F_{px}	
		ft	ft	k	k-ft		k	k	k-ft	k	k	k	
3	High Roof	15.0	48.0	344	16,520	0.161	221.4	221.4	3,321	170.3	344	170.3	1.00
2	Low Roof/Deck	16.0	33.0	1,304	43,016	0.420	576.5	797.9	16,088	613.8	1648	485.6	1.09
1	2nd Floor	17.0	17.0	2,523	42,885	0.419	574.8	1372.7	39,424	1,055.9	4170	638.7	1.44
Sum:				4170	102421	1.000	1372.7						



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location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
		Building&Safety: OCPWAzarvandB			1/16/2025

Seismic Weight

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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High Roof	Area/Perimeter (sq ft/ft)	Height (ft)	DL (psf)	Total Load (k)
Roof				
Roof	10325	1	67	691.8
Walls Below:				
12" Concrete	162	8	150	194.4
Storefront	226	8	17	30.7
Stud Wall	120	8	20	19.2

Total = **936 k**

2nd Floor	Area/Perimeter (sq ft/ft)	Height (ft)	DL (psf)	Total Load (k)
2nd Floor				
Floor	9720	1	131	1273.32
Deck	5025	1	171	859.275
Wall Above:				
12" Concrete	162	8	150	194.4
Storefront	226	8	17	30.7
Stud Wall	120	8	20	19.2
Wall Below:				
12" Concrete	162	8.5	150	206.6
Storefront	226	8.5	17	32.7
Stud Wall	120	8.5	20	20.4

Total = **2637 k**



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location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
			Building&Safety: OCPWArvandB		1/16/2025

Seismic Response Coefficient Calculation

(ASCE/SEI 7-16 Equivalent Lateral Force Procedure - Section 12.8)

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Risk Category	III
Ground Hazard Motion Analysis?	No
Site Class	C
Seismic Design Category	D

Table 1.5-1
per soils report (D "Default" assumed, without soils report)
Table 11.6-1 & 11.6-2

System Type	Bearing Wall Systems
SFRS System	Special Reinforced Concrete Shear Walls
Flexible Diaphragm?	Yes

Table 12.2-1, Footnote B

R	5	
Ω_0	2	
C_d	5	
I_e	1.25	
S_s	1.266	g
S_1	0.455	g
h_n	33.0	ft
C_t	0.02	
x	0.75	
T_L	8	s
T_a	0.28	s
$C_u T_a$	0.39	s
$T_{modeled}$	No	
T_0	0.09	s
T_S	0.45	s
T	0.28	s
k	1.00	
F_a	1.20	
F_v	1.50	
S_{MS}	1.519	g
S_{M1}	0.683	g
S_{D5}	1.013	g
S_{D1}	0.455	g
C_s	0.25	
$C_{s,min}$	0.06	
$C_{s,max}$	0.41	
$C_{s,design}$	0.25	
Seismic Weight, W	3,573	kips
$V = C_s W$	905	kips

Table 12.2-1
Table 12.2-1
Table 12.2-1
Table 1.5-2
2% in 50 years
2% in 50 years
Table 12.8-2
Table 12.8-2
Eq. 12.8-7
Sec. 12.8.2
Sec. 11.4.6
Sec. 11.4.6
Sec. 12.8.2
Sec. 12.8.3
Table 11.4-1
Table 11.4-2
Eq. 11.4-3
Eq. 11.4-4
Eq. 11.4-1
Eq. 11.4-2
Eq. 12.8-2
Eq. 12.8-5
Eq. 12.8-3
Eq. 11.4-1
Eq. 11.4-2
Eq. 12.8-2
Eq. 12.8-5
Eq. 12.8-3
Eq. 12.8-1, Strength Level Base Shear

$$T_a = C_t h_n^x \quad \text{Eq. 12.8-7}$$

$$S_{MS} = F_a S_s \quad \text{Eq. 11.4-3}$$

$$S_{M1} = F_v S_1 \quad \text{Eq. 11.4-4}$$

$$S_{DS} = 2/3 S_{MS} \quad \text{Eq. 11.4-1}$$

$$S_{D1} = 2/3 S_{M1} \quad \text{Eq. 11.4-2}$$

$$C_s = \frac{S_{DS}}{\left(\frac{R}{I_e}\right)} \quad \text{Eq. 12.8-2}$$

$$C_{s,min} = 0.044 S_{DS} I_e \geq 0.01 \quad \text{Eq. 12.8-5}$$

$$C_{s,min} = \frac{0.5 S_1}{(R/I_e)} \text{ where } S_1 \geq 0.6 \quad \text{Eq. 12.8-6}$$

$$C_{s,max} = \frac{S_{D1}}{T(R/I_e)} \text{ for } T \leq T_L \quad \text{Eq. 12.8-3}$$

$$C_{s,max} = \frac{S_{D1} T_L}{T^2 (R/I_e)} \text{ for } T > T_L \quad \text{Eq. 12.8-4}$$

$$F_x = C_{vx} V \quad \text{Eq. 12.8-11}$$

$$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^n w_i h_i^k} \quad \text{Eq. 12.8-12}$$

$$V_x = \sum_{i=x}^n F_i \quad \text{Eq. 12.8-13}$$

$$F_{px} = \frac{\sum_{i=x}^n F_i}{\sum_{i=x}^n w_i} w_{px} \quad \text{Eq. 12.10-1}$$

$$F_{px,min} = 0.2 S_{DS} I_e w_{px} \quad \text{Eq. 12.10-2}$$

$$F_{px,max} = 0.4 S_{DS} I_e w_{px} \quad \text{Eq. 12.10-3}$$

Levels Above Base	2
ρ	1.3
Design	Strength

Diaph. No.	Level Name	Fl to Fl Height	Height h_x	Weight w_x	$w_x h_x^k$	C_{vx}	Lateral Force @ Each Level			Diaphragm Force ($\rho = 1.0$)			F_{px}/F_x
							F_x	V_x	M_{OT}	$V_x = \sum F_i$	$\sum W_i$	F_{px}	
		ft	ft	k	k-ft		k	k	k-ft	k	k	k	
2	Roof	16.0	33.0	936	30,892	0.408	479.8	479.8	7,677	369.1	936	369.1	1.00
1	2nd Floor	17.0	17.0	2,637	44,821	0.592	696.2	1176.0	27,669	904.6	3573	667.6	1.25
Sum:				3573	75713	1.000	1176.0						



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location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
		Building&Safety: OCPWAzarvandB			1/16/2025

Diaphragm Check

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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High Roof:

Fpx = 59.9 k
x = 20.25 ft
y = 68.25 ft

Use:

Verco PLB-36 x 18GA w/ VSC2 @ 6" OC w/ 36/7 Weld Pattern
q-all = 2747 plf

Line	Length	Fpx	v-tot	.7v-max	q-all	
NS1	68.25 ft	30.0 k	439 plf	307 plf	2747 plf	OK
NS2	68.25 ft	30.0 k	439 plf	307 plf	2747 plf	OK
EW1	20.25 ft	30.0 k	1479 plf	1035 plf	2747 plf	OK
EW2	20.25 ft	30.0 k	1479 plf	1035 plf	2747 plf	OK

Roof:

Fpx = 485.6 k
x = 113.00 ft
y = 74.75 ft

Use:

Verco PLB-36 x 18GA w/ VSC2 @ 6" OC w/ 36/7 Weld Pattern
q-all = 2747 plf 3018 plf lrfd

Line	Length	Shear Ratio	Fpx	v-tot	.7v-max	q-all		Difference	# of Studs
NS1	56.25 ft	0.37	179.7 k	3194 plf	2236 plf	2747 plf	OK		
NS2	73.66 ft	0.63	305.9 k	4153 plf	2907 plf	2747 plf	N.G.	160 plf	1
EW2	77.00 ft	0.47	228.2 k	2964 plf	2075 plf	2747 plf	OK		
EW3	66.25 ft	0.16	77.7 k	1173 plf	821 plf	2747 plf	OK		
EW5	41.50 ft	0.37	179.7 k	4329 plf	3031 plf	2747 plf	N.G.	284 plf	1

2nd Floor:

Fpx = 1318.0 k
x = 295.50 ft
y = 124.25 ft

SEE BLDG 9 DIAPHRAGM CHECK

Calculation Check: OK

Type PLB™ -36

- 36/7 Weld Pattern at Supports
- Sidelaps Connected with PunchLok II Tool



Building&Safety: OCPWazarvandB 1/16/2025

Allowable Diaphragm Shear Strength, q (plf) and Flexibility Factors, F ((in./lb)x10⁶)

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

DECK GAGE	SIDELAP ATTACHMENT	SPAN (ft-in.)									
		4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	
22	VSC2 @ 24"	q	700	693	581	594	516	535	482	703	644
		F	8+28R	8.9+22R	10.4+18R	10.8+15R	12+12R	12.2+11R	13.3+9R	10.8+6R	10.7+5R
	VSC2 @ 18"	q	842	808	688	685	682	613	618	863	797
		F	7.2+29R	8.1+23R	9.5+18R	10+15R	10.3+13R	11.3+11R	11.5+10R	9.3+6R	9.4+6R
	VSC2 @ 12"	q	971	914	875	847	825	808	794	1082	912
		F	6.6+29R	7.6+23R	8.2+19R	8.8+16R	9.2+14R	9.5+12R	9.8+11R	8.1+6R	8.2+6R
	VSC2 @ 8"	q	1193	1188	1116	1123	1074	1085	1001	1085	912
		F	5.8+30R	6.4+24R	7+19R	7.3+17R	7.7+14R	7.8+13R	8.2+11R	6.5+7R	6.6+7R
	VSC2 @ 6"	q	1370	1334	1309	1290	1276	1236	1001	1085	912
		F	5.2+30R	5.8+24R	6.3+20R	6.6+17R	6.8+15R	7+13R	7.2+12R	5.9+7R	5.9+6R
	VSC2 @ 4"	q	1617	1595	1579	1568	1559	1236	1001	1085	912
		F	4.5+30R	5+24R	5.4+20R	5.6+17R	5.8+15R	5.9+13R	6.1+12R	4.9+8R	5+7R
20	VSC2 @ 24"	q	970	960	815	830	727	751	676	703	644
		F	7.1+18R	7.6+14R	8.8+11R	9+9R	10+8R	10+7R	10.8+6R	10.7+5R	11.5+4R
	VSC2 @ 18"	q	1162	1116	953	949	945	850	857	863	797
		F	6.3+18R	6.9+14R	8+11R	8.2+10R	8.5+8R	9.2+7R	9.3+6R	9.4+6R	10+5R
	VSC2 @ 12"	q	1337	1261	1208	1170	1140	1117	1098	1082	912
		F	5.8+18R	6.4+14R	6.8+12R	7.2+10R	7.5+9R	7.7+8R	7.9+7R	8.1+6R	8.2+6R
	VSC2 @ 8"	q	1634	1627	1531	1541	1476	1491	1313	1085	912
		F	5+19R	5.4+15R	5.8+12R	6+10R	6.3+9R	6.3+8R	6.5+7R	6.6+7R	6.7+6R
	VSC2 @ 6"	q	1866	1819	1786	1762	1743	1621	1313	1085	912
		F	4.6+19R	4.9+15R	5.2+12R	5.4+11R	5.6+9R	5.7+8R	5.8+7R	5.9+7R	5.9+6R
	VSC2 @ 4"	q	2184	2156	2137	2122	2052	1621	1313	1085	912
		F	4+19R	4.3+15R	4.5+13R	4.6+11R	4.8+9R	4.9+8R	4.9+8R	5+7R	5+6R
18	VSC2 @ 24"	q	1575	1548	1315	1333	1179	1208	1092	1127	1035
		F	5.3+8R	5.5+7R	6.2+5R	6.1+4R	6.8+4R	6.6+3R	7.1+3R	7+3R	7.4+2R
	VSC2 @ 18"	q	1872	1789	1530	1517	1507	1356	1364	1371	1266
		F	4.7+9R	4.9+7R	5.5+6R	5.6+5R	5.6+4R	6.1+3R	6.1+3R	6+3R	6.4+3R
	VSC2 @ 12"	q	2141	2013	1924	1859	1809	1770	1738	1659	1394
		F	4.2+9R	4.5+7R	4.7+6R	4.8+5R	5+4R	5.1+4R	5.1+3R	5.2+3R	5.2+3R
	VSC2 @ 8"	q	2596	2579	2424	2436	2331	2352	2007	1659	1394
		F	3.7+9R	3.8+7R	4+6R	4+5R	4.2+5R	4.2+4R	4.3+4R	4.3+3R	4.4+3R
	VSC2 @ 6"	q	2954	2875	2820	2778	2747	2478	2007	1659	1394
		F	3.3+9R	3.5+7R	3.6+6R	3.7+5R	3.8+5R	3.8+4R	3.9+4R	3.9+3R	3.9+3R
	VSC2 @ 4"	q	3446	3398	3365	3340	3136	2478	2007	1659	1394
		F	2.9+9R	3.1+7R	3.2+6R	3.3+5R	3.3+5R	3.3+4R	3.4+4R	3.4+3R	3.4+3R
16	VSC2 @ 24"	q	2037	2018	1717	1749	1548	1593	1445	1492	1376
		F	4.6+5R	4.7+4R	5.3+3R	5.2+2R	5.7+2R	5.6+2R	6+1R	5.9+1R	6.2+1R
	VSC2 @ 18"	q	2434	2340	2005	1996	1989	1792	1807	1819	1682
		F	4+5R	4.2+4R	4.7+3R	4.7+3R	4.7+2R	5.1+2R	5.1+2R	5.1+1R	5.4+1R
	VSC2 @ 12"	q	2789	2635	2529	2450	2390	2342	2304	2272	1941
		F	3.6+5R	3.8+4R	4+3R	4.1+3R	4.2+2R	4.2+2R	4.3+2R	4.3+2R	4.4+2R
	VSC2 @ 8"	q	3381	3369	3178	3199	3069	3098	2795	2310	1941
		F	3.1+5R	3.2+4R	3.4+3R	3.4+3R	3.5+3R	3.5+2R	3.6+2R	3.6+2R	3.6+2R
	VSC2 @ 6"	q	3833	3743	3679	3632	3596	3451	2795	2310	1941
		F	2.9+5R	3+4R	3+3R	3.1+3R	3.1+3R	3.2+2R	3.2+2R	3.2+2R	3.2+2R
	VSC2 @ 4"	q	4436	4384	4347	4320	4300	3451	2795	2310	1941
		F	2.5+5R	2.6+4R	2.7+4R	2.7+3R	2.8+3R	2.8+2R	2.8+2R	2.8+2R	2.8+2R

County of Orange - OC Public Works
OC Development Services

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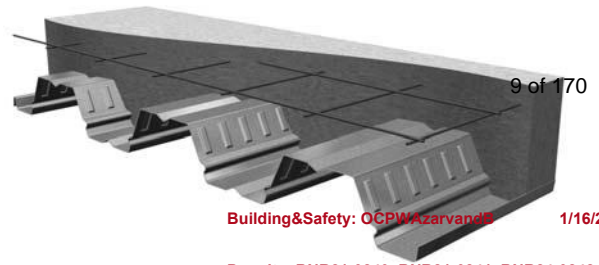
This set of plans and specifications must be kept on the project at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services, Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.

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See footnotes on page 28.

PLW3™ or W3 FORMLOK™

- 6¼ in. TOTAL SLAB DEPTH
- Light Weight Concrete
- 2 Hour Fire Rating



9 of 170

Building&Safety: OCPIWAzarvandh 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

Maximum Unshored Clear Span (ft-in.)

Deck Gage	Number of Deck Spans		
	1	2	3
22	10'-0"	10'-7"	11'-3"
21	10'-10"	11'-8"	12'-1"
20	11'-7"	12'-4"	12'-9"
19	12'-1"	13'-8"	14'-1"
18	12'-5"	14'-10"	14'-7"
16	13'-1"	16'-4"	15'-4"

Shoring is required for spans greater than those shown above. See Footnote 1 on page 69 for required bearing.

Concrete Properties

Density (pcf)	Uniform Weight (psf)	Form Volume (yd ³ /100 ft ²)	Concrete Compressive Strength (psi)
110	43.5	1.466	3000

Notes:

1. Volumes and weights do not include allowance for deflection.
2. Weights are for concrete only and do not include weight of steel deck.
3. Total slab depth is nominal depth from top of concrete to bottom of steel deck.

Development of Orange County Public Works Department

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Specifications shall not be used to permit or be an Ordinance or State law.

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Allowable Superimposed Loads (psf)

Deck Gage	Number of Deck Spans	Span (ft-in.)															
		8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	16'-0"	
22	1	317	287	261	238	219	160	145	132	120	109	100	91	83	70	58	
	2	317	287	261	238	219	202	145	132	120	109	100	91	83	70	58	
	3	317	287	261	238	219	202	145	132	120	109	100	91	83	70	58	
21	1	342	309	281	257	236	218	160	145	133	121	111	101	93	78	66	
	2	342	309	281	257	236	218	201	187	133	121	111	101	93	78	66	
	3	342	309	281	257	236	218	201	187	174	121	111	101	93	78	66	
20	1	366	330	300	275	252	232	215	200	144	132	121	111	102	86	73	
	2	366	330	300	275	252	232	215	200	186	132	121	111	102	86	73	
	3	366	330	300	275	252	232	215	200	186	174	121	111	102	86	73	
19	1	400	373	339	310	285	263	243	226	210	154	142	131	120	103	88	
	2	400	373	339	310	285	263	243	226	210	196	184	173	120	103	88	
	3	400	373	339	310	285	263	243	226	210	196	184	173	163	103	88	
18	1	400	400	375	343	315	290	269	250	232	175	161	149	137	118	102	
	2	400	400	375	343	315	290	269	250	232	217	203	191	180	118	102	
	3	400	400	375	343	315	290	269	250	232	217	203	191	180	118	102	
16	1	400	400	400	400	375	346	320	297	277	259	242	185	171	148	128	
	2	400	400	400	400	375	346	320	297	277	259	242	228	214	186	153	
	3	400	400	400	400	375	346	320	297	277	259	242	228	214	186	128	

See footnotes on page 69.

Shoring required in shaded areas to right of heavy line.

Allowable Diaphragm Shear Strengths, q (plf)

Attachment Pattern	Deck Gage	Span (ft-in.)															
		8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	16'-0"	
36/3	22	q	1676	1664	1653	1644	1635	1628	1621	1614	1608	1603	1598	1593	1589	1581	1574
	21	q	1676	1663	1651	1640	1631	1622	1614	1607	1601	1595	1589	1584	1579	1571	1563
	20	q	1678	1664	1651	1639	1629	1620	1611	1604	1597	1590	1584	1578	1573	1564	1556
	19	q	1689	1672	1657	1644	1632	1621	1611	1602	1594	1586	1579	1572	1566	1555	1546
	18	q	1705	1686	1669	1653	1640	1627	1616	1606	1596	1588	1580	1572	1565	1553	1542
	16	q	1749	1725	1704	1685	1668	1652	1638	1625	1613	1603	1593	1583	1575	1559	1546
36/4	22	q	1778	1756	1737	1719	1703	1689	1676	1664	1653	1643	1634	1625	1617	1603	1590
	21	q	1799	1775	1753	1734	1716	1700	1686	1673	1661	1650	1640	1630	1621	1606	1592
	20	q	1821	1794	1771	1750	1731	1713	1698	1684	1670	1658	1647	1637	1627	1610	1595
	19	q	1872	1841	1813	1788	1766	1746	1728	1711	1696	1682	1669	1657	1645	1625	1608
	18	q	1925	1889	1858	1830	1805	1782	1761	1742	1724	1708	1694	1680	1667	1644	1624
	16	q	2044	2000	1960	1925	1894	1865	1839	1815	1793	1773	1755	1738	1722	1693	1668

See footnotes on page 69.

STEEL HEADED STUD ANCHORS

Table 6: Allowable Shear Strength (kips) per 3/4" Diameter Steel Headed Stud Anchor with FORMLOK Deck

Deck Condition		Normal Weight Concrete (145 pcf)		Light Weight Concrete (110 pcf)		
		f' _c = 3 ksi	f' _c = 4 ksi	f' _c = 3 ksi	f' _c = 4 ksi	
No Deck (Solid Concrete)		9.11	9.32	7.40	9.19	
Deck Parallel	w _r /h _r ≥ 1.5	9.11	9.32	7.40	9.19	
	w _r /h _r < 1.5	7.92	7.92	7.40	7.92	
Deck Perpendicular	Weak Studs per Rib	1	7.46	7.46	7.46	
		2	6.34	6.34	6.34	
		3	5.22	5.22	5.22	
	Strong Studs per Rib	1	9.11	9.32	7.40	9.19
		2	7.92	7.92	7.40	7.92
		3	6.53	6.53	6.53	6.53

Building & Safety: OCPW AzarvandB 1/16/2025
 Permits: BNR21-0241, BNR21-0241, BNR24-0242, BNR21-0243, ELEC21-0846, ELEC21-0847, ELEC21-0848, ELEC21-0849, MEC21-0508, MEC21-0509,
 County of Orange - OC Public Works
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Notes:

1. Values in Table 6 are based on the AISC 360-10 Specification Table 3-21 and Section I8.2a "Strength of Steel Headed Stud Anchors".
2. For Deep Vercor, strengths in Table 6 shall be modified by a factor of 0.44 for both parallel and perpendicular conditions, using a 1/2" diameter stud.
3. w_r/h_r ≥ 1.5 for PLW2 and W2 FORMLOK, PLW3 and W3 FORMLOK, and Deep VERCOR.
w_r/h_r < 1.5 for PLB and B FORMLOK, PLN3 and N3 FORMLOK, PLN and N FORMLOK.
4. Strengths in Table 6 are applicable only to concrete made with ASTM C33 aggregate.
5. w_r indicates average width of concrete rib or haunch (in.); h_r indicates nominal rib height (in.).
6. Steel headed stud anchor lengths are assumed to be ≥ deck height + 1.5 in.
7. An ASD safety factor of Ω = 2.31 was utilized to determine the allowable shear per steel headed stud anchor in Table 6.
8. A "weak" stud is defined as a stud whose distance from the edge of the stud shank to the steel deck web, measured at mid-height of the deck and in the load-bearing direction of the stud, is < 2". For "strong" studs, this distance is ≥ 2". See detail at bottom of Figure 12 for weak and strong stud position.
9. When using composite beams or girders, designers should consider adding reinforcing steel in the concrete fill over the metal deck in the effective width of the composite beam or girder.
10. Designers should consider using partial composite design for possible reduction of the number of studs required.
11. If openings will be cut in the slab adjacent to the composite beams or girder during the life of the building, consideration should be given to the design of the composite section.



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Irvine, CA 92612
(949) 252-1022 Fax (949) 252-8082

project	DPH - Building 9	by	LW	sheet no. 11 of 170
location	Dana Point, CA	date	8/5/2022	
client	SMS Architects	job no.	1900799	1/16/2025
		Building&Safety: OCPW	AzarvandB	

Diaphragm Check

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

County of Orange - OC Public Works
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Roof:

Fpx = 369.1 k
x = 139.00 ft
y = 86.66 ft

Use:

Verco PLB-36 x 18GA w/ VSC2 @ 6" OC w/ 36/7 Weld Pattern
q-all = 2007 plf

Line	Length	Fpx	v-tot	.7v-max	q-all	
NS3	66.75 ft	123.6 k	1852 plf	1297 plf	1750 plf	OK
NS4	86.66 ft	184.6 k	2130 plf	1491 plf	1750 plf	OK
NS5	86.66 ft	60.9 k	703 plf	492 plf	1750 plf	OK
EW1	95.66 ft	184.6 k	1929 plf	1350 plf	1750 plf	OK
EW4	95.66 ft	184.6 k	1929 plf	1350 plf	1750 plf	OK

2nd Floor (Bldg 8 & 9):

Fpx = 1306.3 k
x = 295.50 ft
y = 124.25 ft

Use:

Verco W-3 x 20GA W/ 3.25" Lt. Wt. Conc and 36/4 Attachment Pattern
q-all = 1750 plf

Line	Length	shear ratio	Fpx	v-tot	.7v-max	q-all	Difference	# of Studs
NS1*	50.00 ft	0.23	300.4 k	6009 plf	4206 plf	1794 plf	N.G.	2412 plf 17
NS2*	73.50 ft	0.26	339.6 k	4621 plf	3235 plf	1771 plf	N.G.	1464 plf 15
NS3	100.00 ft	0.07	91.4 k	914 plf	640 plf	1750 plf	OK	
NS4*	108.00 ft	0.33	431.1 k	3991 plf	2794 plf	1750 plf	N.G.	1044 plf 16
NS5	111.17 ft	0.11	143.7 k	1293 plf	905 plf	1750 plf	OK	
EW1	137.50 ft	0.28	365.8 k	2660 plf	1862 plf	1750 plf	N.G.	112 plf 3
EW2	121.00 ft	0.26	339.6 k	2807 plf	1965 plf	1750 plf	N.G.	215 plf 4
EW3	66.25 ft	0.1	130.6 k	1972 plf	1380 plf	1750 plf	OK	
EW4	162.50 ft	0.13	169.8 k	1045 plf	732 plf	1750 plf	OK	
EW5	41.50 ft	0.23	300.4 k	7240 plf	5068 plf	1750 plf	N.G.	3318 plf 19

*Use 3/4" Dia Headed Studs where indicated

Calculation Check: **OK**

Type PLB™ -36

- 36/7 Weld Pattern at Supports
- Sidelaps Connected with PunchLok II Tool



Building&Safety: OCPWArvandB 1/16/2025

Allowable Diaphragm Shear Strength, q (plf) and Flexibility Factors, F ((in./lb)x10⁶)

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

DECK GAGE	SIDELAP ATTACHMENT	SPAN (ft-in.)									
		4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	
22	VSC2 @ 24"	q	700	693	581	594	516	535	482	482	482
		F	8+28R	8.9+22R	10.4+18R	10.8+15R	12+12R	12.2+11R	11.5+10R	11.5+10R	11.5+10R
	VSC2 @ 18"	q	842	808	688	685	682	613	794	794	794
		F	7.2+29R	8.1+23R	9.5+18R	10+15R	10.3+13R	11.3+11R	9.8+11R	9.8+11R	9.8+11R
	VSC2 @ 12"	q	971	914	875	847	825	808	1001	1001	1001
		F	6.6+29R	7.6+23R	8.2+19R	8.8+16R	9.2+14R	9.5+12R	8.2+11R	8.2+11R	8.2+11R
	VSC2 @ 8"	q	1193	1188	1116	1123	1074	1085	1001	1001	1001
		F	5.8+30R	6.4+24R	7+19R	7.3+17R	7.7+14R	7.8+13R	7.2+12R	7.2+12R	7.2+12R
	VSC2 @ 6"	q	1370	1334	1309	1290	1276	1236	1001	1001	1001
		F	5.2+30R	5.8+24R	6.3+20R	6.6+17R	6.8+15R	7+13R	6.1+12R	6.1+12R	6.1+12R
	VSC2 @ 4"	q	1617	1595	1579	1568	1559	1236	1001	1001	1001
		F	4.5+30R	5+24R	5.4+20R	5.6+17R	5.8+15R	5.9+13R	6.1+12R	6.1+12R	6.1+12R
20	VSC2 @ 24"	q	970	960	815	830	727	751	676	703	644
		F	7.1+18R	7.6+14R	8.8+11R	9+9R	10+8R	10+7R	10.8+6R	10.7+5R	11.5+4R
	VSC2 @ 18"	q	1162	1116	953	949	945	850	857	863	797
		F	6.3+18R	6.9+14R	8+11R	8.2+10R	8.5+8R	9.2+7R	9.3+6R	9.4+6R	10+5R
	VSC2 @ 12"	q	1337	1261	1208	1170	1140	1117	1098	1082	912
		F	5.8+18R	6.4+14R	6.8+12R	7.2+10R	7.5+9R	7.7+8R	7.9+7R	8.1+6R	8.2+6R
	VSC2 @ 8"	q	1634	1627	1531	1541	1476	1491	1313	1085	912
		F	5+19R	5.4+15R	5.8+12R	6+10R	6.3+9R	6.3+8R	6.5+7R	6.6+7R	6.7+6R
	VSC2 @ 6"	q	1866	1819	1786	1762	1743	1621	1313	1085	912
		F	4.6+19R	4.9+15R	5.2+12R	5.4+11R	5.6+9R	5.7+8R	5.8+7R	5.9+7R	5.9+6R
	VSC2 @ 4"	q	2184	2156	2137	2122	2052	1621	1313	1085	912
		F	4+19R	4.3+15R	4.5+13R	4.6+11R	4.8+9R	4.9+8R	4.9+8R	5+7R	5+6R
18	VSC2 @ 24"	q	1575	1548	1315	1333	1179	1208	1092	1127	1035
		F	5.3+8R	5.5+7R	6.2+5R	6.1+4R	6.8+4R	6.6+3R	7.1+3R	7+3R	7.4+2R
	VSC2 @ 18"	q	1872	1789	1530	1517	1507	1356	1364	1371	1266
		F	4.7+9R	4.9+7R	5.5+6R	5.6+5R	5.6+4R	6.1+3R	6.1+3R	6+3R	6.4+3R
	VSC2 @ 12"	q	2141	2013	1924	1859	1809	1770	1738	1659	1394
		F	4.2+9R	4.5+7R	4.7+6R	4.8+5R	5+4R	5.1+4R	5.1+3R	5.2+3R	5.2+3R
	VSC2 @ 8"	q	2596	2579	2424	2436	2331	2352	2007	1659	1394
		F	3.7+9R	3.8+7R	4+6R	4+5R	4.2+5R	4.2+4R	4.3+4R	4.3+3R	4.4+3R
	VSC2 @ 6"	q	2954	2875	2820	2778	2747	2478	2007	1659	1394
		F	3.3+9R	3.5+7R	3.6+6R	3.7+5R	3.8+5R	3.8+4R	3.9+4R	3.9+3R	3.9+3R
	VSC2 @ 4"	q	3446	3398	3365	3340	3136	2478	2007	1659	1394
		F	2.9+9R	3.1+7R	3.2+6R	3.3+5R	3.3+5R	3.3+4R	3.4+4R	3.4+3R	3.4+3R
16	VSC2 @ 24"	q	2037	2018	1717	1749	1548	1593	1445	1492	1376
		F	4.6+5R	4.7+4R	5.3+3R	5.2+2R	5.7+2R	5.6+2R	6+1R	5.9+1R	6.2+1R
	VSC2 @ 18"	q	2434	2340	2005	1996	1989	1792	1807	1819	1682
		F	4+5R	4.2+4R	4.7+3R	4.7+3R	4.7+2R	5.1+2R	5.1+2R	5.1+1R	5.4+1R
	VSC2 @ 12"	q	2789	2635	2529	2450	2390	2342	2304	2272	1941
		F	3.6+5R	3.8+4R	4+3R	4.1+3R	4.2+2R	4.2+2R	4.3+2R	4.3+2R	4.4+2R
	VSC2 @ 8"	q	3381	3369	3178	3199	3069	3098	2795	2310	1941
		F	3.1+5R	3.2+4R	3.4+3R	3.4+3R	3.5+3R	3.5+2R	3.6+2R	3.6+2R	3.6+2R
	VSC2 @ 6"	q	3833	3743	3679	3632	3596	3451	2795	2310	1941
		F	2.9+5R	3+4R	3+3R	3.1+3R	3.1+3R	3.2+2R	3.2+2R	3.2+2R	3.2+2R
	VSC2 @ 4"	q	4436	4384	4347	4320	4300	3451	2795	2310	1941
		F	2.5+5R	2.6+4R	2.7+4R	2.7+3R	2.8+3R	2.8+2R	2.8+2R	2.8+2R	2.8+2R

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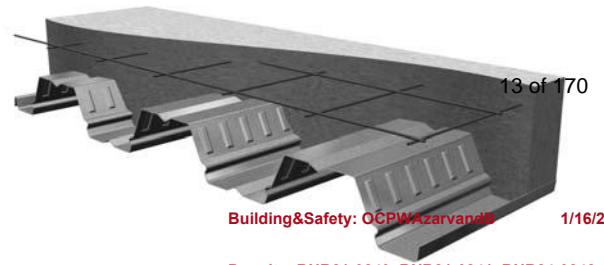
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See footnotes on page 28.

PLW3™ or W3 FORMLOK™

- 6¼ in. TOTAL SLAB DEPTH
- Light Weight Concrete
- 2 Hour Fire Rating



13 of 170

Building&Safety: OCPWAzarvandi 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

Maximum Unshored Clear Span (ft-in.)

Deck Gage	Number of Deck Spans		
	1	2	3
22	10'-0"	10'-7"	11'-3"
21	10'-10"	11'-8"	12'-1"
20	11'-7"	12'-4"	12'-9"
19	12'-1"	13'-8"	14'-1"
18	12'-5"	14'-10"	14'-7"
16	13'-1"	16'-4"	15'-4"

Shoring is required for spans greater than those shown above. See Footnote 1 on page 69 for required bearing.

Concrete Properties

Density (pcf)	Uniform Weight (psf)	Form Volume (yd ³ /100 ft ²)	Concrete Compressive Strength (f _c (psi))
110	43.5	1.466	3000

Notes:

1. Volumes and weights do not include allowance for deflection.
2. Weights are for concrete only and do not include weight of steel deck.
3. Total slab depth is nominal depth from top of concrete to bottom of steel deck.

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Allowable Superimposed Loads (psf)

Deck Gage	Number of Deck Spans	Span (ft-in.)															
		8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	16'-0"	
22	1	317	287	261	238	219	160	145	132	120	109	100	91	83	70	58	
	2	317	287	261	238	219	202	145	132	120	109	100	91	83	70	58	
	3	317	287	261	238	219	202	145	132	120	109	100	91	83	70	58	
21	1	342	309	281	257	236	218	160	145	133	121	111	101	93	78	66	
	2	342	309	281	257	236	218	201	187	133	121	111	101	93	78	66	
	3	342	309	281	257	236	218	201	187	174	121	111	101	93	78	66	
20	1	366	330	300	275	252	232	215	200	144	132	121	111	102	86	73	
	2	366	330	300	275	252	232	215	200	186	132	121	111	102	86	73	
	3	366	330	300	275	252	232	215	200	186	174	121	111	102	86	73	
19	1	400	373	339	310	285	263	243	226	210	154	142	131	120	103	88	
	2	400	373	339	310	285	263	243	226	210	196	184	173	120	103	88	
	3	400	373	339	310	285	263	243	226	210	196	184	173	163	103	88	
18	1	400	400	375	343	315	290	269	250	232	175	161	149	137	118	102	
	2	400	400	375	343	315	290	269	250	232	217	203	191	180	118	102	
	3	400	400	375	343	315	290	269	250	232	217	203	191	180	118	102	
16	1	400	400	400	400	375	346	320	297	277	259	242	185	171	148	128	
	2	400	400	400	400	375	346	320	297	277	259	242	228	214	186	153	
	3	400	400	400	400	375	346	320	297	277	259	242	228	214	186	128	

See footnotes on page 69.

Shoring required in shaded areas to right of heavy line.

Allowable Diaphragm Shear Strengths, q (plf)

Attachment Pattern	Deck Gage	Span (ft-in.)															
		8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	16'-0"	
36/3	22	q	1676	1664	1653	1644	1635	1628	1621	1614	1608	1603	1598	1593	1589	1581	1574
	21	q	1676	1663	1651	1640	1631	1622	1614	1607	1601	1595	1589	1584	1579	1571	1563
	20	q	1678	1664	1651	1639	1629	1620	1611	1604	1597	1590	1584	1578	1573	1564	1556
	19	q	1689	1672	1657	1644	1632	1621	1611	1602	1594	1586	1579	1572	1566	1555	1546
	18	q	1705	1686	1669	1653	1640	1627	1616	1606	1596	1588	1580	1572	1565	1553	1542
	16	q	1749	1725	1704	1685	1668	1652	1638	1625	1613	1603	1593	1583	1575	1559	1546
36/4	22	q	1778	1756	1737	1719	1703	1689	1676	1664	1653	1643	1634	1625	1617	1603	1590
	21	q	1799	1775	1753	1734	1716	1700	1686	1673	1661	1650	1640	1630	1621	1606	1592
	20	q	1821	1794	1771	1750	1731	1713	1698	1684	1670	1658	1647	1637	1627	1610	1595
	19	q	1872	1841	1813	1788	1766	1746	1728	1711	1696	1682	1669	1657	1645	1625	1608
	18	q	1925	1889	1858	1830	1805	1782	1761	1742	1724	1708	1694	1680	1667	1644	1624
	16	q	2044	2000	1960	1925	1894	1865	1839	1815	1793	1773	1755	1738	1722	1693	1668

See footnotes on page 69.

STEEL HEADED STUD ANCHORS

Table 6: Allowable Shear Strength (kips) per 3/4" Diameter Steel Headed Stud Anchor with FORMLOK Deck

Deck Condition		Normal Weight Concrete (145 pcf)		Light Weight Concrete (110 pcf)		
		f' _c = 3 ksi	f' _c = 4 ksi	f' _c = 3 ksi	f' _c = 4 ksi	
No Deck (Solid Concrete)		9.11	9.32	7.40	9.19	
Deck Parallel	w _r /h _r ≥ 1.5	9.11	9.32	7.40	9.19	
	w _r /h _r < 1.5	7.92	7.92	7.40	7.92	
Deck Perpendicular	Weak Studs per Rib	1	7.46	7.46	7.46	
		2	6.34	6.34	6.34	
		3	5.22	5.22	5.22	
	Strong Studs per Rib	1	9.11	9.32	7.40	9.19
		2	7.92	7.92	7.40	7.92
		3	6.53	6.53	6.53	6.53

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Notes:

1. Values in Table 6 are based on the AISC 360-10 Specification Table 3-21 and Section I8.2a "Strength of Steel Headed Stud Anchors".
2. For Deep Vercor, strengths in Table 6 shall be modified by a factor of 0.44 for both parallel and perpendicular conditions, using a 1/2" diameter stud.
3. w_r/h_r ≥ 1.5 for PLW2 and W2 FORMLOK, PLW3 and W3 FORMLOK, and Deep VERCOR.
w_r/h_r < 1.5 for PLB and B FORMLOK, PLN3 and N3 FORMLOK, PLN and N FORMLOK.
4. Strengths in Table 6 are applicable only to concrete made with ASTM C33 aggregate.
5. w_r indicates average width of concrete rib or haunch (in.); h_r indicates nominal rib height (in.).
6. Steel headed stud anchor lengths are assumed to be ≥ deck height + 1.5 in.
7. An ASD safety factor of Ω = 2.31 was utilized to determine the allowable shear per steel headed stud anchor in Table 6.
8. A "weak" stud is defined as a stud whose distance from the edge of the stud shank to the steel deck web, measured at mid-height of the deck and in the load-bearing direction of the stud, is < 2". For "strong" studs, this distance is ≥ 2". See detail at bottom of Figure 12 for weak and strong stud position.
9. When using composite beams or girders, designers should consider adding reinforcing steel in the concrete fill over the metal deck in the effective width of the composite beam or girder.
10. Designers should consider using partial composite design for possible reduction of the number of studs required.
11. If openings will be cut in the slab adjacent to the composite beams or girder during the life of the building, consideration should be given to the design of the composite section.



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project	DANA POINT HARBOR	by	JS	sheet no.	15 of 170
location	DANA POINT, CA	date	8/4/2022		
client	SMS ARCHITECTS	job no.	Building&Safety: OCPW AzarvandB 1900799	116/2025	
			Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,		

Rigid Diaphragm - Horizontal Distribution
(ASCE 7-16 12.8.4)

Story Shear Input

Unit	Description	Direction	Load Factor	ρ	Service Force (k)	X_{mi} ft	Y_{mi} ft
V	Direct (Story) Shear	X	1.0	1.0	734.3	55.9	33.4
V	Direct (Story) Shear	Y	1.0	1.0	734.3	55.9	33.4

Structure Properties

X	124	ft
Y	74.82	ft
% Ecc.	0.05	
$X_{accidental}$	6.2	ft
$Y_{accidental}$	3.7	ft
X_R	60.7	ft
Y_R	38.7	ft
A_x	1.00	
A_y	1.00	

Structure/Diaphragm Width
Structure/Diaphragm Depth
Accidental Torsion, 12.8.4.2
= 0.05X
= 0.05Y
Center of Rigidity, X-Direction
Center of Rigidity, Y-Direction
Torsional Amplification, 12.8-14
Torsional Amplification, 12.8-14

Note: Torsional Amplification has been included

Building Geometry & Relative Rigidities

Wall ID	Type	Material	E ksi	H ft	L ft	t in	Wall Angle	X_{sw} ft	Y_{sw} ft	R_x kips/in	R_y kips/in	$R_x X$	$R_x Y$	D_x ft	D_y ft	R_{x,D_x}	R_{y,D_x}	
NS1.1	CntVr	Conc	3605	17.00	19.75	12	-77	122.00	17.96	1896	8211	1001792	34048	61.3	-20.8	816607	30854395	
NS2.1	CntVr	Conc	3605	17.00	25.00	12	90	20.75	61.50	0	13118	272201	0	-40.0	0.0	0	20938134	
EW2.1	CntVr	Conc	3605	17.00	12.00	12	13	94.00	1.30	2698	623	58553	3508	33.3	-37.4	3776921	690665	
EW2.2	CntVr	Conc	3605	17.00	19.25	12	0	32.92	0.50	8005	0	4002	0	0.0	-38.2	11689773	0	
EW3.1	CntVr	Conc	3605	17.00	14.50	12	0	62.92	61.50	4342	0	267025	0	0.0	22.8	2254180	0	
EW5.1	CntVr	Conc	3605	17.00	21.25	12	0	10.63	74.42	9726	0	73787	0	0.0	35.7	12395032	0	
Sum:										26666	21952	1032370	1332545					

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Deputy Director
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location	DANA POINT, CA	date	8/4/2022		
client	SMS ARCHITECTS	job no.	Building&Safety: OCPW Azarvand B 1900799		116/2025

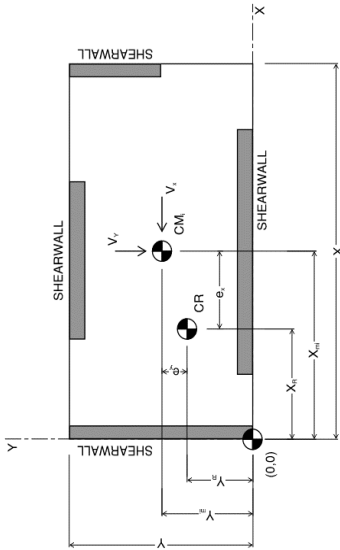
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Rigid Diaphragm - Horizontal Distribution
(ASCE 7-16 12.8.4)



Load Output					
100+30% Orthogonal Factored Loads	Yes	No			

Torsional Moments (k-ft)					
Unit	+M _x	-M _x	+M _y	-M _y	
	ft-kips	ft-kips	ft-kips	ft-kips	
V	-1140.8	-6634.9	1048.9	-8056.4	
Total	-1140.8	-6634.9	1048.9	-8056.4	

Direct and Torsional Shears

Wall ID	X - direction				Y - direction				1+0.3 (Vtotal)		f _v
	V _{direct} kif	+V _{dir} kif	-V _{dir} kif	V _{total} max	V _{direct} kif	+V _{dir} kif	-V _{dir} kif	V _{total} max	kips	kif	
NS1.1	57.2	0.5	3.1	55.3	274.7	6.3	-48.6	226.1	299.3	15.2	105.2
NS2.1	0.0	7.2	41.7	41.7	438.8	-6.6	50.6	489.4	503.2	20.1	139.8
EW2.1	74.3	1.4	8.0	82.3	20.8	0.3	-2.0	18.8	89.3	7.4	51.7
EW2.2	220.4	4.2	24.3	244.8	0.0	-3.8	29.5	-3.8	254.5	13.2	91.8
EW3.1	119.6	-1.4	-7.9	111.7	0.0	1.2	-9.6	1.2	121.4	8.4	58.1
EW5.1	267.8	-4.7	-27.6	240.2	0.0	4.4	-33.5	-33.5	274.1	12.9	89.6



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location	DANA POINT, CA	date	8/4/2022	
client	SMS ARCHITECTS	job no.	Building&Safety: OCPW AzarvandB 1900799	116/2025
			Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,	

Amplification of Accidental Torsional Moment

(ASCE 7-16 12.8.4.3)

Wall ID	Wall Elastic Deflections			X-Direction		Y-Direction		Δ _y in
	V _{max} kips	R _x	D _y ft	R _y	D _x ft			
NS1.1	299.3	1896	-20.8	8211	61.3	0.036		
NS2.1	503.2	0	0	13118	-40.0	0.038		
EW2.1	89.3	2698	-37.4	623	33.3	0.143		
EW2.2	254.5	8005	-38.2	0	0			
EW3.1	121.4	4342	22.8	0	0			
EW5.1	274.1	9736	35.7	0	0			

Accidental Torsional Moment Amplification	
D _{y,min}	-38.2 ft
D _{y,max}	35.7 ft
Δ _{x@Dy,min}	3.2E-02 in
Δ _{x@Dy,max}	2.8E-02 in
δ _{avg,x}	3.0E-02 in
A _x	1.00
D _{x,min}	-40.0 ft
D _{x,max}	61.3 ft
Δ _{y@Dx,min}	3.8E-02 in
Δ _{y@Dx,max}	3.6E-02 in
δ _{avg,y}	3.7E-02 in
A _y	1.00

Fig. 12.8-1
Eq. 12.8-14

Fig. 12.8-1
Eq. 12.8-14

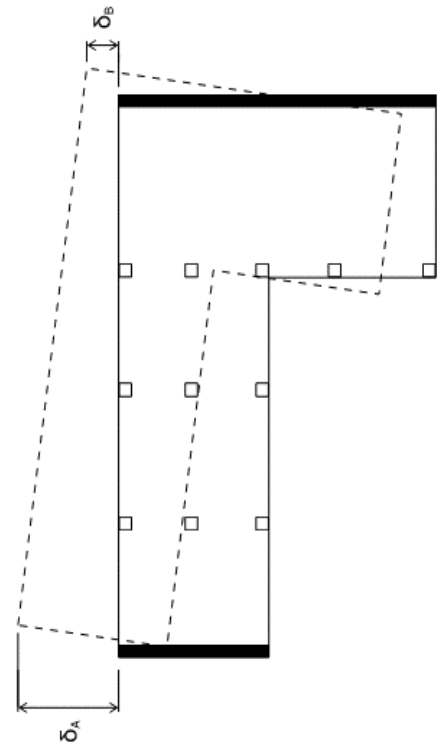


Figure 12.8-1 Torsional Amplification Factor, A_x

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$$\delta_{avg} = \frac{\delta_a + \delta_b}{2}$$

$$A_x = \left(\frac{\delta_{max}}{\delta_{avg}} \right)^2$$



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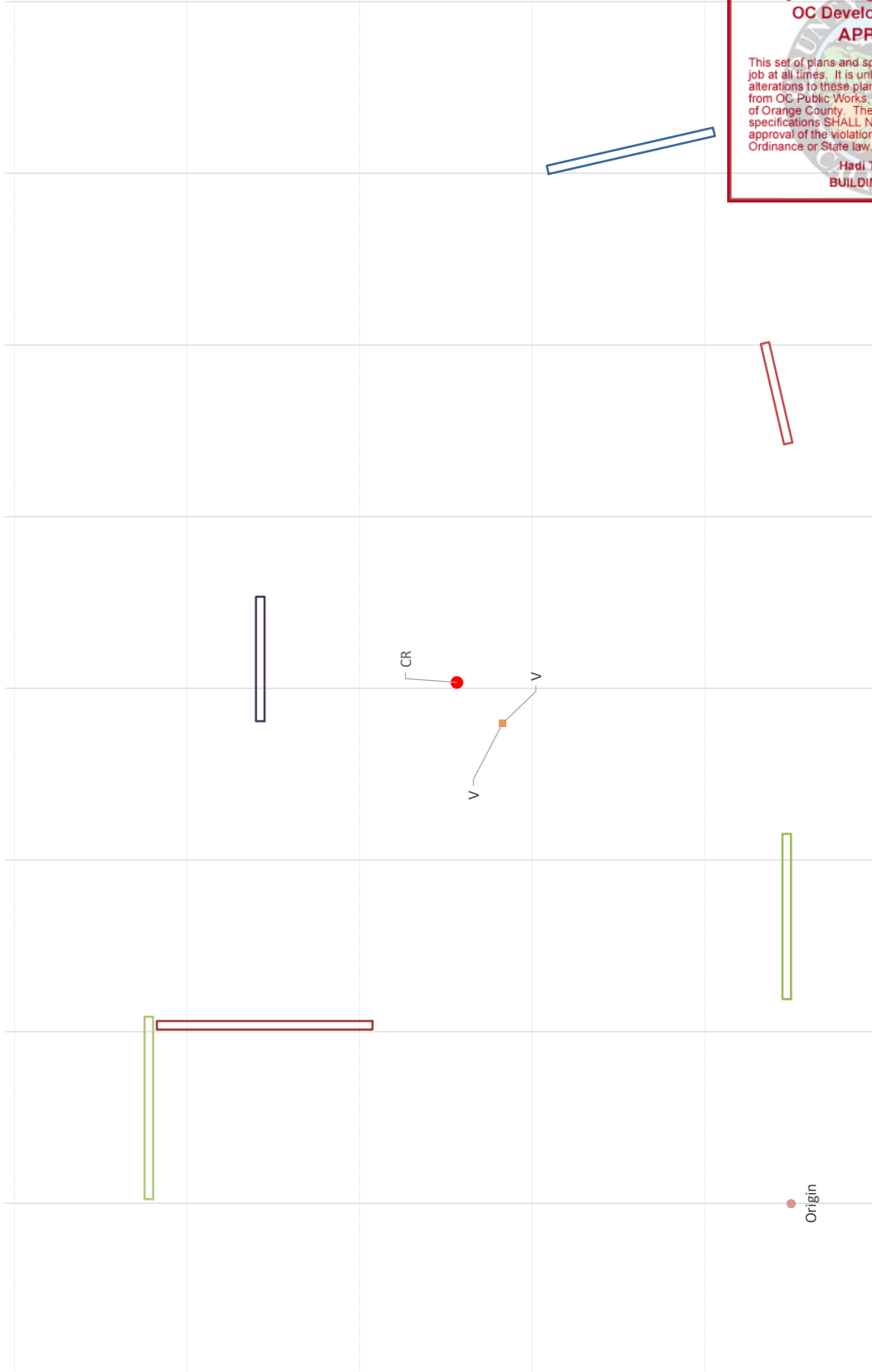
project	DANA POINT HARBOR	by	JS	sheet no. 18 of 170
location	DANA POINT, CA	date	8/4/2022	
client	SMS ARCHITECTS	job no.	Building&Safety: OCPWAzarvandB 1900799	11/16/2025
		Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,		

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Wall Layout Key Plan
(ASCE 7-16 12.8.4)



Note: wall layout is not to scale and is for reference only.



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project **DANA POINT HARBOR**
location **DANA POINT, CA**
client **SMS ARCHITECTS**

by **JS**
date **8/4/2022**
job no. **Building&Safety: OCPWazarvandB 116/2025**
1900799
Permits: **BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,**

Rigid Diaphragm - Horizontal Distribution
(ASCE 7-16 12.8.4)

Story Shear Input

Unit	Description	Direction	Load Factor	ρ	Service Force (k)	X_{mi} ft	Y_{mi} ft
V	Direct (Story) Shear	X	1.0	1.0	1271.0	147.5	62.1
V	Direct (Story) Shear	Y	1.0	1.0	1271.0	147.5	62.1

Structure Properties

X	295.5	ft
Y	124.25	ft
% Ecc.	0.05	
$X_{accidental}$	14.8	ft
$Y_{accidental}$	6.2	ft
X_R	117.3	ft
Y_R	69.1	ft
A_x	1.00	
A_y	1.35	

Structure/Diaphragm Width
Structure/Diaphragm Depth
Accidental Torsion, 12.8.4.2
= 0.05X
= 0.05Y
Center of Rigidity, X-Direction
Center of Rigidity, Y-Direction
Torsional Amplification, 12.8-14
Torsional Amplification, 12.8-14

Note: Torsional Amplification has been included

Building Geometry & Relative Rigidities

Wall ID	Type	Material	E	H	L	t	Wall Angle	X_{sw} ft	Y_{sw} ft	R_x kips/in	R_y kips/in	R_x	R_y	$R_x X$	$R_y Y$	D_x ft	D_y ft	$R_x D_x^2$	$R_y D_y^2$	#####
NS1.1	CntIvr	Conc	3605	17.00	19.75	12	-77	290.50	56.46	1896	8211	107034	2385414	-12.7	173.2	304818	0	67940654		
NS2.1	CntIvr	Conc	3605	17.00	25.00	12	90	189.25	100.00	0	13118	0	2482602	0.0	72.0	0	0	2984149		
NS3.1	CntIvr	Conc	3605	17.00	14.50	12	90	143.50	43.25	0	4342	0	623059	0.0	26.2	0	0	18942869		
NS4.1	CntIvr	Conc	3605	17.00	14.00	12	90	48.50	32.33	0	20351	0	987045	0.0	-68.8	0	0	96286662		
NS4.2	CntIvr	Conc	3605	17.00	32.66	12	90	48.50	95.33	0	3839	0	23993	0.0	-111.0	0	0	47328451		
NS5.1	CntIvr	Conc	3605	17.00	13.75	12	90	6.25	32.25	0	4226	0	26411	0.0	-111.0	0	0	57096691		
NS5.2	CntIvr	Conc	3605	17.00	14.33	12	90	6.25	104.50	0	4342	0	434188	0	30.9	0.0	0.0	4134858		
EW1.1	CntIvr	Conc	3605	17.00	12.00	12	13	262.50	39.80	2698	623	107383	163511	-29.3	145.2	2322649	0	13135579		
EW1.2	CntIvr	Conc	3605	17.00	19.25	12	0	201.42	39.00	8005	0	312184	0	-30.1	0.0	7271792	0	0		
EW2.1	CntIvr	Conc	3605	17.00	14.83	12	0	137.25	35.67	4571	0	163042	0	-33.5	0.0	5120533	0	0		
EW2.2	CntIvr	Conc	3605	17.00	11.50	12	0	79.58	35.67	2492	0	88906	0	-33.5	0.0	2792213	0	0		
EW2.3	CntIvr	Conc	3605	17.00	15.00	12	0	56.50	35.67	4691	0	167311	0	-33.5	0.0	5254628	0	0		
EW3.1	CntIvr	Conc	3605	17.00	14.50	12	0	231.42	100.00	4342	0	434188	0	30.9	0.0	4134858	0	0		
EW4.1	CntIvr	Conc	3605	17.00	15.00	12	0	137.00	101.33	4691	0	475292	0	32.2	0.0	4860224	0	0		
EW4.2	CntIvr	Conc	3605	17.00	6.50	12	0	60.50	101.33	545	0	55704	0	32.2	0.0	564506	0	0		
EW4.3	CntIvr	Conc	3605	17.00	5.25	12	0	51.63	101.33	297	0	30123	0	32.2	0.0	308026	0	0		
EW5.1	CntIvr	Conc	3605	17.00	21.25	12	0	179.13	112.92	9726	0	1098227	0	43.8	0.0	18640896	0	0		
Sum:										43953	58714	3038895	6886222							

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Had Tatabaee
Deputy Director
BUILDING OFFICIAL

Shan
Director
BUILDING OFFICIAL



18400 Von Karman Ave., Suite 600
Irvine, CA 92612
(949) 252-1022 Fax (949) 252-8082

project	DANA POINT HARBOR	by	JS	sheet no. 21 of 170
location	DANA POINT, CA	date	8/4/2022	
client	SMS ARCHITECTS	job no.	Building&Safety: OCPW AzarvandB 1900799	116/2025
			Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,	

Amplification of Accidental Torsional Moment

(ASCE 7-16 12.8.4.3)

Wall ID	V _{max}		X-Direction		Y-Direction		Δ _y	in
	kips		R _x	D _y	R _y	D _x		
NS1.1	348.0	1896		-12.7	8211	173.2	0.042	
NS2.1	393.6	0			13118	72.0	0.030	
NS3.1	107.2	0			4342	26.2	0.025	
NS4.1	83.2	0			4004	-68.8	0.021	
NS4.2	422.9	0			20351	-68.8	0.021	
NS5.1	77.7	0			3839	-111.0	0.020	
NS5.2	85.5	0			4226	-111.0	0.020	
EW1.1	87.9	2698		-29.3	623	145.2	0.141	
EW1.2	246.8	8005		-30.1	0			
EW2.1	141.9	4571		-33.5	0			
EW2.2	77.4	2492		-33.5	0			
EW2.3	145.6	4691		-33.5	0			
EW3.1	130.0	4342		30.9	0			
EW4.1	140.7	4651		32.2	0			
EW4.2	16.3	545		32.2	0			
EW4.3	8.9	297		32.2	0			
EW5.1	295.5	9726		43.8	0			

Accidental Torsional Moment Amplification	
D _{y,min}	-33.5 ft
D _{y,max}	43.8 ft
Δ _{x@Dy,min}	3.1E-02 in
Δ _{x@Dy,max}	3.0E-02 in
Δ _{avg,x}	3.1E-02 in
A _x	1.00
D _{x,min}	-111.0 ft
D _{x,max}	173.2 ft
Δ _{y@Dx,min}	2.0E-02 in
Δ _{y@Dx,max}	4.2E-02 in
Δ _{avg,y}	3.1E-02 in
A _y	1.27

Fig. 12.8-1
Eq. 12.8-14

Fig. 12.8-1
Eq. 12.8-14

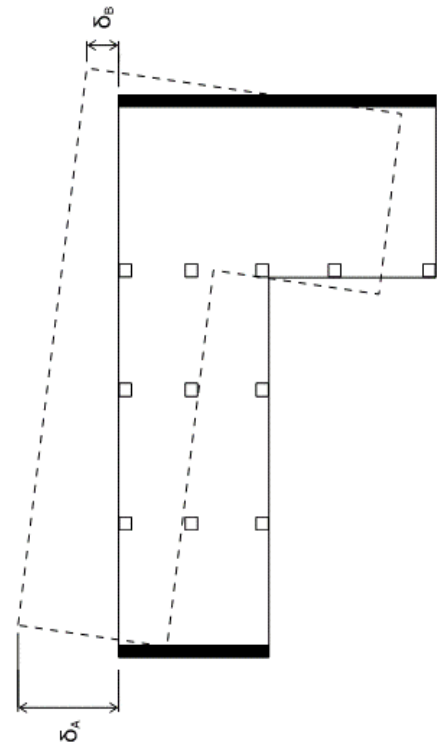


Figure 12.8-1 Torsional Amplification Factor, A_x

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Hadi Tabatabaee
ENGINEERING OFFICIAL

$$\delta_{avg} = \frac{\delta_A + \delta_B}{2}$$

$$A_x = \frac{\delta_{avg}}{\delta_{max}}$$



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project	Dana Point Harbor Phase 4A	by	JS	sheet no.	22 of 170
location	Dana Point, CA	date	8/5/2022		
client	SMS Architects	job no.	1900799		
	Bldg. 8	Building&Safety: OCPWAzarvandB			1/16/2025

Horizontal Structural Irregularities

(ASCE 7-16 - Section No. 12.3.2.1)

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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BUILDING OFFICIAL

1a. Torsional Irregularity:

X-Direction

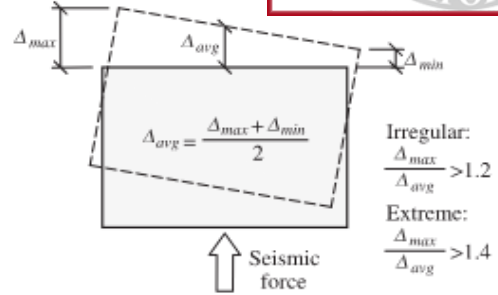
$\Delta_{x@Dy,min}$	0.031	in	From Rigid Diaphragm Analysis
$\Delta_{x@Dy,max}$	0.030	in	From Rigid Diaphragm Analysis
$\delta_{avg,x}$	0.031	in	
$1.2\delta_{avg,x}$	0.037	in	

0.031 ≤ 0.037 in **OK**

Y-Direction

$\Delta_{y@Dx,min}$	0.020	in	From Rigid Diaphragm Analysis
$\Delta_{y@Dy,max}$	0.042	in	From Rigid Diaphragm Analysis
$\delta_{avg,y}$	0.031	in	
$1.2\delta_{avg,y}$	0.038	in	

0.042 > 0.038 in **Torsional Irregularity Present**
Design for seismic load effects of Section 12.3.3.4
And Section 12.8.4.3



Type 1. Torsional

1b. Extreme Torsional Irregularity:

X-Direction

$\Delta_{x@Dy,min}$	0.031	in	From Rigid Diaphragm Analysis
$\Delta_{x@Dy,max}$	0.030	in	From Rigid Diaphragm Analysis
$\delta_{avg,x}$	0.031	in	
$1.4\delta_{avg,x}$	0.043	in	

0.031 ≤ 0.043 in **OK**

Y-Direction

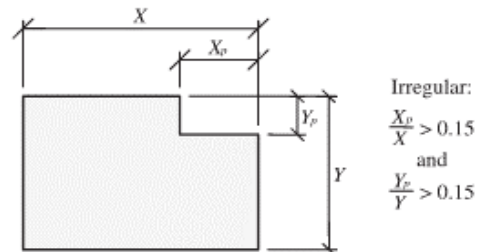
$\Delta_{y@Dx,min}$	0.020	in	From Rigid Diaphragm Analysis
$\Delta_{y@Dy,max}$	0.042	in	From Rigid Diaphragm Analysis
$\delta_{avg,y}$	0.031	in	
$1.4\delta_{avg,y}$	0.044	in	

0.042 ≤ 0.044 in **OK**

2. Reentrant Corner Irregularity:

Length, X	295.00	ft
Width, Y	124.50	ft
X_p	49.00	ft
Y_p	26.00	ft

X_p/X : 0.17 > 0.15 **OK**
 Y_p/Y : 0.21 > 0.15 **Reentrant Corner Irregularity Present**
Design for seismic load effects of Section 12.3.3.4





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Irvine, CA 92612
(949) 252-1022 Fax (949) 252-8082

project Dana Point Harbor | Phase 4A

location Dana Point, CA

client SMS Architects

Bldg. 8

by JS

date 8/5/2022

job no. 1900799

Building&Safety: OCPWazarvandB

sheet no. 23 of 170

1/16/2025

Horizontal Structural Irregularities

(ASCE 7-16 - Section No. 12.3.2.1)

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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BUILDING OFFICIAL

3. Diaphragm Discontinuity:

Roof

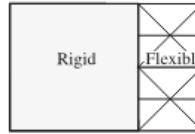
Length, X	111.00	ft
Width, Y	72.00	ft
A _{total}	7992.0	ft ²
A _{open-Roof}	574.0	ft ²

$0.5XY_{Roof} = 574.0 \leq 3996$ **OK**

Level 2

Length, X	152.00	ft
Width, Y	108.00	ft
A _{total}	16416.0	ft ²
A _{open-Lvl 2}	344.0	ft ²

$0.5XY_{Lvl 2} = 344.0 \leq 8208$ **OK**



Type 3. Diaphragm discontinuity

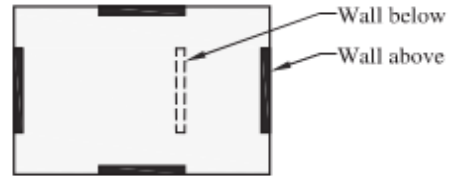


4. Out-of-Plane Offset:

Are there discontinuities in the lateral-force-resisting path, such as out-of-plane offsets of vertical elements?

No

OK



Type 4. Out-of-plane offset

5. Nonparallel Systems:

Are vertical lateral-force-resisting element not parallel or symmetric about the major orthogonal axes of the LFRS?

Yes

**Nonparallel System Present
Use 100+30% Orthogonal**



Type 5. Nonparallel system



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project	Dana Point Harbor Phase 4A	by	LW	sheet no.	24 of 170
location	Dana Point, CA	date	8/5/2022		
client	SMS Architects	job no.	1900799		
	Bldg. 9		Building&Safety: OCPWAzarvandB		1/16/2025

Horizontal Structural Irregularities

(ASCE 7-16 - Section No. 12.3.2.1)

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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1a. Torsional Irregularity:

X-Direction

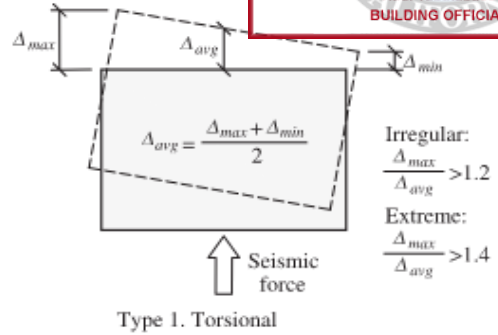
$\Delta_{X@Dy,min}$	0.031	in	From Rigid Diaphragm Analysis
$\Delta_{X@Dy,max}$	0.030	in	From Rigid Diaphragm Analysis
$\delta_{avg,x}$	0.031	in	
$1.2\delta_{avg,x}$	0.037	in	

0.031 ≤ 0.037 in **OK**

Y-Direction

$\Delta_{Y@Dx,min}$	0.020	in	From Rigid Diaphragm Analysis
$\Delta_{Y@Dy,max}$	0.042	in	From Rigid Diaphragm Analysis
$\delta_{avg,y}$	0.031	in	
$1.2\delta_{avg,y}$	0.038	in	

0.042 > 0.038 in **Torsional Irregularity Present**
Design for seismic load effects of Section 12.3.3.4
And Section 12.8.4.3



1b. Extreme Torsional Irregularity:

X-Direction

$\Delta_{X@Dy,min}$	0.031	in	From Rigid Diaphragm Analysis
$\Delta_{X@Dy,max}$	0.030	in	From Rigid Diaphragm Analysis
$\delta_{avg,x}$	0.031	in	
$1.4\delta_{avg,x}$	0.043	in	

0.031 ≤ 0.043 in **OK**

Y-Direction

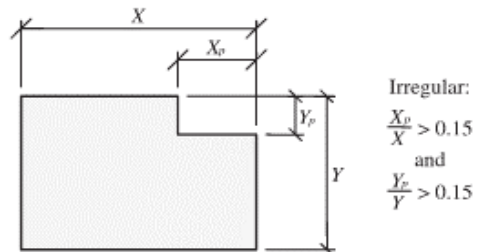
$\Delta_{Y@Dx,min}$	0.020	in	From Rigid Diaphragm Analysis
$\Delta_{Y@Dy,max}$	0.042	in	From Rigid Diaphragm Analysis
$\delta_{avg,y}$	0.031	in	
$1.4\delta_{avg,y}$	0.044	in	

0.042 ≤ 0.044 in **OK**

2. Reentrant Corner Irregularity:

Length, X	295.00	ft
Width, Y	124.50	ft
X_p	96.00	ft
Y_p	13.00	ft

X_p/X : 0.33 > 0.15 **Reentrant Corner Irregularity Present**
 Y_p/Y : 0.10 ≤ 0.15 **OK**
Design for seismic load effects of Section 12.3.3.4





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project	Dana Point Harbor Phase 4A	by	LW	sheet no.	25 of 170
location	Dana Point, CA	date	8/5/2022		
client	SMS Architects	job no.	1900799		
	Bldg. 9	Building&Safety: OCPW AzarvandB			1/16/2025

Horizontal Structural Irregularities

(ASCE 7-16 - Section No. 12.3.2.1)

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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3. Diaphragm Discontinuity:

Roof

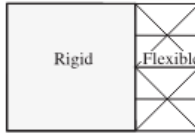
Length, X	140.00	ft
Width, Y	86.33	ft
A _{total}	12086.2	ft ²
A _{open-Roof}	200.0	ft ²

$0.5XY_{Roof} = 200.0 \leq 6043.1$ **OK**

Level 2

Length, X	143.00	ft
Width, Y	105.00	ft
A _{total}	15015.0	ft ²
A _{open-Lvl 2}	700.0	ft ²

$0.5XY_{Lvl 2} = 700.0 \leq 7507.5$ **OK**



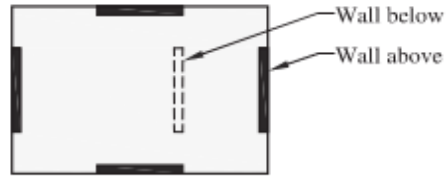
Type 3. Diaphragm discontinuity

4. Out-of-Plane Offset:

Are there discontinuities in the lateral-force-resisting path, such as out-of-plane offsets of vertical elements?

No

OK



Type 4. Out-of-plane offset

5. Nonparallel Systems:

Are vertical lateral-force-resisting element not parallel or symmetric about the major orthogonal axes of the LFRS?

No

OK



Type 5. Nonparallel system



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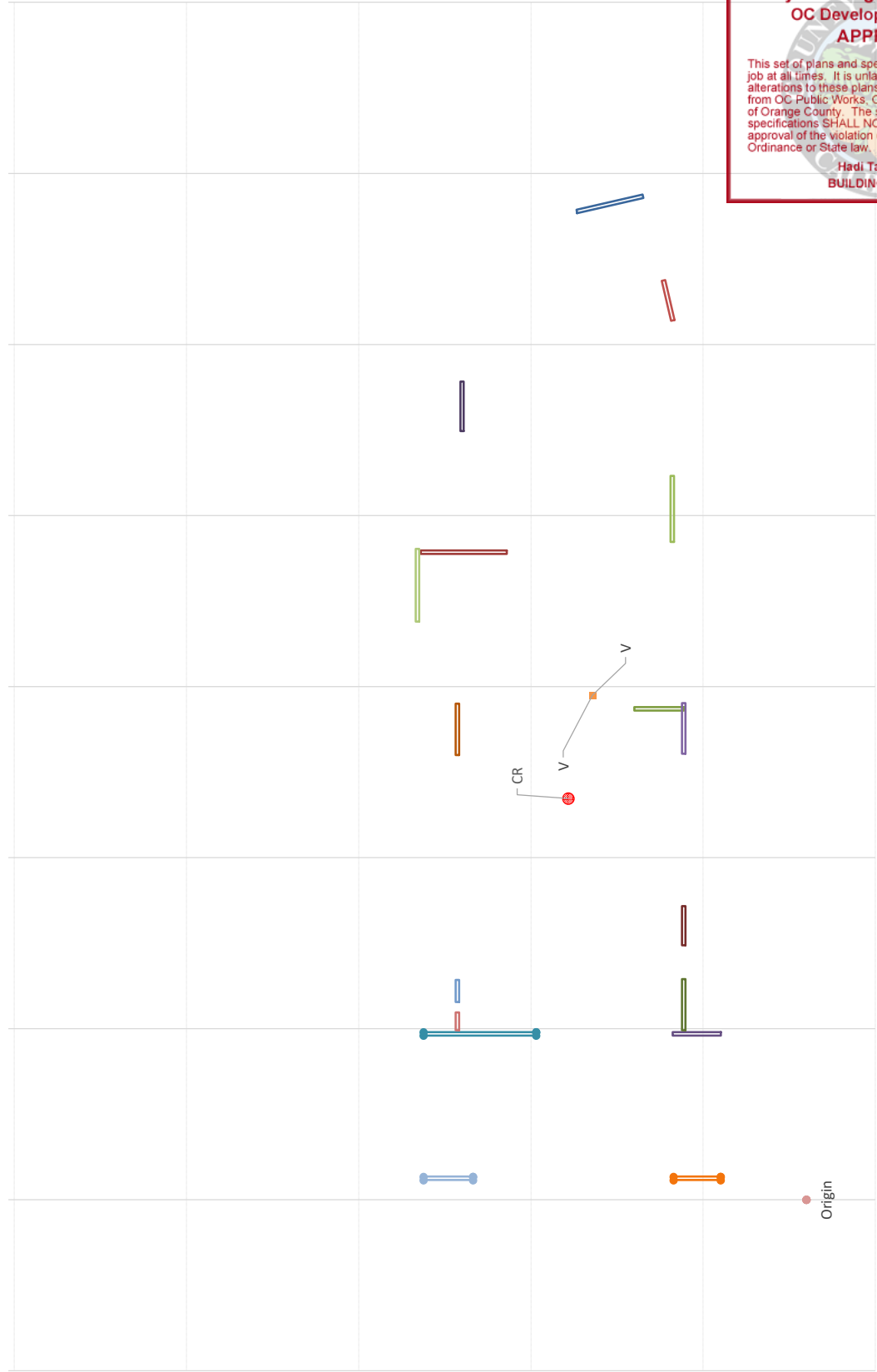
project	DANA POINT HARBOR	by	JS	sheet no. 26 of 170
location	DANA POINT, CA	date	8/4/2022	
client	SMS ARCHITECTS	job no.	Building&Safety: OCPW AzarvandB 1900799	11/16/2025
		Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,		

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Wall Layout Key Plan
(ASCE 7-16 12.8.4)



Note: wall layout is not to scale and is for reference only.



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project	DPH - Building 8	by	JS	sheet no.	27 of 170
location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
		Building&Safety: OCPWArvandB			1/16/2025

Shear Walls

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

Roof

V = 797.9311

Wall	Length	Height	t	h/l	l/t	Shear	AcvF'c	rho
NS1.1	19.75	33	12	1.67	19.75	299.3	201.1012	234.6
NS2.1	25.00	33	12	1.32	25	503.2	254.5584	297.0
EW1.1	12.00	33	12	2.75	12	89.3	122.1881	142.6
EW1.2	19.25	33	12	1.71	19.25	254.5	196.01	228.7
EW2.1	14.50	33	12	2.28	14.5	121.4	147.6439	172.3
EW5.1	21.25	33	12	1.55	21.25	274.1	216.3747	252.5


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2nd Floor

Wall	Length	Height	Shear (RA)	Shear	Total Shear	KLF	Mu	Pu(DL)	Pu(LL)	Ev	Notes
NS1.1	19.75	33	348.0	299.3	647.3	32.77	15792.9	203.0	108.9	41.1	
NS2.1	25.00	33	393.6	503.2	896.8	35.87	23296.8	288.3	145.2	58.3	
EW2.1	12.00	33	87.9	89.3	177.2	14.77	4441.2	132.4	42.4	26.8	
EW2.2	19.25	33	246.8	254.5	501.3	26.04	12594.1	206.1	54.3	41.7	
EW3.1	14.50	33	130.0	121.4	251.4	17.34	6216.2	185.5	56.1	37.5	
EW5.1	21.25	33	295.5	274.1	569.6	26.80	14068.8	176.0	66.0	35.6	

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - NS1.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	19.75	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2844	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	312	kips				
M _u	15793	k-ft				
V _u	647	kips				
Two Curtains Minimum Required						
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	201.10	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	1.7		α_c	2.6		
V _n max (per 18.10.4.1)	1305	kips				
V _n max (per 18.10.4.4)	1609	kips	(Conservativley assumes limit of 8 f _c)			
V _c	322	kips				
V _s	1030	kips				
V _n	1305					
ϕV_n	979		66%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - NS1.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED (Per ACI section 8.6.1) Heri Tahar Djene BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	19.75	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	Acv	2844	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				As (longit)	1.58	in ² /ft
				As (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	312	kips				
M _u	15793	k-ft				
V _u	647	kips				
Critical Section	6.10	ft				
Two Curtains Minimum Required						
Boundary Element Check						
E_c	4031					
C _d	5.00					
l	1.00					
h/l	1.67					
$\delta_{ex} =$	0.633626	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	3.168128	in		$C_d \delta_{ex} / l$		
C _{max}	36.68	in				(From SP Column Output)
$l_w / (600(\delta_u / h_w))$	32.91533					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	1.11					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - NS1.1		Building&Safety: OCPWAzayvandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	19.75	ft				
Footing Length	35.75	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	175	kips				
M_a	15793	k-ft				
V_a	647	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	12.16	ft				
Use:	12.20	ft				
P_u	191.45	kips				
$q_{u\ max}$	6.52	ksf				
$q_{u\ min}$	-5.64	ksf				
Inflection Point, X	16.58	ft	$P_{ot\ soil}$	46.75	k	
			P_a	175	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	35.84	in				
Use h_{min}	40.00	in				
V_u	14.77	k/ft				
ϕV_c	36.66	k/ft				OK
M_u	102.2	k-ft/ft				
$A_{s\ min}$	0.70	in ² /ft				
Reinforcement						
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft OK
Longitudinal	# 5		12		$A_{s\ min}$	0.86 in ² /ft
					$A_{s\ total}$	11.0 OK
a	1.04	in				
c	1.22	in				
ϵ_s	0.086	>	0.005	ϕ	0.9	
ϕM_n	1686.1	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_{tc}	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



2. Section

2.1. Section Figure

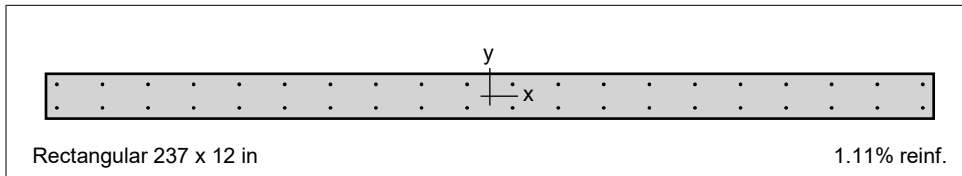


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	40 #8
Total steel area, A_s	31.60 in ²
Rho	1.11 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand B 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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My @ Top My @ Bottom

4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	203.00	0.00	0.00	0.00	0.00
1	Live	108.90	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	41.10	0.00	0.00	0.00	15792.90
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	284.20	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
2	1 U1 Bot	284.20	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
3	1 U2 Top	417.84	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
4	1 U2 Bot	417.84	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
5	1 U3 Top	352.50	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
6	1 U3 Bot	352.50	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
7	1 U4 Top	243.60	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
8	1 U4 Bot	243.60	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
9	1 U5 Top	352.50	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
10	1 U5 Bot	352.50	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
11	1 U6 Top	182.70	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
12	1 U6 Bot	182.70	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
13	1 U7 Top	243.60	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
14	1 U7 Bot	243.60	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
15	1 U8 Top	352.50	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
16	1 U8 Bot	352.50	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
17	1 U9 Top	182.70	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
18	1 U9 Bot	182.70	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
19	1 U10 Top	393.60	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
20	1 U10 Bot	393.60	-15792.90	202.46	-16254.62	37.14	0.01591	0.900	0.97
21	1 U11 Top	223.80	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
22	1 U11 Bot	223.80	-15792.90	158.84	-15942.72	36.25	0.01637	0.900	0.99
23	1 U12 Top	311.40	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
24	1 U12 Bot	311.40	15792.90	179.88	16096.21	36.68	0.01615	0.900	0.98
25	1 U13 Top	141.60	0.00	183.71	16124.09	36.76	0.01611	0.900	0.45
26	1 U13 Bot	141.60	15792.90	139.09	15798.70	35.85	0.01659	0.900	1.00

6. Diagrams

6.1. PM at $\theta=0$ [deg]

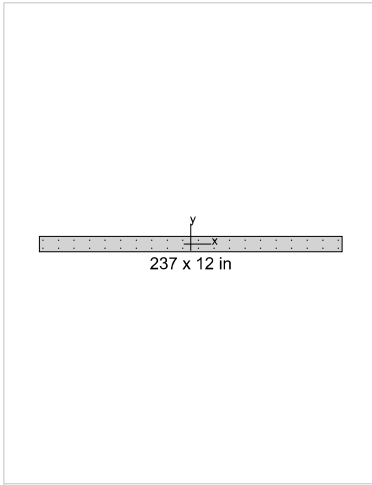
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 8
Column	NS1.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

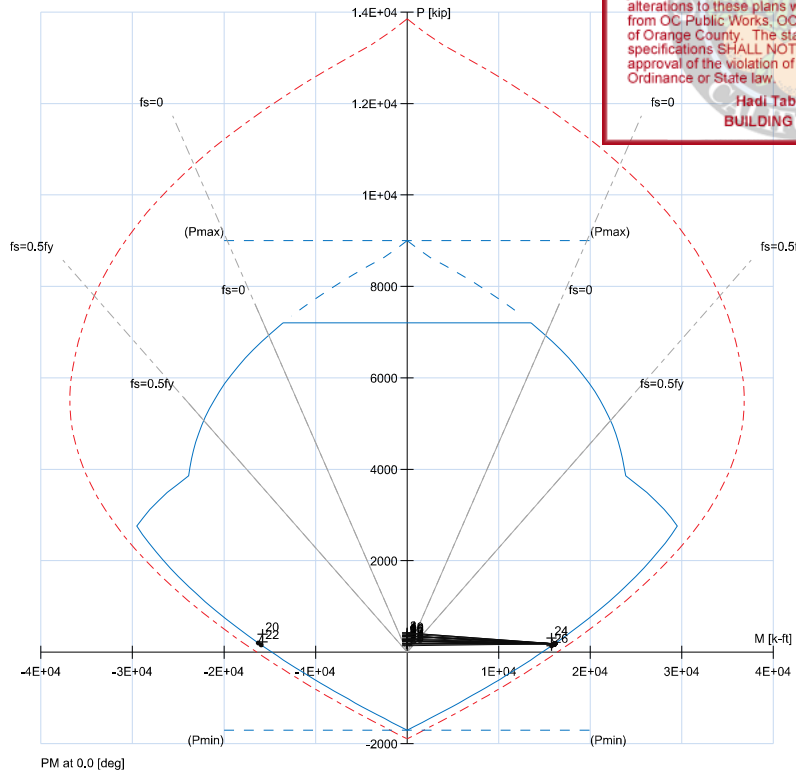
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	237 in
Depth	12 in
A_g	2844 in ²
I_x	34128 in ⁴
I_y	1.33121e+007 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	40 #8
Confinement type	Tied
Total steel area, A_s	31.60 in ²
Rho	1.11 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	141.6	15792.9	139.09	15798.70	1.00
22	1 U11 Bot	223.8	-15792.9	158.84	-15942.72	0.99
24	1 U12 Bot	311.4	15792.9	179.88	16096.21	0.98
20	1 U10 Bot	393.6	-15792.9	202.46	-16254.62	0.97
1	1 U1 Top	284.2	0.0	183.71	16124.09	0.45
2	1 U1 Bot	284.2	0.0	183.71	16124.09	0.45
3	1 U2 Top	417.8	0.0	183.71	16124.09	0.45
4	1 U2 Bot	417.8	0.0	183.71	16124.09	0.45
5	1 U3 Top	352.5	0.0	183.71	16124.09	0.45
6	1 U3 Bot	352.5	0.0	183.71	16124.09	0.45
7	1 U4 Top	243.6	0.0	183.71	16124.09	0.45
8	1 U4 Bot	243.6	0.0	183.71	16124.09	0.45
9	1 U5 Top	352.5	0.0	183.71	16124.09	0.45
10	1 U5 Bot	352.5	0.0	183.71	16124.09	0.45
11	1 U6 Top	182.7	0.0	183.71	16124.09	0.45

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 1.00

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	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - NS2.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	25	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	3600	in2	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in2/ft	
				As (transv)	0.66 in2/ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	434	kips				
M _u	23297	k-ft				
V _u	897	kips				
Two Curtains Minimum Required						
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	254.56	kips				
-->Minimum Requirements of Section 18.10.2.1 Apply						
Min ρ_l	.0025		Asmin (longit)	0.36 in2/ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in2/ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	1.4		α_c	3		
V _n max (per 18.10.4.1)	1754	kips				
V _n max (per 18.10.4.4)	2036	kips			(Conservativley assumes limit of 8 f _c)	
V _c	407	kips				
V _s	1650	kips				
V _n	1754					
ϕV_n	1315	68%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - NS2.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	25	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	3600	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	434	kips				
M_u	23297	k-ft				
V_u	897	kips				
Critical Section	6.49	ft				
Two Curtains Minimum Required						
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	1.32					
$\delta_{ex} =$	0.488018	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	2.440092	in		$C_d \delta_{ex} / l$		
C_{max}	43.48	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	54.09633					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.80					
<1.0--Boundary Elements NOT Required						

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet no.	130
	location	Dana Point, CA		date			
	client	SMS Architects		job no.			
		Bldg 8 - NS2.1		Building&Safety: OCPWAzayvandB	1900799	1/16/2025	
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL	
Wall Length	25	ft					
Footing Length	41	ft					
Wall Height	33	ft					
Wall Thickness	12	in.					
P_a	234	kips					
M_a	23297	k-ft					
V_a	897	kips					
Allowable Bearing, q_{ALL}	5000	psf					
Determine Width:							
Minimum Width	13.67	ft					
Use:	13.70	ft					
P_u	254.18	kips					
$q_{u\ max}$	6.52	ksf					
$q_{u\ min}$	-5.62	ksf					
Inflection Point, X	18.97	ft	$P_{ot\ soil}$	53.28	k		
			P_a	234	k	OK	
Shear & Flexure:							
f'_c	5000	psi	F_y	60	ksi		
b	12.00						
d	40.67	in					
Use h_{min}	46.00	in					
V_u	16.41	k/ft					
ϕV_c	42.77	k/ft	OK				
M_u	131.5	k-ft/ft					
$A_{s\ min}$	0.77	in ² /ft					
Reinforcement							
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft	OK
Longitudinal	# 5		14		$A_{s\ min}$	0.99 in ² /ft	
					$A_{s\ total}$	14.0	OK
a	1.04	in					
c	1.22	in					
ϵ_s	0.100	>	0.005	ϕ	0.9		
ϕM_n	1971.2	k-ft/ft	OK				

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

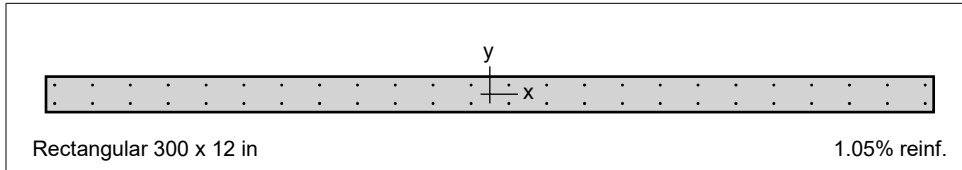


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	48 #8
Total steel area, A_s	37.92 in ²
Rho	1.05 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Building&Safety: OCPWArvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	288.30	0.00	0.00	0.00	0.00
1	Live	145.20	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	58.30	0.00	0.00	0.00	23296.80
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	403.62	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
2	1 U1 Bot	403.62	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
3	1 U2 Top	578.28	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
4	1 U2 Bot	578.28	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
5	1 U3 Top	491.16	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
6	1 U3 Bot	491.16	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
7	1 U4 Top	345.96	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
8	1 U4 Bot	345.96	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
9	1 U5 Top	491.16	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
10	1 U5 Bot	491.16	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
11	1 U6 Top	259.47	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
12	1 U6 Bot	259.47	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
13	1 U7 Top	345.96	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
14	1 U7 Bot	345.96	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
15	1 U8 Top	491.16	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
16	1 U8 Bot	491.16	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
17	1 U9 Top	259.47	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
18	1 U9 Bot	259.47	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
19	1 U10 Top	549.46	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
20	1 U10 Bot	549.46	-23296.80	186.75	-24321.26	44.02	0.01725	0.900	0.95
21	1 U11 Top	317.77	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
22	1 U11 Bot	317.77	-23296.80	132.82	-23819.19	42.95	0.01775	0.900	0.98
23	1 U12 Top	432.86	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
24	1 U12 Bot	432.86	23296.80	159.61	24068.59	43.48	0.01750	0.900	0.97
25	1 U13 Top	201.17	0.00	231.00	24733.22	44.91	0.01685	0.900	0.47
26	1 U13 Bot	201.17	23296.80	105.68	23566.52	42.41	0.01802	0.900	0.99

6. Diagrams

6.1. PM at $\theta=0$ [deg]

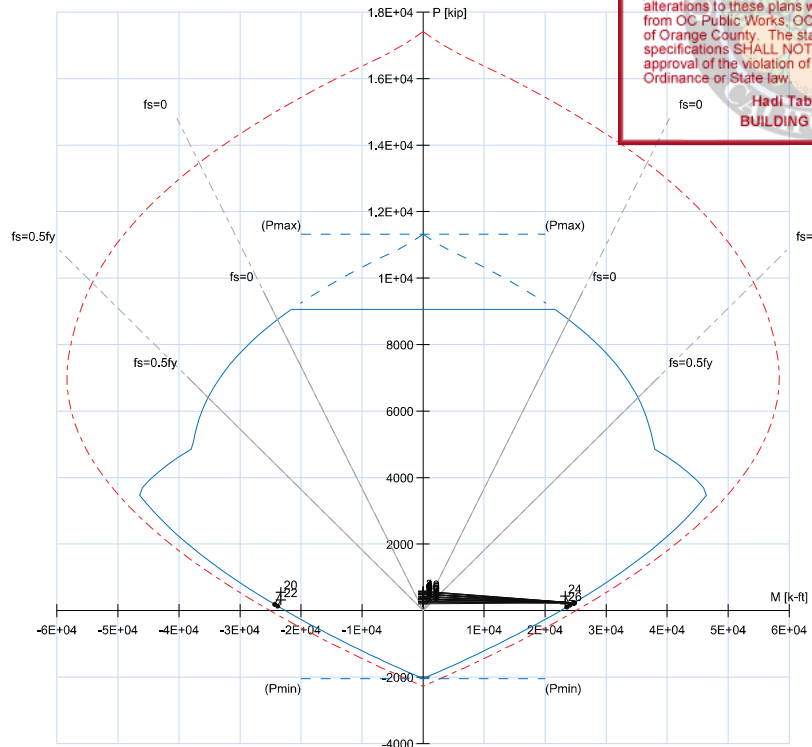
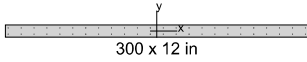
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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PM at 0.0 [deg]

General Information

Project	DPH - Bldg 6
Column	NS2.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	300 in
Depth	12 in
A_g	3600 in ²
I_x	43200 in ⁴
I_y	2.7e+007 in ⁴


Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	48 #8
Confinement type	Tied
Total steel area, A_s	37.92 in ²
Rho	1.05 %
Min. clear spacing	5.25 in


No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	201.2	23296.8	105.68	23566.52	0.99
22	1 U11 Bot	317.8	-23296.8	132.82	-23819.19	0.98
24	1 U12 Bot	432.9	23296.8	159.61	24068.59	0.97
20	1 U10 Bot	549.5	-23296.8	186.75	-24321.26	0.95
1	1 U1 Top	403.6	0.0	231.00	24733.22	0.47
2	1 U1 Bot	403.6	0.0	231.00	24733.22	0.47
3	1 U2 Top	578.3	0.0	231.00	24733.22	0.47
4	1 U2 Bot	578.3	0.0	231.00	24733.22	0.47
5	1 U3 Top	491.2	0.0	231.00	24733.22	0.47
6	1 U3 Bot	491.2	0.0	231.00	24733.22	0.47
7	1 U4 Top	346.0	0.0	231.00	24733.22	0.47
8	1 U4 Bot	346.0	0.0	231.00	24733.22	0.47
9	1 U5 Top	491.2	0.0	231.00	24733.22	0.47
10	1 U5 Bot	491.2	0.0	231.00	24733.22	0.47
11	1 U6 Top	259.5	0.0	231.00	24733.22	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.99

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW2.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	12	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	1728	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	175	kips				
M _u	4441	k-ft				
V _u	177	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	122.19	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.8		α_c	2		
V _n max (per 18.10.4.1)	720	kips				
V _n max (per 18.10.4.4)	978	kips	(Conservativley assumes limit of 8 f _c)			
V _c	196	kips				
V _s	380	kips				
V _n	576					
ϕV_n	432	41%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW2.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	12	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	1728	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	175	kips				
M_u	4441	k-ft				
V_u	177	kips				
Critical Section	6.27	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.75					
$\delta_{ex} =$	0.670003	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	3.350017	in		$C_d \delta_{ex} / l$		
C_{max}	16.73	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	18.91334					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.88					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	Sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW2.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	12	ft				
Footing Length	22	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	138	kips				
M_a	4441	k-ft				
V_a	177	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	9.44	ft				
Use:	9.50	ft				
P_u	146.47	kips				
$q_{u \max}$	6.50	ksf				
$q_{u \min}$	-5.09	ksf				
Inflection Point, X	9.67	ft	$P_{ot \ soil}$	24.63	k	
			P_a	138	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	27.11	in				
Use h_{min}	32.00	in				
V_u	10.29	k/ft				
ϕV_c	28.51	k/ft	OK			
M_u	58.7	k-ft/ft				
$A_{s \ min}$	0.52	in ² /ft				
Reinforcement						
Transverse	# 6	@	8	OC	A_s	0.66 in ² /ft OK
Longitudinal	# 5		4		$A_{s \ min}$	0.69 in ² /ft
					$A_{s \ total}$	7.0 OK
a	0.78	in				
c	0.91	in				
ϵ_s	0.089	>	0.005	ϕ	0.9	
ϕM_n	984.1	k-ft/ft	OK			

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



2. Section

2.1. Section Figure

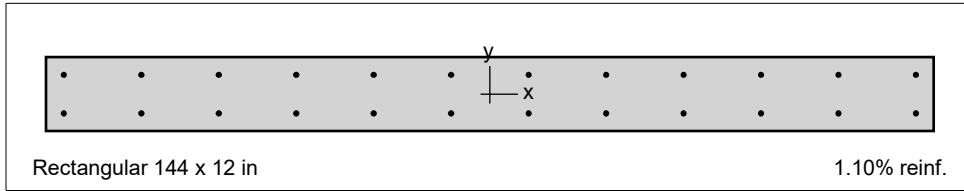


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	24 #8
Total steel area, A_s	18.96 in ²
Rho	1.10 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand B
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	132.40	0.00	0.00	0.00	0.00
1	Live	42.40	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	26.80	0.00	0.00	0.00	4441.20
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	185.36	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
2	1 U1 Bot	185.36	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
3	1 U2 Top	226.72	0.00	111.44	5917.84	21.90	0.01633	0.900	0.45
4	1 U2 Bot	226.72	0.00	111.44	5917.84	21.90	0.01633	0.900	0.45
5	1 U3 Top	201.28	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
6	1 U3 Bot	201.28	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
7	1 U4 Top	158.88	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
8	1 U4 Bot	158.88	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
9	1 U5 Top	201.28	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
10	1 U5 Bot	201.28	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
11	1 U6 Top	119.16	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
12	1 U6 Bot	119.16	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
13	1 U7 Top	158.88	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
14	1 U7 Bot	158.88	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
15	1 U8 Top	201.28	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
16	1 U8 Bot	201.28	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
17	1 U9 Top	119.16	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
18	1 U9 Bot	119.16	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
19	1 U10 Top	228.08	0.00	111.44	5917.84	21.90	0.01633	0.900	0.45
20	1 U10 Bot	228.08	-4441.20	0.00	-5419.71	19.64	0.01856	0.900	0.90
21	1 U11 Top	145.96	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
22	1 U11 Bot	145.96	-4441.20	0.00	-5419.71	19.64	0.01856	0.900	0.90
23	1 U12 Top	174.48	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
24	1 U12 Bot	174.48	4441.20	0.00	5419.71	19.64	0.01856	0.900	0.90
25	1 U13 Top	92.36	0.00	111.44	5917.84	21.90	0.01633	0.900	0.46
26	1 U13 Bot	92.36	4441.20	0.00	5419.71	19.64	0.01856	0.900	0.91

6. Diagrams

6.1. PM at $\theta=0$ [deg]

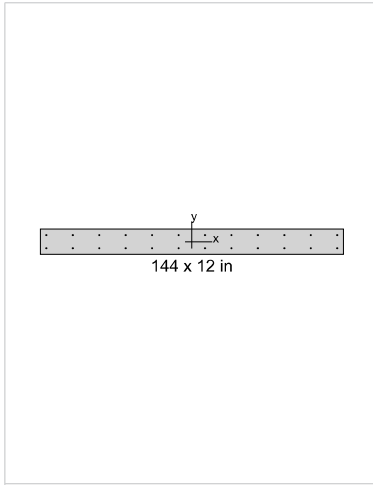
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Hadi Tabatabaee
 BUILDING OFFICIAL



General Information

Project	DPH - Bldg 8
Column	EW1.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

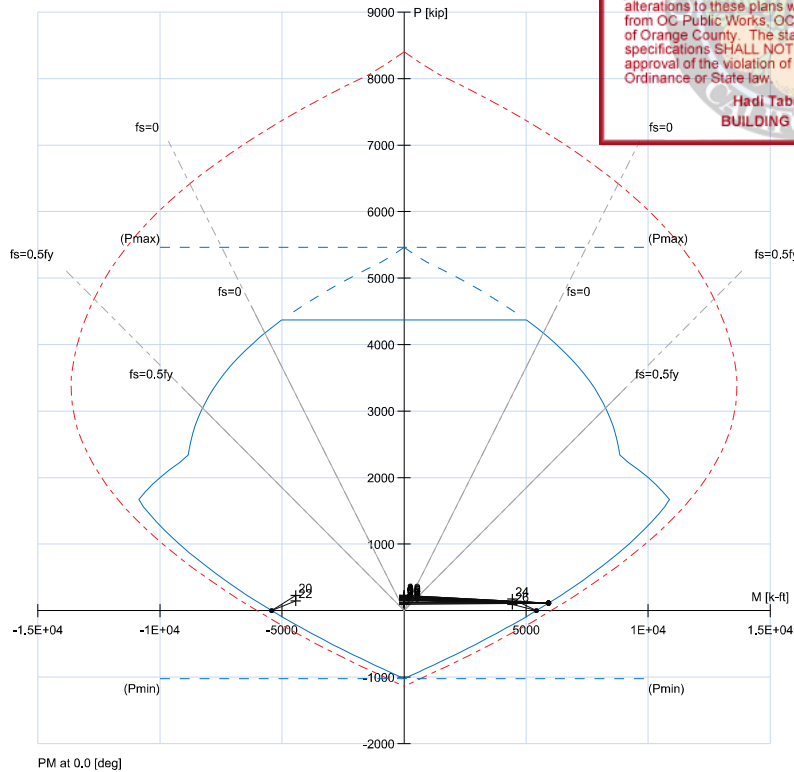
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	144 in
Depth	12 in
A_g	1728 in ²
I_x	20736 in ⁴
I_y	2.98598e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	24 #8
Confinement type	Tied
Total steel area, A_s	18.96 in ²
Rho	1.10 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	92.4	4441.2	0.00	5419.71	0.91
20	1 U10 Bot	228.1	-4441.2	0.00	-5419.71	0.90
22	1 U11 Bot	146.0	-4441.2	0.00	-5419.71	0.90
24	1 U12 Bot	174.5	4441.2	0.00	5419.71	0.90
1	1 U1 Top	185.4	0.0	111.44	5917.84	0.46
2	1 U1 Bot	185.4	0.0	111.44	5917.84	0.46
5	1 U3 Top	201.3	0.0	111.44	5917.84	0.46
6	1 U3 Bot	201.3	0.0	111.44	5917.84	0.46
7	1 U4 Top	158.9	0.0	111.44	5917.84	0.46
8	1 U4 Bot	158.9	0.0	111.44	5917.84	0.46
9	1 U5 Top	201.3	0.0	111.44	5917.84	0.46
10	1 U5 Bot	201.3	0.0	111.44	5917.84	0.46
11	1 U6 Top	119.2	0.0	111.44	5917.84	0.46
12	1 U6 Bot	119.2	0.0	111.44	5917.84	0.46
13	1 U7 Top	158.9	0.0	111.44	5917.84	0.46

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.91

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW2.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	19.25	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2772	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 16	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.185 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.0082	
				ρ_t	0.0046	
P _u	260	kips				
M _u	12594	k-ft				
V _u	501	kips				
			Two Curtains Minimum Required			
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	196.01	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	1.8		α_c	2.4		
V _n max (per 18.10.4.1)	1233	kips				
V _n max (per 18.10.4.4)	1568	kips	(Conservativley assumes limit of 8 f _c)			
V _c	314	kips				
V _s	978	kips				
V _n	1233					
ϕV_n	925		54%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW2.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Herb Taharabone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	19.25	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	2772	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	16	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.185	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.0082	
				ρ_t	0.0046	
P_u	260	kips				
M_u	12594	k-ft				
V_u	501	kips				
Critical Section	6.28	ft				
Two Curtains Minimum Required						
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	1.71					
$\delta_{ex} =$	0.524339	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	2.621694	in		$C_d \delta_{ex} / l$		
C_{max}	29.99	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	38.76882					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.77					
<1.0--Boundary Elements NOT Required						

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet no	48 of 130
	location	Dana Point, CA		date			
	client	SMS Architects		job no.			
		Bldg 8 - EW2.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025	
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL	
Wall Length	19.25	ft					
Footing Length	29.25	ft					
Wall Height	33	ft					
Wall Thickness	12	in.					
P_a	138	kips					
M_a	12594	k-ft					
V_a	501	kips					
Allowable Bearing, q_{ALL}	5000	psf					
Determine Width:							
Minimum Width	14.31	ft					
Use:	14.40	ft					
P_u	146.47	kips					
$q_{u\ max}$	6.48	ksf					
$q_{u\ min}$	-5.79	ksf					
Inflection Point, X	13.80	ft	$P_{ot\ soil}$	39.91	k		
			P_a	138	k	OK	
Shear & Flexure:							
f'_c	5000	psi	F_y	60	ksi		
b	12.00						
d	42.65	in					
Use h_{min}	48.00	in					
V_u	17.50	k/ft					
ϕV_c	44.80	k/ft	OK				
M_u	145.5	k-ft/ft					
$A_{s\ min}$	0.82	in ² /ft					
Reinforcement							
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft	OK
Longitudinal	# 5		14		$A_{s\ min}$	1.04 in ² /ft	
					$A_{s\ total}$	15.0	OK
a	1.04	in					
c	1.22	in					
ϵ_s	0.105	>	0.005	ϕ	0.9		
ϕMn	2066.3	k-ft/ft	OK				

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



2. Section

2.1. Section Figure

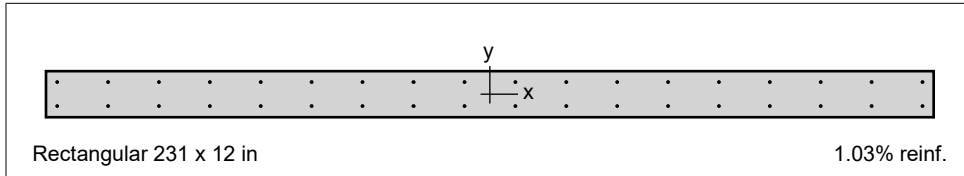


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	36 #8
Total steel area, A_s	28.44 in ²
Rho	1.03 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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 BUILDING OFFICIAL

4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	206.10	0.00	0.00	0.00	0.00
1	Live	54.30	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	41.70	0.00	0.00	0.00	12594.10
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	288.54	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
2	1 U1 Bot	288.54	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
3	1 U2 Top	334.20	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
4	1 U2 Bot	334.20	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
5	1 U3 Top	301.62	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
6	1 U3 Bot	301.62	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
7	1 U4 Top	247.32	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
8	1 U4 Bot	247.32	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
9	1 U5 Top	301.62	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
10	1 U5 Bot	301.62	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
11	1 U6 Top	185.49	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
12	1 U6 Bot	185.49	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
13	1 U7 Top	247.32	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
14	1 U7 Bot	247.32	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
15	1 U8 Top	301.62	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
16	1 U8 Bot	301.62	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
17	1 U9 Top	185.49	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
18	1 U9 Bot	185.49	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
19	1 U10 Top	343.32	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
20	1 U10 Bot	343.32	-12594.10	24.15	-13273.52	30.74	0.01926	0.900	0.95
21	1 U11 Top	227.19	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
22	1 U11 Bot	227.19	-12594.10	0.00	-13097.76	30.24	0.01963	0.900	0.96
23	1 U12 Top	259.92	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
24	1 U12 Bot	259.92	12594.10	5.28	13136.17	30.35	0.01955	0.900	0.96
25	1 U13 Top	143.79	0.00	177.31	14388.09	33.88	0.01720	0.900	0.47
26	1 U13 Bot	143.79	12594.10	0.00	13097.77	30.24	0.01963	0.900	0.97

6. Diagrams

6.1. PM at $\theta=0$ [deg]

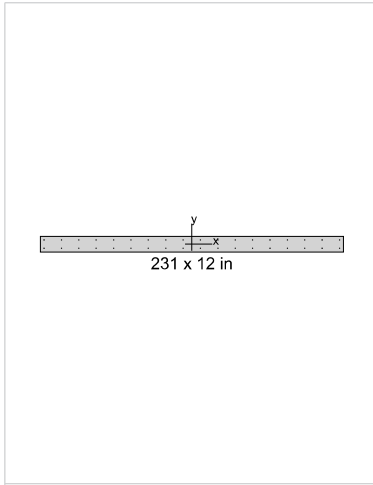
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 8
Column	EW1.2
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

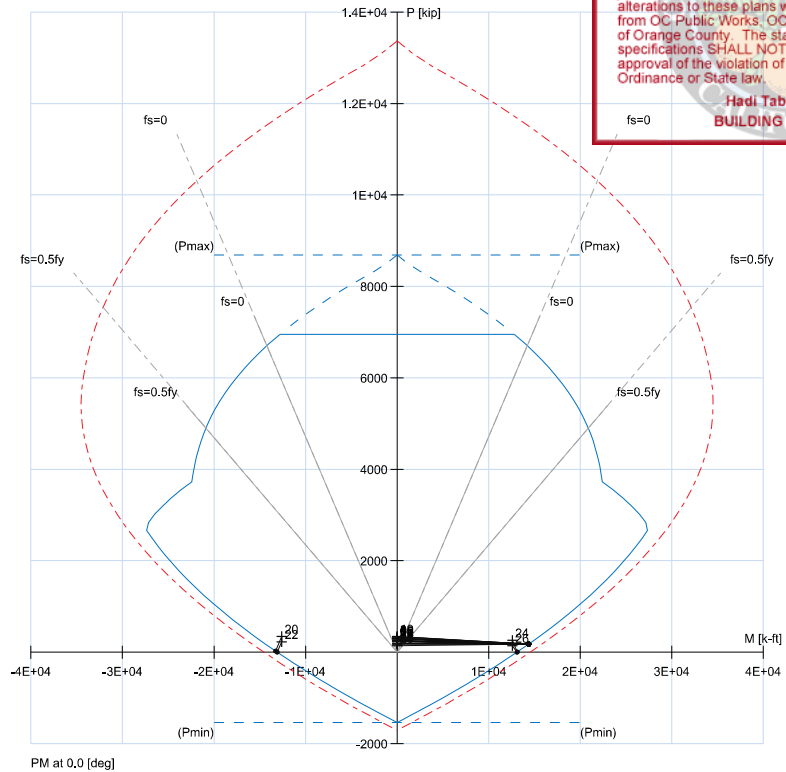
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	231 in
Depth	12 in
A_g	2772 in ²
I_x	33264 in ⁴
I_y	1.23264e+007 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	36 #8
Confinement type	Tied
Total steel area, A_s	28.44 in ²
Rho	1.03 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	143.8	12594.1	0.00	13097.77	0.97
22	1 U11 Bot	227.2	-12594.1	0.00	-13097.76	0.96
24	1 U12 Bot	259.9	12594.1	5.28	13136.17	0.96
20	1 U10 Bot	343.3	-12594.1	24.15	-13273.52	0.95
1	1 U1 Top	288.5	0.0	177.31	14388.09	0.47
2	1 U1 Bot	288.5	0.0	177.31	14388.09	0.47
3	1 U2 Top	334.2	0.0	177.31	14388.09	0.47
4	1 U2 Bot	334.2	0.0	177.31	14388.09	0.47
5	1 U3 Top	301.6	0.0	177.31	14388.09	0.47
6	1 U3 Bot	301.6	0.0	177.31	14388.09	0.47
7	1 U4 Top	247.3	0.0	177.31	14388.09	0.47
8	1 U4 Bot	247.3	0.0	177.31	14388.09	0.47
9	1 U5 Top	301.6	0.0	177.31	14388.09	0.47
10	1 U5 Bot	301.6	0.0	177.31	14388.09	0.47
11	1 U6 Top	185.5	0.0	177.31	14388.09	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.97

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW3.1		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	14.5	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2088	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@	6	oc	OK	
Horizontal	# 6	@	16	oc	OK	
Number of Curtains	2					
				As (longit)	3.16 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.0219	
				ρ_t	0.0046	
P _u	242	kips				
M _u	6216	k-ft				
V _u	251	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	147.64	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.3		α_c	2		
V _n max (per 18.10.4.1)	869	kips				
V _n max (per 18.10.4.4)	1181	kips	(Conservativley assumes limit of 8 f _c)			
V _c	236	kips				
V _s	555	kips				
V _n	791					
ϕV_n	593	42%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	Sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW3.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Herb Taharabone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	14.5	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	2088	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	16	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.185	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.0082	
				ρ_t	0.0046	
P_u	242	kips				
M_u	6216	k-ft				
V_u	251	kips				
Critical Section	6.18	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.28					
$\delta_{ex} =$	0.561154	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	2.805768	in		$C_d \delta_{ex} / l$		
C_{max}	19.95	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	27.28665					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.73					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #39
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW3.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	14.5	ft				
Footing Length	24.5	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	259	kips				
M_a	6216	k-ft				
V_a	251	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	11.19	ft				
Use:	11.20	ft				
P_u	272.17	kips				
$q_{u \max}$	6.54	ksf				
$q_{u \min}$	-4.56	ksf				
Inflection Point, X	10.06	ft	$P_{ot \ soil}$	22.92	k	
			P_a	259	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	32.76	in				
Use h_{min}	38.00	in				
V_u	12.64	k/ft				
ϕV_c	34.62	k/ft				OK
M_u	85.0	k-ft/ft				
$A_{s \ min}$	0.62	in ² /ft				
Reinforcement						
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft OK
Longitudinal	# 5		12		$A_{s \ min}$	0.82 in ² /ft
					$A_{s \ total}$	10.0 OK
a	1.04	in				
c	1.22	in				
ϵ_s	0.081	>	0.005	ϕ	0.9	
ϕM_n	1591.1	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



2. Section

2.1. Section Figure

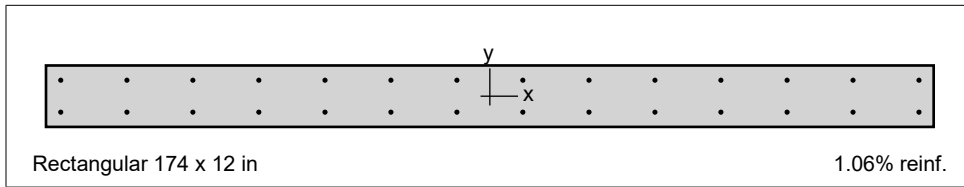


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.06 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 1/16/2025
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510
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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	185.50	0.00	0.00	0.00	0.00
1	Live	56.10	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	37.50	0.00	0.00	0.00	6216.20
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	259.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
2	1 U1 Bot	259.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
3	1 U2 Top	312.36	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
4	1 U2 Bot	312.36	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
5	1 U3 Top	278.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
6	1 U3 Bot	278.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
7	1 U4 Top	222.60	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
8	1 U4 Bot	222.60	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
9	1 U5 Top	278.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
10	1 U5 Bot	278.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
11	1 U6 Top	166.95	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
12	1 U6 Bot	166.95	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
13	1 U7 Top	222.60	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
14	1 U7 Bot	222.60	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
15	1 U8 Top	278.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
16	1 U8 Bot	278.70	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
17	1 U9 Top	166.95	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
18	1 U9 Bot	166.95	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
19	1 U10 Top	316.20	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
20	1 U10 Bot	316.20	-6216.20	0.00	-7665.94	23.28	0.01905	0.900	0.89
21	1 U11 Top	204.45	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
22	1 U11 Bot	204.45	-6216.20	0.00	-7665.94	23.28	0.01905	0.900	0.90
23	1 U12 Top	241.20	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
24	1 U12 Bot	241.20	6216.20	0.00	7665.94	23.28	0.01905	0.900	0.90
25	1 U13 Top	129.45	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
26	1 U13 Bot	129.45	6216.20	0.00	7665.94	23.28	0.01905	0.900	0.90

6. Diagrams

6.1. PM at $\theta=0$ [deg]

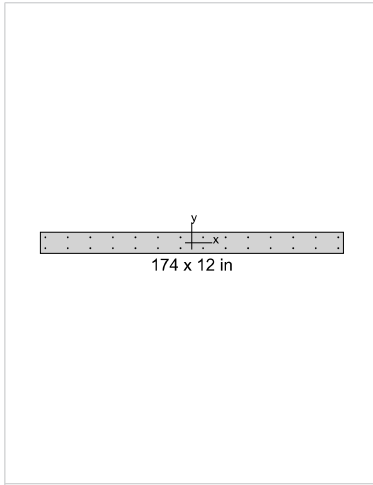
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 8
Column	EW2.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

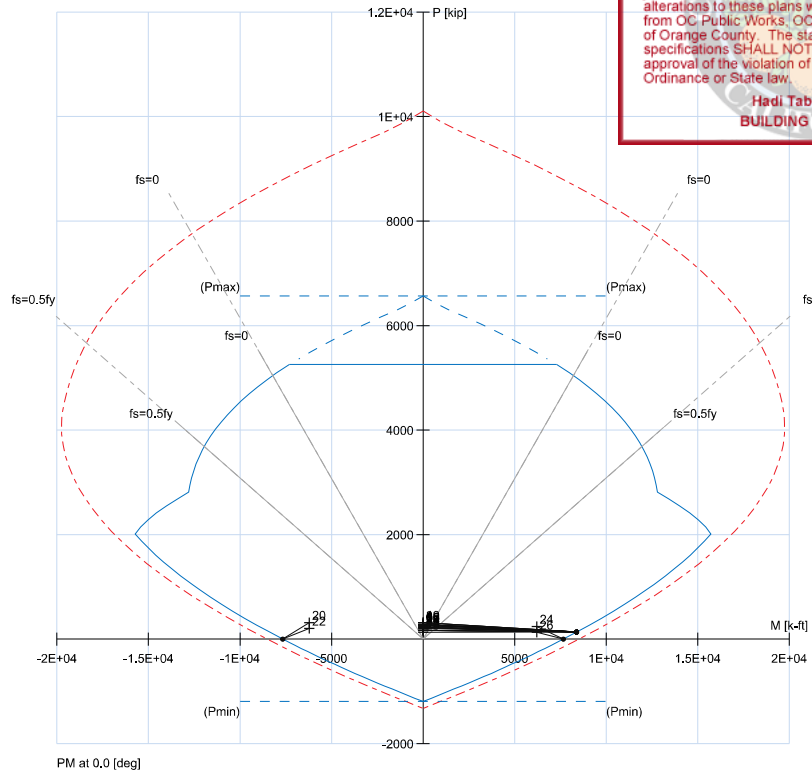
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	174 in
Depth	12 in
A_g	2088 in ²
I_x	25056 in ⁴
I_y	5.26802e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.06 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
22	1 U11 Bot	204.4	-6216.2	0.00	-7665.94	0.90
24	1 U12 Bot	241.2	6216.2	0.00	7665.94	0.90
26	1 U13 Bot	129.4	6216.2	0.00	7665.94	0.90
20	1 U10 Bot	316.2	-6216.2	0.00	-7665.94	0.89
1	1 U1 Top	259.7	0.0	134.07	8389.66	0.47
2	1 U1 Bot	259.7	0.0	134.07	8389.66	0.47
3	1 U2 Top	312.4	0.0	134.07	8389.66	0.47
4	1 U2 Bot	312.4	0.0	134.07	8389.66	0.47
5	1 U3 Top	278.7	0.0	134.07	8389.66	0.47
6	1 U3 Bot	278.7	0.0	134.07	8389.66	0.47
7	1 U4 Top	222.6	0.0	134.07	8389.66	0.47
8	1 U4 Bot	222.6	0.0	134.07	8389.66	0.47
9	1 U5 Top	278.7	0.0	134.07	8389.66	0.47
10	1 U5 Bot	278.7	0.0	134.07	8389.66	0.47
11	1 U6 Top	166.9	0.0	134.07	8389.66	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.90

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	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW5.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	21.25	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	3060	in2	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 16	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.185 in2/ft	
				As (transv)	0.66 in2/ft	
				ρ_l	0.0082	
				ρ_t	0.0046	
P _u	242	kips				
M _u	14069	k-ft				
V _u	570	kips				
			Two Curtains Minimum Required			
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	216.37	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in2/ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in2/ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	1.6		α_c	2.8		
V _n max (per 18.10.4.1)	1447	kips				
V _n max (per 18.10.4.4)	1731	kips	(Conservativley assumes limit of 8 f _c)			
V _c	346	kips				
V _s	1192	kips				
V _n	1447					
ϕV_n	1086	52%	OK			

 <p>18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082</p>	project	DPH - Phase 4A		by	JS	Sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW5.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						<p>Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,</p> <p>County of Orange - OC Public Works OC Development Services APPROVED</p> <p>Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.</p> <p>Heri Taharjone BUILDING OFFICIAL</p>
Input (per Shear Analysis)						
Wall Length	21.25 ft	λ	1.00	(Per ACI section 8.6.1)		
Wall Height	33 ft	A_{cv}	3060 in ²			
Thickness	12 in.	ϕ	0.75			
f_c	5000 psi					
f_y	60000 psi					
Reinforcement						
Vertical	# 8 @ 16 oc		OK			
Horizontal	# 6 @ 16 oc		OK			
Number of Curtains	2					
				As (longit)	1.185 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.0082	
				ρ_t	0.0046	
P_u	242 kips					
M_u	14069 k-ft					
V_u	570 kips					
Critical Section	6.17 ft			Two Curtains Minimum Required		
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	1.55					
$\delta_{ex} =$	0.462577 in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$			
$\delta_{x,u} =$	2.312887 in		$C_d \delta_{ex} / l$			
C_{max}	31.17 in		(From SP Column Output)			
$l_w / (600(\delta_u / h_w))$	48.5108					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.64			<1.0--Boundary Elements NOT Required		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 8 - EW5.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	21.25	ft				
Footing Length	31.25	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	143	kips				
M_a	14069	k-ft				
V_a	570	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	14.00	ft				
Use:	14.10	ft				
P_u	154.41	kips				
$q_{u\ max}$	6.48	ksf				
$q_{u\ min}$	-5.78	ksf				
Inflection Point, X	14.73	ft	$P_{ot\ soil}$	42.57	k	
			P_a	143	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	41.69	in				
Use h_{min}	46.00	in				
V_u	17.61	k/ft				
ϕV_c	42.77	k/ft				OK
M_u	139.0	k-ft/ft				
$A_{s\ min}$	0.82	in ² /ft				
Reinforcement						
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft OK
Longitudinal	# 5		12		$A_{s\ min}$	0.99 in ² /ft
					$A_{s\ total}$	15.0 OK
a	1.04	in				
c	1.22	in				
ϵ_s	0.100	>	0.005	ϕ	0.9	
ϕM_n	1971.2	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

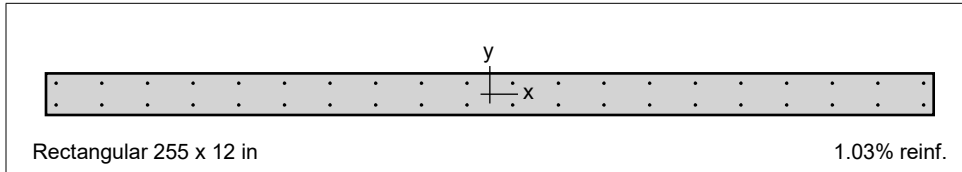


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	40 #8
Total steel area, A_s	31.60 in ²
Rho	1.03 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	176.00	0.00	0.00	0.00	0.00
1	Live	66.00	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	35.60	0.00	0.00	0.00	14068.80
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	246.40	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
2	1 U1 Bot	246.40	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
3	1 U2 Top	316.80	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
4	1 U2 Bot	316.80	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
5	1 U3 Top	277.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
6	1 U3 Bot	277.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
7	1 U4 Top	211.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
8	1 U4 Bot	211.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
9	1 U5 Top	277.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
10	1 U5 Bot	277.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
11	1 U6 Top	158.40	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
12	1 U6 Bot	158.40	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
13	1 U7 Top	211.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
14	1 U7 Bot	211.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
15	1 U8 Top	277.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
16	1 U8 Bot	277.20	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
17	1 U9 Top	158.40	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
18	1 U9 Bot	158.40	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
19	1 U10 Top	312.80	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
20	1 U10 Bot	312.80	-14068.80	0.00	-16048.96	33.66	0.01947	0.900	0.93
21	1 U11 Top	194.00	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
22	1 U11 Bot	194.00	-14068.80	0.00	-16048.96	33.66	0.01947	0.900	0.94
23	1 U12 Top	241.60	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
24	1 U12 Bot	241.60	14068.80	0.00	16048.96	33.66	0.01947	0.900	0.93
25	1 U13 Top	122.80	0.00	195.88	17603.89	37.65	0.01709	0.900	0.47
26	1 U13 Bot	122.80	14068.80	0.00	16048.96	33.66	0.01947	0.900	0.94

6. Diagrams

6.1. PM at $\theta=0$ [deg]

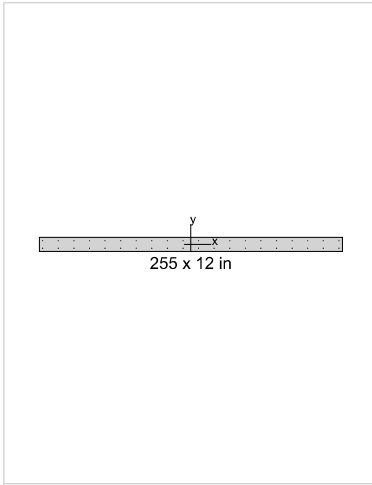
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 8
Column	EW5.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

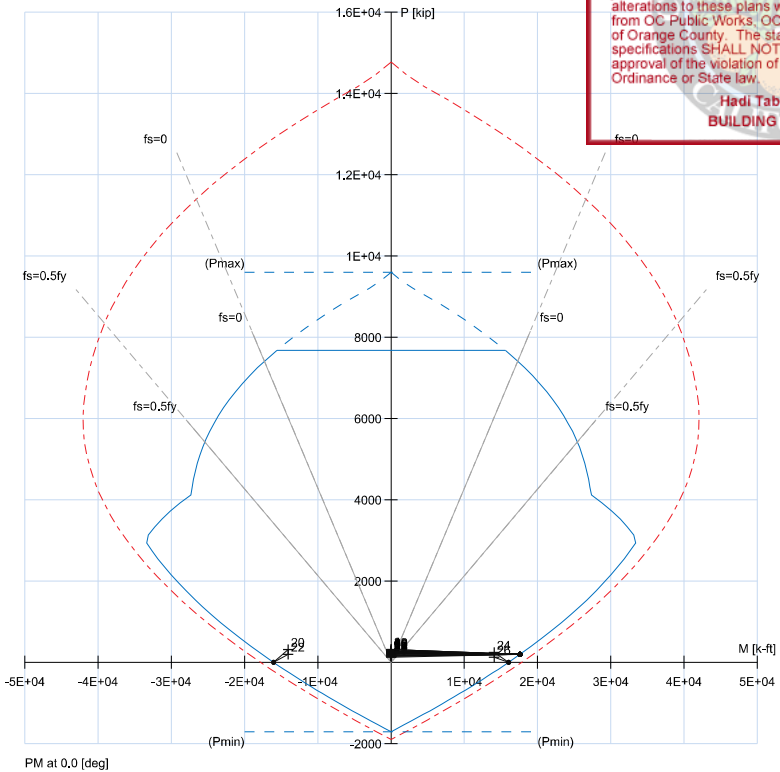
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	255 in
Depth	12 in
A_g	3060 in ²
I_x	36720 in ⁴
I_y	1.65814e+007 in ⁴

Reinforcement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	40 #8
Confinement type	Tied
Total steel area, A_s	31.60 in ²
Rho	1.03 %
Min. clear spacing	5.25 in



No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
22	1 U11 Bot	194.0	-14068.8	0.00	-16048.96	0.94
26	1 U13 Bot	122.8	14068.8	0.00	16048.96	0.94
20	1 U10 Bot	312.8	-14068.8	0.00	-16048.96	0.93
24	1 U12 Bot	241.6	14068.8	0.00	16048.96	0.93
1	1 U1 Top	246.4	0.0	195.88	17603.89	0.47
2	1 U1 Bot	246.4	0.0	195.88	17603.89	0.47
3	1 U2 Top	316.8	0.0	195.88	17603.89	0.47
4	1 U2 Bot	316.8	0.0	195.88	17603.89	0.47
5	1 U3 Top	277.2	0.0	195.88	17603.89	0.47
6	1 U3 Bot	277.2	0.0	195.88	17603.89	0.47
7	1 U4 Top	211.2	0.0	195.88	17603.89	0.47
8	1 U4 Bot	211.2	0.0	195.88	17603.89	0.47
9	1 U5 Top	277.2	0.0	195.88	17603.89	0.47
10	1 U5 Bot	277.2	0.0	195.88	17603.89	0.47
11	1 U6 Top	158.4	0.0	195.88	17603.89	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.94



18400 Von Karman Ave., Suite 600
Irvine, CA 92612
(949) 252-1022 Fax (949) 252-8082

project	DPH - Building 8	by	JS	sheet no.	64 of 170
location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
		Building&Safety: OCPWAzarvandB			1/16/2025

Seismic Weight

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Wall	Width (ft)	Depth (in)	Reinforcing		Mark	
			Longitudinal	Transverse		
NS1.1	12.2	40	(12) #5 T&B	#6 @ 6" OC	2	8' extra per side
NS2.1	13.7	46	(14) #5 T&B	#6 @ 6" OC	2	8' extra per side
EW2.1	9.5	32	(4) #5 T&B	#6 @ 8" OC	1	
EW2.2	14.4	48	(14) #5 T&B	#6 @ 6" OC	3	
EW3.1	11.2	38	(12) #5 T&B	#6 @ 6" OC	2	
EW5.1	14.1	46	(12) #5 T&B	#6 @ 6" OC	3	8' extra per side



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Irvine, CA 92612
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project	DPH - Building 9	by	LW	sheet no.	65 of 170
location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
		Building&Safety: OCPW	AzarvandB		1/16/2025

Shear Walls

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

Roof

$$V = 479.81$$

Wall	Length	Height	t	h/l	l/t	Shear	AcvF'c	rho
NS3.1	15.5	33	12	2.13	15.5	165.6	157.8262	184.1
NS4.1	14	33	12	2.36	14	72.0	142.5527	166.3
NS4.2	32.66	33	12	1.01	32.66	168.0	332.5551	388.0
NS5.1	13.75	33	12	2.40	13.75	34.6	140.0071	163.4
NS5.2	14.42	33	12	2.29	14.42	42.8	146.8293	171.3
EW1.3	14.83	33	12	2.23	14.83	84.0	151.0041	176.2
EW1.4	11.5	33	12	2.87	11.5	64.8	117.0969	136.6
EW1.5	16.25	33	12	2.03	16.25	91.1	165.463	193.1
EW4.1	15	33	12	2.20	15	127.2	152.7351	178.2
EW4.2	6.5	33	12	5.08	6.5	55.2	66.18519	77.2
EW4.3	6.66	33	12	4.95	6.66	57.5	67.81437	79.1


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2nd Floor

Wall	Length	Height	Shear (RA)	Total Shear	KLF	Mu	Pu(DL)	Pu(LL)	Ev	Notes
NS3.1	14.5	33	107.2	165.6	272.8	18.8	7287.2	93.7	13.1	19.0
NS4.1	14	33	83.2	72.0	155.2	11.1	3790.4	91.4	9.9	18.5
NS4.2	32.66	33	422.9	168.0	590.9	18.1	12733.3	218.7	26.7	44.3
NS5.1	13.75	33	77.7	34.6	112.3	8.2	2462.7	87.8	10.5	17.8
NS5.2	14.33	33	85.5	42.8	128.3	9.0	2865.9	92.3	10.7	18.7
EW1.1	14.83	33	141.9	84.0	225.9	15.2	5184.3	138.8	38.9	28.1
EW1.2	11.5	33	77.4	64.8	142.2	12.4	3454.2	120.8	31.1	24.4
EW1.3	15	33	145.6	91.1	236.7	15.8	5481.5	125.3	29.1	25.4
EW4.1	15	33	140.7	127.2	267.9	17.9	6589.5	127.7	33.8	25.8
EW4.2	6.5	33	16.3	55.2	71.5	11.0	2098.7	44.9	6.7	9.1 Boundary Element Required
EW4.3	5.25	33	8.9	57.5	66.4	12.6	2048.8	46.1	6.9	9.3 Boundary Element Required

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	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS3.1		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	14.5	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2088	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
			As (longit)	1.58	in ² /ft	
			As (transv)	0.66	in ² /ft	
			ρ_l	0.011		
			ρ_t	0.0046		
P _u	107	kips				
M _u	7287	k-ft				
V _u	273	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	147.64	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025	Asmin (longit)	0.36	in ² /ft	OK	
Min ρ_t	.0025	Asmin (transv)	0.36	in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.3		ac	2		
V _n max (per 18.10.4.1)	869	kips				
V _n max (per 18.10.4.4)	1181	kips	(Conservativley assumes limit of 8 f _c)			
V _c	236	kips				
V _s	555	kips				
V _n	791					
ϕV_n	593	46%	OK			

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	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS3.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Herb Tahara BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	14.5	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	2088	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	106.8	kips				
M_u	7287.2	k-ft				
V_u	272.8	kips				
Critical Section	6.68	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.28					
$\delta_{ex} =$	0.608921	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	3.044604	in		$C_d \delta_{ex} / l$		
C_{max}	23.28	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	25.14613					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.93					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS3.1		Building&Safety: OCPWAzayvandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.  Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	14.5	ft				
Footing Length	24.5	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	131	kips				
M_a	7287	k-ft				
V_a	273	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	12.03	ft				
Use:	12.10	ft				
P_u	144.87	kips				
$q_{u \max}$	6.51	ksf				
$q_{u \min}$	-5.53	ksf				
Inflection Point, X	11.26	ft	$P_{ot \ soil}$	31.13	k	
			P_a	131	k	OK
Shear & Flexure:						
f'_c	5000	psi		F_y	60	ksi
b	12.00					
d	35.48	in				
Use h_{min}	40.00	in				
V_u	14.43	k/ft				
ϕV_c	36.66	k/ft				OK
M_u	100.2	k-ft/ft				
$A_{s \ min}$	0.69	in ² /ft				
Reinforcement						
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft OK
Longitudinal	# 5		12		$A_{s \ min}$	0.86 in ² /ft
					$A_{s \ total}$	11.0 OK
a	1.04	in				
c	1.22	in				
ϵ_s	0.086	>	0.005	ϕ	0.9	
ϕM_n	1686.1	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

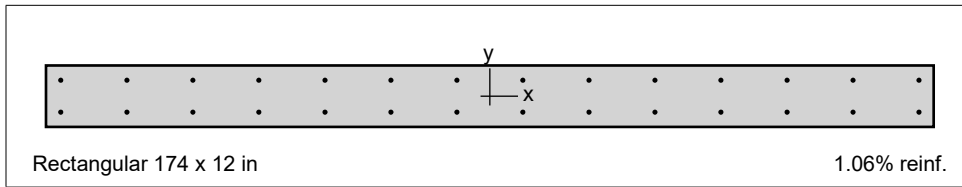


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.06 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load	Mx @ Top	Mx @ Bottom	My @ Top	My @ Bottom
		kip	k-ft	k-ft	k-ft	k-ft
1	Dead	93.70	0.00	0.00	0.00	0.00
1	Live	13.10	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	19.00	0.00	0.00	0.00	7287.20
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u	M _{uy}	φP _n	φM _{ny}	NA Depth	ε _t	φ	
		kip	k-ft	kip	k-ft	in			
1	1 U1 Top	131.18	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
2	1 U1 Bot	131.18	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
3	1 U2 Top	133.40	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
4	1 U2 Bot	133.40	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
5	1 U3 Top	125.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
6	1 U3 Bot	125.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
7	1 U4 Top	112.44	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
8	1 U4 Bot	112.44	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
9	1 U5 Top	125.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
10	1 U5 Bot	125.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
11	1 U6 Top	84.33	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
12	1 U6 Bot	84.33	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
13	1 U7 Top	112.44	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
14	1 U7 Bot	112.44	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
15	1 U8 Top	125.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
16	1 U8 Bot	125.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
17	1 U9 Top	84.33	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
18	1 U9 Bot	84.33	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
19	1 U10 Top	144.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
20	1 U10 Bot	144.54	-7287.20	0.00	-7665.94	23.28	0.01905	0.900	0.96
21	1 U11 Top	103.33	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
22	1 U11 Bot	103.33	-7287.20	0.00	-7665.94	23.28	0.01905	0.900	0.97
23	1 U12 Top	106.54	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
24	1 U12 Bot	106.54	7287.20	0.00	7665.94	23.28	0.01905	0.900	0.97
25	1 U13 Top	65.33	0.00	134.07	8389.66	25.98	0.01676	0.900	0.47
26	1 U13 Bot	65.33	7287.20	0.00	7665.94	23.28	0.01905	0.900	0.97

6. Diagrams

6.1. PM at $\theta=0$ [deg]

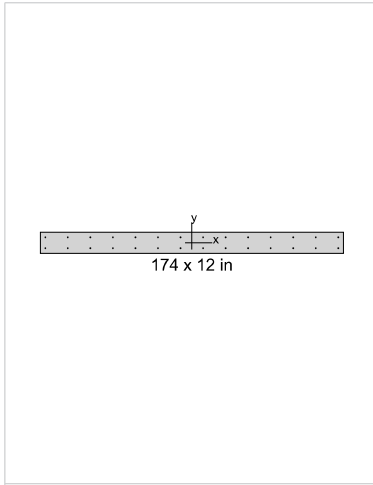
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 9
Column	NS3.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

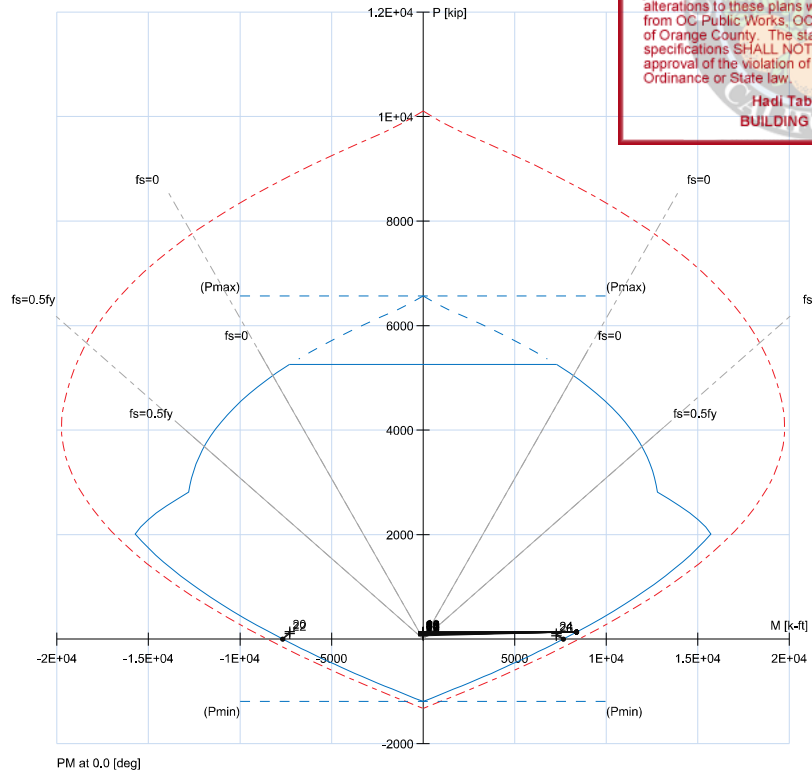
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	174 in
Depth	12 in
A_g	2088 in ²
I_x	25056 in ⁴
I_y	5.26802e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.06 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
22	1 U11 Bot	103.3	-7287.2	0.00	-7665.94	0.97
24	1 U12 Bot	106.5	7287.2	0.00	7665.94	0.97
26	1 U13 Bot	65.3	7287.2	0.00	7665.94	0.97
20	1 U10 Bot	144.5	-7287.2	0.00	-7665.94	0.96
1	1 U1 Top	131.2	0.0	134.07	8389.66	0.47
2	1 U1 Bot	131.2	0.0	134.07	8389.66	0.47
3	1 U2 Top	133.4	0.0	134.07	8389.66	0.47
4	1 U2 Bot	133.4	0.0	134.07	8389.66	0.47
5	1 U3 Top	125.5	0.0	134.07	8389.66	0.47
6	1 U3 Bot	125.5	0.0	134.07	8389.66	0.47
7	1 U4 Top	112.4	0.0	134.07	8389.66	0.47
8	1 U4 Bot	112.4	0.0	134.07	8389.66	0.47
9	1 U5 Top	125.5	0.0	134.07	8389.66	0.47
10	1 U5 Bot	125.5	0.0	134.07	8389.66	0.47
11	1 U6 Top	84.3	0.0	134.07	8389.66	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.97

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS4.1		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	14	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2016	in2	
Thickness	12	in.	ϕ	0.75		
f'c	5000	psi				
fy	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
			As (longit)	1.58	in2/ft	
			As (transv)	0.66	in2/ft	
			ρ_l	0.011		
			ρ_t	0.0046		
Pu	101	kips				
Mu	3790	k-ft				
Vu	155	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f'c}$	142.55	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025	Asmin (longit)	0.36	in2/ft	OK	
Min ρ_t	.0025	Asmin (transv)	0.36	in2/ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.4		ac	2		
Vn max (per 18.10.4.1)	840	kips				
Vn max (per 18.10.4.4)	1140	kips	(Conservativley assumes limit of 8 f'c)			
Vc	228	kips				
Vs	517	kips				
Vn	746					
ϕVn	559	28%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS4.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED (Per ACI section 8.6.1) Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	14	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	2016		
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	101	kips				
M_u	3790.4	k-ft				
V_u	155.2	kips				
Critical Section	6.11	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.36					
$\delta_{ex} =$	0.381583	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	1.907914	in		$C_d \delta_{ex} / l$		
C_{max}	11.20	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	38.74387					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.29					
						<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS4.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	14	ft				
Footing Length	24	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	120	kips				
M_a	3790	k-ft				
V_a	155	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	6.84	ft				
Use:	6.90	ft				
P_u	133.13	kips				
$q_{u \max}$	6.53	ksf				
$q_{u \min}$	-4.92	ksf				
Inflection Point, X	10.31	ft	$P_{ot \ soil}$	25.36	k	
			P_a	120	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	18.91	in				
Use h_{min}	24.00	in				
V_u	6.20	k/ft				
ϕV_c	20.36	k/ft				OK
M_u	28.4	k-ft/ft				
$A_{s \ min}$	0.35	in ² /ft				
Reinforcement						
Transverse	# 6	@	12	OC	A_s	0.44 in ² /ft OK
Longitudinal	# 5		4		$A_{s \ min}$	0.52 in ² /ft
					$A_{s \ total}$	4.0 OK
a	0.52	in				
c	0.61	in				
ϵ_s	0.096	>	0.005	ϕ	0.9	
ϕM_n	469.1	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_c	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

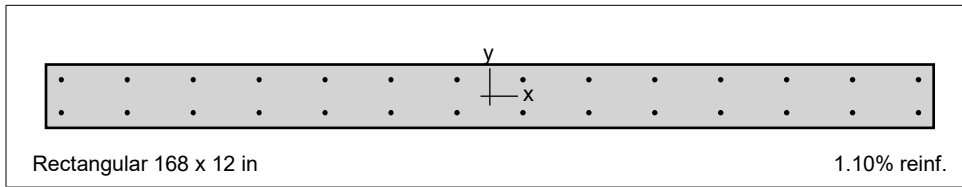


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.10 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

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Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand B 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	91.40	0.00	0.00	0.00	0.00
1	Live	9.90	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	18.50	0.00	0.00	0.00	3790.40
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	127.96	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
2	1 U1 Bot	127.96	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
3	1 U2 Top	125.52	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
4	1 U2 Bot	125.52	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
5	1 U3 Top	119.58	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
6	1 U3 Bot	119.58	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
7	1 U4 Top	109.68	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
8	1 U4 Bot	109.68	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
9	1 U5 Top	119.58	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
10	1 U5 Bot	119.58	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
11	1 U6 Top	82.26	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
12	1 U6 Bot	82.26	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
13	1 U7 Top	109.68	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
14	1 U7 Bot	109.68	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
15	1 U8 Top	119.58	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
16	1 U8 Bot	119.58	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
17	1 U9 Top	82.26	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
18	1 U9 Bot	82.26	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
19	1 U10 Top	138.08	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
20	1 U10 Bot	138.08	-3790.40	0.00	-7373.66	23.12	0.01843	0.900	0.76
21	1 U11 Top	100.76	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
22	1 U11 Bot	100.76	-3790.40	0.00	-7373.66	23.12	0.01843	0.900	0.76
23	1 U12 Top	101.08	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
24	1 U12 Bot	101.08	3790.40	0.00	7373.66	23.12	0.01843	0.900	0.76
25	1 U13 Top	63.76	0.00	130.02	8039.83	25.65	0.01632	0.900	0.46
26	1 U13 Bot	63.76	3790.40	0.00	7373.66	23.12	0.01843	0.900	0.76

6. Diagrams

6.1. PM at $\theta=0$ [deg]

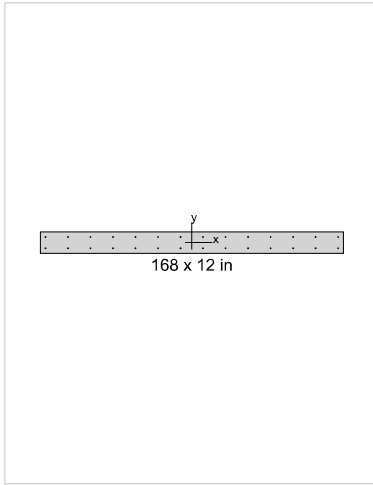
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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 BUILDING OFFICIAL



General Information

Project	DPH - Bldg 9
Column	NS4.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

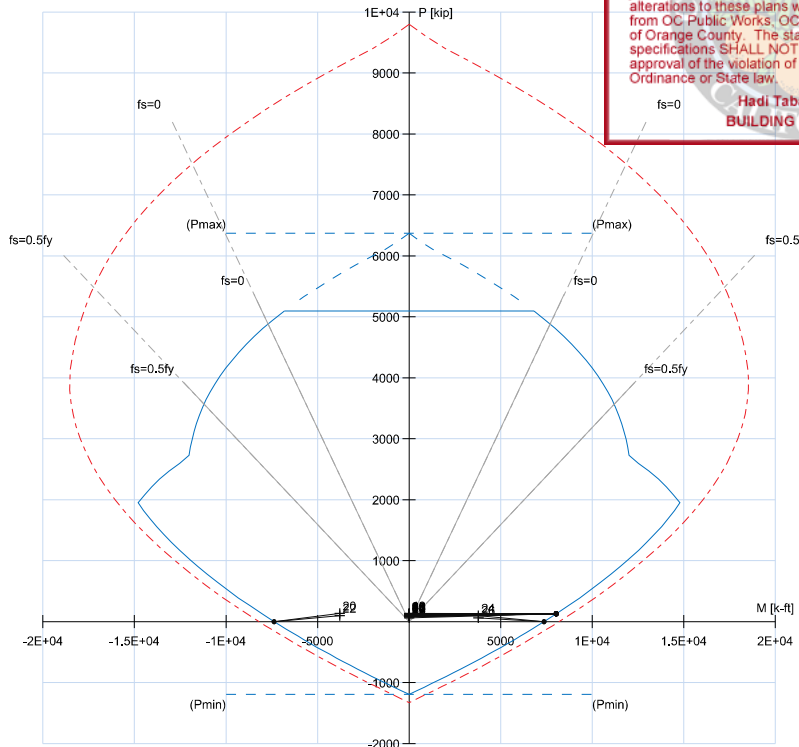
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	168 in
Depth	12 in
A_g	2016 in ²
I_x	24192 in ⁴
I_y	4.74163e+006 in ⁴

Reinforcement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.10 %
Min. clear spacing	5.25 in





PM at 0.0 [deg]


No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
20	1 U10 Bot	138.1	-3790.4	0.00	-7373.66	0.76
22	1 U11 Bot	100.8	-3790.4	0.00	-7373.66	0.76
24	1 U12 Bot	101.1	3790.4	0.00	7373.66	0.76
26	1 U13 Bot	63.8	3790.4	0.00	7373.66	0.76
1	1 U1 Top	128.0	0.0	130.02	8039.83	0.46
2	1 U1 Bot	128.0	0.0	130.02	8039.83	0.46
3	1 U2 Top	125.5	0.0	130.02	8039.83	0.46
4	1 U2 Bot	125.5	0.0	130.02	8039.83	0.46
5	1 U3 Top	119.6	0.0	130.02	8039.83	0.46
6	1 U3 Bot	119.6	0.0	130.02	8039.83	0.46
7	1 U4 Top	109.7	0.0	130.02	8039.83	0.46
8	1 U4 Bot	109.7	0.0	130.02	8039.83	0.46
9	1 U5 Top	119.6	0.0	130.02	8039.83	0.46
10	1 U5 Bot	119.6	0.0	130.02	8039.83	0.46
11	1 U6 Top	82.3	0.0	130.02	8039.83	0.46

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.76

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS4.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	32.66	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	4703.04	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	245	kips				
M _u	12733	k-ft				
V _u	591	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	332.56	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Determine Shear Strength						
Limits:						
hw / lw	1.1		α_c	3		
V _n max (per 18.10.4.1)	2291	kips				
V _n max (per 18.10.4.4)	2660	kips	(Conservativley assumes limit of 8 f _c)			
V _c	532	kips				
V _s	2816	kips				
V _n	2291					
ϕV_n	1718		34%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS4.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Herb Taharabone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	32.66	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	4703.04	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	245.4	kips				
M_u	12733.3	k-ft				
V_u	590.9	kips				
Critical Section	5.39	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	1.01					
$\delta_{ex} =$	0.174889	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	0.874444	in		$C_d \delta_{ex} / l$		
C_{max}	53.74	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	197.2052					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.27					
<1.0--Boundary Elements NOT Required						

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS4.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	32.66	ft				
Footing Length	44.66	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	290	kips				
M_a	12733	k-ft				
V_a	591	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	6.89	ft				
Use:	6.90	ft				
P_u	320.09	kips				
$q_{u\ max}$	6.59	ksf				
$q_{u\ min}$	-4.51	ksf				
Inflection Point, X	18.15	ft	$P_{ot\ soil}$	40.96	k	
			P_a	290	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	19.09	in				
Use h_{min}	24.00	in				
V_u	6.26	k/ft				
ϕV_c	20.36	k/ft				OK
M_u	28.7	k-ft/ft				
$A_{s\ min}$	0.35	in ² /ft				
Reinforcement						
Transverse	# 6	@	9	OC	A_s	0.59 in ² /ft OK
Longitudinal	# 5		8		$A_{s\ min}$	0.52 in ² /ft
					$A_{s\ total}$	4.0 OK
a	0.69	in				
c	0.81	in				
ϵ_s	0.071	>	0.005	ϕ	0.9	
ϕM_n	622.7	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



2. Section

2.1. Section Figure

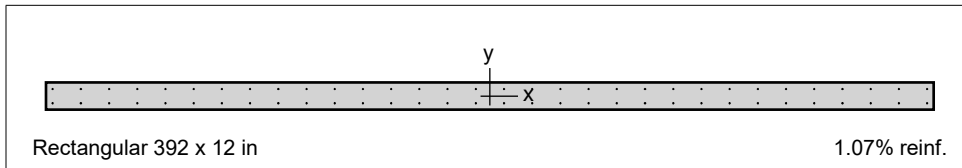


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	64 #8
Total steel area, A_s	50.56 in ²
Rho	1.07 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, 1/16/2025

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 BUILDING OFFICIAL

4.2. Service Loads

No.	Load Case	Axial Load	Mx @ Top	Mx @ Bottom	My @ Top	My @ Bottom
		kip	k-ft	k-ft	k-ft	k-ft
1	Dead	218.70	0.00	0.00	0.00	0.00
1	Live	26.70	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	44.30	0.00	0.00	0.00	12733.30
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u	M _{uy}	φP _n	φM _{ny}	NA Depth	ε _t	φ	
		kip	k-ft	kip	k-ft	in			
1	1 U1 Top	306.18	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
2	1 U1 Bot	306.18	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
3	1 U2 Top	305.16	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
4	1 U2 Bot	305.16	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
5	1 U3 Top	289.14	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
6	1 U3 Bot	289.14	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
7	1 U4 Top	262.44	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
8	1 U4 Bot	262.44	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
9	1 U5 Top	289.14	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
10	1 U5 Bot	289.14	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
11	1 U6 Top	196.83	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
12	1 U6 Bot	196.83	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
13	1 U7 Top	262.44	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
14	1 U7 Bot	262.44	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
15	1 U8 Top	289.14	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
16	1 U8 Bot	289.14	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
17	1 U9 Top	196.83	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
18	1 U9 Bot	196.83	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
19	1 U10 Top	333.44	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
20	1 U10 Bot	333.44	-12733.30	0.00	-39204.24	53.74	0.01872	0.900	0.67
21	1 U11 Top	241.13	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
22	1 U11 Bot	241.13	-12733.30	0.00	-39204.24	53.74	0.01872	0.900	0.67
23	1 U12 Top	244.84	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
24	1 U12 Bot	244.84	12733.30	0.00	39204.23	53.74	0.01872	0.900	0.67
25	1 U13 Top	152.53	0.00	302.59	42856.92	59.75	0.01654	0.900	0.46
26	1 U13 Bot	152.53	12733.30	0.00	39204.23	53.74	0.01872	0.900	0.67

6. Diagrams

6.1. PM at $\theta=0$ [deg]

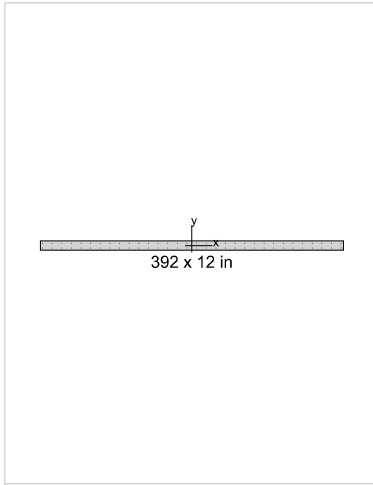
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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 BUILDING OFFICIAL



General Information

Project	DPH - Bldg 9
Column	NS4.2
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

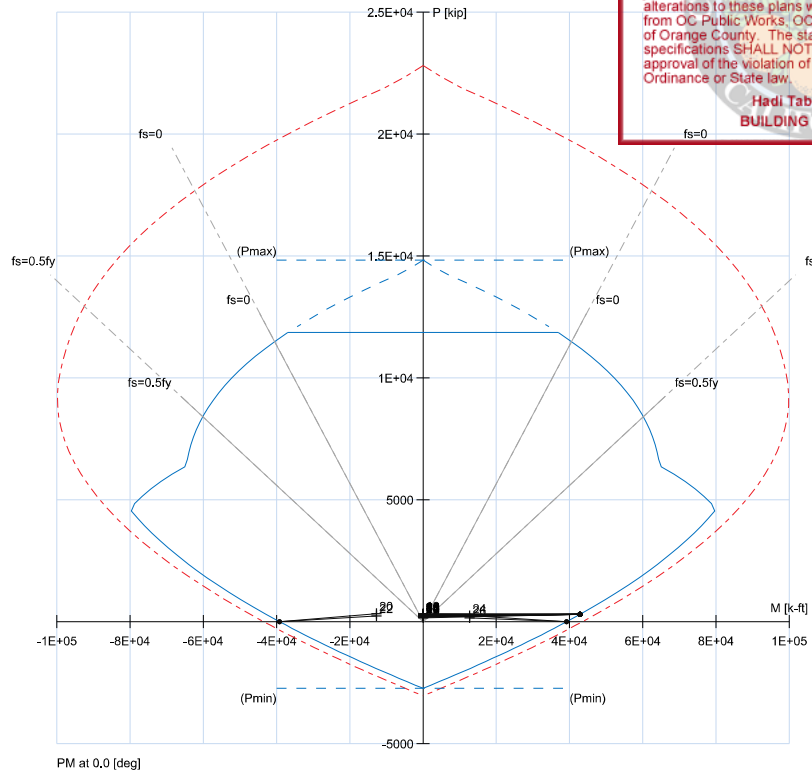
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	392 in
Depth	12 in
A_g	4704 in ²
I_x	56448 in ⁴
I_y	6.02363e+007 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	64 #8
Confinement type	Tied
Total steel area, A_s	50.56 in ²
Rho	1.07 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
20	1 U10 Bot	333.4	-12733.3	0.00	-39204.24	0.67
22	1 U11 Bot	241.1	-12733.3	0.00	-39204.24	0.67
24	1 U12 Bot	244.8	12733.3	0.00	39204.23	0.67
26	1 U13 Bot	152.5	12733.3	0.00	39204.23	0.67
1	1 U1 Top	306.2	0.0	302.59	42856.92	0.46
2	1 U1 Bot	306.2	0.0	302.59	42856.92	0.46
3	1 U2 Top	305.2	0.0	302.59	42856.92	0.46
4	1 U2 Bot	305.2	0.0	302.59	42856.92	0.46
5	1 U3 Top	289.1	0.0	302.59	42856.92	0.46
6	1 U3 Bot	289.1	0.0	302.59	42856.92	0.46
7	1 U4 Top	262.4	0.0	302.59	42856.92	0.46
8	1 U4 Bot	262.4	0.0	302.59	42856.92	0.46
9	1 U5 Top	289.1	0.0	302.59	42856.92	0.46
10	1 U5 Bot	289.1	0.0	302.59	42856.92	0.46
11	1 U6 Top	196.8	0.0	302.59	42856.92	0.46

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.67

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	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS5.1		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	13.75	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	1980	in2	
Thickness	12	in.	ϕ	0.75		
f'c	5000	psi				
fy	60000	psi				
Reinforcement						
Vertical	# 8	@	12	oc	OK	
Horizontal	# 6	@	16	oc	OK	
Number of Curtains	2					
				As (longit)	1.58 in2/ft	
				As (transv)	0.66 in2/ft	
				ρ_l	0.011	
				ρ_t	0.0046	
Pu	98	kips				
Mu	2463	k-ft				
Vu	112	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f'c}$	140.01	kips	-->Minimum Requirements of Section 14.3 Apply			
Min ρ_l	.0015		Asmin (longit)	0.216 in2/ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in2/ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.4		ac	2		
Vn max (per 18.10.4.1)	825	kips				
Vn max (per 18.10.4.4)	1120	kips	(Conservativley assumes limit of 8 f'c)			
Vc	224	kips				
Vs	499	kips				
Vn	723					
ϕVn	542	21%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	sheet #30
	location	Dana Point, CA	date		
	client	SMS Architects	job no.		
		Bldg 9 - NS5.1	Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>					
<p style="text-align: right;">Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,</p>					
<p style="text-align: right;">County of Orange - OC Public Works OC Development Services APPROVED</p> <p style="text-align: right; font-size: small;">Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.</p>					
Input (per Shear Analysis)					
Wall Length	13.75 ft		λ	1.00	(Per ACI section 8.6.1)
Wall Height	33 ft		A_{cv}	1980 in ²	
Thickness	12 in.		ϕ	0.75	
f_c	5000 psi				
f_y	60000 psi				
Reinforcement					
Vertical	# 8 @ 12	oc		OK	
Horizontal	# 6 @ 16	oc		OK	
Number of Curtains	2				
				A_s (longit)	1.58 in ² /ft
				A_s (transv)	0.66 in ² /ft
				ρ_l	0.011
				ρ_t	0.0046
P_u	98.3 kips				
M_u	2462.7 k-ft				
V_u	112.3 kips				
Critical Section	5.48 ft				
Boundary Element Check					
E_c	4031				
C_d	5.00				
l	1.00				
h/l	2.40				
$\delta_{ex} =$	0.290216 in			$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$	
$\delta_{x,u} =$	1.451078 in			$C_d \delta_{ex} / l$	
C_{max}	6.35 in			(From SP Column Output)	
$l_w / (600(\delta_u / h_w))$	50.03176				
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.13				
					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS5.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	13.75	ft				
Footing Length	23.75	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	116	kips				
M_a	2463	k-ft				
V_a	112	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	4.78	ft				
Use:	4.80	ft				
P_u	128.41	kips				
$q_{u\ max}$	6.58	ksf				
$q_{u\ min}$	-4.33	ksf				
Inflection Point, X	9.42	ft	$P_{ot\ soil}$	20.41	k	
			P_a	116	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	12.29	in				
Use h_{min}	18.00	in				
V_u	2.63	k/ft				
ϕV_c	14.26	k/ft				OK
M_u	11.9	k-ft/ft				
$A_{s\ min}$	0.21	in ² /ft				
Reinforcement						
Transverse	# 6	@	12	OC	A_s	0.44 in ² /ft OK
Longitudinal	# 5		2		$A_{s\ min}$	0.39 in ² /ft
					$A_{s\ total}$	2.0 OK
a	0.52	in				
c	0.61	in				
ϵ_s	0.066	>	0.005	ϕ	0.9	
ϕM_n	326.5	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

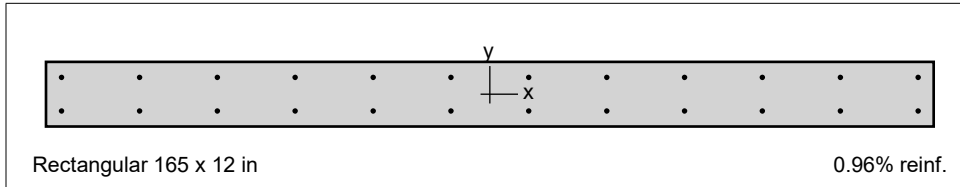


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	24 #8
Total steel area, A_s	18.96 in ²
Rho	0.96 %
Minimum clear spacing	5.25 in

(Note: Rho < 1.0%)

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



Combination	Dead	Live	Wind	EQ	Snow
U9	0.900	0.000	-1.600	0.000	0.000
U10	1.200	1.000	0.000	0.000	0.000
U11	0.900	0.000	0.000	0.000	0.000
U12	1.200	1.000	0.000	0.000	0.000
U13	0.900	0.000	0.000	0.000	0.000

Building & Safety: OCPW Azarvand B 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load	Mx @ Top	Mx @ Bottom	My @ Top	My @ Bottom
		kip	k-ft	k-ft	k-ft	k-ft
1	Dead	87.80	0.00	0.00	0.00	0.00
1	Live	10.50	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	17.80	0.00	0.00	0.00	2462.70
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u	M _{uy}	φP _n	φM _{ny}	NA Depth	ε _t	φ	
		kip	k-ft	kip	k-ft	in			
1	1 U1 Top	122.92	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
2	1 U1 Bot	122.92	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
3	1 U2 Top	122.16	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
4	1 U2 Bot	122.16	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
5	1 U3 Top	115.86	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
6	1 U3 Bot	115.86	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
7	1 U4 Top	105.36	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
8	1 U4 Bot	105.36	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
9	1 U5 Top	115.86	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
10	1 U5 Bot	115.86	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
11	1 U6 Top	79.02	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
12	1 U6 Bot	79.02	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
13	1 U7 Top	105.36	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
14	1 U7 Bot	105.36	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
15	1 U8 Top	115.86	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
16	1 U8 Bot	115.86	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
17	1 U9 Top	79.02	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
18	1 U9 Bot	79.02	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
19	1 U10 Top	133.66	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
20	1 U10 Bot	133.66	-2462.70	0.00	-6283.62	20.84	0.02034	0.900	0.71
21	1 U11 Top	96.82	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
22	1 U11 Bot	96.82	-2462.70	0.00	-6283.62	20.84	0.02034	0.900	0.71
23	1 U12 Top	98.06	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
24	1 U12 Bot	98.06	2462.70	0.00	6283.62	20.84	0.02034	0.900	0.71
25	1 U13 Top	61.22	0.00	120.96	6911.47	23.51	0.01769	0.900	0.48
26	1 U13 Bot	61.22	2462.70	0.00	6283.62	20.84	0.02034	0.900	0.71

6. Diagrams

6.1. PM at $\theta=0$ [deg]

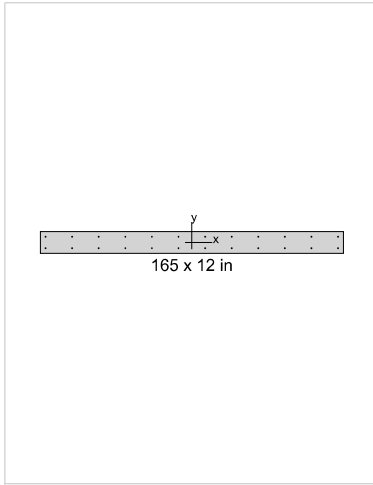
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 9
Column	NS5.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

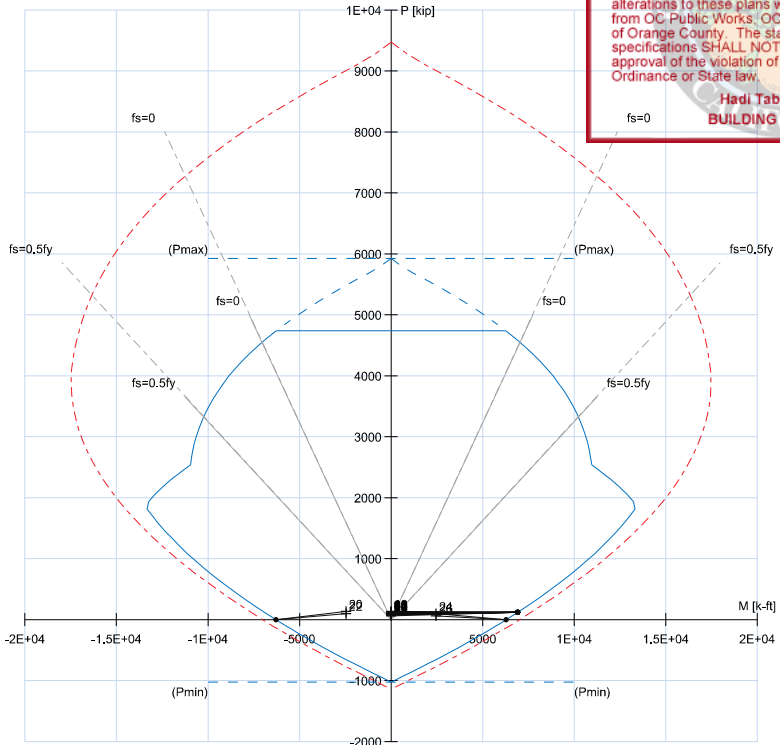
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	165 in
Depth	12 in
A_g	1980 in ²
I_x	23760 in ⁴
I_y	4.49213e+006 in ⁴

Reinforcement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	24 #8
Confinement type	Tied
Total steel area, A_s	18.96 in ²
Rho	0.96 %
Min. clear spacing	5.25 in





PM at 0.0 [deg]


No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
20	1 U10 Bot	133.7	-2462.7	0.00	-6283.62	0.71
22	1 U11 Bot	96.8	-2462.7	0.00	-6283.62	0.71
24	1 U12 Bot	98.1	2462.7	0.00	6283.62	0.71
26	1 U13 Bot	61.2	2462.7	0.00	6283.62	0.71
1	1 U1 Top	122.9	0.0	120.96	6911.47	0.48
2	1 U1 Bot	122.9	0.0	120.96	6911.47	0.48
3	1 U2 Top	122.2	0.0	120.96	6911.47	0.48
4	1 U2 Bot	122.2	0.0	120.96	6911.47	0.48
5	1 U3 Top	115.9	0.0	120.96	6911.47	0.48
6	1 U3 Bot	115.9	0.0	120.96	6911.47	0.48
7	1 U4 Top	105.4	0.0	120.96	6911.47	0.48
8	1 U4 Bot	105.4	0.0	120.96	6911.47	0.48
9	1 U5 Top	115.9	0.0	120.96	6911.47	0.48
10	1 U5 Bot	115.9	0.0	120.96	6911.47	0.48
11	1 U6 Top	79.0	0.0	120.96	6911.47	0.48

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.71

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS5.2		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	14.33	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2063.52	in2	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in2/ft	
				As (transv)	0.66 in2/ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	140	kips				
M _u	2866	k-ft				
V _u	128	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	145.91	kips	-->Minimum Requirements of Section 14.3 Apply			
Min ρ_l	.0015		Asmin (longit)	0.216 in2/ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in2/ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.4		ac	2		
V _n max (per 18.10.4.1)	859	kips				
V _n max (per 18.10.4.4)	1167	kips	(Conservativley assumes limit of 8 f _c)			
V _c	233	kips				
V _s	542	kips				
V _n	776					
ϕV_n	582	22%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	Sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - NS5.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	14.33	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	2063.52		
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	140.2	kips				
M_u	2865.9	k-ft				
V_u	128.3	kips				
Critical Section	5.58	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.30					
$\delta_{ex} =$	0.295819	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	1.479095	in		$C_d \delta_{ex} / l$		
C_{max}	9.46	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	51.15452					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.18					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet no.	130
	location	Dana Point, CA		date			
	client	SMS Architects		job no.			
		Bldg 9 - NS5.2		Building&Safety: OCPWAazayandB	1900799		1/16/2025
Foundation Bearing:				Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,			
				County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL			
Wall Length	14.33	ft					
Footing Length	24.33	ft					
Wall Height	33	ft					
Wall Thickness	12	in.					
P_a	122	kips					
M_a	2866	k-ft					
V_a	128	kips					
Allowable Bearing, q_{ALL}	5000	psf					
Determine Width:							
Minimum Width	5.24	ft					
Use:	5.30	ft					
P_u	134.81	kips					
$q_{u\ max}$	6.53	ksf					
$q_{u\ min}$	-4.44	ksf					
Inflection Point, X	9.84	ft	$P_{ot\ soil}$	21.83	k		
			P_a	122	k	OK	
Shear & Flexure:							
f'_c	5000	psi	F_y	60	ksi		
b	12.00						
d	13.78	in					
Use h_{min}	18.00	in					
V_u	4.24	k/ft					
ϕV_c	14.26	k/ft	OK				
M_u	15.1	k-ft/ft					
$A_{s\ min}$	0.27	in ² /ft					
Reinforcement							
Transverse	# 6	@	12	OC	A_s	0.44 in ² /ft	OK
Longitudinal	# 5		2		$A_{s\ min}$	0.39 in ² /ft	
					$A_{s\ total}$	3.0	OK
a	0.52	in					
c	0.61	in					
ϵ_s	0.066	>	0.005	ϕ	0.9		
ϕM_n	326.5	k-ft/ft	OK				

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

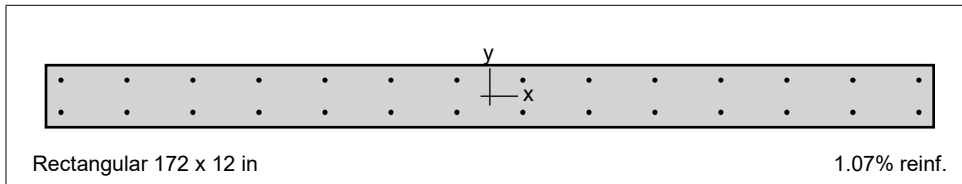


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.07 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



6. Diagrams

6.1. PM at $\theta=0$ [deg]

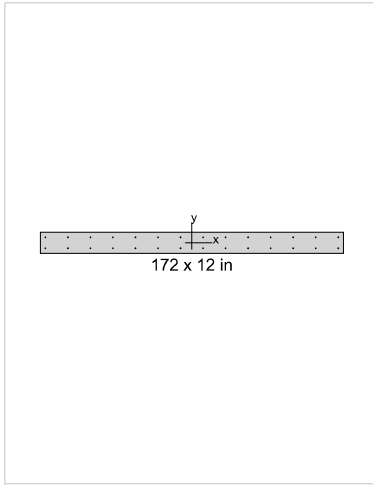
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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 BUILDING OFFICIAL



General Information

Project	DPH - Bldg 9
Column	NS5.2
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

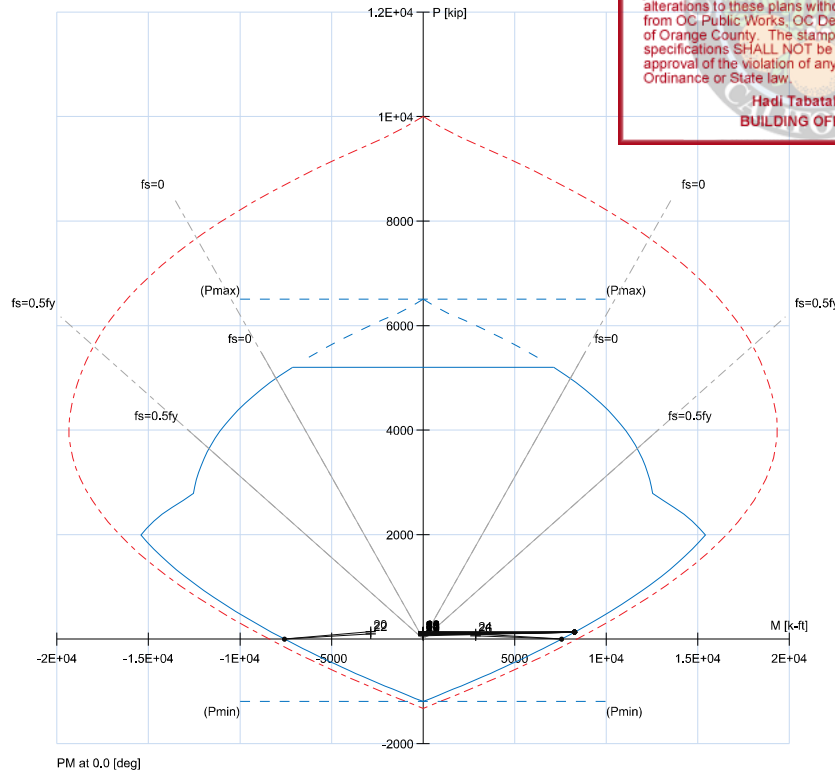
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	172 in
Depth	12 in
A_g	2064 in ²
I_x	24768 in ⁴
I_y	5.08845e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.07 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
20	1 U10 Bot	140.2	-2865.9	0.00	-7568.40	0.69
22	1 U11 Bot	101.8	-2865.9	0.00	-7568.40	0.69
24	1 U12 Bot	102.8	2865.9	0.00	7568.40	0.69
26	1 U13 Bot	64.4	2865.9	0.00	7568.40	0.69
1	1 U1 Top	129.2	0.0	132.72	8272.71	0.46
2	1 U1 Bot	129.2	0.0	132.72	8272.71	0.46
3	1 U2 Top	127.9	0.0	132.72	8272.71	0.46
4	1 U2 Bot	127.9	0.0	132.72	8272.71	0.46
5	1 U3 Top	121.5	0.0	132.72	8272.71	0.46
6	1 U3 Bot	121.5	0.0	132.72	8272.71	0.46
7	1 U4 Top	110.8	0.0	132.72	8272.71	0.46
8	1 U4 Bot	110.8	0.0	132.72	8272.71	0.46
9	1 U5 Top	121.5	0.0	132.72	8272.71	0.46
10	1 U5 Bot	121.5	0.0	132.72	8272.71	0.46
11	1 U6 Top	83.1	0.0	132.72	8272.71	0.46

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.69

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW1.1		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	14.83	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2135.52	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@	12	oc	OK	
Horizontal	# 6	@	16	oc	OK	
Number of Curtains	2					
				As (longit)	1.58 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	178	kips				
M _u	5184	k-ft				
V _u	226	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	151.00	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.3		α_c	2		
V _n max (per 18.10.4.1)	889	kips				
V _n max (per 18.10.4.4)	1208	kips	(Conservativley assumes limit of 8 f _c)			
V _c	242	kips				
V _s	581	kips				
V _n	822					
ϕV_n	617		37%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW1.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	14.83	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	A_{cv}	2135.52	in ²	
Thickness	12	in.	ϕ	0.75		
f_c	5000	psi				
f_y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				A_s (longit)	1.58	in ² /ft
				A_s (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	177.7	kips				
M_u	5184.3	k-ft				
V_u	225.9	kips				
Critical Section	5.74	ft				
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.23					
$\delta_{ex} =$	0.474061	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	2.370307	in		$C_d \delta_{ex} / l$		
C_{max}	16.38	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	33.0347					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.50					
<1.0--Boundary Elements NOT Required						

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW1.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	14.83	ft				
Footing Length	26.83	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	206	kips				
M_a	5184	k-ft				
V_a	226	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	7.83	ft				
Use:	7.90	ft				
P_u	214.11	kips				
$q_{u \max}$	6.48	ksf				
$q_{u \min}$	-4.46	ksf				
Inflection Point, X	10.94	ft	$P_{ot \ soil}$	24.39	k	
			P_a	206	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	21.96	in				
Use h_{min}	26.00	in				
V_u	8.32	k/ft				
ϕV_c	22.40	k/ft	OK			
M_u	38.6	k-ft/ft				
$A_{s \ min}$	0.43	in ² /ft				
Reinforcement						
Transverse	# 6	@	9	OC	A_s	0.59 in ² /ft OK
Longitudinal	# 5		6		$A_{s \ min}$	0.56 in ² /ft
					$A_{s \ total}$	5.0 OK
a	0.69	in				
c	0.81	in				
ϵ_s	0.078	>	0.005	ϕ	0.9	
ϕM_n	686.0	k-ft/ft	OK			

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



2. Section

2.1. Section Figure

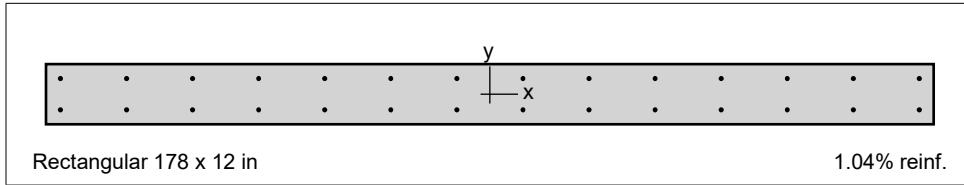


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.04 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand B 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	138.80	0.00	0.00	0.00	0.00
1	Live	38.90	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	28.10	0.00	0.00	0.00	5184.30
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	194.32	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
2	1 U1 Bot	194.32	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
3	1 U2 Top	228.80	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
4	1 U2 Bot	228.80	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
5	1 U3 Top	205.46	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
6	1 U3 Bot	205.46	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
7	1 U4 Top	166.56	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
8	1 U4 Bot	166.56	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
9	1 U5 Top	205.46	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
10	1 U5 Bot	205.46	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
11	1 U6 Top	124.92	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
12	1 U6 Bot	124.92	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
13	1 U7 Top	166.56	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
14	1 U7 Bot	166.56	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
15	1 U8 Top	205.46	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
16	1 U8 Bot	205.46	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
17	1 U9 Top	124.92	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
18	1 U9 Bot	124.92	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
19	1 U10 Top	233.56	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
20	1 U10 Bot	233.56	-5184.30	0.00	-7861.09	23.38	0.01947	0.900	0.83
21	1 U11 Top	153.02	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
22	1 U11 Bot	153.02	-5184.30	0.00	-7861.09	23.38	0.01947	0.900	0.83
23	1 U12 Top	177.36	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
24	1 U12 Bot	177.36	5184.30	0.00	7861.09	23.38	0.01947	0.900	0.83
25	1 U13 Top	96.82	0.00	136.78	8624.57	26.19	0.01706	0.900	0.47
26	1 U13 Bot	96.82	5184.30	0.00	7861.09	23.38	0.01947	0.900	0.84

6. Diagrams

6.1. PM at $\theta=0$ [deg]

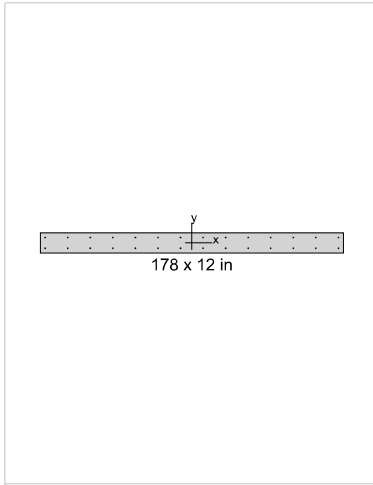
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 9
Column	EW1.3
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

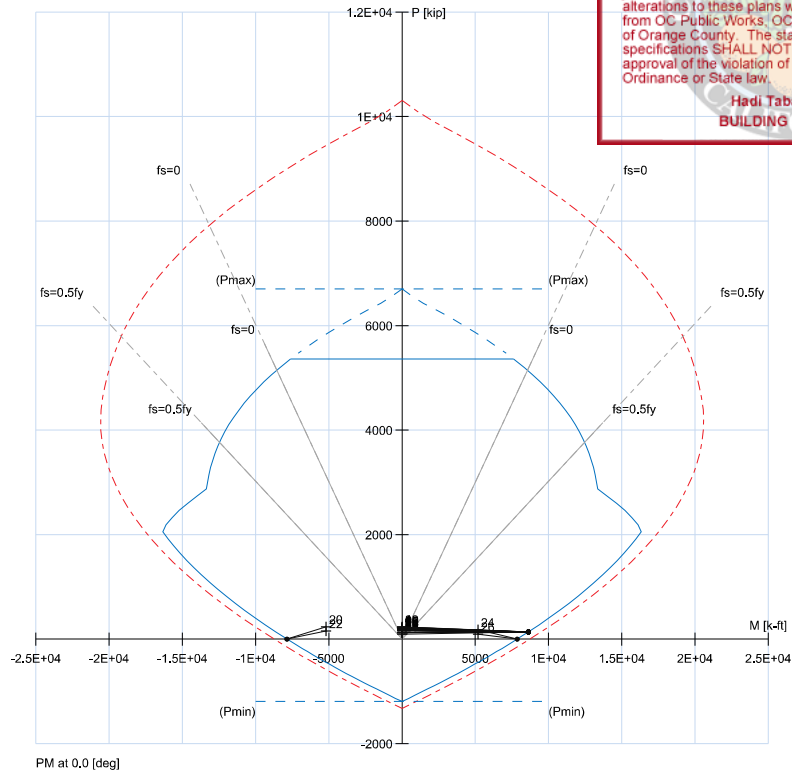
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	178 in
Depth	12 in
A_g	2136 in ²
I_x	25632 in ⁴
I_y	5.63975e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.04 %
Min. clear spacing	5.25 in






No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	96.8	5184.3	0.00	7861.09	0.84
20	1 U10 Bot	233.6	-5184.3	0.00	-7861.09	0.83
22	1 U11 Bot	153.0	-5184.3	0.00	-7861.09	0.83
24	1 U12 Bot	177.4	5184.3	0.00	7861.09	0.83
1	1 U1 Top	194.3	0.0	136.78	8624.57	0.47
2	1 U1 Bot	194.3	0.0	136.78	8624.57	0.47
3	1 U2 Top	228.8	0.0	136.78	8624.57	0.47
4	1 U2 Bot	228.8	0.0	136.78	8624.57	0.47
5	1 U3 Top	205.5	0.0	136.78	8624.57	0.47
6	1 U3 Bot	205.5	0.0	136.78	8624.57	0.47
7	1 U4 Top	166.6	0.0	136.78	8624.57	0.47
8	1 U4 Bot	166.6	0.0	136.78	8624.57	0.47
9	1 U5 Top	205.5	0.0	136.78	8624.57	0.47
10	1 U5 Bot	205.5	0.0	136.78	8624.57	0.47
11	1 U6 Top	124.9	0.0	136.78	8624.57	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.84

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	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW1.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	11.5	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	1656	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in ² /ft	
				As (transv)	0.66 in ² /ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	200	kips				
M _u	3454	k-ft				
V _u	142	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	117.10	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.9		α_c	2		
V _n max (per 18.10.4.1)	690	kips				
V _n max (per 18.10.4.4)	937	kips	(Conservativley assumes limit of 8 f _c)			
V _c	187	kips				
V _s	349	kips				
V _n	536					
ϕV_n	402		35%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	Sheet #30
	location	Dana Point, CA	date		
	client	SMS Architects	job no.		
		Bldg 9 - EW1.2	Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>					
<p style="text-align: right;">Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,</p> <p style="text-align: right;">County of Orange - OC Public Works OC Development Services APPROVED</p> <p style="text-align: right; font-size: small;">Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.</p> <p style="text-align: right; font-size: x-small;">Heri Taharjone BUILDING OFFICIAL</p>					
Input (per Shear Analysis)					
Wall Length	11.5 ft		λ	1.00	(Per ACI section 8.6.1)
Wall Height	33 ft		A_{cv}	1656 in ²	
Thickness	12 in.		ϕ	0.75	
f_c	5000 psi				
f_y	60000 psi				
Reinforcement					
Vertical	# 8 @ 12 oc			OK	
Horizontal	# 6 @ 16 oc			OK	
Number of Curtains	2				
				A_s (longit)	1.58 in ² /ft
				A_s (transv)	0.66 in ² /ft
				ρ_l	0.011
				ρ_t	0.0046
P_u	200.46 kips				
M_u	3454.2 k-ft				
V_u	142.2 kips				
Critical Section	6.07 ft				
Boundary Element Check					
E_c	4031				
C_d	5.00				
l	1.00				
h/l	2.87				
$\delta_{ex} =$	0.606393 in			$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$	
$\delta_{x,u} =$	3.031963 in			$C_d \delta_{ex} / l$	
C_{max}	13.95 in			(From SP Column Output)	
$l_w / (600(\delta_u / h_w))$	20.02663				
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.70				<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	Sheet #30
	location	Dana Point, CA	date		
	client	SMS Architects	job no.		
		Bldg 9 - EW1.2	Building&Safety: OCPWAzayvandB	1900799	1/16/2025
Foundation Bearing:					Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.  Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	11.5	ft			
Footing Length	21.5	ft			
Wall Height	33	ft			
Wall Thickness	12	in.			
P_a	176	kips			
M_a	3454	k-ft			
V_a	142	kips			
Allowable Bearing, q_{ALL}	5000	psf			
Determine Width:					
Minimum Width	8.16	ft			
Use:	8.20	ft			
P_u	184.91	kips			
$q_{u\ max}$	6.52	ksf			
$q_{u\ min}$	-4.42	ksf			
Inflection Point, X	8.69	ft	$P_{ot\ soil}$	19.20	k
			P_a	176	k
					OK
Shear & Flexure:					
f'_c	5000	psi	F_y	60	ksi
b	12.00				
d	23.04	in			
Use h_{min}	28.00	in			
V_u	8.25	k/ft			
ϕV_c	24.44	k/ft			OK
M_u	42.2	k-ft/ft			
$A_{s\ min}$	0.43	in ² /ft			
Reinforcement					
Transverse	# 6	@	12	OC	A_s 0.44 in ² /ft OK
Longitudinal	# 5		6		$A_{s\ min}$ 0.60 in ² /ft
					$A_{s\ total}$ 5.0 OK
a	0.52	in			
c	0.61	in			
ϵ_s	0.115	>	0.005	ϕ	0.9
ϕM_n	564.1	k-ft/ft			OK

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

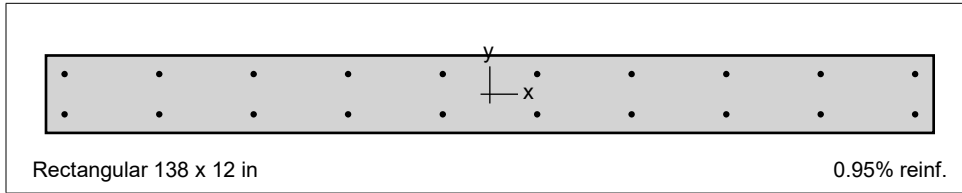


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	20 #8
Total steel area, A_s	15.80 in ²
Rho	0.95 %
Minimum clear spacing	5.25 in

(Note: Rho < 1.0%)

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500

Building&Safety: OCPWAzarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



Combination	Dead	Live	Wind	EQ	Snow
U9	0.900	0.000	-1.600	0.000	0.000
U10	1.200	1.000	0.000	0.000	0.000
U11	0.900	0.000	0.000	0.000	0.000
U12	1.200	1.000	0.000	0.000	0.000
U13	0.900	0.000	0.000	0.000	0.000

Building & Safety: OCPW Azarvand 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load	Mx @ Top	Mx @ Bottom	My @ Top	My @ Bottom
		kip	k-ft	k-ft	k-ft	k-ft
1	Dead	120.80	0.00	0.00	0.00	0.00
1	Live	31.10	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	24.40	0.00	0.00	0.00	3454.20
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u	M _{uy}	φP _n	φM _{ny}	NA Depth	ε _t	φ	
		kip	k-ft	kip	k-ft	in			
1	1 U1 Top	169.12	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
2	1 U1 Bot	169.12	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
3	1 U2 Top	194.72	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
4	1 U2 Bot	194.72	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
5	1 U3 Top	176.06	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
6	1 U3 Bot	176.06	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
7	1 U4 Top	144.96	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
8	1 U4 Bot	144.96	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
9	1 U5 Top	176.06	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
10	1 U5 Bot	176.06	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
11	1 U6 Top	108.72	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
12	1 U6 Bot	108.72	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
13	1 U7 Top	144.96	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
14	1 U7 Bot	144.96	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
15	1 U8 Top	176.06	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
16	1 U8 Bot	176.06	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
17	1 U9 Top	108.72	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
18	1 U9 Bot	108.72	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
19	1 U10 Top	200.46	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
20	1 U10 Bot	200.46	-3454.20	0.00	-4396.21	17.27	0.02047	0.900	0.89
21	1 U11 Top	133.12	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
22	1 U11 Bot	133.12	-3454.20	0.00	-4396.21	17.27	0.02047	0.900	0.89
23	1 U12 Top	151.66	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
24	1 U12 Bot	151.66	3454.20	0.00	4396.21	17.27	0.02047	0.900	0.89
25	1 U13 Top	84.32	0.00	100.80	4841.14	19.58	0.01770	0.900	0.48
26	1 U13 Bot	84.32	3454.20	0.00	4396.21	17.27	0.02047	0.900	0.90

6. Diagrams

6.1. PM at $\theta=0$ [deg]

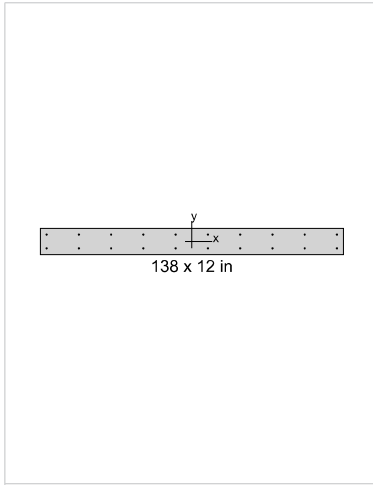
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 9
Column	EW1.4
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

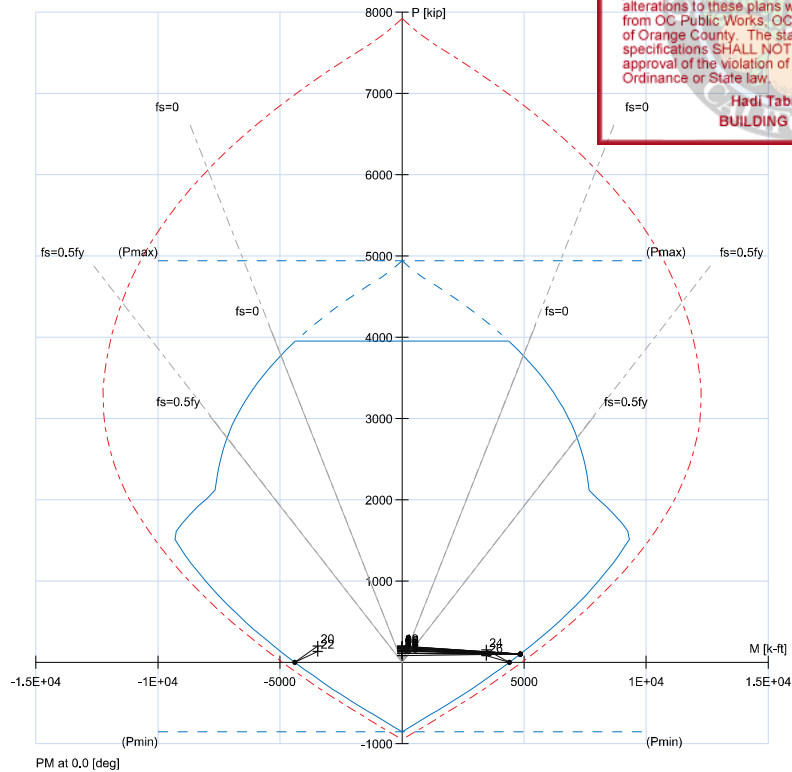
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	138 in
Depth	12 in
A_g	1656 in ²
I_x	19872 in ⁴
I_y	2.62807e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	20 #8
Confinement type	Tied
Total steel area, A_s	15.80 in ²
Rho	0.95 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	84.3	3454.2	0.00	4396.21	0.90
20	1 U10 Bot	200.5	-3454.2	0.00	-4396.21	0.89
22	1 U11 Bot	133.1	-3454.2	0.00	-4396.21	0.89
24	1 U12 Bot	151.7	3454.2	0.00	4396.21	0.89
1	1 U1 Top	169.1	0.0	100.80	4841.14	0.48
2	1 U1 Bot	169.1	0.0	100.80	4841.14	0.48
3	1 U2 Top	194.7	0.0	100.80	4841.14	0.48
4	1 U2 Bot	194.7	0.0	100.80	4841.14	0.48
5	1 U3 Top	176.1	0.0	100.80	4841.14	0.48
6	1 U3 Bot	176.1	0.0	100.80	4841.14	0.48
7	1 U4 Top	145.0	0.0	100.80	4841.14	0.48
8	1 U4 Bot	145.0	0.0	100.80	4841.14	0.48
9	1 U5 Top	176.1	0.0	100.80	4841.14	0.48
10	1 U5 Bot	176.1	0.0	100.80	4841.14	0.48
11	1 U6 Top	108.7	0.0	100.80	4841.14	0.48

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.90

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet no.	108 of 130
	location	Dana Point, CA		date			
	client	SMS Architects		job no.			
		Bldg 9 - EW1.3		Building&Safety: OCPWA	1900799	1/16/2025	
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL	
<u>Input:</u>							
Wall Length	14.83	ft	λ	1.00	(Per ACI section 19.2.4.2)		
Wall Height	33	ft	Acv	2135.52	in ²		
Thickness	12	in.	ϕ	0.75			
f _c	5000	psi					
f _y	60000	psi					
Reinforcement							
Vertical	# 8	@ 12	oc	OK			
Horizontal	# 6	@ 16	oc	OK			
Number of Curtains	2						
				As (longit)	1.58 in ² /ft		
				As (transv)	0.66 in ² /ft		
				ρ_l	0.011		
				ρ_t	0.0046		
P _u	154	kips					
M _u	5482	k-ft					
V _u	237	kips					
<u>Output</u>							
Check Minimum Reinforcing							
Acv $\lambda \sqrt{f_c}$	151.00	kips	-->Minimum Requirements of Section 18.10.2.1 Apply				
Min ρ_l	.0025		Asmin (longit)	0.36 in ² /ft	OK		
Min ρ_t	.0025		Asmin (transv)	0.36 in ² /ft	OK		
Detemine Shear Strength							
Limits:							
hw / lw	2.3		α_c	2			
V _n max (per 18.10.4.1)	889	kips					
V _n max (per 18.10.4.4)	1208	kips	(Conservativley assumes limit of 8 f _c)				
V _c	242	kips					
V _s	581	kips					
V _n	822						
ϕV_n	617		38%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	Sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW1.3		Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED (Per ACI section 8.6.1) Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	15 ft		λ	1.00		(Per ACI section 8.6.1)
Wall Height	33 ft		A_{cv}	2160 in ²		
Thickness	12 in.		ϕ	0.75		
f_c	5000 psi					
f_y	60000 psi					
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				A_s (longit)	1.58 in ² /ft	
				A_s (transv)	0.66 in ² /ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P_u	154.4 kips					
M_u	5481.5 k-ft					
V_u	236.7 kips					
Critical Section	5.79 ft					
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.20					
$\delta_{ex} =$	0.481484 in			$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	2.407419 in			$C_d \delta_{ex} / l$		
C_{max}	17.37 in			(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	32.89831					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.53					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet no.	130
	location	Dana Point, CA		date			
	client	SMS Architects		job no.			
		Bldg 9 - EW1.3		Building&Safety: OCPWAazayandB	1900799	1/16/2025	
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL	
Wall Length	14.83	ft					
Footing Length	26.83	ft					
Wall Height	33	ft					
Wall Thickness	12	in.					
P_a	180	kips					
M_a	5482	k-ft					
V_a	237	kips					
Allowable Bearing, q_{ALL}	5000	psf					
Determine Width:							
Minimum Width	8.06	ft					
Use:	8.10	ft					
P_u	190.31	kips					
$q_{u\ max}$	6.52	ksf					
$q_{u\ min}$	-4.76	ksf					
Inflection Point, X	11.33	ft	$P_{ot\ soil}$	27.00	k		
			P_a	180	k	OK	
Shear & Flexure:							
f'_c	5000	psi	F_y	60	ksi		
b	12.00						
d	22.72	in					
Use h_{min}	28.00	in					
V_u	7.93	k/ft					
ϕV_c	24.44	k/ft	OK				
M_u	41.1	k-ft/ft					
$A_{s\ min}$	0.42	in ² /ft					
Reinforcement							
Transverse	# 6	@	9	OC	A_s	0.59 in ² /ft	OK
Longitudinal	# 5		8		$A_{s\ min}$	0.60 in ² /ft	
					$A_{s\ total}$	5.0	OK
a	0.69	in					
c	0.81	in					
ϵ_s	0.086	>	0.005	ϕ	0.9		
ϕM_n	749.4	k-ft/ft	OK				

1. Material Properties

1.1. Concrete

Type	Standard
f_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

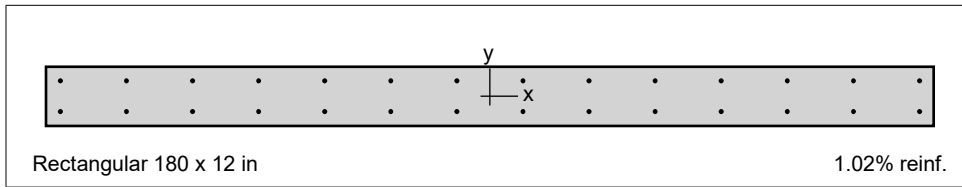


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.02 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,



Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand
 Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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Hadi Tabatabaei
 BUILDING OFFICIAL

4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	125.30	0.00	0.00	0.00	0.00
1	Live	29.10	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	25.40	0.00	0.00	0.00	5481.50
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	175.42	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
2	1 U1 Bot	175.42	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
3	1 U2 Top	196.92	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
4	1 U2 Bot	196.92	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
5	1 U3 Top	179.46	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
6	1 U3 Bot	179.46	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
7	1 U4 Top	150.36	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
8	1 U4 Bot	150.36	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
9	1 U5 Top	179.46	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
10	1 U5 Bot	179.46	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
11	1 U6 Top	112.77	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
12	1 U6 Bot	112.77	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
13	1 U7 Top	150.36	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
14	1 U7 Bot	150.36	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
15	1 U8 Top	179.46	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
16	1 U8 Bot	179.46	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
17	1 U9 Top	112.77	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
18	1 U9 Bot	112.77	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
19	1 U10 Top	204.86	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
20	1 U10 Bot	204.86	-5481.50	0.00	-7958.78	23.43	0.01968	0.900	0.85
21	1 U11 Top	138.17	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
22	1 U11 Bot	138.17	-5481.50	0.00	-7958.78	23.43	0.01968	0.900	0.85
23	1 U12 Top	154.06	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
24	1 U12 Bot	154.06	5481.50	0.00	7958.78	23.43	0.01968	0.900	0.85
25	1 U13 Top	87.37	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
26	1 U13 Bot	87.37	5481.50	0.00	7958.78	23.43	0.01968	0.900	0.85

6. Diagrams

6.1. PM at $\theta=0$ [deg]

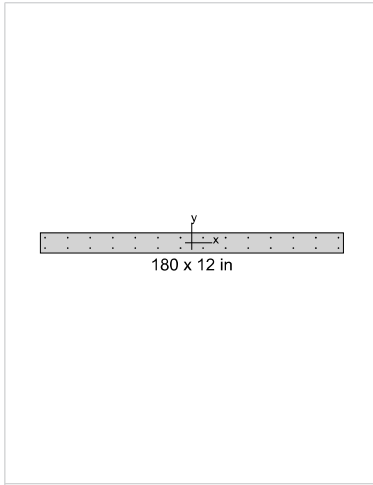
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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 BUILDING OFFICIAL



General Information

Project	DPH - Bldg 9
Column	EW1.5
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

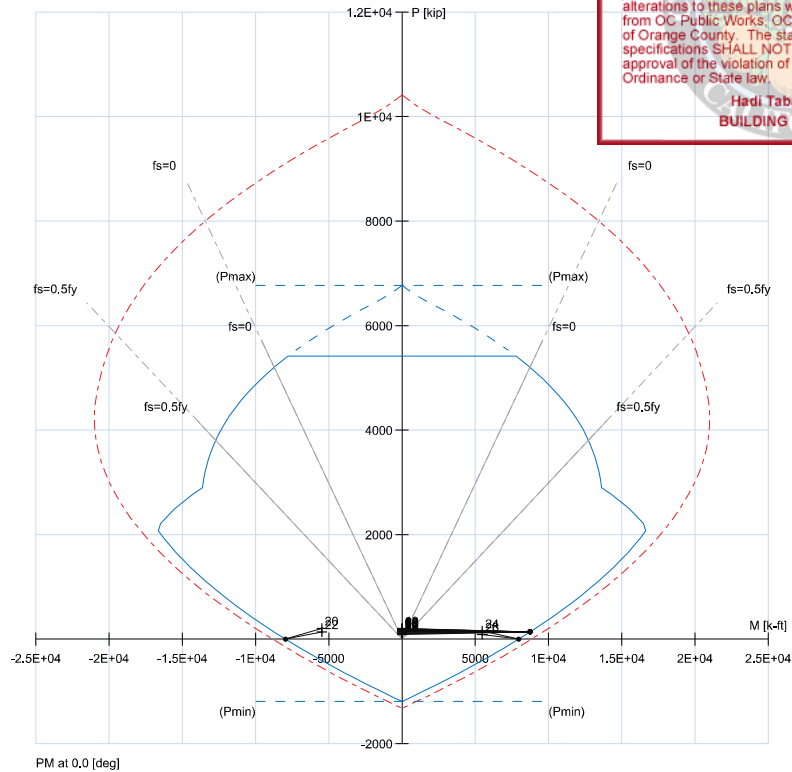
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	180 in
Depth	12 in
A_g	2160 in ²
I_x	25920 in ⁴
I_y	5.832e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.02 %
Min. clear spacing	5.25 in





No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
20	1 U10 Bot	204.9	-5481.5	0.00	-7958.78	0.85
22	1 U11 Bot	138.2	-5481.5	0.00	-7958.78	0.85
24	1 U12 Bot	154.1	5481.5	0.00	7958.78	0.85
26	1 U13 Bot	87.4	5481.5	0.00	7958.78	0.85
1	1 U1 Top	175.4	0.0	138.13	8742.53	0.47
2	1 U1 Bot	175.4	0.0	138.13	8742.53	0.47
3	1 U2 Top	196.9	0.0	138.13	8742.53	0.47
4	1 U2 Bot	196.9	0.0	138.13	8742.53	0.47
5	1 U3 Top	179.5	0.0	138.13	8742.53	0.47
6	1 U3 Bot	179.5	0.0	138.13	8742.53	0.47
7	1 U4 Top	150.4	0.0	138.13	8742.53	0.47
8	1 U4 Bot	150.4	0.0	138.13	8742.53	0.47
9	1 U5 Top	179.5	0.0	138.13	8742.53	0.47
10	1 U5 Bot	179.5	0.0	138.13	8742.53	0.47
11	1 U6 Top	112.8	0.0	138.13	8742.53	0.47

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.85

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW4.1		Building&Safety: OCPWAzayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	15	ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33	ft	Acv	2160	in2	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	# 8	@ 12	oc	OK		
Horizontal	# 6	@ 16	oc	OK		
Number of Curtains	2					
				As (longit)	1.58 in2/ft	
				As (transv)	0.66 in2/ft	
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	162	kips				
M _u	6590	k-ft				
V _u	268	kips				
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	152.74	kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025		Asmin (longit)	0.36 in2/ft	OK	
Min ρ_t	.0025		Asmin (transv)	0.36 in2/ft	OK	
Detemine Shear Strength						
Limits:						
hw / lw	2.2		α_c	2		
V _n max (per 18.10.4.1)	899	kips				
V _n max (per 18.10.4.4)	1222	kips	(Conservativley assumes limit of 8 f _c)			
V _c	244	kips				
V _s	594	kips				
V _n	838					
ϕV_n	629		43%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	15 of 170
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW4.1		Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED (Per ACI section 8.6.1) Heri Tahar Djene BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	15 ft			λ	1.00	(Per ACI section 8.6.1)
Wall Height	33 ft			Ac_v	2160 in ²	
Thickness	12 in.			ϕ	0.75	
f_c	5000 psi					
f_y	60000 psi					
Reinforcement						
Vertical	# 8	@	12	oc	OK	
Horizontal	# 6	@	16	oc	OK	
Number of Curtains	2					
					A_s (longit)	1.58 in ² /ft
					A_s (transv)	0.66 in ² /ft
					ρ_l	0.011
					ρ_t	0.0046
P_u	162 kips					
M_u	6589.5 k-ft					
V_u	267.9 kips					
Critical Section	6.15 ft					
Boundary Element Check						
E_c	4031					
C_d	5.00					
l	1.00					
h/l	2.20					
$\delta_{ex} =$	0.544949 in				$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$	
$\delta_{x,u} =$	2.724746 in				$C_d \delta_{ex} / l$	
C_{max}	20.69 in				(From SP Column Output)	
$l_w / (600(\delta_u / h_w))$	29.06693					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	0.71					<1.0--Boundary Elements NOT Required

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	sheet no.	14 of 17
	location	Dana Point, CA	date			
	client	SMS Architects	job no.			
		Bldg 9 - EW4.1	Building&Safety: OCPWAazayandB	1900799	1/16/2025	
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	15	ft				
Footing Length	25	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	187	kips				
M_a	6590	k-ft				
V_a	268	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	10.88	ft				
Use:	10.90	ft				
P_u	195.94	kips				
$q_{u\ max}$	6.52	ksf				
$q_{u\ min}$	-5.08	ksf				
Inflection Point, X	10.95	ft	$P_{ot\ soil}$	27.84	k	
			P_a	187	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	31.71	in				
Use h_{min}	36.00	in				
V_u	12.72	k/ft				
ϕV_c	32.58	k/ft				OK
M_u	79.9	k-ft/ft				
$A_{s\ min}$	0.62	in ² /ft				
Reinforcement						
Transverse	# 6	@	6	OC	A_s	0.88 in ² /ft OK
Longitudinal	# 5		10		$A_{s\ min}$	0.78 in ² /ft
					$A_{s\ total}$	9.0 OK
a	1.04	in				
c	1.22	in				
ϵ_s	0.076	>	0.005	ϕ	0.9	
ϕM_n	1496.0	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

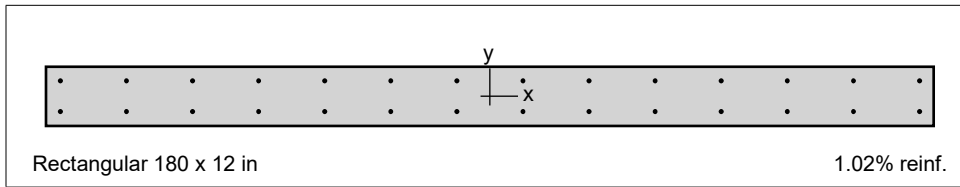


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Total steel area, A_s	22.12 in ²
Rho	1.02 %
Minimum clear spacing	5.25 in

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.500
U3	1.200	1.000	0.000	0.000	1.600
U4	1.200	0.000	0.800	0.000	1.600
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Combination	Dead	Live	Wind	EQ	Snow
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	1.000	0.200
U13	0.900	0.000	0.000	1.000	0.000

Building & Safety: OCPW Azarvand B 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR20-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, MEC21-0510

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	127.70	0.00	0.00	0.00	0.00
1	Live	33.80	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	25.80	0.00	0.00	0.00	6589.50
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	178.78	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
2	1 U1 Bot	178.78	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
3	1 U2 Top	207.32	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
4	1 U2 Bot	207.32	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
5	1 U3 Top	187.04	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
6	1 U3 Bot	187.04	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
7	1 U4 Top	153.24	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
8	1 U4 Bot	153.24	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
9	1 U5 Top	187.04	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
10	1 U5 Bot	187.04	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
11	1 U6 Top	114.93	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
12	1 U6 Bot	114.93	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
13	1 U7 Top	153.24	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
14	1 U7 Bot	153.24	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
15	1 U8 Top	187.04	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
16	1 U8 Bot	187.04	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
17	1 U9 Top	114.93	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
18	1 U9 Bot	114.93	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
19	1 U10 Top	212.84	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
20	1 U10 Bot	212.84	-6589.50	0.00	-7958.78	23.43	0.01968	0.900	0.91
21	1 U11 Top	140.73	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
22	1 U11 Bot	140.73	-6589.50	0.00	-7958.78	23.43	0.01968	0.900	0.91
23	1 U12 Top	161.24	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
24	1 U12 Bot	161.24	6589.50	0.00	7958.78	23.43	0.01968	0.900	0.91
25	1 U13 Top	89.13	0.00	138.13	8742.53	26.30	0.01720	0.900	0.47
26	1 U13 Bot	89.13	6589.50	0.00	7958.78	23.43	0.01968	0.900	0.92

6. Diagrams

6.1. PM at $\theta=0$ [deg]

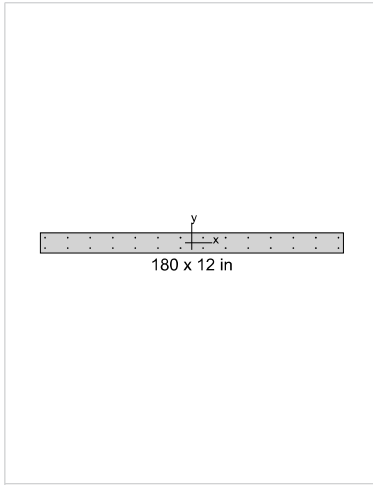
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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 BUILDING OFFICIAL



General Information

Project	DPH - Bldg 9
Column	EW4.1
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

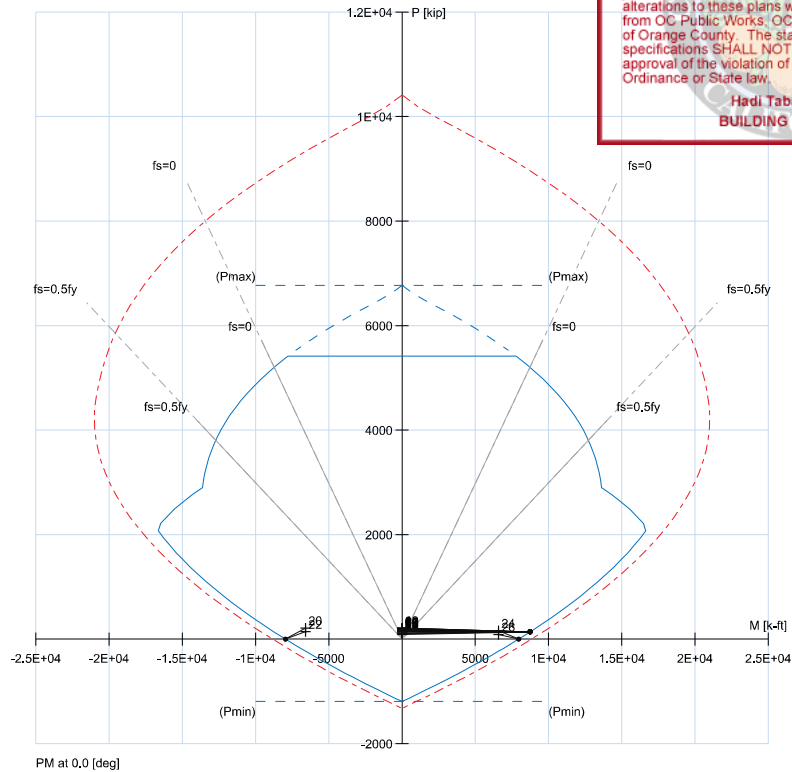
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	180 in
Depth	12 in
A_g	2160 in ²
I_x	25920 in ⁴
I_y	5.832e+006 in ⁴

Reinforcement


Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	2 in
Bars	28 #8
Confinement type	Tied
Total steel area, A_s	22.12 in ²
Rho	1.02 %
Min. clear spacing	5.25 in




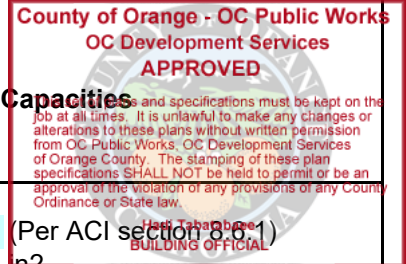
No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	89.1	6589.5	0.00	7958.78	0.92
20	1 U10 Bot	212.8	-6589.5	0.00	-7958.78	0.91
22	1 U11 Bot	140.7	-6589.5	0.00	-7958.78	0.91
24	1 U12 Bot	161.2	6589.5	0.00	7958.78	0.91
1	1 U1 Top	178.8	0.0	138.13	8742.53	0.47
2	1 U1 Bot	178.8	0.0	138.13	8742.53	0.47
3	1 U2 Top	207.3	0.0	138.13	8742.53	0.47
4	1 U2 Bot	207.3	0.0	138.13	8742.53	0.47
5	1 U3 Top	187.0	0.0	138.13	8742.53	0.47
6	1 U3 Bot	187.0	0.0	138.13	8742.53	0.47
7	1 U4 Top	153.2	0.0	138.13	8742.53	0.47
8	1 U4 Bot	153.2	0.0	138.13	8742.53	0.47
9	1 U5 Top	187.0	0.0	138.13	8742.53	0.47
10	1 U5 Bot	187.0	0.0	138.13	8742.53	0.47
11	1 U6 Top	114.9	0.0	138.13	8742.53	0.47


Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.92

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	sheet #30
	location	Dana Point, CA	date		
	client	SMS Architects	job no.		
		Bldg 9 - EW4.2	Building&Safety: OCPWAzayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>					
<p style="text-align: right;">Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, 1/16/2025</p>					
<p style="text-align: right;">County of Orange - OC Public Works OC Development Services APPROVED</p> <p style="text-align: right; font-size: small;">Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.</p>					
<u>Input:</u>					
Wall Length	6.5 ft	λ	1.00	(Per ACI section 19.2.4.2)	
Wall Height	33 ft	Acv	936 in ²		
Thickness	12 in.	ϕ	0.75		
f _c	5000 psi				
f _y	60000 psi				
Reinforcement					
Vertical	# 8 @ 8 oc		OK		
Horizontal	# 6 @ 16 oc		OK		
Number of Curtains	2				
		As (longit)	2.37 in ² /ft		
		As (transv)	0.66 in ² /ft		
		ρ_l	0.0165		
		ρ_t	0.0046		
P _u	52 kips				
M _u	2099 k-ft				
V _u	72 kips				
<u>Output</u>					
Check Minimum Reinforcing					
Acv $\lambda \sqrt{f_c}$	66.19 kips	-->Minimum Requirements of Section 18.10.2.1 Apply			
Min ρ_l	.0025	Asmin (longit)	0.36 in ² /ft	OK	
Min ρ_t	.0025	Asmin (transv)	0.36 in ² /ft	OK	
Detemine Shear Strength					
Limits:					
hw / lw	5.1	α_c	2		
V _n max (per 18.10.4.1)	390 kips				
V _n max (per 18.10.4.4)	529 kips	(Conservativley assumes limit of 8 f _c)			
V _c	106 kips				
V _s	112 kips				
V _n	217				
ϕV_n	163	44%	OK		

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	sheet #30
	location	Dana Point, CA	date		
	client	SMS Architects	job no.		
		Bldg 9 - EW4.2	Building&Safety: OCPWAazayandB	1900799	1/16/2025
<p>Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>					
<p style="text-align: right;">Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, 1/16/2025</p>					
<p>Input (per Shear Analysis)</p>					
Wall Length	6.5 ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33 ft	Acv	936 in ²		
Thickness	12 in.	ϕ	0.75		
f_c	5000 psi				
f_y	60000 psi				
Reinforcement					
Vertical	# 8 @ 8 oc		OK		
Horizontal	# 6 @ 16 oc		OK		
Number of Curtains	2				
		A_s (longit)	2.37 in ² /ft		
		A_s (transv)	0.66 in ² /ft		
		ρ_l	0.0165		
		ρ_t	0.0046		
P_u	51.6 kips				
M_u	2098.7 k-ft				
V_u	71.5 kips				
Critical Section	7.34 ft				
<p>Boundary Element Check</p>					
E_c	4031				
C_d	5.00				
l	1.00				
h/l	5.08				
$\delta_{ex} =$	1.592624 in	$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$			
$\delta_{x,u} =$	7.963121 in	$C_d \delta_{ex} / l$			
C_{max}	14.48 in	(From SP Column Output)			
$l_w / (600(\delta_u / h_w))$	4.309868				
$c_{max} / (l_w / (600(\delta_u / h_w)))$	3.36				
<p>>1.0--Boundary Elements Required</p>					
<p>-->Provide Special Boundary Detailing per ACI 18.10.6</p>					
<p>Length of Boundaries Shall be at Least 7.24 in.</p>					



 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet no	130
	location	Dana Point, CA		date			
	client	SMS Architects		job no.			
		Bldg 9 - EW4.2		Building&Safety: OCPWAazayandB	1900799	1/16/2025	
Foundation Bearing:				Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL			
Wall Length	6.5	ft					
Footing Length	16.5	ft					
Wall Height	33	ft					
Wall Thickness	12	in.					
P_a	61	kips					
M_a	2099	k-ft					
V_a	72	kips					
Allowable Bearing, q_{ALL}	5000	psf					
Determine Width:							
Minimum Width	7.68	ft					
Use:	7.70	ft					
P_u	66.33	kips					
$q_{u\ max}$	6.53	ksf					
$q_{u\ min}$	-5.48	ksf					
Inflection Point, X	7.53	ft	$P_{ot\ soil}$	20.66	k		
			P_a	61	k	OK	
Shear & Flexure:							
f'_c	5000	psi	F_y	60	ksi		
b	12.00						
d	21.48	in					
Use h_{min}	26.00	in					
V_u	7.73	k/ft					
ϕV_c	22.40	k/ft	OK				
M_u	36.6	k-ft/ft					
$A_{s\ min}$	0.41	in ² /ft					
Reinforcement							
Transverse	# 6	@	9	OC	A_s	0.59 in ² /ft	OK
Longitudinal	# 5		6		$A_{s\ min}$	0.56 in ² /ft	
					$A_{s\ total}$	5.0	OK
a	0.69	in					
c	0.81	in					
ϵ_s	0.078	>	0.005	ϕ	0.9		
ϕM_n	686.0	k-ft/ft	OK				

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

2. Section

2.1. Section Figure

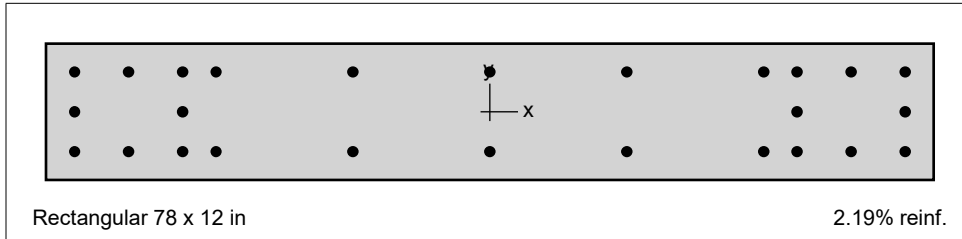


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Irregular
Bar layout	---
Cover to	---
Clear cover	---
Bars	---
Total steel area, A_s	20.54 in ²
Rho	2.19 %
Minimum clear spacing	1.93 in

3.2. Bars Provided

Area in ²	X in	Y in	Area in ²	X in	Y in	Area in ²	X in	Y in
0.79	-36.5	3.5	0.79	-27.0	3.5	0.79	-27.0	0.0
0.79	-24.1	3.5	0.79	-12.0	3.5	0.79	12.0	3.5
0.79	24.1	3.5	0.79	27.0	3.5	0.79	27.0	0.0
0.79	36.5	3.5	0.79	-36.5	-3.5	0.79	-27.0	-3.5
0.79	-24.1	-3.5	0.79	-12.0	-3.5	0.79	12.0	-3.5
0.79	24.1	-3.5	0.79	27.0	-3.5	0.79	36.5	-3.5
0.79	36.5	0.0	0.79	-36.5	0.0	0.79	0.0	-3.5

Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Area in ²	X in	Y in	Area in ²	X in	Y in	Area in ²	X in	Y in
0.79	0.0	3.5	0.79	31.8	3.5	0.79	0.0	3.5
0.79	-31.8	-3.5	0.79	-31.8	3.5			

Building & Safety: OCPW Azar and B
 1/16/2025
 Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0343, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.000
U3	1.200	1.000	0.000	0.000	0.000
U4	1.200	0.000	0.800	0.000	0.000
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	-1.000	0.200
U13	0.900	0.000	0.000	-1.000	0.000

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	44.90	0.00	0.00	0.00	0.00
1	Live	6.70	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	9.10	0.00	0.00	0.00	2098.70
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.
 Each loading combination includes the following cases:
 Top - At column top
 Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	62.86	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
2	1 U1 Bot	62.86	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
3	1 U2 Top	64.60	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
4	1 U2 Bot	64.60	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
5	1 U3 Top	60.58	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
6	1 U3 Bot	60.58	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
7	1 U4 Top	53.88	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
8	1 U4 Bot	53.88	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
9	1 U5 Top	60.58	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
10	1 U5 Bot	60.58	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
11	1 U6 Top	40.41	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
12	1 U6 Bot	40.41	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
13	1 U7 Top	53.88	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
14	1 U7 Bot	53.88	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29
15	1 U8 Top	60.58	0.00	67.96	3155.13	14.75	0.01236	0.900	0.29

No.	Load Combo	Demand		Capacity		Parameters at Capacity		Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε	
16	1 U8 Bot	60.58	0.00	67.96	3155.13	14.75	0.01236	0.900
17	1 U9 Top	40.41	0.00	67.96	3155.13	14.75	0.01236	0.900
18	1 U9 Bot	40.41	0.00	67.96	3155.13	14.75	0.01236	0.900
19	1 U10 Top	69.68	0.00	67.96	3155.13	14.75	0.01236	0.900
20	1 U10 Bot	69.68	-2098.70	0.00	-3000.57	13.64	0.01360	0.900
21	1 U11 Top	49.51	0.00	67.96	3155.13	14.75	0.01236	0.900
22	1 U11 Bot	49.51	-2098.70	0.00	-3000.57	13.64	0.01360	0.900
23	1 U12 Top	51.48	0.00	67.96	3155.13	14.75	0.01236	0.900
24	1 U12 Bot	51.48	2098.70	0.00	3000.57	13.64	0.01360	0.900
25	1 U13 Top	31.31	0.00	67.96	3155.13	14.75	0.01236	0.900
26	1 U13 Bot	31.31	2098.70	0.00	3000.57	13.64	0.01360	0.900

Building & Safety - OCPWAzarvands 1/16/2025

Permits: BNR20-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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6. Diagrams

6.1. PM at $\theta=0$ [deg]

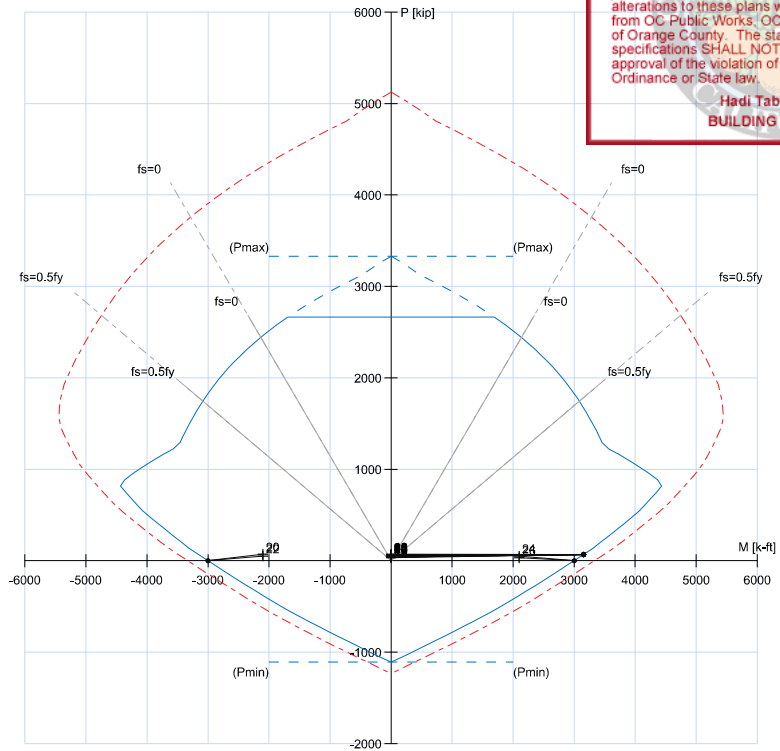
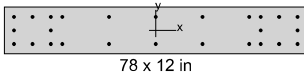
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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PM at 0.0 [deg]

General Information

Project	DPH - Bldg 9
Column	EW4.2
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	78 in
Depth	12 in
A_g	936 in ²
I_x	11232 in ⁴
I_y	474552 in ⁴


Reinforcement


Pattern	Irregular
Bar layout	--
Cover to	--
Clear cover	--
Bars	--
Confinement type	Tied
Total steel area, A_s	20.54 in ²
Rho	2.19 %
Min. clear spacing	1.93 in


No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
22	1 U11 Bot	49.5	-2098.7	0.00	-3000.57	0.80
24	1 U12 Bot	51.5	2098.7	0.00	3000.57	0.80
26	1 U13 Bot	31.3	2098.7	0.00	3000.57	0.80
20	1 U10 Bot	69.7	-2098.7	0.00	-3000.57	0.79
1	1 U1 Top	62.9	0.0	67.96	3155.13	0.29
2	1 U1 Bot	62.9	0.0	67.96	3155.13	0.29
3	1 U2 Top	64.6	0.0	67.96	3155.13	0.29
4	1 U2 Bot	64.6	0.0	67.96	3155.13	0.29
5	1 U3 Top	60.6	0.0	67.96	3155.13	0.29
6	1 U3 Bot	60.6	0.0	67.96	3155.13	0.29
7	1 U4 Top	53.9	0.0	67.96	3155.13	0.29
8	1 U4 Bot	53.9	0.0	67.96	3155.13	0.29
9	1 U5 Top	60.6	0.0	67.96	3155.13	0.29
10	1 U5 Bot	60.6	0.0	67.96	3155.13	0.29
11	1 U6 Top	40.4	0.0	67.96	3155.13	0.29

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.80

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	sheet no	137 of 139
	location	Dana Point, CA	date			
	client	SMS Architects	job no.			
		Bldg 9 - EW4.3	Building&Safety: OCPWAazayandB	1900799		1/16/2025
<p>Special Reinforced Concrete Shearwall--In Plane Shear Analysis Per ACI 318-14 Section 18.10 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities</p>						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjoto BUILDING OFFICIAL
<u>Input:</u>						
Wall Length	5.25 ft	λ	1.00	(Per ACI section 19.2.4.2)		
Wall Height	33 ft	Acv	756 in ²			
Thickness	12 in.	ϕ	0.75			
f _c	5000 psi					
f _y	60000 psi					
Reinforcement						
Vertical	# 8 @ 12 oc		OK			
Horizontal	# 6 @ 16 oc		OK			
Number of Curtains	2					
			As (longit)	1.58 in ² /ft		
			As (transv)	0.66 in ² /ft		
			ρ_l	0.011		
			ρ_t	0.0046		
P _u	53 kips					
M _u	2049 k-ft					
V _u	66 kips					
<u>Output</u>						
Check Minimum Reinforcing						
Acv $\lambda \sqrt{f_c}$	53.46 kips	-->Minimum Requirements of Section 18.10.2.1 Apply				
Min ρ_l	.0025	Asmin (longit)	0.36 in ² /ft	OK		
Min ρ_t	.0025	Asmin (transv)	0.36 in ² /ft	OK		
Detemine Shear Strength						
Limits:						
hw / lw	6.3	α_c	2			
V _n max (per 18.10.4.1)	315 kips					
V _n max (per 18.10.4.4)	428 kips	(Conservativley assumes limit of 8 f _c)				
V _c	86 kips					
V _s	73 kips					
V _n	158					
ϕV_n	119	56%	OK			

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A		by	JS	sheet #30
	location	Dana Point, CA		date		
	client	SMS Architects		job no.		
		Bldg 9 - EW4.3		Building&Safety: OCPWAazayandB	1900799	1/16/2025
Special Reinforced Concrete Shearwall--Boundary Element Check Per ACI 318-14 Section 18.10.6 Use in Conjunction with SP Column Program to Determine Wall Axial and Flexural Capacities						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED Plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works. OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Heri Taharjone BUILDING OFFICIAL
Input (per Shear Analysis)						
Wall Length	5.25	ft	λ	1.00	(Per ACI section 8.6.1)	
Wall Height	33	ft	Acv	756	in ²	
Thickness	12	in.	ϕ	0.75		
f _c	5000	psi				
f _y	60000	psi				
Reinforcement						
Vertical	#	8	@	12	oc	OK
Horizontal	#	6	@	16	oc	OK
Number of Curtains		2				
				As (longit)	1.58	in ² /ft
				As (transv)	0.66	in ² /ft
				ρ_l	0.011	
				ρ_t	0.0046	
P _u	53	kips				
M _u	2048.8	k-ft				
V _u	66.4	kips				
Critical Section	7.71	ft				
Boundary Element Check						
E_c	4031					
C _d	5.00					
l	1.00					
h/l	6.29					
$\delta_{ex} =$	2.779378	in		$(V/0.5E_c t_w) * [4 * (h/l)^3 + 3 * (h/l)]$		
$\delta_{x,u} =$	13.89689	in		$C_d \delta_{ex} / l$		
C _{max}	15.19	in		(From SP Column Output)		
$l_w / (600(\delta_u / h_w))$	1.994691					
$c_{max} / (l_w / (600(\delta_u / h_w)))$	7.62					
>1.0--Boundary Elements Required						
-->Provide Special Boundary Detailing per ACI 18.10.6						
Length of Boundaries Shall be at Least 7.595 in.						

 18400 Von Karman Ave., Suite 600 Irvine, CA 92612 (949) 252-1022 Fax (949) 252-8082	project	DPH - Phase 4A	by	JS	sheet no.	130
	location	Dana Point, CA	date			
	client	SMS Architects	job no.			
		Bldg 9 - EW4.3	Building&Safety: OCPWAazayandB	1900799	1/16/2025	
Foundation Bearing:						Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509, County of Orange - OC Public Works OC Development Services APPROVED This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law. Hadi Tabatabaee BUILDING OFFICIAL
Wall Length	5.25	ft				
Footing Length	15.25	ft				
Wall Height	33	ft				
Wall Thickness	12	in.				
P_a	62	kips				
M_a	2049	k-ft				
V_a	66	kips				
Allowable Bearing, q_{ALL}	5000	psf				
Determine Width:						
Minimum Width	8.76	ft				
Use:	8.80	ft				
P_u	68.07	kips				
$q_{u\ max}$	6.51	ksf				
$q_{u\ min}$	-5.50	ksf				
Inflection Point, X	6.98	ft	$P_{ot\ soil}$	19.20	k	
			P_a	62	k	OK
Shear & Flexure:						
f'_c	5000	psi	F_y	60	ksi	
b	12.00					
d	24.95	in				
Use h_{min}	30.00	in				
V_u	9.12	k/ft				
ϕV_c	26.47	k/ft				OK
M_u	49.5	k-ft/ft				
$A_{s\ min}$	0.47	in ² /ft				
Reinforcement						
Transverse	# 6	@	9	OC	A_s	0.59 in ² /ft OK
Longitudinal	# 5		6		$A_{s\ min}$	0.65 in ² /ft
					$A_{s\ total}$	6.0 OK
a	0.69	in				
c	0.81	in				
ϵ_s	0.093	>	0.005	ϕ	0.9	
ϕM_n	812.7	k-ft/ft				OK

1. Material Properties

1.1. Concrete

Type	Standard
f'_c	5 ksi
E_c	4030.51 ksi
f_t	4.25 ksi
ϵ_u	0.003 in/in
β_1	0.8

1.2. Steel

Type	Standard
f_y	60 ksi
E_s	29000 ksi
ϵ_{yt}	0.00206897 in/in

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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2. Section

2.1. Section Figure

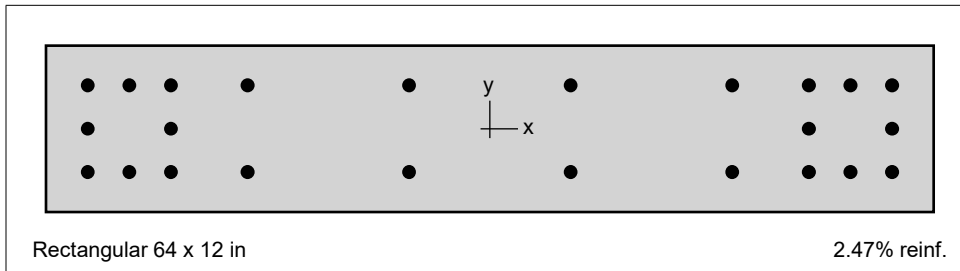


Figure 1: Column section

3. Reinforcement

3.1. Arrangement

Pattern	Irregular
Bar layout	---
Cover to	---
Clear cover	---
Bars	---
Total steel area, A_s	18.96 in ²
Rho	2.47 %
Minimum clear spacing	2.00 in

3.2. Bars Provided

Area in ²	X in	Y in	Area in ²	X in	Y in	Area in ²	X in	Y in
0.79	-29.0	3.1	0.79	-29.0	0.0	0.79	-23.0	3.1
0.79	-23.0	-3.1	0.79	-23.0	0.0	0.79	-17.5	3.1
0.79	-5.8	3.1	0.79	5.8	3.1	0.79	17.5	3.1
0.79	29.0	3.1	0.79	-29.0	-3.1	0.79	-17.5	-3.1
0.79	-5.8	-3.1	0.79	5.8	-3.1	0.79	17.5	-3.1
0.79	29.0	-3.1	0.79	29.0	0.0	0.79	23.0	3.1

Area in ²	X in	Y in	Area in ²	X in	Y in	Area in ²	X in	Y in
0.79	23.0	0.0	0.79	23.0	-3.1	0.79	23.0	0.0
0.79	26.0	3.1	0.79	-26.0	3.1	0.79	-26.0	3.1

Building & Safety: OCPW Azar and B
 1/16/2025
 Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,
 MEC21-0510

4. Loading

4.1. Load Combinations

Combination	Dead	Live	Wind	EQ	Snow
U1	1.400	0.000	0.000	0.000	0.000
U2	1.200	1.600	0.000	0.000	0.000
U3	1.200	1.000	0.000	0.000	0.000
U4	1.200	0.000	0.800	0.000	0.000
U5	1.200	1.000	1.600	0.000	0.500
U6	0.900	0.000	1.600	0.000	0.000
U7	1.200	0.000	-0.800	0.000	1.600
U8	1.200	1.000	-1.600	0.000	0.500
U9	0.900	0.000	-1.600	0.000	0.000
U10	1.200	1.000	0.000	1.000	0.200
U11	0.900	0.000	0.000	1.000	0.000
U12	1.200	1.000	0.000	-1.000	0.200
U13	0.900	0.000	0.000	-1.000	0.000

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4.2. Service Loads

No.	Load Case	Axial Load kip	Mx @ Top k-ft	Mx @ Bottom k-ft	My @ Top k-ft	My @ Bottom k-ft
1	Dead	46.10	0.00	0.00	0.00	0.00
1	Live	6.90	0.00	0.00	0.00	0.00
1	Wind	0.00	0.00	0.00	0.00	0.00
1	EQ	9.30	0.00	0.00	0.00	2048.80
1	Snow	0.00	0.00	0.00	0.00	0.00

5. Factored Loads and Moments with Corresponding Capacity Ratios

NOTE: Calculations are based on "Critical Capacity" Method.

Each loading combination includes the following cases:

Top - At column top

Bot - At column bottom

No.	Load Combo	Demand		Capacity		Parameters at Capacity			Capacity Ratio
		P _u kip	M _{uy} k-ft	φP _n kip	φM _{ny} k-ft	NA Depth in	ε _t	φ	
1	1 U1 Top	64.54	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
2	1 U1 Bot	64.54	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
3	1 U2 Top	66.36	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
4	1 U2 Bot	66.36	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
5	1 U3 Top	62.22	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
6	1 U3 Bot	62.22	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
7	1 U4 Top	55.32	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
8	1 U4 Bot	55.32	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
9	1 U5 Top	62.22	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
10	1 U5 Bot	62.22	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
11	1 U6 Top	41.49	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
12	1 U6 Bot	41.49	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
13	1 U7 Top	55.32	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
14	1 U7 Bot	55.32	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26
15	1 U8 Top	62.22	0.00	57.32	2355.08	12.43	0.01172	0.900	0.26

No.	Load Combo	Demand		Capacity		Parameters at Capacity		Capacity Ratio
		P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	NA Depth in	ϵ	
16	1 U8 Bot	62.22	0.00	57.32	2355.08	12.43	0.01172	0.900
17	1 U9 Top	41.49	0.00	57.32	2355.08	12.43	0.01172	0.900
18	1 U9 Bot	41.49	0.00	57.32	2355.08	12.43	0.01172	0.900
19	1 U10 Top	71.52	0.00	57.32	2355.08	12.43	0.01172	0.900
20	1 U10 Bot	71.52	-2048.80	0.00	-2250.63	11.56	0.01283	0.900
21	1 U11 Top	50.79	0.00	57.32	2355.08	12.43	0.01172	0.900
22	1 U11 Bot	50.79	-2048.80	0.00	-2250.63	11.56	0.01283	0.900
23	1 U12 Top	52.92	0.00	57.32	2355.08	12.43	0.01172	0.900
24	1 U12 Bot	52.92	2048.80	0.00	2250.63	11.56	0.01283	0.900
25	1 U13 Top	32.19	0.00	57.32	2355.08	12.43	0.01172	0.900
26	1 U13 Bot	32.19	2048.80	0.00	2250.63	11.56	0.01283	0.900

Building & Safety - OCPWAzarvandB 1/16/2025

Permits: BNR20-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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BUILDING OFFICER

6. Diagrams

6.1. PM at $\theta=0$ [deg]

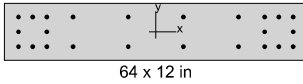
Building&Safety: OCPWazarvandB 1/16/2025

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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General Information

Project	DPH - Bldg 9
Column	EW4.3
Engineer	LW
Code	ACI 318-14
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	Y - axis
Slenderness	Not Considered
Column Type	Architectural
Capacity Method	Critical capacity

Materials

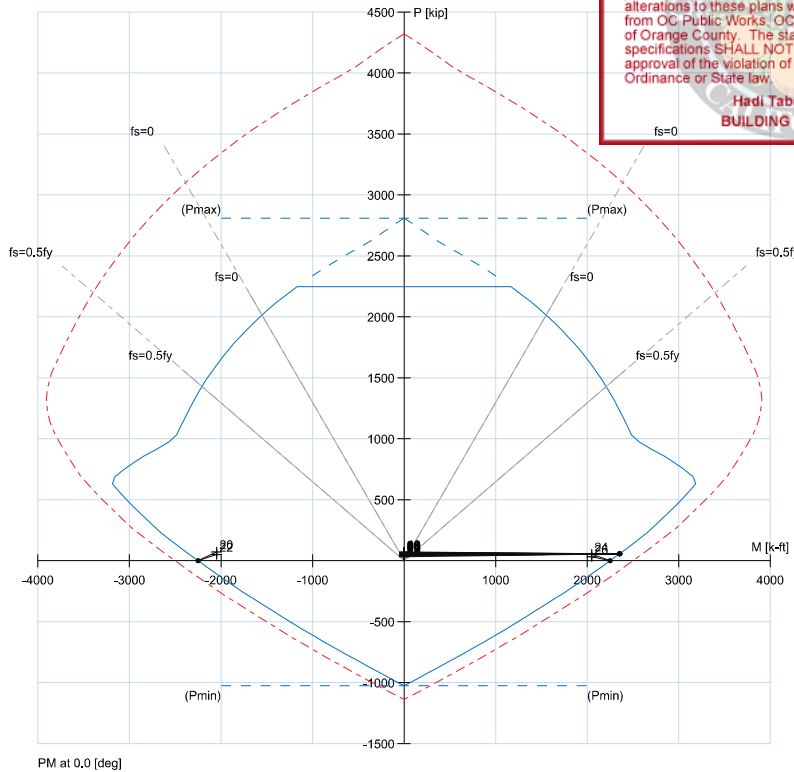
f'_c	5 ksi
E_c	4030.51 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	64 in
Depth	12 in
A_g	768 in ²
I_x	9216 in ⁴
I_y	262144 in ⁴

Reinforcement

Pattern	Irregular
Bar layout	--
Cover to	--
Clear cover	--
Bars	--
Confinement type	Tied
Total steel area, A_s	18.96 in ²
Rho	2.47 %
Min. clear spacing	2.00 in



No.	Load Combo	P_u kip	M_{uy} k-ft	ϕP_n kip	ϕM_{ny} k-ft	Capacity Ratio
26	1 U13 Bot	32.2	2048.8	0.00	2250.63	0.94
20	1 U10 Bot	71.5	-2048.8	0.00	-2250.63	0.93
22	1 U11 Bot	50.8	-2048.8	0.00	-2250.63	0.93
24	1 U12 Bot	52.9	2048.8	0.00	2250.63	0.93
1	1 U1 Top	64.5	0.0	57.32	2355.08	0.26
2	1 U1 Bot	64.5	0.0	57.32	2355.08	0.26
3	1 U2 Top	66.4	0.0	57.32	2355.08	0.26
4	1 U2 Bot	66.4	0.0	57.32	2355.08	0.26
5	1 U3 Top	62.2	0.0	57.32	2355.08	0.26
6	1 U3 Bot	62.2	0.0	57.32	2355.08	0.26
7	1 U4 Top	55.3	0.0	57.32	2355.08	0.26
8	1 U4 Bot	55.3	0.0	57.32	2355.08	0.26
9	1 U5 Top	62.2	0.0	57.32	2355.08	0.26
10	1 U5 Bot	62.2	0.0	57.32	2355.08	0.26
11	1 U6 Top	41.5	0.0	57.32	2355.08	0.26

Only 15 points out of 26 are listed.

Max. Capacity Ratio: 0.94



18400 Von Karman Ave., Suite 600
Irvine, CA 92612
(949) 252-1022 Fax (949) 252-8082

project	DPH - Building 9	by	LW	sheet no.	134 of 170
location	Dana Point, CA	date	8/4/2022		
client	SMS Architects	job no.	1900799		
		Building&Safety: OCPWAzarvandB			1/16/2025

Footings

Permits: BNR21-0240, BNR21-0241, BNR21-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

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Wall	Width (ft)	Depth (in)	Reinforcing		Mark
			Longitudinal	Transverse	
NS3.1	12.1	40	(12) #5 T&B	#6 @ 6" OC	2
NS4.1	6.9	24	(4) #5 T&B	#6 @ 12" OC	1
NS4.2	6.9	24	(8) #5 T&B	#6 @ 9" OC	1
NS5.1	4.8	18	(2) #5 T&B	#6 @ 12" OC	1
NS5.2	5.3	18	(2) #5 T&B	#6 @ 12" OC	1
EW1.1	7.9	26	(6) #5 T&B	#6 @ 9" OC	1
EW1.2	8.2	28	(6) #5 T&B	#6 @ 12" OC	1
EW1.3	8.1	28	(8) #5 T&B	#6 @ 9" OC	1
EW4.1	10.9	36	(10) #5 T&B	#6 @ 6" OC	2
EW4.2	7.7	26	(6) #5 T&B	#6 @ 9" OC	1
EW4.3	8.8	30	(6) #5 T&B	#6 @ 9" OC	1

6' beyond

6' beyond

6' beyond

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8 - 82 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W12x40**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 12.0 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns :
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 12.0 ft - K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

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Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 12.0 ft, E = 250.0 k

BENDING LOADS . . .

W1: Lat. Uniform Load creating Mx-x, D = 0.7580, L = 1.040 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8582** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 5.960 ft
 At maximum location values are . . .
 Pu 250.0 k
 0.9 * Pn 351.920 k
 Mu-x 35.091 k-ft
 0.9 * Mn-x : 211.061 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 63.0 k-ft

Maximum Load Reactions . . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 10.788 k
 Bottom along Y-Y 10.788 k

Maximum Load Deflections . . .
 Along Y-Y 0.09524 in at 6.040ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios							
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location		
+1.40D	0.090	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		
+1.20D+1.60L	0.219	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		
+1.20D+L	0.166	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		
+1.20D	0.078	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		
+0.90D	0.058	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		
+1.20D+L+E	0.858	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		
+0.90D+E	0.762	PASS	5.96 ft	1.14	1.00	74.23	0.00	0.000	PASS	0.00 ft		

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8 - 82 BEAM2

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x143**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 23.420 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 23.420 ft, K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
 DRAG: Axial Load at 23.420 ft, E = 755.0 k
 BENDING LOADS . . .
 W1: Lat. Uniform Load creating Mx-x, D = 0.770, L = 1.040 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9779** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 11.789 ft
 At maximum location values are . . .
 Pu 755.0 k
 0.9 * Pn 865.88 k
 Mu-x 134.650 k-ft
 0.9 * Mn-x : 1,129.31 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 320.250 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 21.195 k
 Bottom along Y-Y 21.195 k

Maximum Load Deflections . . .
 Along Y-Y 0.1553 in at 11.789ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios							
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location		
+1.40D	0.065	PASS	11.79 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		
+1.20D+1.60L	0.157	PASS	11.63 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		
+1.20D+L	0.119	PASS	11.79 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		
+1.20D	0.056	PASS	11.79 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		
+0.90D	0.042	PASS	11.79 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		
+1.20D+L+E	0.978	PASS	11.79 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		
+0.90D+E	0.909	PASS	11.63 ft	1.14	1.00	103.32	0.00	0.000	PASS	0.00 ft		

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8 - 8C&8D BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x106**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 19.750 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis

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Hadi Tabatabaee
BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 19.750 ft, E = 917.80 k

BENDING LOADS . . .

W1: Lat. Uniform Load from 0.0-->4.0 ft creating Mx-x, D = 0.1070, L = 0.10 k/ft

W3: Lat. Uniform Load from 4.0-->19.750 ft creating Mx-x, D = 0.0350 k/ft

P1: Lat. Point Load at 4.0 ft creating Mx-x, D = 1.566, L = 2.10 k

P2: Lat. Point Load at 9.875 ft creating Mx-x, D = 16.716, L = 22.433 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9810** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 10.074 ft
 At maximum location values are . . .
 Pu 917.80 k
 0.9 * Pn 1,210.47 k
 Mu-x 216.157 k-ft
 0.9 * Mn-x : 862.50 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 226.875 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 20.732 k
 Bottom along Y-Y 23.462 k

Maximum Load Deflections . . .
 Along Y-Y 0.2119 in at 9.941ft above base
 for load combination : +D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.141	PASS	9.81 ft	1.26	1.00	26.50	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.334	PASS	9.81 ft	1.26	1.00	26.50	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.254	PASS	9.81 ft	1.26	1.00	26.50	0.00	0.000	PASS	0.00 ft
+1.20D	0.121	PASS	9.81 ft	1.26	1.00	26.50	0.00	0.000	PASS	0.00 ft
+0.90D	0.091	PASS	9.81 ft	1.26	1.00	26.50	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.981	PASS	10.07 ft	1.65	1.00	44.55	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.838	PASS	10.07 ft	1.65	1.00	44.55	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8 - 8A.1&8D.9 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x76**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 25.080 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 25.080 ft, E = 218.50 k

BENDING LOADS . . .

- W1: Lat. Uniform Load creating Mx-x, D = 0.0350 k/ft
- P1: Lat. Point Load at 4.0 ft creating Mx-x, D = 17.127, L = 12.464 k
- P2: Lat. Point Load at 8.417 ft creating Mx-x, D = 4.233, L = 5.80 k
- P3: Lat. Point Load at 13.810 ft creating Mx-x, D = 17.873, L = 13.187 k
- P4: Lat. Point Load at 19.330 ft creating Mx-x, D = 4.617, L = 6.237 k
- P5: Lat. Point Load at 23.581 ft creating Mx-x, D = 16.483, L = 12.141 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8176** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 13.802 ft
 At maximum location values are . . .
 Pu 218.50 k
 0.9 * Pn 834.79 k
 Mu-x 382.247 k-ft
 0.9 * Mn-x : 611.25 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 158.250 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 60.907 k
 Bottom along Y-Y 50.133 k

Maximum Load Deflections . . .

Along Y-Y 0.9744 in at 12.624ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.432	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.778	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.625	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft
+1.20D	0.370	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft
+0.90D	0.278	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.818	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.509	PASS	13.80 ft	1.07	1.00	50.17	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8 - 86 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W27x146**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 20.0 ft - K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 20.0 ft, E = 740.50 k

BENDING LOADS . . .

Lat. Uniform Load creating Mx-x, D = 0.7610, L = 0.4730 k/ft

Lat. Point Load at 7.440 ft creating Mx-x, D = 39.393, L = 24.371 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.7779** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 7.517 ft
 At maximum location values are . . .
 Pu 740.50 k
 0.9 * Pn 1,288.48 k
 Mu-x 397.727 k-ft
 0.9 * Mn-x : 1,740.0 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 366.375 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 36.060 k
 Bottom along Y-Y 52.384 k

Maximum Load Deflections . . .

Along Y-Y 0.1309 in at 9.530ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.176	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.275	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.229	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft
+1.20D	0.151	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft
+0.90D	0.113	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.778	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.675	PASS	7.52 ft	1.34	1.00	75.00	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8 - 8E.9 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W21x62**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 25.650 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
 DRAG: Axial Load at 25.650 ft, Yecc = 10.50 in, E = 141.50 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4707** : 1
 Load Combination E Only
 Location of max. above base 21.346 ft
 At maximum location values are . . .
 Pu 141.50 k
 0.9 * Pn 527.64 k
 Mu-x -103.039 k-ft
 0.9 * Mn-x : 452.137 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 81.375 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination E Only
 Location of max. above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 4.827 k
 Bottom along Y-Y 4.827 k

Maximum Load Deflections . . .
 Along Y-Y -0.2362 in at 14.977ft above base
 for load combination :E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
E Only	0.000	PASS	0.00 ft	0.00	0.00	0.00	0.00	0.000	PASS	0.00 ft	
	0.471	PASS	21.35 ft	1.00	1.00	76.56	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8roof - 8E.9 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x40**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 25.650 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns :
 X-X (width) axis :
 Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 25.650 ft, Yecc = 8.950 in, E = 54.250 k

BENDING LOADS . . .

P1: Lat. Point Load at 1.522 ft creating Mx-x, D = 0.2030, LR = 0.1290, W = 0.250 k

P2: Lat. Point Load at 9.935 ft creating Mx-x, D = 7.869, LR = 5.105 k

P3: Lat. Point Load at 21.228 ft creating Mx-x, D = 4.274, LR = 2.755, E = 0.250 k

W1: Lat. Uniform Load from 0.0-->1.523 ft creating Mx-x, D = 0.090, LR = 0.0360 k/ft

W4: Lat. Uniform Load from 1.523-->9.934 ft creating Mx-x, D = 0.5370, LR = 0.3310 k/ft

W5: Lat. Uniform Load from 9.934-->25.645 ft creating Mx-x, D = 0.5280, LR = 0.3390 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9309** : 1
 Load Combination +1.20D+1.60Lr+0.50W
 Location of max.above base 10.157 ft
 At maximum location values are . . .
 Pu 0.0 k
 0.9 * Pn 230.960 k
 Mu-x 214.672 k-ft
 0.9 * Mn-x : 230.604 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 37.50 k-ft

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 21.945 k
 Bottom along Y-Y 19.504 k

Maximum Load Deflections . . .
 Along Y-Y 1.018 in at 12.739ft above base
 for load combination :+D+Lr
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.585	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+0.50Lr	0.636	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D	0.502	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+1.60Lr	0.930	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+1.60Lr+0.50W	0.931	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+0.50W	0.502	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+0.50Lr+W	0.637	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+W	0.503	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+0.90D+W	0.377	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+1.20D+E	0.621	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.509	PASS	10.16 ft	1.13	1.00	106.71	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8roof - 8D.9 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 21.50 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 9.5 ft K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 21.50 ft, Yecc = 9.050 in, E = 272.0 k

BENDING LOADS . . .

P1: Lat. Point Load at 12.167 ft creating Mx-x, D = 1.905, LR = 3.241 k
 P2: Lat. Point Load at 21.833 ft creating Mx-x, D = 1.680, LR = 2.823 k
 W1: Lat. Uniform Load creating Mx-x, D = 0.0890, LR = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9553** : 1
 Load Combination +0.90D+E
 Location of max.above base 21.356 ft
 At maximum location values are . . .
 Pu 272.0 k
 0.9 * Pn 518.51 k
 Mu-x -203.493 k-ft
 0.9 * Mn-x : 420.0 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 69.375 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 10.394 k
 Bottom along Y-Y 9.541 k

Maximum Load Deflections . . .

Along Y-Y -0.4108 in at 12.554ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.050	PASS	12.12 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	
+1.20D+0.50Lr	0.070	PASS	12.12 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	
+1.20D	0.043	PASS	12.12 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60Lr	0.130	PASS	12.12 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	
+0.90D	0.032	PASS	12.12 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	
+1.20D+E	0.955	PASS	21.36 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.955	PASS	21.36 ft	1.77	1.00	68.26	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8roof - 8A.1 BEAM1 [RHO NOT INCLUDED]

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

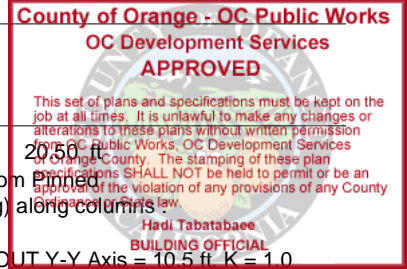
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 20.50 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 10.5 ft K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 20.50 ft, Yecc = 9.050 in, E = 261.0 k

BENDING LOADS . . .

P1: Lat. Point Load at 12.167 ft creating Mx-x, D = 1.905, LR = 3.241 k
 P2: Lat. Point Load at 21.833 ft creating Mx-x, D = 1.680, LR = 2.823 k
 W1: Lat. Uniform Load creating Mx-x, D = 0.0890, LR = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9594** : 1
 Load Combination +1.20D+E
 Location of max.above base 20.50 ft
 At maximum location values are . . .
 Pu 261.0 k
 0.9 * Pn 480.799 k
 Mu-x -196.838 k-ft
 0.9 * Mn-x : 420.0 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 69.375 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 9.602 k
 Bottom along Y-Y 9.602 k

Maximum Load Deflections . . .

Along Y-Y -0.3584 in at 11.970ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.046	PASS	12.11 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	
+1.20D+0.50Lr	0.065	PASS	12.11 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	
+1.20D	0.040	PASS	12.11 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60Lr	0.120	PASS	12.11 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	
+0.90D	0.030	PASS	12.11 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	
+1.20D+E	0.959	PASS	20.50 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.959	PASS	20.50 ft	1.77	1.00	75.45	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8roof - 86 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x89**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 20.0 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 20.0 ft. K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 20.0 ft, Yecc = 8.40 in, E = 371.50 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9714** : 1
 Load Combination E Only
 Location of max. above base 19.866 ft
 At maximum location values are . . .
 Pu 371.50 k
 0.9 * Pn 597.74 k
 Mu-x -258.305 k-ft
 0.9 * Mn-x : 656.25 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 180.375 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max. above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 13.003 k
 Bottom along Y-Y 13.003 k

Maximum Load Deflections . . .
 Along Y-Y -0.3085 in at 11.678ft above base
 for load combination :E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
E Only	0.000	PASS	0.00 ft	0.00	0.00	0.00	0.00	0.000	PASS	0.00 ft
E Only	0.971	PASS	19.87 ft	1.66	1.00	96.39	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 8 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 8roof - 82 BEAM2 (RHO NOT INCLUDED)

Permits: BNR21-0240, BNR21-0241, BNR24-0242, BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848, ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x77**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 11 ft, K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
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Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 24.0 ft, E = 634.0 k

BENDING LOADS . . .

W1: Lat. Uniform Load creating Mx-x, D = 0.730, LR = 0.1870 k/ft

W3: Lat. Uniform Load from 11.395-->23.416 ft creating Mx-x, D = 0.2880, LR = 0.4760 k/ft

P1: Lat. Point Load at 11.395 ft creating Mx-x, D = 6.670, LR = 6.088 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9637** : 1
 Load Combination +1.20D+E
 Location of max.above base 11.436 ft
 At maximum location values are . . .
 Pu 634.0 k
 0.9 * Pn 825.34 k
 Mu-x 123.732 k-ft
 0.9 * Mn-x : 562.50 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 154.125 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 23.722 k
 Bottom along Y-Y 20.228 k

Maximum Load Deflections . . .

Along Y-Y 0.5098 in at 12.081ft above base
 for load combination :+D+Lr
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.257	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	
+1.20D+0.50Lr	0.280	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	
+1.20D	0.220	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60Lr	0.413	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	
+0.90D	0.165	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	
+1.20D+E	0.964	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.915	PASS	11.44 ft	1.22	1.00	53.44	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 9C.9 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W24x94**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 28.750 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns :
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis

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OC Development Services
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 Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 28.750 ft, Yecc = 12.150 in, E = 75.80 k

BENDING LOADS . . .

- W1: Lat. Uniform Load creating Mx-x, D = 0.0840 k/ft
- P2: Lat. Point Load at 3.50 ft creating Mx-x, D = 28.453, L = 26.689 k
- P3: Lat. Point Load at 12.0 ft creating Mx-x, D = 9.826, L = 12.978 k
- P4: Lat. Point Load at 13.330 ft creating Mx-x, D = 19.415, L = 14.586 k
- P5: Lat. Point Load at 20.375 ft creating Mx-x, D = 9.872, L = 12.980 k
- P6: Lat. Point Load at 23.105 ft creating Mx-x, D = 18.950, L = 14.252 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9901** : 1
 Load Combination +1.20D+1.60L
 Location of max.above base 13.314 ft
 At maximum location values are . . .
 Pu 0.0 k
 0.9 * Pn 957.57 k
 Mu-x 943.09 k-ft
 0.9 * Mn-x : 952.50 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 140.625 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 76.081 k
 Bottom along Y-Y 94.335 k

Maximum Load Deflections . . .

Along Y-Y 1.250 in at 14.471ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.517	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.990	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.785	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft
+1.20D	0.443	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft
+0.90D	0.332	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.787	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.335	PASS	13.31 ft	1.23	1.00	59.21	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building&Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 9C.9 BEAM2

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

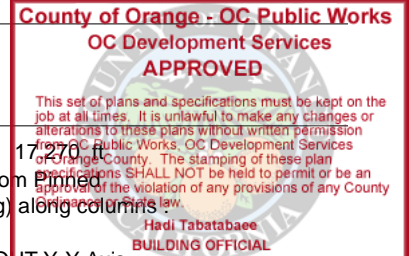
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W21x44**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 17.270 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 17.270 ft, Yecc = 10.350 in, E = 235.80 k

BENDING LOADS . . .

- W1: Lat. Uniform Load creating Mx-x, D = 0.0260 k/ft
- P1: Lat. Point Load at 4.125 ft creating Mx-x, D = 15.550, L = 11.784 k
- P2: Lat. Point Load at 7.979 ft creating Mx-x, D = 9.250, L = 12.369 k
- P3: Lat. Point Load at 10.899 ft creating Mx-x, D = 12.514, L = 9.369 k
- P4: Lat. Point Load at 15.958 ft creating Mx-x, D = 10.813, L = 14.289 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9819** : 1
 Load Combination +0.90D+E
 Location of max.above base 17.270 ft
 At maximum location values are . . .
 Pu 235.80 k
 0.9 * Pn 494.786 k
 Mu-x -203.378 k-ft
 0.9 * Mn-x : 357.750 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 38.220 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 53.747 k
 Bottom along Y-Y 42.640 k

Maximum Load Deflections . . .

Along Y-Y 0.5007 in at 8.693ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.464	PASS	8.00 ft	1.10	1.00	36.70	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.914	PASS	8.00 ft	1.10	1.00	36.70	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.720	PASS	8.00 ft	1.10	1.00	36.70	0.00	0.000	PASS	0.00 ft
+1.20D	0.398	PASS	8.00 ft	1.10	1.00	36.70	0.00	0.000	PASS	0.00 ft
+0.90D	0.298	PASS	8.00 ft	1.10	1.00	36.70	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.982	PASS	17.27 ft	1.57	1.00	12.50	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.982	PASS	17.27 ft	1.57	1.00	12.50	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 93 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

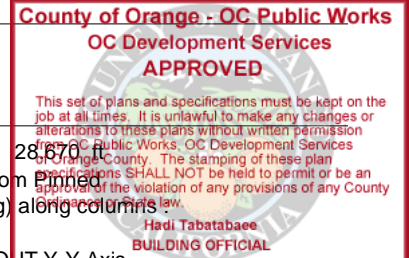
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W21x83**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 28.670 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 28.670 ft, Yecc = 10.70 in, E = 252.50 k

BENDING LOADS . . .

P1: Lat. Point Load at 18.670 ft creating Mx-x, D = 1.390, L = 1.779 k
 W1: Lat. Uniform Load from 0.0-->18.670 ft creating Mx-x, D = 0.8150, L = 1.052 k/ft
 W3: Lat. Uniform Load from 18.670-->28.670 ft creating Mx-x, D = 0.5050, L = 0.6190 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8594** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 10.390 ft
 At maximum location values are . . .
 Pu 252.50 k
 0.9 * Pn 367.774 k
 Mu-x 109.091 k-ft
 0.9 * Mn-x : 561.21 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 114.375 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 23.650 k
 Bottom along Y-Y 26.573 k

Maximum Load Deflections . . .

Along Y-Y 0.5278 in at 14.431ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.207	PASS	14.24 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60L	0.480	PASS	14.24 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	
+1.20D+L	0.367	PASS	14.24 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	
+1.20D	0.177	PASS	14.24 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	
+0.90D	0.133	PASS	14.24 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	
+1.20D+L+E	0.859	PASS	10.39 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.812	PASS	18.66 ft	1.17	1.00	122.43	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 93 BEAM2

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

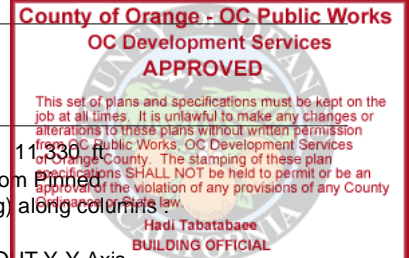
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W21x83**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 11.330 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 11.330 ft, E = 589.30 k

BENDING LOADS . . .

P1: Lat. Point Load at 10.330 ft creating Mx-x, D = 0.4220, L = 0.5170 k
 W1: Lat. Uniform Load from 0.0-->10.330 ft creating Mx-x, D = 0.7790, L = 1.052 k/ft
 W3: Lat. Uniform Load from 10.330-->11.330 ft creating Mx-x, D = 0.4810, L = 0.6350 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.7898** : 1
 Load Combination +1.20D+L+E
 Location of max.above base 5.703 ft
 At maximum location values are . . .
 Pu 589.30 k
 0.9 * Pn 785.06 k
 Mu-x 32.199 k-ft
 0.9 * Mn-x : 731.90 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 114.375 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 10.545 k
 Bottom along Y-Y 10.424 k

Maximum Load Deflections . . .

Along Y-Y 0.01308 in at 5.703ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.024	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60L	0.058	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	
+1.20D+L	0.044	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	
+1.20D	0.021	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	
+0.90D	0.016	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	
+1.20D+L+E	0.790	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.764	PASS	5.70 ft	1.12	1.00	67.74	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 96.8 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

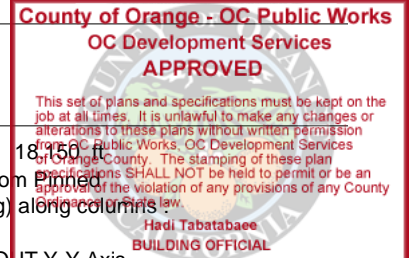
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x55**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 18.150 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 18.150 ft, Yecc = 9.050 in, E = 255.0 k

BENDING LOADS . . .

- P1: Lat. Point Load at 6.167 ft creating Mx-x, D = 0.8110, L = 0.6220 k
- P2: Lat. Point Load at 8.167 ft creating Mx-x, D = 0.0560 k
- P3: Lat. Point Load at 8.646 ft creating Mx-x, D = 4.230, L = 5.413 k
- W1: Lat. Uniform Load from 0.0-->6.166 ft creating Mx-x, D = 0.2920, L = 0.3820 k/ft
- W3: Lat. Uniform Load from 6.166-->8.166 ft creating Mx-x, D = 0.6770, L = 0.6980 k/ft
- W4: Lat. Uniform Load from 8.166-->8.645 ft creating Mx-x, D = 0.8030, L = 0.7930 k/ft
- W5: Lat. Uniform Load from 8.645-->18.145 ft creating Mx-x, D = 0.9070, L = 0.590 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8989** : 1
 Load Combination +0.90D+E
 Location of max.above base 18.150 ft
 At maximum location values are . . .
 Pu 255.0 k
 0.9 * Pn 518.36 k
 Mu-x -192.313 k-ft
 0.9 * Mn-x : 420.0 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 69.375 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 21.296 k
 Bottom along Y-Y 15.277 k

Maximum Load Deflections . . .

Along Y-Y -0.2745 in at 10.598ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.171	PASS	8.65 ft	1.01	1.00	3.44	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.336	PASS	8.65 ft	1.01	1.00	3.44	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.265	PASS	8.65 ft	1.01	1.00	3.44	0.00	0.000	PASS	0.00 ft
+1.20D	0.146	PASS	8.65 ft	1.01	1.00	3.44	0.00	0.000	PASS	0.00 ft
+0.90D	0.110	PASS	8.65 ft	1.01	1.00	3.44	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.899	PASS	18.15 ft	1.35	1.00	68.29	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.899	PASS	18.15 ft	1.35	1.00	68.29	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 9B.1 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

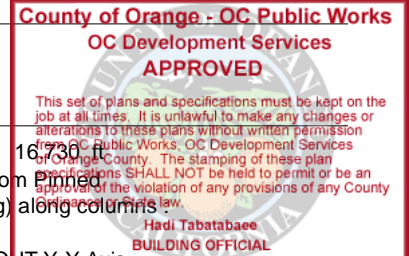
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x35**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 16.730 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 16.730 ft, E = 7.80 k

BENDING LOADS . . .

- P2: Lat. Point Load at 4.813 ft creating Mx-x, D = 4.110, L = 3.360 k
- P3: Lat. Point Load at 6.396 ft creating Mx-x, D = 12.694, L = 16.834 k
- P4: Lat. Point Load at 12.813 ft creating Mx-x, D = 4.333, L = 3.685 k
- W1: Lat. Uniform Load creating Mx-x, D = 0.0220 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8608** : 1
 Load Combination +1.20D+1.60L
 Location of max.above base 6.40 ft
 At maximum location values are . . .
 Pu 0.0 k
 0.9 * Pn 395.536 k
 Mu-x 214.659 k-ft
 0.9 * Mn-x : 249.375 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 30.225 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 19.763 k
 Bottom along Y-Y 25.622 k

Maximum Load Deflections . . .

Along Y-Y 0.4444 in at 7.972ft above base
 for load combination : +D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.391	PASS	6.40 ft	1.08	1.00	15.57	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.861	PASS	6.40 ft	1.08	1.00	15.57	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.664	PASS	6.40 ft	1.08	1.00	15.57	0.00	0.000	PASS	0.00 ft
+1.20D	0.335	PASS	6.40 ft	1.08	1.00	15.57	0.00	0.000	PASS	0.00 ft
+0.90D	0.251	PASS	6.40 ft	1.08	1.00	15.57	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.673	PASS	6.40 ft	1.08	1.00	15.57	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.261	PASS	6.51 ft	1.23	1.00	63.12	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 9B.1 BEAM2

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

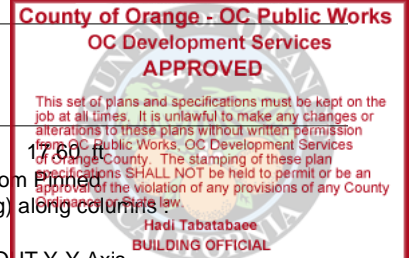
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x35**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis :
 Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 17.60 ft, Yecc = 8.850 in, E = 191.30 k

BENDING LOADS . . .

- P1: Lat. Point Load at 2.583 ft creating Mx-x, D = 4.356, L = 3.785 k
- P2: Lat. Point Load at 7.979 ft creating Mx-x, D = 9.803, L = 12.999 k
- P3: Lat. Point Load at 10.583 ft creating Mx-x, D = 4.150, L = 3.578 k
- P4: Lat. Point Load at 15.958 ft creating Mx-x, D = 9.770, L = 12.893 k
- W1: Lat. Uniform Load creating Mx-x, D = 0.0220 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9774** : 1
 Load Combination +0.90D+E
 Location of max.above base 17.482 ft
 At maximum location values are . . .
 Pu 191.30 k
 0.9 * Pn 395.099 k
 Mu-x -138.369 k-ft
 0.9 * Mn-x : 249.375 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 30.225 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 36.921 k
 Bottom along Y-Y 24.80 k

Maximum Load Deflections . . .

Along Y-Y 0.5335 in at 8.859ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.394	PASS	8.03 ft	1.29	1.00	53.08	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.869	PASS	8.03 ft	1.29	1.00	53.08	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.669	PASS	8.03 ft	1.29	1.00	53.08	0.00	0.000	PASS	0.00 ft
+1.20D	0.337	PASS	8.03 ft	1.29	1.00	53.08	0.00	0.000	PASS	0.00 ft
+0.90D	0.253	PASS	8.03 ft	1.29	1.00	53.08	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.967	PASS	17.48 ft	1.59	1.00	16.15	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.977	PASS	17.48 ft	1.59	1.00	16.15	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building&Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 96.8 BEAM1 (WT6X)

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

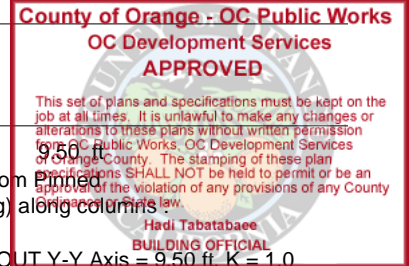
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **WT6x53**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 9.50 ft. K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 9.50 ft, E = 102.0 k

BENDING LOADS . . .

W5: Lat. Uniform Load from 0.0-->9.50 ft creating Mx-x, D = 0.9070, L = 0.590 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8835** : 1
 Load Combination +1.20D+1.60L
 Location of max.above base 4.718 ft
 At maximum location values are . . .
 Pu 0.0 k
 0.9 * Pn 556.07 k
 Mu-x 22.927 k-ft
 0.9 * Mn-x : 25.950 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 0.0 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 7.111 k
 Bottom along Y-Y 7.111 k

Maximum Load Deflections . . .
 Along Y-Y 0.2634 in at 4.782ft above base
 for load combination :+D+L
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios							
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location		
+1.40D	0.552	PASS	4.72 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		
+1.20D+1.60L	0.884	PASS	4.72 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		
+1.20D+L	0.730	PASS	4.72 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		
+1.20D	0.473	PASS	4.78 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		
+0.90D	0.355	PASS	4.72 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		
+1.20D+L+E	0.821	PASS	4.72 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		
+0.90D+E	0.447	PASS	4.72 ft	1.14	1.00	36.66	0.00	0.000	PASS	0.00 ft		

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building&Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 9d BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x26**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 10.710 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 10.710 ft, K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
 DRAG: Axial Load at 10.710 ft, E = 118.90 k
 BENDING LOADS . . .
 W1: Lat. Uniform Load creating Mx-x, D = 0.10 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9151** : 1
 Load Combination +1.20D+E
 Location of max.above base 5.319 ft
 At maximum location values are . . .
 Pu 118.90 k
 0.9 * Pn 131.764 k
 Mu-x 1.720 k-ft
 0.9 * Mn-x : 119.768 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 20.550 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 0.5355 k
 Bottom along Y-Y 0.5355 k

Maximum Load Deflections . . .
 Along Y-Y 0.003428 in at 5.391 ft above base
 for load combination : D Only
 Along X-X 0.0 in at 0.0 ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios							
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location		
+1.40D	0.017	PASS	5.32 ft	1.14	1.00	114.75	0.00	0.000	PASS	0.00 ft		
+1.20D	0.014	PASS	5.32 ft	1.14	1.00	114.75	0.00	0.000	PASS	0.00 ft		
+0.90D	0.011	PASS	5.32 ft	1.14	1.00	114.75	0.00	0.000	PASS	0.00 ft		
+1.20D+E	0.915	PASS	5.32 ft	1.14	1.00	114.75	0.00	0.000	PASS	0.00 ft		
+0.90D+E	0.912	PASS	5.32 ft	1.14	1.00	114.75	0.00	0.000	PASS	0.00 ft		

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building&Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 91.1 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

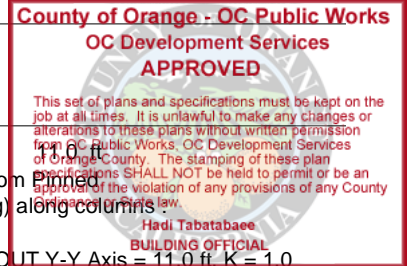
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x40**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 11.0 ft. K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 11.0 ft, Yecc = 8.950 in, E = 130.0 k

BENDING LOADS . . .

Lat. Uniform Load creating Mx-x, D = 0.1740, L = 0.60 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8325** : 1
 Load Combination +0.90D+E
 Location of max.above base 11.0 ft
 At maximum location values are . . .
 Pu 130.0 k
 0.9 * Pn 241.021 k
 Mu-x -96.958 k-ft
 0.9 * Mn-x : 294.0 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 37.50 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 8.814 k
 Bottom along Y-Y 8.814 k

Maximum Load Deflections . . .
 Along Y-Y -0.07391 in at 6.423ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.013	PASS	5.46 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft
+1.20D+1.60L	0.060	PASS	5.54 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft
+1.20D+L	0.042	PASS	5.46 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft
+1.20D	0.011	PASS	5.46 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft
+0.90D	0.008	PASS	5.54 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft
+1.20D+L+E	0.833	PASS	11.00 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft
+0.90D+E	0.833	PASS	11.00 ft	1.71	1.00	103.94	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPW AzarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 - 9d & 9b

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

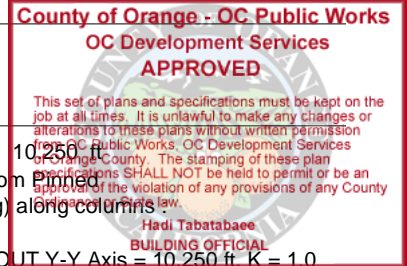
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W14x38**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 10.250 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 10.250 ft, K = 1.0
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .
 DRAG: Axial Load at 10.250 ft, E = 297.30 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9348** : 1
 Load Combination E Only
 Location of max. above base 0.0 ft
 At maximum location values are . . .
 Pu 297.30 k
 0.9 * Pn 318.029 k
 Mu-x 0.0 k-ft
 0.9 * Mn-x : 191.967 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 45.375 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max. above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 0.0 k
 Bottom along Y-Y 0.0 k

Maximum Load Deflections . . .
 Along Y-Y 0.0 in at 0.0ft above base
 for load combination :
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
E Only	0.000	PASS	0.00 ft	0.00	0.00	0.00	0.00	0.000	PASS	0.00 ft
E Only	0.935	PASS	0.00 ft	1.00	1.00	79.35	0.00	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPW AzarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9 roof - 9C.9 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

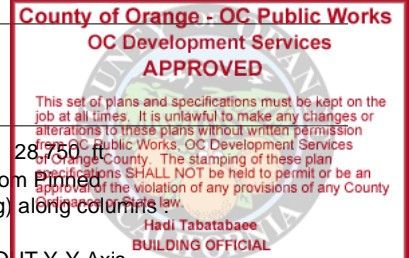
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W21x48**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 28.750 ft
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 28.750 ft, Yecc = 10.30 in, E = 50.0 k

BENDING LOADS . . .

P2: Lat. Point Load at 3.625 ft creating Mx-x, D = 5.407, LR = 5.783 k
 P3: Lat. Point Load at 12.0 ft creating Mx-x, D = 5.407, LR = 5.785 k
 P4: Lat. Point Load at 20.375 ft creating Mx-x, D = 5.399, LR = 5.797 k
 W3: Lat. Uniform Load creating Mx-x, D = 0.0980, LR = 0.0750 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4481** : 1
 Load Combination +1.20D+Lr+E
 Location of max.above base 11.963 ft
 At maximum location values are . . .
 Pu 50.0 k
 0.9 * Pn 441.272 k
 Mu-x 155.778 k-ft
 0.9 * Mn-x : 397.951 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 55.227 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 16.504 k
 Bottom along Y-Y 22.048 k

Maximum Load Deflections . . .
 Along Y-Y 0.830 in at 14.279ft above base
 for load combination : +D+Lr
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location					Stress Ratio	Status	Location
+1.20D+Lr+E	0.448	PASS	11.96 ft	1.22	1.00	60.54	12.20	0.000	PASS	0.00 ft
+0.90D+E	0.188	PASS	11.96 ft	1.22	1.00	60.54	12.20	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9roof - 9C.9 BEAM2

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x35**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 17.270 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 17.270 ft, Yecc = 8.850 in, E = 142.50 k

BENDING LOADS . . .

P1: Lat. Point Load at 7.979 ft creating Mx-x, D = 5.314, LR = 6.743 k
 P2: Lat. Point Load at 15.958 ft creating Mx-x, D = 5.667, LR = 7.362 k
 W1: Lat. Uniform Load creating Mx-x, D = 0.0760, LR = 0.0910 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8264** : 1
 Load Combination +0.90D+E
 Location of max.above base 15.995 ft
 At maximum location values are . . .
 Pu 142.50 k
 0.9 * Pn 277.569 k
 Mu-x -87.812 k-ft
 0.9 * Mn-x : 249.375 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 30.225 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 19.052 k
 Bottom along Y-Y 8.918 k

Maximum Load Deflections . . .

Along Y-Y -0.2370 in at 10.084ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.163	PASS	8.00 ft	1.61	1.00	78.48	0.00	0.000	PASS	0.00 ft	
+1.20D+0.50Lr	0.213	PASS	8.00 ft	1.61	1.00	78.48	0.00	0.000	PASS	0.00 ft	
+1.20D	0.140	PASS	8.00 ft	1.61	1.00	78.48	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60Lr	0.375	PASS	8.00 ft	1.61	1.00	78.48	0.00	0.000	PASS	0.00 ft	
+0.90D	0.105	PASS	8.00 ft	1.61	1.00	78.48	0.00	0.000	PASS	0.00 ft	
+1.20D+E	0.815	PASS	16.00 ft	1.30	1.00	78.48	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.826	PASS	16.00 ft	1.30	1.00	78.48	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9roof - 9B.1 BEAMB

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x50**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis

County of Orange - OC Public Works
OC Development Services
APPROVED

This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County law.
 Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 17.60 ft, Yecc = 9.0 in, E = 245.0 k

BENDING LOADS . . .

P1: Lat. Point Load at 7.979 ft creating Mx-x, D = 5.632, LR = 7.025 k
 P2: Lat. Point Load at 15.958 ft creating Mx-x, D = 6.039, LR = 7.511 k
 W1: Lat. Uniform Load creating Mx-x, D = 0.0760, LR = 0.0890 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8549** : 1
 Load Combination +0.90D+E
 Location of max.above base 16.064 ft
 At maximum location values are . . .
 Pu 245.0 k
 0.9 * Pn 500.67 k
 Mu-x -155.778 k-ft
 0.9 * Mn-x : 378.750 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 62.250 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 19.476 k
 Bottom along Y-Y 10.440 k

Maximum Load Deflections . . .

Along Y-Y -0.2743 in at 10.277ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
+1.40D	0.118	PASS	8.03 ft	1.62	1.00	58.03	0.00	0.000	PASS	0.00 ft	
+1.20D+0.50Lr	0.153	PASS	8.03 ft	1.62	1.00	58.03	0.00	0.000	PASS	0.00 ft	
+1.20D	0.101	PASS	8.03 ft	1.62	1.00	58.03	0.00	0.000	PASS	0.00 ft	
+1.20D+1.60Lr	0.268	PASS	8.03 ft	1.62	1.00	58.03	0.00	0.000	PASS	0.00 ft	
+0.90D	0.076	PASS	8.03 ft	1.62	1.00	58.03	0.00	0.000	PASS	0.00 ft	
+1.20D+E	0.846	PASS	16.06 ft	1.27	1.00	58.03	0.00	0.000	PASS	0.00 ft	
+0.90D+E	0.855	PASS	16.06 ft	1.27	1.00	58.03	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9roof - 93 BEAMB

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x46**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 28.670 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 28.670 ft, Yecc = 9.050 in, E = 82.50 k

BENDING LOADS . . .

- W1: Lat. Uniform Load from 0.0-->18.670 ft creating Mx-x, D = 0.7080, LR = 0.3950 k/ft
- W3: Lat. Uniform Load from 18.670-->28.670 ft creating Mx-x, D = 0.5920, LR = 0.2690 k/ft
- P1: Lat. Point Load at 4.453 ft creating Mx-x, D = 0.280 k
- P2: Lat. Point Load at 12.793 ft creating Mx-x, D = 0.280 k
- P3: Lat. Point Load at 15.833 ft creating Mx-x, D = 1.229, LR = 0.9720 k
- P4: Lat. Point Load at 18.667 ft creating Mx-x, D = 0.6080, LR = 0.5060 k
- P5: Lat. Point Load at 21.133 ft creating Mx-x, D = 0.280 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.5809** : 1
 Load Combination +1.20D+1.60Lr
 Location of max.above base 15.201 ft
 At maximum location values are . . .
 Pu 0.0 k
 0.9 * Pn 403.203 k
 Mu-x 175.490 k-ft
 0.9 * Mn-x : 302.093 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 43.875 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 16.129 k
 Bottom along Y-Y 17.229 k

Maximum Load Deflections . . .

Along Y-Y 0.9280 in at 14.431ft above base
 for load combination :+D+Lr
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D	0.391	PASS	15.01 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft
+1.20D+0.50Lr	0.412	PASS	15.01 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft
+1.20D	0.335	PASS	15.01 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft
+1.20D+1.60Lr	0.581	PASS	15.20 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft
+0.90D	0.251	PASS	15.01 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft
+1.230D+E	0.422	PASS	12.70 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft
+0.90D+E	0.342	PASS	11.93 ft	1.04	1.00	74.42	13.24	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9roof - 91.1 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W16x26**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Unbraced Length for buckling ABOUT Y-Y Axis = 11.0 ft, K = 1.0
 Y-Y (depth) axis :
 Unbraced Length for buckling ABOUT X-X Axis = 11.0 ft, K = 1.0

County of Orange - OC Public Works
OC Development Services
APPROVED

This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County law.

Hadi Tabatabaee
 BUILDING OFFICIAL

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 11.0 ft, Yecc = 7.850 in, E = 68.30 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.7864** : 1
 Load Combination E Only
 Location of max. above base 11.0 ft
 At maximum location values are . . .
 Pu 68.30 k
 0.9 * Pn 124.908 k
 Mu-x -44.680 k-ft
 0.9 * Mn-x : 165.750 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 20.550 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max. above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .
 Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 4.062 k
 Bottom along Y-Y 4.062 k

Maximum Load Deflections . . .
 Along Y-Y -0.06925 in at 6.423ft above base
 for load combination :E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
E Only	0.000	PASS	0.00 ft	0.00	0.00	0.00	0.00	0.000	PASS	0.00 ft
E Only	0.786	PASS	11.00 ft	1.66	1.00	117.86	21.09	0.000	PASS	0.00 ft

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9roof - 93 BEAMA

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

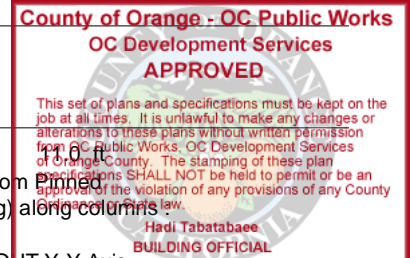
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x46**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height
 Top & Bottom Fixity Pinned
 Brace condition for deflection (buckling) along columns
 X-X (width) axis :
 Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis :
 Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 11.0 ft, Yecc = 9.050 in, E = 192.50 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.8420** : 1
 Load Combination E Only
 Location of max. above base 11.0 ft
 At maximum location values are . . .
 Pu 192.50 k
 0.9 * Pn 450.628 k
 Mu-x -145.177 k-ft
 0.9 * Mn-x : 311.102 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 43.875 k-ft

PASS Maximum Shear Stress Ratio = **0.0** : 1
 Load Combination 0.0
 Location of max. above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 13.198 k
 Bottom along Y-Y 13.198 k

Maximum Load Deflections . . .

Along Y-Y -0.09513 in at 6.423ft above base
 for load combination :E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Cb _x	Cb _y	K _x L _x /R _y	K _y L _y /R _x	Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio					Status	Location	
E Only	0.000	PASS	0.00 ft	0.00	0.00	0.00	0.00	0.000	PASS	0.00 ft	
	0.842	PASS	11.00 ft	1.00	1.00	60.90	0.00	0.000	PASS	0.00 ft	

Steel Column

Project File: bldg 9 - DRAGS.ec6
 Building & Safety: OCPWazarvandB 1/16/2025
 (c) ENERCALC INC 1983-2022

LIC# : KW-06015364, Build:20.22.3.31

KPFF CONSULTING ENGINEERS

DESCRIPTION: Bldg 9roof - 96.8 BEAM1

Permits: BNR21-0240, BNR21-0241, BNR24-0242,
 BNR21-0243, ELE21-0846, ELE21-0847, ELE21-0848,
 ELE21-0849, MEC21-0508, MEC21-0509,

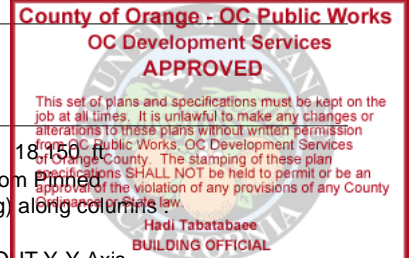
Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combinations Used : ASCE 7-16

General Information

Steel Section Name : **W18x65**
 Analysis Method : Load Resistance Factor
 Steel Stress Grade
 Fy : Steel Yield 50.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 18.150 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition for deflection (buckling) along columns:
 X-X (width) axis : Fully braced against buckling ABOUT Y-Y Axis
 Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

AXIAL LOADS . . .

DRAG: Axial Load at 18.150 ft, Yecc = 9.20 in, E = 317.80 k

BENDING LOADS . . .

- P2: Lat. Point Load at 5.312 ft creating Mx-x, D = 0.0370 k
- P3: Lat. Point Load at 8.646 ft creating Mx-x, D = 3.051, LR = 3.778 k
- W3: Lat. Uniform Load from 0.0-->8.645 ft creating Mx-x, D = 0.1550, LR = 0.2520 k/ft
- W5: Lat. Uniform Load from 8.645-->18.145 ft creating Mx-x, D = 0.10, LR = 0.150 k/ft
- W4: Lat. Uniform Load from 8.166-->8.645 ft creating Mx-x, D = 0.8030, LR = 0.7930 k/ft
- W5: Lat. Uniform Load from 8.645-->18.145 ft creating Mx-x, D = 0.9070, LR = 0.590 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9501** : 1
 Load Combination +1.40D+Lr+E
 Location of max.above base 18.150 ft
 At maximum location values are . . .
 Pu 317.80 k
 0.9 * Pn 616.07 k
 Mu-x -243.647 k-ft
 0.9 * Mn-x : 498.750 k-ft
 Mu-y 0.0 k-ft
 0.9 * Mn-y : 84.375 k-ft

PASS Maximum Shear Stress Ratio **0.0** : 1
 Load Combination 0.0
 Location of max.above base 0.0 ft
 At maximum location values are . . .
 Vu : Applied 0.0 k
 Vn * Phi : Allowable 0.0 k

Maximum Load Reactions . .

Top along X-X 0.0 k
 Bottom along X-X 0.0 k
 Top along Y-Y 18.419 k
 Bottom along Y-Y 13.424 k

Maximum Load Deflections . . .

Along Y-Y -0.2892 in at 10.598ft above base
 for load combination : E Only
 Along X-X 0.0 in at 0.0ft above base
 for load combination :

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Ry	KyLy/Rx	Stress Ratio	Status	Location
+1.40D+Lr+E	0.950	PASS	18.15 ft	1.78	1.00	67.48	15.46	0.000	PASS	0.00 ft

